MEMORANDUM

To:	Oregon Department of Environmental Quality	**Date:**	April 25, 2018
From:	Dale Richwine - REI	**cc:**	Dan Huff Gerald Fisher J.W. Ring Mark P. Strandberg
Subject:	Molalla WWTP Permit Modification Request		

1 SUMMARY

The City of Molalla (the "City" or "Molalla") is submitting this request to modify its NPDES Permit, Permit #101514, (the "Permit"). To aid in this process, a proposed modified permit (the "Modified Permit") was developed to bridge the period of time until the permit for the new wastewater treatment plant can be developed. The Modified Permit is attached to this memorandum. In its permit modification request, Molalla is requesting the following changes to the Permit:

- Allow summer season discharge during the months of May, June and October
- Allow for summer season (May 1 – October 31) mass limits to be based on Willamette River water quality standard of 10-mg/L BOD_5 and 10-mg/L TSS
- Allow for wet season (November 1 – April 30) mass limits to be based on Willamette River water quality standard of 30-mg/L BOD_5 and 30-mg/L TSS
- Allow for summer season (May 1 – October 31) mass limits to be based on the dry weather design flow for the existing treatment plant of 2.3-mgd
- Allow for winter season (November 1 – April 30) mass limits to be based on the wet weather design flow for the existing treatment plant of 4.1-mgd
- Maintains the 350-cfs river flow discharge limitation
- Replaces the 18°C discharge limitation with an Excess Thermal Load allocation for each of the months May, June and October as allowed by the Molalla River TMDL

This technical memorandum provides the technical basis for each of these changes to the permit.

2 DRAFT INTERIM PERMIT

The Modified Permit is based on the design of the current treatment plant and establishes discharge limits as allowed by the Willamette Basin Water Quality Standards specified in OAR 340-041-0340 and the Molalla-Pudding River TMDL.

2.1 BASIS OF FLOWS

The Modified Permit limits that Molalla is requesting are based on the design flows for the City's existing wastewater treatment plant. The 2007 Construction Drawings for Wastewater Treatment Plant Improvements for the City of Molalla, Oregon were the design basis for the last

upgrade to the liquids treatment facilities. The flows from the Design Data Sheet (Drawing G3) are shown in ***Table 1***.

FLOW DATA Existing and Projected Flows	2005	2015	2025
ADWF – Average dry weather flow	0.80 mgd	1.1 mgd	1.4 mgd
MMDWF – Max month dry weather flow	1.28 mgd	1.7 mgd	2.3 mgd
AWWF – Average wet weather flow	1.30 mgd	2.3 mgd	3.0 mgd
MMWWF – Max month wet weather flow	2.04 mgd	3.1 mgd	4.1 mgd
PDF – Peak day flow	7.06 mgd	8.5 mgd	10.3 mgd

Table 1: Current Treatment Plant Design Basis

Using this design data as the basis for existing plant design, the dry season design flow is the 2025 MMDWF of 2.30-mgd and the wet season design flow is the 2025 MMWWF of 4.1-mgd. These values were used to calculate the mass limits for Molalla's requested permit modification.

2.2 Requested Permit Limits

Schedule A of an NPDES permit provides the discharge limits for the permit. The proposed Schedule A for the Modified Permit with the proposed permit limits is provided below. This memorandum provides the rationale for these limits in the following sections.

SCHEDULE A: WASTE DISCHARGE LIMITS

Outfall 001 –Permit Limits

a. May 1 – October 31: During this period the permittee must comply with the limits in Table A1 while discharging to waters of the state.

b. November 1 – April 30: During this period the permittee must comply with the limits in Table A1 while discharging to waters of the state.

c. During the term of this permit, the effluent quality must comply with the limits in the following table:

Table A1: Permit Limits

Parameter	Units	Average Monthly	Average Weekly	Daily Maximum
BOD_5 (May 1 – October 31)	mg/L	10	15	-
	lbs/day	190	290	380
	% removal	85	-	-
TSS (May 1 – October 31)	mg/L	10	15	-
	lbs/day	190	290	380
	% removal	85	-	-
BOD_5 (November 1 – April 30)	mg/L	30	45	-
	lbs/day	1000	1500	2000
	%	85	-	-
TSS (November 1 – April 30)	mg/L	30	45	-
	lbs/day	1000	1500	2000
	%	85	-	-
pH[b]	SU	Between 6.0 and 9.0		
Design Effluent Flow Dry Season	MGD	2.30	-	-
Design Effluent Flow Wet Season	MGD	4.10		
Total Residual Chlorine[c]	mg/L	0.07	-	0.18
E. coli[ad]	MPN/100 ml	126	-	406
Ammonia	mg/L	16.7	-	25.9
Dilution	Discharge may not commence until gauged stream flow exceeds 350-cfs and will cease when the average stream flow for the previous seven-day-period is less than-350-cfs.			
Excess Thermal Load (May)[e]	Shall not exceed a 7-day moving average of the daily excess thermal loads of 77.95 million kcals/day.			
Excess Thermal Load (June)[e]	Shall not exceed a 7-day moving average of the daily excess thermal loads of 72.38 million kcals/day.			
Excess Thermal Load (July, August, September)	No Thermal Load Available – Effluent temperature must be less than 16°C.			
Excess Thermal Load (October)[e]	Shall not exceed a 7-day moving average of the daily excess thermal loads of 42.43 million kcals/day.			

Notes:

a. No single *E. coli* sample may exceed 406 organisms per 100 mL; The permittee may take at least 5 consecutive re-samples at 4-hour intervals beginning within 48 hours after the original sample was taken and the geometric mean of the 5 re-samples is less than or equal to 126 *E. coli* organisms/100 mL to demonstrate compliance with the limit.
b. May not be outside the range of 6.0 to 9.0 S.U.
c. DEQ has established a minimum Quantitation Limit of 0.05 mg/L for Total Residual Chlorine. In cases where the average monthly or maximum daily limit for Total Residual Chlorine is lower than the Quantitation Limit, DEQ will use the reported Quantitation Limit as the compliance evaluation level.
d. Reported as a monthly geometric mean.
e. Refer to Table B3 for formula to calculate Excess Thermal Load.

d. Additional information for the limits in Table A1 above.

i. Average dry weather design flow to the facility equals 2.3 MGD and mass load limits from May 1 to October 31 are based on 2.30 MGD. Average wet weather design flow to the facility equals 4.1 MGD and mass load limits from November 1 to April 30 are based on 4.10 MGD

3 SEASONAL DISCHARGE LIMITATIONS

Molalla is requesting that the seasonal discharge limitation be removed in the Modified Permit, allowing discharge during the summer season (May 1 – October 31) within strict guidelines to ensure river water quality is maintained. The current Permit does not provide the ability to discharge during the summer season months of May 1 – October 31. This restriction has no basis in the Willamette Basin water quality standards nor in the Molalla River TMDL and has no technical relationship to water quality. Water quality will be protected by limiting the plant discharge based on river flow to protect the river's dissolved oxygen levels and by including temperature limits based on Excess Thermal Loads that will provide protection from temperature increase in accordance with the Molalla-Pudding River TMDL.

4 MASS LIMIT INCREASE

The discharge limits in the Molalla's permit should be based on the water quality standards for the Willamette Basin. There is currently no TMDL on the Molalla for dissolved oxygen (DO), but to ensure DO sag downstream of the discharge will not be an issue, the mass limits for this permit are derived as Technology-Based Effluent Limits (TBELs).

4.1 Technology-Based Effluent Limits

TBELs must be met at the outfall. The applicable TBELS for the Molalla WWTP are the more stringent of the federal secondary treatment standards and the Oregon basin standards, adjusted as necessary for the type of treatment system.

Table 2 shows a comparison of the federal secondary treatment standards and Oregon basin standards and also lists bacteria standards. Basin standards and bacteria standards are not strictly speaking TBELs; however, they function as such when they have to be met at the end of the pipe.

Table 2
Comparison of Federal Secondary Treatment and Basin Design Standards

Parameter	Federal Secondary Treatment Standards		Applicable Willamette River Design Standards (OAR 340-041-0340)
	30-Day Average	7-Day Average	30-Day Average
5-Day BOD or cBOD (See note 1)	30 mg/L or 25 mg/L	45 mg/L Or 40 mg/L	During periods of low stream flows (approximately May 1 to October 31): Treatment resulting in monthly average effluent concentrations not to exceed 10 mg/l of BOD and 10 mg/l of SS or equivalent control During the period of high stream flows (approximately November 1 to April 30): A minimum of secondary treatment or equivalent control
TSS	30 mg/L	45 mg/L	
pH	6.0 – 9.0		6.5 – 8.5 Note: Basin standards for pH do not have to be met at the outfall and can instead be met at the edge of the mixing zone.
% Removal	85% BOD_5 and TSS		Not Specified

1. Federal regulations allow the replacement of BOD_5 limits with $CBOD_5$ (Carbonaceous BOD) limits. For wastewaters with significant nitrogen content, basing permit limitations on $CBOD_5$ instead of BOD_5 eliminates the impact of nitrification on discharge limitations and compliance determinations. EPA sets $CBOD_5$ concentration limits 5 mg/L less than BOD_5.

The more stringent of the federal or Oregon TBELS are applicable to the permit. These are summarized in ***Table 3***.

Table 3
Summary of Technology-Based Effluent Limits for the Molalla WWTP

Effluent Parameter	Concentration		Percent Removal	Comments
	Monthly	Weekly		
BOD5	10 mg/L	15 mg/L	85%	Low Stream Flow: approximately May 1 – October 31
BOD5	30 mg/L	45 mg/L	85%	High Stream Flow: approximately November 1 – April 31
TSS	10 mg/L	15 mg/L	85%	Low Stream Flow: approximately May 1 – October 31
TSS	30 mg/L	45 mg/L		High Stream Flow: approximately November 1 – April 31
pH	Must not be outside the range of 6.0 and 9.0			

The limits for BOD_5 and TSS shown in ***Table 3*** are concentration-based limits. The following equation is used to develop the monthly average mass load:

> Monthly Avg. Mass Load = POTW design flow x Conc. - based limit x 8.34 lbs/gal
>
> The weekly average and maximum daily mass loads are developed from the monthly average by multiplying by 1.5 and 2, respectively.

The permittee's low stream flow (summer season) mass load limits for BOD_5 and TSS limits (monthly and weekly average and daily maximum) are based on the current WWTP's average dry weather design flow of 2.3 MGD and a concentration of 10 mg/L. Utilizing the equation presented above, the low stream flow (summer season) calculations for BOD_5 and TSS are:

> Monthly Average: 2.3 MGD x 10 mg/L x 8.34 = 191.8 lbs/day rounded off to 190 lbs/day
> Weekly Average: 190 lbs/day monthly average x 1.5 = 285 lbs/day (rounded to 290 lbs/day)
> Daily Maximum: 190 lbs/day monthly x 2 = 380 lbs/day

The facility's high stream flow (winter season) mass limits (monthly and weekly average and daily maximum) for TSS are based on an average wet weather design flow of 4.1 MGD and a concentration of 30 mg/L. The high stream flow (winter season) calculations are:

> Monthly Average: 4.1 MGD x 30 mg/L x 8.34 = 1025.82 lbs/day (rounded off to 1000 lbs/day)
> Weekly Average: 1000 lbs/day x 1.5 = 1500 lbs/day
> Daily Maximum: 1000 lbs/day monthly x 2 = 2000 lbs/day

All mass load limitations are rounded to two significant figures, consistent with the number of significant figures associated with flow measurements with this facility, and with the accuracy of TSS and BOD_5 measurements of 10 or greater. The rounding to two significant figures resulted in slight reductions to the mass load limitations in the permit modification request.

4.2 Antidegradation Evaluation

This permit modification increases the mass load for BOD_5 and TSS for the high stream flow discharge period (winter season) and allows for discharge during the low stream flow discharge period (summer season) when river flows measured at the Canby station are greater than 350-cfs. An antidegradation evaluation on the impact on river dissolved oxygen from the BOD_5 discharge was performed by Geosyntec showing the river dissolved oxygen staying above 95% saturation through its course to the Canby station. The antidegradation evaluation also considered the

impact of the plant's effluent TSS on river TSS. This evaluation showed no significant impact to the river dissolved oxygen from the increased winter season discharge and the summer season discharge when river flows are greater than 350-cfs. This Technical Memorandum is provided in ***Attachment A***.

4.3 Water Quality-Based Effluent Limits

The water quality based effluent limits for pH, ammonia and chlorine residual remain the same as the current permit. Temperature limits are discussed in a following section.

5 SUMMER SEASON TEMERATURE ALLOCATION

The Molalla River is water quality limited for temperature. The Molalla-Pudding Subbasin Total Maximum Daily Load (TMDL) and Water Quality management Plan (WQMP) was developed in December 2008 to establish temperature allocations to the Molalla River for temperature. Sampling was performed along the river at the sampling locations shown in ***Figure 1***[1]. Sample location Number 13 is at the Molalla River at Hwy 211 bridge which is located at River Mile (RM) 19. The Molalla WWTP discharge is at RM-20.

A detailed evaluation of the TMDL and temperature allocations was performed to determine the temperature allocation available for the Molalla WWTP for discharge during the early and late summer season. This forms the basis for the Excess Thermal Load (ETL) values in the requested Modified Permit.

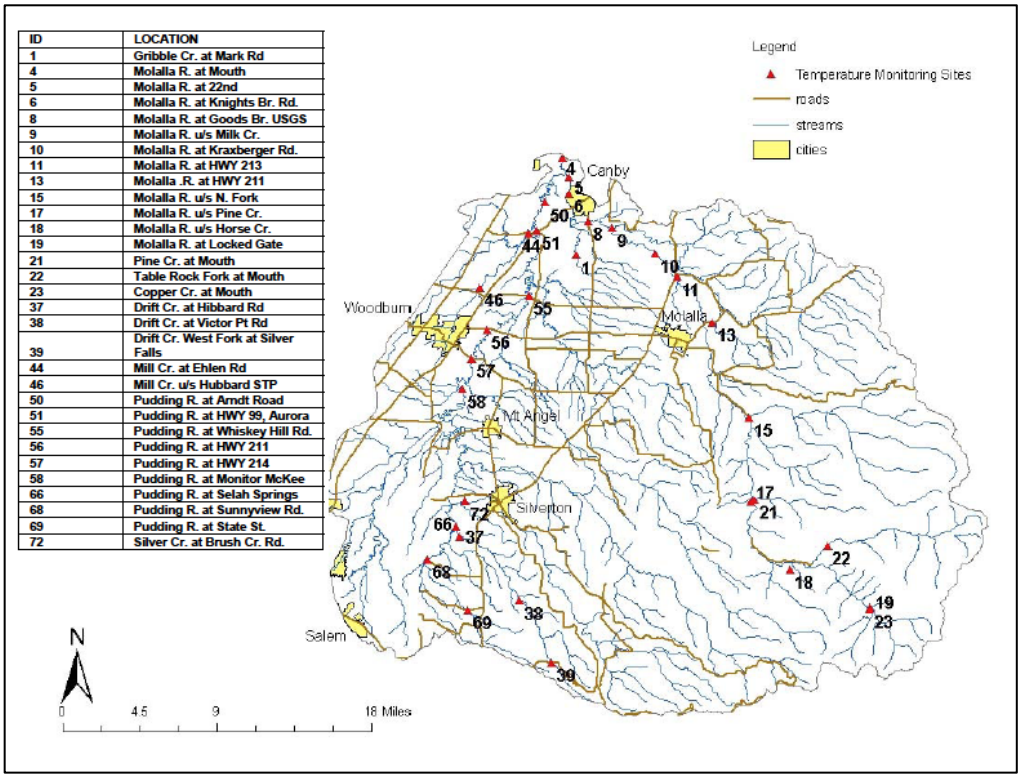

Figure 1: Molalla River Sampling Locations

[1] ODEQ, 2008. Molalla-Pudding Subbasin TMDL & WQMP. December. Figure 2-1

5.1 Water Quality Standards

Both narrative and numeric temperature criteria apply in the Molalla-Pudding Subbasin. Numeric criteria are shown in ***Figures 2[2] and 3[3].*** These figures indicate where the salmonid spawning through fry emergence, salmonid rearing and migration, and the core cold water habitat criteria apply.

The Biologically Based Numeric Criteria (BBNC) for the Molalla River for each of the beneficial uses identified are as follows:

- Salmon and Steelhead Spawning 13.0 °C (55.4 °F) - OAR 340-041-0028((4)(a) - The seven-day-average maximum temperature of a stream identified as having salmon and steelhead spawning may not exceed 13.0 degrees Celsius (55.4 degrees Fahrenheit)
- Core Cold Water Habitat 16.0 °C (60.8 °F) - OAR 340-041-0028((4)(b) - The seven-day-average maximum temperature of a stream identified as having core cold water habitat may not exceed 16.0 degrees Celsius (60.8 degrees Fahrenheit);
- Salmon and Trout Rearing and Migration 18.0°C (64.4°F) - The seven-day-average maximum temperature of a stream identified as having salmon and trout rearing and migration may not exceed 18.0 degrees Celsius (64.4 degrees Fahrenheit);

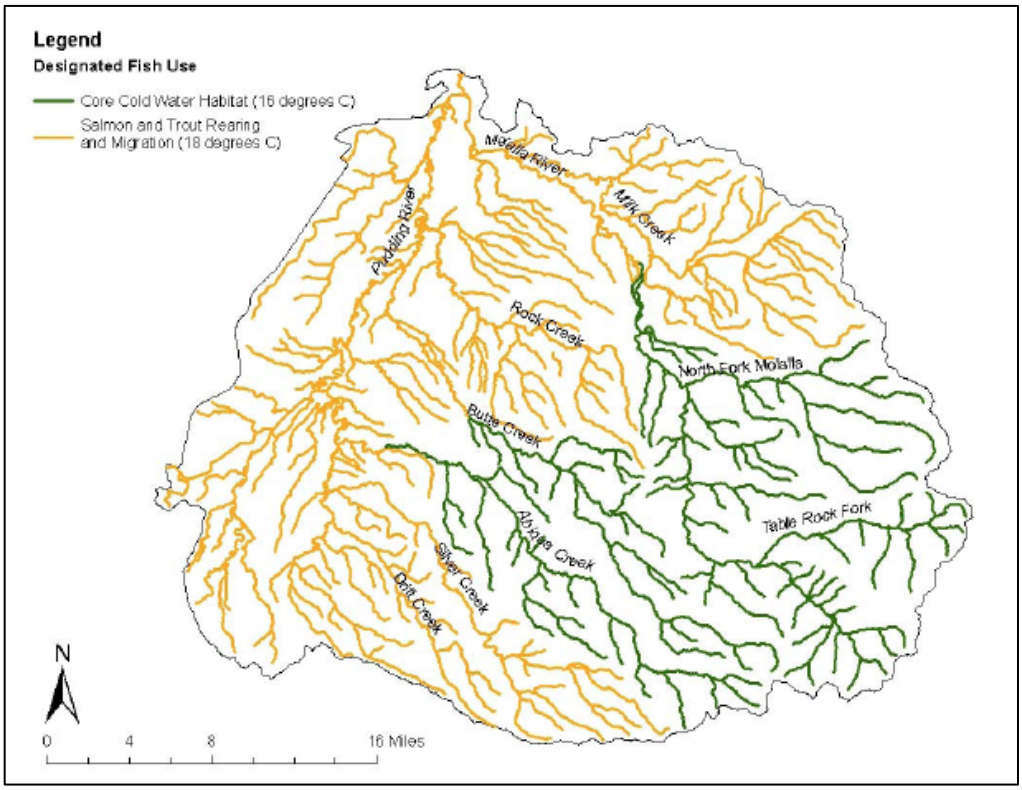

Figure 2: Molalla-Pudding Subbasin Designated Fish Use Distribution of Anadromous Salmonids

[2] ODEQ, 2008. Molalla-Pudding Subbasin TMDL & WQMP. December. Figure 2-4
[3] ODEQ, 2008. Molalla-Pudding Subbasin TMDL & WQMP. December. Figure 2-5

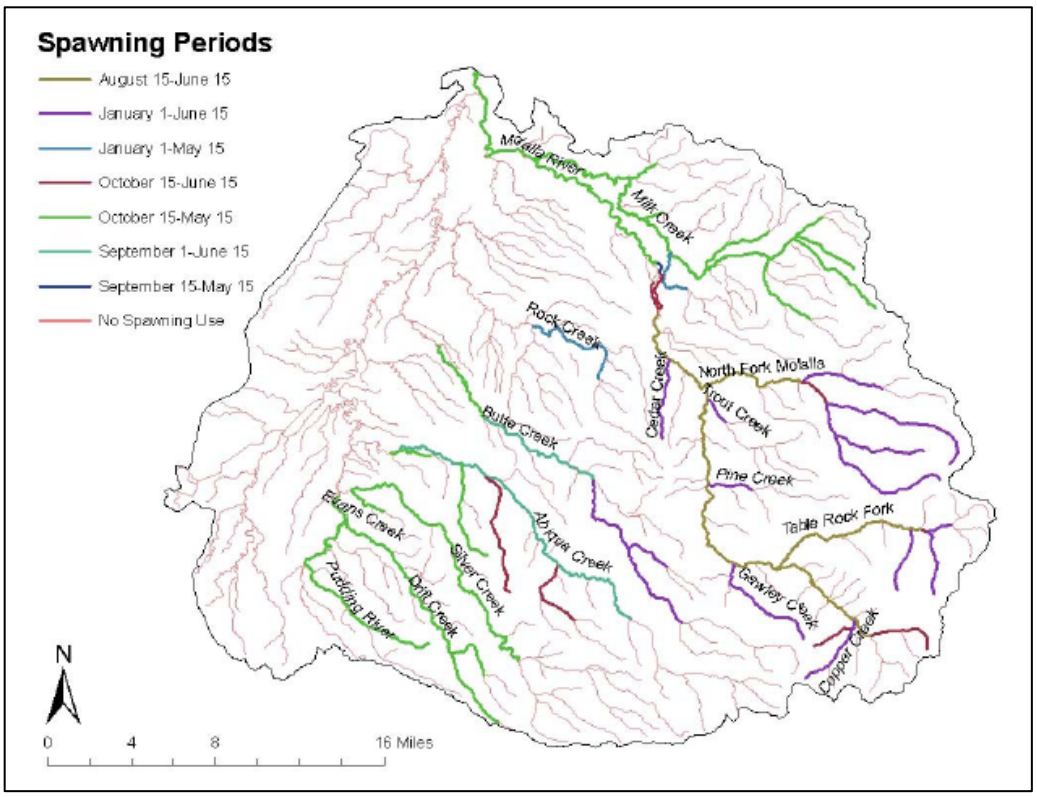

Figure 3: Molalla-Pudding Subbasin Designated Spawning Use Distribution of Anadromous Salmonids

5.2 SEASONAL VARIATION

The temperature during the wet weather season is not an issue as stated in the 2008 Molalla-Pudding Subbasin TMDL(TMDL)[4]:

> This TMDL comprises allocations that apply year-round and explicit WLAs that apply for defined periods within the year. WLAs to point sources on the Pudding River and its tributaries apply from June 1 – September 30. WLAs to point sources on the Molalla River and its tributaries (except for the Pudding River) apply from May 1 – October 31. DEQ refers to these two periods as the critical periods for the Pudding and Molalla portions of the subbasin, respectively. Outside of the critical periods, temperature data collected in 2001, 2002, 2004, 2007 (Molalla River only), and 2008 (Molalla River only) indicate no reasonable potential for temperature criteria to be exceeded. Point sources discharging outside of the applicable critical period are given an implicit heat load allocation sufficient to cover their current conditions of discharge. If future data were to indicate that temperature criteria were exceeded outside of the critical periods, WLAs to existing point sources would be extended through the end of the month of the last temperature criteria exceedance. DEQ would also calculate explicit WLAs for facilities given implicit heat load allocations for current conditions in this TMDL. From mid-June to mid-September, stream temperatures in the Molalla-Pudding Subbasin exceed biologically based rearing and migration criteria. Between late June (potentially as early as mid-May) and mid-October stream temperatures in the Molalla River portion of the subbasin exceed core cold water habitat criteria and spawning criteria. Maximum stream temperatures throughout the subbasin occur from late July to late August.

[4] ODEQ, 2008. Molalla-Pudding Subbasin TMDL & WQMP. December. Pages 2-14 – 2-15

And continued:

> For the Molalla River, although DEQ data were not collected into the latest of four applicable spawning seasons (i.e. after October 15), temperatures collected through October 12 indicate exceedance of the 13 ºC criteria in mid-October is possible. Figure 2 - 16 through Figure 2 - 19 illustrate the summer 2004 temperature conditions in the Molalla River and two tributaries. By late June, the temperatures at the mouth of the Molalla River exceed the criterion by more than 5ºC. Upstream of the confluence with North Fork, temperatures in the Molalla River begin to climb above the criterion in late June and remain well above the core cold water and spawning criteria until late September. Two tributaries to the Molalla River, Table Rock Fork (Figure 2 - 18) and Pine Creek (Figure 2 - 19), indicate a similar pattern, with temperatures beginning to exceed the core cold water criterion in mid-July and remaining above the core cold water and spawning criteria until late September.
>
> For many point sources the most challenging time to comply with the allocations in the TMDL will occur when low stream flow coincides with cooler applicable stream temperature criteria, usually in late summer to early fall. For nonpoint sources, allocations have no season-specific applicability because the activities that will lead to compliance with the TMDL (e.g. channel and riparian restoration) are on-going processes.

The TMDL states three important conclusions in the sections of the TMDL cited above. These are:

1. There are no temperature issues during the winter season of November 1 through April 30.
2. The temperature criteria for the Molalla subbasin exceeds "biologically based rearing and migration from mid-June to mid-September.
3. The temperature criteria for the Molalla subbasin exceeds "core cold water habitat criteria and spawning criteria" from late June (potentially as early as mid-May) through mid-October.

5.3 Oregon Administrative Rules for Temperature Discharges

The Oregon Administrative Rules (OAR) for temperature discharges is specified in OAR 340-041-0028. This rule identifies the Biologically Based Numeric Criteria (BBNC) that sets the water quality temperature criteria based on beneficial use to support salmonids. Fish maps have been developed for the Molalla-Pudding basins to show the specific uses for each river and tributary segment. These were shown in ***Figures 2*** and ***3***, above. The section of the river in which the Molalla WWTP discharges is designated as core cold water habitat and salmon and steelhead spawning. The criteria for each of these beneficial uses is noted in OAR 340-041-0028 (4) as follows:

> (4) Biologically Based Numeric Criteria. Unless superseded by the natural conditions criteria described in section (8) of this rule, or by subsequently adopted site-specific criteria approved by EPA, the temperature criteria for State waters supporting salmonid fishes are as follows:
> (a) The seven-day-average maximum temperature of a stream identified as having salmon and steelhead spawning use on subbasin maps and tables set out in OAR 340-041-0101 to 340-041-0340: Tables 101B, and 121B, and Figures 130B, 151B, 160B, 170B, 220B, 230B, 271B, 286B, 300B, 310B, 320B, and 340B, may not exceed 13.0 degrees Celsius (55.4 degrees Fahrenheit) at the times indicated on these maps and tables;
> (b) The seven-day-average maximum temperature of a stream identified as having core cold water habitat use on subbasin maps set out in OAR 340-041-101 to 340-041-340: Figures 130A, 151A, 160A, 170A, 220A, 230A, 271A, 286A, 300A, 310A, 320A, and 340A, may not exceed 16.0 degrees Celsius (60.8 degrees Fahrenheit);

> (c) The seven-day-average maximum temperature of a stream identified as having salmon and trout rearing and migration use on subbasin maps set out at OAR 340-041-0101 to 340-041-0340: Figures 130A, 151A, 160A, 170A, 220A, 230A, 271A, 286A, 300A, 310A, 320A, and 340A, may not exceed 18.0 degrees Celsius (64.4 degrees Fahrenheit);

The above reverence sets the water quality criteria. The OAR then specifies how the temperature criteria is to be implemented in each of the river basins. In the implementation of the temperature criteria, a Human Use Allowance (HUA) is allowed. The implementation of the human use allowance is specified in OAR 340-041-0028 (12) as follows.

> (12) Implementation of the Temperature Criteria.
> (a) Minimum Duties. There is no duty for anthropogenic sources to reduce heating of the waters of the State below their natural condition. Similarly, each anthropogenic point and nonpoint source is responsible only for controlling the thermal effects of its own discharge or activity in accordance with its overall heat contribution. In no case may a source cause more warming than that allowed by the human use allowance provided in subsection (b) of this rule.
> (b) Human Use Allowance. Insignificant additions of heat are authorized in waters that exceed the applicable temperature criteria as follows:
> (A) Prior to the completion of a temperature TMDL or other cumulative effects analysis, no single NPDES point source that discharges into a temperature water quality limited water may cause the temperature of the water body to increase more than 0.3 degrees Celsius (0.5 Fahrenheit) above the applicable criteria after mixing with either twenty five (25) percent of the stream flow, or the temperature mixing zone, whichever is more restrictive; or
> (B) Following a temperature TMDL or other cumulative effects analysis, waste load and load allocations will restrict all NPDES point sources and nonpoint sources to a cumulative increase of no greater than 0.3 degrees Celsius (0.5 Fahrenheit) above the applicable criteria after complete mixing in the water body, and at the point of maximum impact.
> (C) Point sources must be in compliance with the additional mixing zone requirements set out in OAR 340-041-0053(2)(d).
> (D) A point source in compliance with the temperature conditions of its NPDES permit is deemed in compliance with the applicable criteria.

The implementation of the human use allowance provides the basis for the development of permit limits as excess thermal loads. A TMDL has been developed for the Molalla River. The portion of this OAR that outlines how the human use allowance is to be implemented for the City of Molalla is section (12)(b)(B). This states that following a temperature TMDL, there can be a cumulative increase of no greater than 0.3 degrees Celsius after mixing in the water body. The cumulative affects analysis was developed in the Molalla-Pudding River TMDL and is documented in the following section.

5.4 Molalla River TMDL

The Molalla-Pudding Subbasins Total Maximum Daily Load and Water Quality Management Plan (WQMP) was published in December 2008. This document provides the basis of the temperature allocations for the Molalla River. The TMDL[5] documents how the TMDL allocations were provided on the Molalla River as follows:

> For point sources of heat such as wastewater treatment plants, waste load allocations have been developed that limit the increase in temperature of the receiving stream (due to the point source effluent) to a portion of an allowance for "human use." The heat loads allocated to point sources in the Molalla- Pudding Subbasin are those

[5] ODEQ, 2008. Molalla-Pudding Subbasin TMDL & WQMP. December. Executive Summary, Page 3

loads that would cause no more than a 0.2ºC increase when fully mixed in the stream above the applicable criterion (which may be the NTP). Available data indicated that existing discharges from point sources to the Molalla River caused less than a 0.2°C in-stream temperature increase, and they were allocated heat loads equivalent to the heat load from their current discharge. For non-point sources, the load allocation is the heat load that would result if system potential vegetation were allowed to develop in the riparian zone. Representation of system potential vegetation followed the methodology used in the Willamette Basin temperature TMDL, which takes into account factors such as soils, slope, elevation, historical vegetation, and geomorphology. Non-point sources are allocated a heat load equivalent to a 0.05°C increase in-steam above the applicable criterion. A heat load equivalent to the remaining 0.05°C increase allowed for human use is allocated to reserve capacity to accommodate for future growth.

Chapter 2 of the TMDL[6] documents the temperature allocations for the TMDL. The point sources of heat are described on page 2-21 of the TMDL as follows:

POINT SOURCES OF HEAT
There are approximately 75 stormwater permits, at the time of this writing, active in the Molalla-Pudding subbasin, including both construction and industrial permits. In previous TMDLs, including the Willamette Basin TMDL, DEQ has generally considered heat load from stormwater to have no reasonable potential to cause temperature criteria violations. For that reason, DEQ has not assigned explicit wasteload allocations(WLAs) for sources discharging only stormwater, but these sources receive implicit heat load allocations sufficient to cover current conditions of discharge. Source locations, other than stormwater permits, are illustrated in Figure 2 - 20. In addition to stormwater permits, there are five individual and two general NPDES permitted sources in the Molalla watershed that are potential sources of heating (Table 2 - 9). There are nine individual and three general permitted sources in the Pudding watershed, but five of those sources do not discharge during the critical period in which explicit wasteload allocations apply, June 1 – September 30. Sources that do not discharge during the applicable critical periods are not assigned explicit wasteload allocations (WLAs), but rather receive implicit heat load allocations sufficient to cover current conditions of discharge. Those point sources that do not discharge during the critical periods, with one exception, are not described in this section. The Molalla Wastewater Treatment Plant (WWTP) does not discharge during the Molalla River critical period (May 1 – October 31), but the Protecting Cold Water criterion does apply during a portion of the spawning season when the WWTP does discharge. For that reason, the Molalla WWTP is described in this section and the potential heating effects of the WWTP are evaluated following the Wasteload Allocations section.

5.4.1 Temperature Waste Load Allocations on the Molalla River

There are five individual and two general NPDES permitted point sources in the Molalla watershed that are potential sources of heating. These are summarized in ***Table 4***. The map of point sources shown in ***Figure 7***[7] shows the location of the seven dischargers in the Molalla subbasin.

Table 4
Molalla Subbasin NPDES Dischargers
(Taken from Molalla-Pudding TMDL Table 2-9)

Facility Name	Permit Type	Permit Description	Receiving Stream	River Mile	Season
City of Molalla WWTP	NPDES-DOM-Da	Sewage disposal; less than 1 mgd with lagoons	Molalla River	20	Nov. 1 – April 30
Molalla Municipal Water Treatment Plant	GEN02	Industrial wastewater; NPDES filter backwash	Molalla River	21.6	Year round

[6] ODEQ, 2008. Molalla-Pudding Subbasin TMDL & WQMP. December. Page 2-21
[7] ODEQ, 2008. Molalla-Pudding Subbasin TMDL & WQMP. December. Figure 2-20

Table 4 (cont)
Molalla Subbasin NPDES Dischargers
(Taken from Molalla-Pudding TMDL Table 2-9)

Canby Utility Board – Canby Water Treatment Plant	NPDES-IW-B16	Non-process wastewater; infiltration and filter gallery backwash	Molalla River	3.5	Year round
Sunstone Circuits, LLC	NPDES-IW-N	Process wastewater NEC (includes remediated groundwater)	Mill Creek	5.3	Year round
Sanders Wood Products, Inc. (RSG Forest Products)	NPDES-IW-B19	Timber and wood products – sawmills, log storage, instream log storage	Molalla River	17.3	Year round
Arrow Auto Group, Inc.	GEN17A	Industrial wastewater; NPDES wash water	Molalla River	10.2	Year round
Chevron Environmental Management Co.	NPDES-IW-B16	Non-process wastewater; groundwater remediation	Molalla River	20	Year round

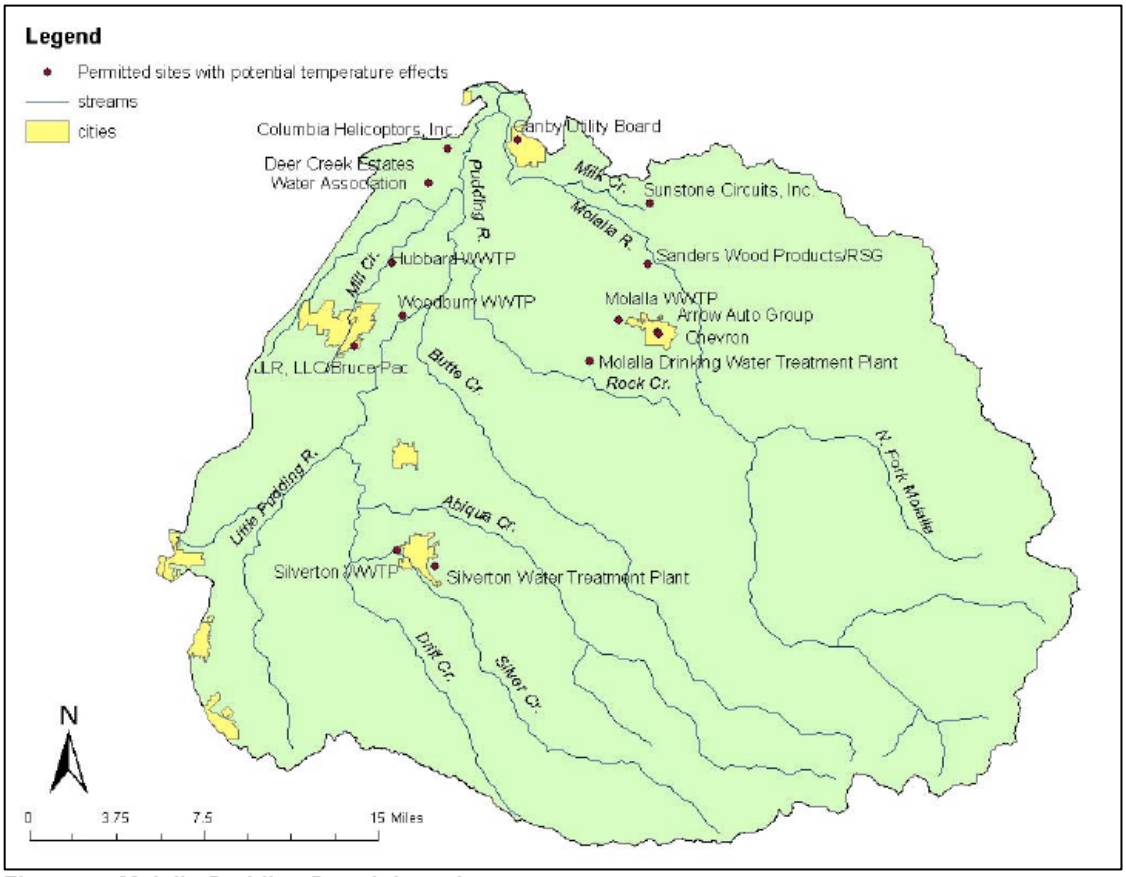

Figure 7: Molalla-Pudding Permit Locations

A description of each point source discharger to the Molalla subbasin is provided in the TMDL. A summary of the point sources, the heat wasteload and their temperature allocations are summarized below. This information is a summary of the information provided on each of the point source discharger allocations in the TMDL on Pages 2-24 – 2-16.

- City of Molalla WWTP – No discharge from May 1 – October 31. There are no thermal load limits set in the permit because discharge was limited to the winter season.
- Sunstone Circuits – Permitted design flow is 0.042-mgd with typical flows of 0.021-mgd. has an ETL allocation of 1.3-million kcals/day. This equates to a stream temperature increase of 0.04°C in Mill Creek and applies May 1 – October 31.
- Sanders Wood Products – Effluent flows range from 0.37 to 0.48-mgd, including stormwater, at the outfall from the settling pond that flows to a drainage ditch. The drainage ditch contributes to and receives overflow from far ponds. The ditch does not visibly flow into the Molalla River, but ends in a low ponded area. Effluent from the facility does not visibly flow into the Molalla River during the dry season. If connection of the drainage ditch with the Molalla River were to occur during late summer rains, for example, temperature in the drainage ditch surface water would likely be influenced by overflow from agricultural ponds, as well. Despite an uncertain connection of facility discharge to the Molalla River and uncertainty about temperature measurements in the facility effluent, DEQ assigned an allocation for the facility because of potential temperature effects from the facility during the late summer/early fall when rains begin, and Molalla River flow is still low. The allocation applies May 1 – October 31. Outside of the critical period (May 1 – October 31), the facility did not receive an explicit wasteload allocation, but rather an implicit heat load allocation sufficient to cover current conditions of discharge.

  DEQ evaluated potential heating effects from the facility's discharge. Time periods evaluated were late summer and early fall when there is a more likely connection between the drainage ditch into which the facility discharges and the Molalla River. In the analysis of the facility's potential heating effects, DEQ used the measured temperatures from the settling pond during the months when overflow into the drainage ditch is more likely. These were summarized in Table 2-24 of the TMDL as shown below:

Table 2 - 24: Potential heating effects of Sanders Wood Products effluent discharge at river mile 17 on the Molalla River.
DEQ has assumed maximum effluent temperatures as no effluent temperature data are available.

Month Evaluated	Point Source Discharge (cfs)	Maximum Temperature (°C)	Monthly 7Q10 Stream Discharge or Minimum Flow Requirements (cfs)	Applicable Temperature Criteria (°C)	Effect on River Temperature at 100% mix (°C)
August	0.155 (0.1 MGD)	24 (75.2 °F)	23	20.7 (69.3 °F)	0.02 (0.04 °F)
September	0.155 (0.1 MGD)	23 (73.4 °F)	19	18.0 (64.4 °F)	0.04 (0.07 °F)
October	0.155 (0.1 MGD)	20 (68 °F)	25	13.0 (55.4 °F)	0.04 (0.07 °F)
September	0.65 (0.48 MGD)	23 (73.4 °F)	19	18.0 (64.4 °F)	0.16 (0.3 °F)

  This facility received a heat load allocation equivalent to a stream temperature increase between 0.04°C and 0.16°C depending on the actual flow that occurs. This was based on extremely conservative assumptions made in the late summer, in the month of September.
- Canby Utilities – No wasteload allocation as backwash water has no reasonable potential for heat contribution
- Chevron Environmental Management – This is a groundwater remediation site. The treated groundwater is discharged to the Molalla River by way of the City of Molalla stormwater system, Creamery Creek and Gribble Creek. The discharge is intermittent

from 0.029 to 0.057-mgd. The median groundwater temperature is estimated to be 14.8°C and the maximum 19.9°C. This facility received a heat load allocation equivalent to a 0.02°C stream temperature increase applicable May 1 – October 31.

- Molalla Drinking Water Plant - The permit allows discharge of filter backwash and settling basin water to the Molalla River at river mile 21.6. Backwashing occurs 6 to 8 times per month with a typical discharge of 45,000-gallons. The backwash settling pond drains into a ditch which enters a slough. In the summer months, the drainage water tends to infiltrate, resulting in no visible surface discharge to the Molalla River. This facility receives a heat load allocation equivalent to a 0.022°C rise in ambient river temperature, applicable May 1 – October 31.
- Arrow Auto Group - Based on the size of the discharge from Arrow Auto Group, DEQ considers the discharge to have no reasonable potential to increase stream temperature in the Molalla River.

Five of the above facilities were determined to have an impact on the temperature of the Molalla River. These are the City of Molalla WWTP, Molalla Municipal Drinking Water Treatment Plant, Sanders Wood Products, Inc., Sunstone Circuits, LLC. and Chevron Environmental Management. The portion of the 0.2°C human use allowance for the river was calculated in the TMDL. The calculated HUA for each of the dischargers is summarized in ***Table 5*** for each month of the summer season between May 1 and October 30 as determined in the TMDL. This shows that there is allocation remaining for each month except for September. This is due to the total remaining allocation being given to Sanders Wood Products as a conservative measure. The flows and temperatures for this allocation are intermittent and estimated as discussed above an in the TMDL.

Table 5
Molalla River Current Human Use Allowance Allocation (°C) in the TMDL

Month Evaluated	Molalla WWTP	Molalla Drinking Water Plant	Sanders Wood Products	Sunstone Circuits, LLC.	Chevron Environmental Management	Total HUA Allocation
May	0	0.000	0.00	0.04	0.02	0.060
June	0	0.010	0.00	0.04	0.02	0.070
July	0	0.016	0.00	0.04	0.02	0.076
August	0	0.017	0.02	0.04	0.02	0.097
September	0	0.022	0.16	0.04	0.02	0.242
October	0	0.022	0.04	0.04	0.02	0.122

A summary of the calculations is provided in the following section.

5.4.2 Determination of Available Temperature Wasteload Allocation on Molalla River

The TMDL provided waste load allocations for temperature to the dischargers into the Molalla River. The Molalla River wasteload allocations are described in the TMDL[8] as follows:

> Molalla River Wasteload Allocations
> DEQ evaluated or calculated wasteload allocations for facilities with potential heating effects on the Molalla River (Table 2 - 21). DEQ allocated only the heat load that conservative calculations indicated the facilities would contribute under presumed worst-case conditions (e.g. maximum discharge and effluent temperatures). DEQ did

[8] ODEQ, 2008. Molalla-Pudding Subbasin TMDL & WQMP. December. Page 2-45

not complete a cumulative effects analysis for Molalla River point sources because the two point sources (Molalla Municipal Drinking Water Treatment Plant and Sanders Wood Products) that are permitted to discharge to the Molalla River during the critical period (May 1 – October 31) are small relative to 7Q10 stream flows, and the discharge from the facilities may not even reach surface water for most or all of the applicable TMDL period. The potential discharge quantities of these sources relative to stream flow and calculations of potential stream heating are included in the following descriptions of the WLAs for each of these sources.

DEQ estimated the maximum NTP values for the Molalla River before and after the two-week model period by the same method as for the Pudding River model, but with a larger margin-of-safety. The larger margin-of-safety takes into account the larger uncertainty associated with the Molalla River model and that only two years of continuous stream temperatures were available (2002 and 2004) to estimate current conditions. Rather than subtracting the average differences between current calibration condition (CCC) temperatures and NTP temperatures (for the model period) from the 90th percentile of observed current temperatures, DEQ subtracted the maximum difference between CCC modeled temperatures and NTP temperatures from the median of observed temperatures. Table 2 - 22 summarizes the NTP temperatures derived at three locations on the Molalla River where continuous stream temperatures were measured and presents examples of two interpolated values at river mile 17 and 21.6, where point sources are located. The details of the analysis and NTP temperatures estimated for other time periods are presented in Appendix E.

Table 2 - 21: Sources DEQ evaluated for potential heat loads to the Molalla River.

Facility Name	Permit Type	Permit Description	Receiving Stream	River Mile	Season
City of Molalla WWTP	NPDES-DOM-Da	Sewage disposal; less that 1 MGD, with lagoons.	Molalla River	20	Nov. 1 – April 30
Molalla Municipal Drinking Water Treatment Plant	GEN02	Industrial wastewater; NPDES filter backwash	Molalla River	21.6	Year round
Sanders Wood Products, Inc. (RSG Forest Products)	NPDES-IW-B19	Timber and wood products – sawmills, log storage, instream log storage	Molalla River	17.3	Year round
Sunstone Circuits, LLC	NPDES-IW-N	Process wastewater, Not Elsewhere Classified	Milk Creek	5.3	Year round

Table 2 - 22: Molalla River applicable NTP temperatures August 1 - 15.

	Molalla River at Hwy. 213 (RM 15)	Molalla River Mile 17	Molalla River at Hwy. 211 (River Mile 19)	Molalla River Mile 21.6	Molalla River u/s North Fork (River Mile 26.5)
Maximum difference CCC – NTP (T °C)	2.8	NA	2.8	NA	2.8
median observed 7DADM August 1 - 15 Temperature (T °C)	23.9	NA	23.1	NA	21.3
7DADM NTP Temperatures August 1 -15 (T °C)	**21.1**	**20.7**	**20.3**	**19.7**	**18.5**

As shown above, DEQ used natural thermal potential in the development of the Molalla River TMDL. The use of natural thermal potential in the development of TMDL waste load allocations has been subject to litigation for many years. In response to a recent court ruling, DEQ provided a memorandum for "Implementation of Water Quality Standards for Temperature in NPDES Permits" on March 19, 2018 (***Attachment B***). This memo provided guidance for permit writers for situations, like the Molalla River, where the TMDL was based on natural conditions criteria or on natural thermal potential. Per this guidance memorandum Molalla-Pudding River falls into Scenario D:

> Scenario D. The receiving stream is impaired for temperature and there is a TMDL based on natural conditions criteria (or natural thermal potential). For permit renewals, permit writers will determine the thermal loads that are consistent with TMDL waste load allocations and compare it

to the thermal loads based on BBNC with the human use allowance of 0.3°C (see OAR 340-041-0028(12)(b)(A)). The more stringent of the two loads must be addressed in the permit. The permit evaluation report should clearly describe how the temperature limits were developed. The additional mixing zone requirements in OAR 340-041-0053(2)(d) also will be applied to the permit.

For new sources, permit writers will need to consult with DEQ Headquarters staff.

Wasteload allocations under the Molalla TMDL use a human use allowance of 0.2°C, not the 0.3°C as stated in Scenario D above. This provides conservatism in the allocation and provides an allocation for non-point sources. The analysis below uses the Biologically Based Numeric Criteria (BBNC) of 13.0°C for Salmon and Steelhead Spawning. The TMDL presents the concept of calculating wasteload allocations as follows[9]:

> A wasteload allocation (WLA) is the portion of the loading capacity allocated to point sources. DEQ provides waste load allocations to all NPDES facilities with reasonable potential to warm the receiving stream above the applicable criteria. Equation 1 calculates the maximum allowable increase in stream temperature (ΔT) for a given thermal discharge.
>
> In most cases for this TMDL, a WLA is expressed as a flow-based formula (Equation 2). Using the formula as the wasteload allocation captures varying flow conditions, both effluent and in-stream, up to and including the design flow of the facility. This method allows facilities to increase discharge and still be within receiving water requirements. Waste load allocations for temperature are expressed as heat load limits (kcal/day or equivalent SI units MW-day/day) by multiplying the allowable stream temperature increase (not more than 0.2 ºC) by the combined flow of the point source and the receiving stream. This form of wasteload allocation is referred to as excess thermal load (ETL).
>
> $$\Delta T = \left(\frac{Q_e}{Q_e + Q_R}\right)(T_e - T_c) \quad \text{(Equation 1)}$$
>
> where:
>
> Q_R = river flow rate
>
> Q_e = effluent flow rate
>
> T_c = applicable river temperature criteria
>
> T_e = effluent temperature
>
> In terms of dilution factor, D_F
>
> $$\Delta T = \frac{T_e - T_c}{D_F}$$
>
> where:
>
> $$D_F = \frac{Q_e + Q_R}{Q_e}$$
>
> $$ETL = (\Delta T)(Q_R + Q_e)C_F \quad \text{(Eq. 2)}$$
>
> where:
>
> ETL = Excess thermal load, $kcal/day$
>
> ΔT = allowable temperature increase, $^\circ C$
>
> Q_R = river flow rate, upstream, m^3/s
>
> Q_e = effluent flow rate, m^3/s
>
> C_F = conversion factor
>
> $$C_F = 86.4 \times 10^6 \frac{kcal \cdot s}{^\circ C \cdot m^3 \cdot day}$$
>
> Alternatively, for flow as cfs:
>
> Q_R, Q_e units: ft^3/s
>
> $$C_F = 2{,}446{,}665 \frac{kcal \cdot s}{^\circ C \cdot ft^3 \cdot day}$$
>
> Where in-stream and effluent flow information are sufficient, DEQ assigns flow-based ETLs, such that the allowable heat load varies with the flow of the stream and the point source. If daily stream discharge information is not readily available or attainable, DEQ calculates a fixed ETL based on an estimated 7Q10 flow of the stream and the design flow of the facility.
>
> The current excess thermal load (ETL) from a point source can be quantified with Equation 3 by calculating the difference between the effluent temperature and applicable stream temperature criterion – either the biologically based numeric temperature criterion or the natural thermal potential temperature at the location of the discharge. Since applicable criteria are based on 7-day average daily maximum (7DADM) values, generally all calculations should be performed using trailing 7-day averages, with 7-day average daily maximum values used for effluent temperature (Te) and 7-day average values used for effluent flow (Qe). Effluent temperatures and effluent flows that correspond with a particular
>
> $$ETL = Q_e(T_e - T_c)C_F \quad \text{(Equation 3)}$$
>
> $$T_e = \frac{ETL}{Q_e C_F} + T_c \quad \text{(Eq. 3a)}$$
>
> $$Q_e = \frac{ETL}{(T_e - T_c)C_F} \quad \text{(Eq. 3b)}$$
>
> where:
>
> ETL = Excess thermal load, $kcal/day$

[99] ODEQ, 2008. Molalla-Pudding Subbasin TMDL & WQMP. December. Page 2-29

excess thermal load (ETL) can be calculated with Equations 3a and 3b. DEQ estimated the target criteria (natural thermal potential temperatures) at point source locations on both the Pudding and Molalla Rivers with methods described in the following section and Appendix E. Also, in the following section, the heat loading equivalent to 0.2ºC of the human use allowance is apportioned among the facilities, based in part on simulations of cumulative thermal effects from neighboring sources. Example tables of effluent temperatures and effluent flows within a point source's allocated ETL are included in Appendix D.

The current Molalla WWTP permit does not allow a discharge during the period May 1 – October 30 and limits the discharge to the river at a river flow of 350-cfs at the Canby station and a river temperature of 18°C. The requested permit modification eliminates the date restriction only limiting the discharge to periods when the river flow is greater than 350-cfs at Canby station and a using a human use allowance of 0.2°C above the BBNC of 13.0°C for Salmon and Steelhead Spawning.

The methodology used in the Molalla-Pudding TMDL shown above was used to calculate the temperature limit. Equation 1 above was used to determine the maximum allowable effluent temperature as follows:

$$\Delta T = \left(\frac{Q_e}{Q_e + Q_R}\right)(T_e - T_{c)}$$

Where: Q_e = Effluent Flow
Q_R = Minimum River Flow
T_c = River Temperature Criteria

Equation 1 requires data on the plant effluent temperature to determine the portion of the human use allowance used by a discharger. Effluent temperature data has been reported on a daily basis for the Molalla WWTP when it has discharged to the river and on some occasions when there has been no discharge. Available effluent temperature data for the period January 2010 through July 2017 was evaluated with the monthly statistics summarized in ***Table 6***.

Table 6
Molalla WWTP Effluent Temperature Statistics

Month	Monthly Statistics					
	Maximum	Minimum	Average	Median	90 Percentile	Count
Jan	9.3	0.0	4.2	5.3	8.6	376
Feb	10.7	4.1	8.5	8.6	10.1	222
Mar	15.3	5.9	10.7	10.7	12.8	222
Apr	18.5	10.1	14.1	14.0	16.4	235
May	20.4	15.1	17.2	17.0	18.8	57
Jun	20.4	16.2	18.0	17.9	18.7	30
Jul	-	-	-	-	-	0
Aug	-	-	-	-	-	0
Sep	17.6	15.7	16.7	16.9	17.6	5
Oct	15.1	8.4	13.7	13.8	14.7	41
Nov	14.8	5.5	10.6	10.6	13.2	172
Dec	10.2	4.0	7.2	7.7	9.3	207

The potential heating effects of the Molalla WWTP discharge was calculated for potential discharge months using Equation 1 from the TMDL. In this analysis, the historical 90-Percentile plant effluent temperature from ***Table 6*** for each month being evaluated was used as T_e. The current plant design flows for the respective months (Q_e) and the minimum stream flow (Q_R) of 224-cfs which is 64% of the minimum flow to discharge at the Canby station was used. The spawning temperature criteria of 13°C was used for T_c.

The results of this analysis are summarized in ***Table 7***. This analysis shows that the effect on river temperature of the Molalla WWTP discharge during the early summer season months of May and June and the late summer month of October using a 100% mix of the plant effluent. This calculation was not performed for the months of July, August and September due to lack of plant effluent data.

Table 7
Potential Heating Effects from Molalla WWTP Discharge to Molalla Rivera at River Mile 20

Month Evaluated	Point Source Discharge Flow (cfs)	90 Percentile Discharge Temperature (°C)	Minimum Stream Flow (cfs)	Spawning Temperature Criteria (°C)	Increase in River Temperature at 100% mix (°C) from Molalla WWTP
April	6.34 (4.10 mgd)	16.4 (57.2°F)	224	13 (55.4°F)	0.094
May	3.56 (2.30 mgd)	18.8 (64.4°F)	224	13 (55.4°F)	0.091
June	3.56 (2.30 mgd)	18.7 (64.4°F)	224	13 (55.4°F)	0.090
October	3.56 (2.30 mgd)	14.7 (59.0°F)	224	13 (55.4°F)	0.027
November	6.34 (4.10 mgd)	13.2 (53.6°F)	224	13 (55.4°F)	0.006

Table 5 provides a summary of the current waste load allocations in the Molalla subbasin. Table 5 shows no discharge or heat input from the Molalla WWTP. The information in ***Table 5*** was updated by adding the potential heating effects of the Molalla discharge. The results are summarized in ***Table 8***.

Table 8
Total Potential Heating Effects on Molalla River From Point Source Dischargers

Month Evaluated	Increase in River Temperature from Molalla WWTP	Molalla Drinking Water Plant	Sanders Wood Products	Sunstone Circuits, LLC.	Chevron Environmental Management	Updated Total HUA Allocation
May	0.094	0.000	0.000	0.040	0.020	0.154
June	0.091	0.010	0.000	0.040	0.020	0.161
July	-	0.016	0.000	0.040	0.020	0.076
August	-	0.017	0.020	0.040	0.020	0.097
September	-	0.022	0.160	0.040	0.020	0.242
October	0.027	0.022	0.040	0.040	0.020	0.149

The analysis summarized in ***Table 8*** shows that there is available temperature allocation within the TMDL for the Molalla WWTP to discharge during the months of May, June and October without exceeding the allowed combined human use allowance for the river of 0.2°C.

The next step in this analysis was to determine the maximum allowable Molalla WWTP effluent temperature that will limit the discharge during each of the summer season months without exceeding the human use allowance. The total current allocation summarized in ***Table 5*** was used as the Total Allocation Used. This was then subtracted from the available Human Use Allowance of 0.2°C to obtain the available allocation for each month. Equation 1 from the TMDL was again used to calculate the maximum effluent temperature with the results summarized in ***Table 9***. The analysis was done at the current summer season design flow of 2.30-mgd (3.56-cfs) and the minimum river flow of 224-cfs at the discharge point (350-cfs at the Canby station).

Table 9
Maximum Allowable Molalla WWTP Discharge Temperature

Month	Total HUA Allocation In TMDL (°C)	Allocation Available (°C)	Maximum Molalla WWTP Discharge Temperature (°C)
May	0.060	0.140	21.9
June	0.070	0.130	21.3
July	0.076	0.124	-
August	0.097	0.103	-
September	0.242	0.000	-
October	0.122	0.078	18.0

This results in a maximum effluent temperature of 21.9°C and 21.3°C for the months of May and June, respectively. The maximum temperature for October was 18°C. The analysis of plant effluent temperatures summarized in ***Table 6*** shows that the 90-Percentile temperatures for each of these months is less than the maximum temperature allowed within the Human Use Allowance. The 90-Percentile temperatures as shown in ***Table 6*** are 18.8, °C 18.7°C and 14.7°C for the months of May, June and October, respectively.

This analysis shows the existing TMDL provides thermal capacity within its limits. The analysis also shows the allowable effluent temperatures, from heat load capacity perspective, are higher than the current permit's temperature limits of 18°C and the 90% percentile discharge temperatures. This demonstrates that the excess thermal loads can be added to the Molalla NPDES permit and falls within the limits set forth in the TMDL.

5.4.3 Calculation of Molalla WWTP Excess Thermal Loads

Permit limits established in the TMDL are determined as Excess Thermal Loads (ETL). The basis for calculating the ETL is documented in the TMDL[10] as follows:

[10] ODEQ, 2008. Molalla-Pudding Subbasin TMDL & WQMP. December. Page 2-29

In most cases for this TMDL, a WLA is expressed as a flow-based formula (Equation 2). Using the formula as the wasteload allocation captures varying flow conditions, both effluent and in-stream, up to and including the design flow of the facility. This method allows facilities to increase discharge and still be within receiving water requirements. Waste load allocations for temperature are expressed as heat load limits (kcal/day or equivalent SI units MW-day/day) by multiplying the allowable stream temperature increase (not more than 0.2 ºC) by the combined flow of the point source and the receiving stream. This form of wasteload allocation is referred to as excess thermal load (ETL). Where in-stream and effluent flow information are sufficient, DEQ assigns flow-based ETLs, such that the allowable heat load varies with the flow of the stream and the point source. If daily stream discharge information is not readily available or attainable, DEQ calculates a fixed ETL based on an estimated 7Q10 flow of the stream and the design flow of the facility.

$ETL = (\Delta T)(Q_R + Q_e)C_F$ (Eq. 2)

where:

ETL = Excess thermal load, $kcal/day$

ΔT = allowable temperature increase, $^{\circ}C$

Q_R = river flow rate, upstream, m^3/s

Q_e = effluent flow rate, m^3/s

C_F = conversion factor

$C_F = 86.4 \times 10^6 \frac{kcal \cdot s}{^{\circ}C \cdot m^3 \cdot day}$

Alternatively, for flow as cfs:

Q_R, Q_e units: ft^3/s

$C_F = 2{,}446{,}665 \frac{kcal \cdot s}{^{\circ}C \cdot ft^3 \cdot day}$

There are three months where an ETL can be incorporated into the permit during the summer season: May, June and October. During this period of time, the temperature allocation (ΔT) that is available in the river for the Molalla WWTP discharge for each of the three months that allocation is available was calculated. The ETL for this period was calculated using Equation 3 as follows:

$$ETL = (\Delta T)(Q_R + Q_e)C_F$$

Where: ETL = Excess Thermal Load, kcal/day
ΔT = allowable temperature increase, °C
Q_R = river flow rate, upstream, ft^3/s
Q_e = effluent flow rate, ft^3/s
CF = conversion factor = 2,446,665 kcal-s/°C-ft^3-day

The ETL was determined using the available allocation that was determined in ***Table 9*** for each of the months. The ETLs were calculated for the three months with the following results:

- The ETL for the month of May is:

$$ETL = (0.140)(224+3.56)(2{,}446{,}665) = 77.95\text{-million kcal/day}$$

- The ETL for the month of June is:

$$ETL = (0.130)(224+3.56)(2{,}446{,}665) = 72.38\text{-million kcal/day}$$

- The ETL for the month of October is:

$$ETL = (0.078)(224+3.56)(2{,}446{,}665) = 43.43\text{-million kcal/day}$$

These values of ETL should be incorporated into the NPDES permit and the maximum temperature for discharge be removed.

5.5 Thermal Plumes

The administrative rule for temperature discharges discussed in Section 5.3 provides the bases for implementation of the temperature criteria and the human use allowance. Section OAR 340-041-0028 (12)(b)(C) states that point sources must be in compliance with the additional mixing zone requirements set out in OAR 340-041-0053(2)(d). This section provides the criteria that must be met within the thermal plume of the discharge. The temperature thermal plume requirements specified in OAR 340-041-0053(2)(d) are as follows:

> (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 salmonids inside the mixing zone:
> (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 less for salmon and steelhead, and 9 degrees Celsius (48 degrees Fahrenheit) for bull trout;
> (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 additional exposure timing restrictions to prevent thermal shock; and
> (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.

Each of these requirements will be addressed in the following sections for the Molalla WWTP discharge.

5.5.1 Section (2)(d)A

The Molalla WWTP discharges into a segment of the river that is Core Cold Water Habitat and an active salmon spawning segment of the river. The portion of the river that the treatment plant discharges to has not been classified as an active redd.

5.5.2 Section (2)(d)(B)

This requirement is to limit fish exposure to temperatures of 32°C or more. The plant effluent is less that 32°C at all times, so this is not an issue.

5.5.3 Section (2)(d)(C)

This rule limits thermal shock caused by a sudden increase in water temperature by limiting potential fish exposure to temperatures of 25.0°C (77.0°F) or more to less than 5 percent of the cross section of 100 percent of the stream flow. The Molalla River flow at the plant outfall has been determined to be 224-cfs at the minimum flow of 350-cfs at the Canby gage. Using the Thermal Plume Model on the DEQ Temperature RPA spreadsheet[11], there is No Reasonable Potential at a temperature of 21.3°C. The RPA spreadsheet output is shown in ***Figure 8***.

[11] ODEQ, 2014. RPA Calculation Workbook for Temperature, Revision 2014. Retrieved from http:// *www.oregon.gov/deq/FilterPermitsDocs/RPATemperature.xlsx*

5.5.4 SECTION (2)(d)(D)

This requirement state that 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 low flow of the water body.

The plume model results shown above calculated the increase in stream temperature being 0.50° C to a temperature of 13.50° C which is less than the maximum allowed of 21° C. There is No Reasonable Potential at an effluent temperature of 21.3° C.

State of Oregon Department of Environmental Quality

l Plume Limitations within the Mixing Zone Rule (OAR 340-041-0053)

Shock - 25 deg C at 5% of the stream cross section

n Blockage - 21 deg C at 25% of the stream cross section

Section 5.6 of Temperature IMD

Facility Name Molalla WWTP - Interim Permit **Date:** 4/24/18

Enter data into white cells below:

7Q10 =	224	cfs
Ambient Temperature or Criterion =	13	ºC
Effluent Flow =	2.3	mgd
Max Effluent Temperature =	21.3	ºC
7 day Max Effluent Temperature =	21.3	ºC

5% of 7Q10 =	11.2	cfs
5% dilution =	4	
25% of 7Q10 =	56.0	cfs
25% dilution =	17	dilution = (Qe+Qr)/Qe

Temperature at 5% cross section =	**15.00**	**ºC**	**No Reasonable Potential**
Temperature at 25% cross section =	**13.50**	**ºC**	**No Reasonable Potential**
ΔT at 25% Stream Flow=	**0.50**	**ºC**	

Equation used to calculate ΔT at edge of MZ

Equation used to calculate thermal load limit

Where:

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

Figure 8: Temperature RPA Worksheet for Thermal Plumes for Molalla Effluent

ATTACHMENT A

TECHNICAL ANALYSES IN SUPPORT OF
DRAFT NPDES PERMIT MODIFICATION
Geosyntec Consultants

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Date:	16 May 2018
To:	Tiffany Yelton Bram, Oregon Department of Environmental Quality
Cc:	Dan Huff, City of Molalla
	J.W. Ring, Mark Strandberg, and Christine Hein, Ring Bender LLP
	Dale Richwine, Richwine Environmental.
From:	Rob Annear and Jacob Krall, Geosyntec Consultants
Subject:	Technical Analyses in Support of NPDES Permit Modification Request

INTRODUCTION

This memorandum details analyses conducted to support the City of Molalla (City) in its draft National Pollutant Discharge Elimination System (NPDES) permit for its wastewater treatment plant (WWTP). The impacts of the proposed revised permit conditions on dissolved oxygen (DO) and total suspended solids (TSS) are evaluated.

The WWTP currently discharges to the Molalla River between November and April. The maximum WWTP effluent concentration is 10 mg/L for both Biochemical Oxygen Demand (BOD) and TSS. The WWTP is currently required to stop discharging when the 7-day average flow as measured at the USGS Gauge at Canby (Gauge #14200000) drops below 350 cfs.

This memorandum also evaluates the impacts of potentially increasing the maximum BOD and TSS concentration to 30 mg/L for November-April and allowing river discharge for the full year, provided the other conditions are met.

DISSOLVED OXYGEN

The Streeter-Phelps equation was used to evaluate the predicted maximum dissolved oxygen deficit due to the Biochemical Oxygen Demand (BOD) from the current WWTP with the proposed new permit conditions. The Oregon DEQ Streeter-Phelps equation spreadsheet, developed for reasonable potential analysis, was used[1]. Table 1 outlines the assumptions made in these calculations. The dissolved oxygen analysis was conducted for the current WWTP, based on 2025

[1] ODEQ, 2005. RPA Calculation Workbook Dissolved Oxygen, Revision 1.0. Retrieved from http://www.oregon.gov/deq/wq/wqpermits/Pages/NPDES-Individual-Permit-Templates.aspx

Dry Weather Design Flow conditions from the 2007 design documents. The assumptions made in this analysis are outlined in Table 1.

Table 1. Assumptions made in Dissolved Oxygen Analysis for Current WWTP Using the Streeter-Phelps Equation Spreadsheet (from DEQ).

Assumption/Parameter	Assumed Value	Notes/Reference
Ambient River Flow	350 cfs at Canby	Table 1
Ambient DO concentration	10.48 mg/L	Saturation value based on temperature at the point where the WWTP enters the river after mixing
WWTP Design Flow	2.3 MGD	2025 Dry Weather Design Flows For Current WWTP
WWTP DO Concentration	6 mg/L	Typical value for Cascade Aeration System
WWTP $CBOD_5$ concentration	10 mg/L	Draft NPDES Permit, May-October conditions
WWTP NH3-N concentration	16.7 mg/L	Current Permit Conditions
Total Kjeldahl Nitrogen	20.9 mg/L	Based on NH3-N being 80% of total Nitrogen
Deoxygenation rate constant at 20°C	Worst Case: 0.14/day	Maximum of range for Willamette River (McCutchen, 1983, DEQ spreadsheet)
River velocity	2.5 feet/second	Estimated based on USGS (2010)
River depth	1.7 feet	Estimated based on USGS (2010)
River width	67 feet	Estimated based on USGS (2010)
Sediment Oxygen Demand	0.45 $g/m^2/day$	Set so that the river without the WWTP maintains a constant DO.

The calculation conducted here is conservative for three reasons.

1) The calculation assumes that the WWTP is discharging at the Dry Weather Design Flow despite low river flow conditions, which is very unlikely.
2) The calculation assumes an effluent BOD of 30 mg/L—the November-April permit limit. It is much more likely that a river flow of 350 cfs at Canby would occur during the summer months, when the maximum BOD would be 10 mg/L.
3) The calculation assumes a WWTP effluent DO of 6 mg/L. Discharge monitoring report data shows that effluent DO is typically 10-12 mg/L.

Figure 1 shows the DO concentration sag curve for the assumptions indicated in Table 1, with an ambient river flow at Canby of 350 cfs. The figure demonstrates the current WWTP would have a small impact on the DO concentration in the Molalla River for 2025 Dry Weather Design Flow.

The figure shows the DO concentration sag curve for the river both with and without the current WWTP discharge. The DO in the river is reduced by 0.07 mg/L within the mixing zone due to the mixing with the current WWTP effluent.

Downstream of the WWTP, in the absence of other point sources and tributaries, the river DO concentration trends towards a value 0.09 mg/L below the river absent the WWTP. The analysis based on the current plant flows for 2025 show the DO concentration remains above 95% of saturation, meeting the standard in OAR 340-041-006 and the antidegradation condition in OAR 340-041-0028 (3) (c).

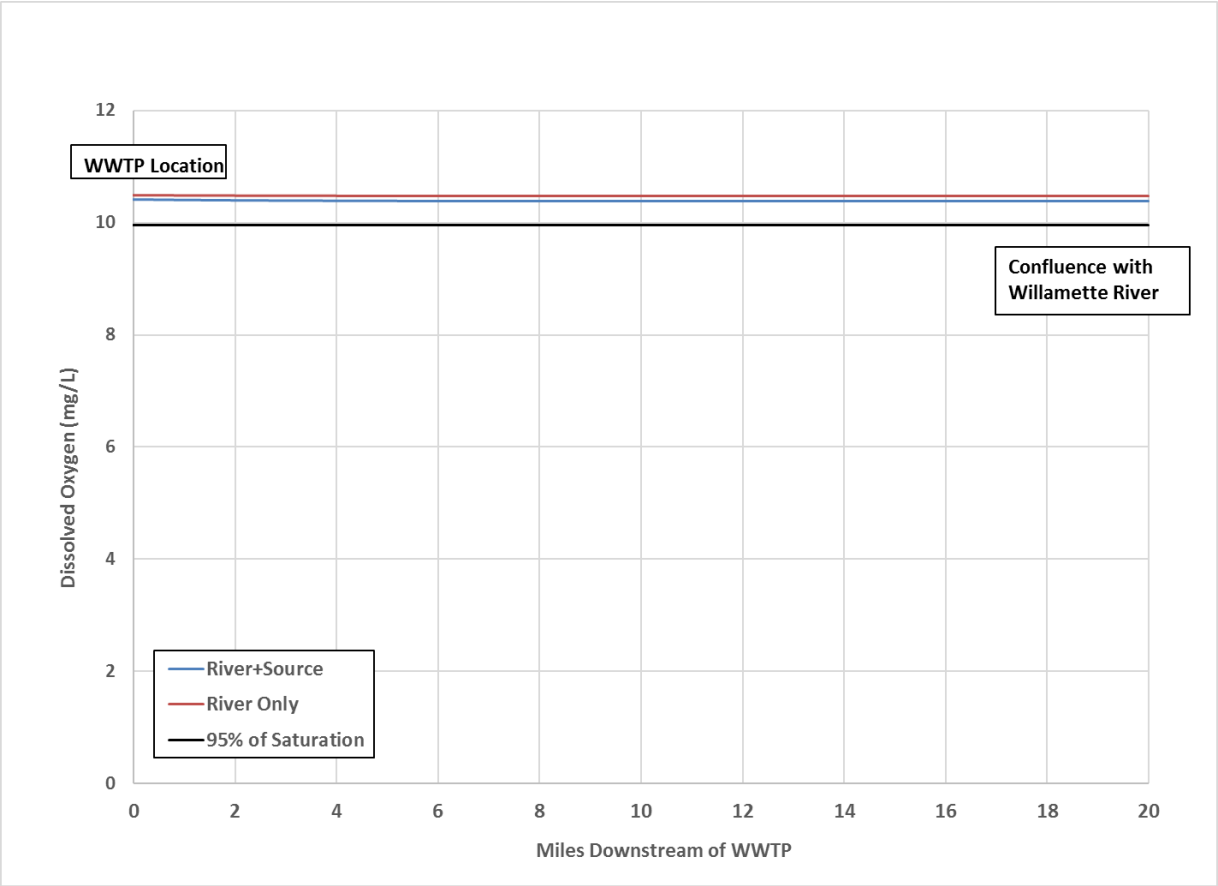

Figure 1. Dissolved Oxygen Sag Curve for the current WWTP 2025 Dry Weather Design Flow Conditions for Ambient River Flow of 350 cfs at Canby.

TOTAL SUSPENDED SOLIDS

Molalla River TSS concentration data were analyzed to understand the natural variability of TSS in the river and as the basis for determining the impacts to river TSS due to the WWTP.

Figure 2 is a box-and-whisker plot showing the natural variability of TSS in the Molalla River based on 25 samples collected by the ODEQ at Canby from February 2013 through April 2017. The average TSS concentration for these samples is 7.5 mg/L and the median is 3.0 mg/L. The 25^{th}-75^{th} percentile range is 1-6 mg/L.

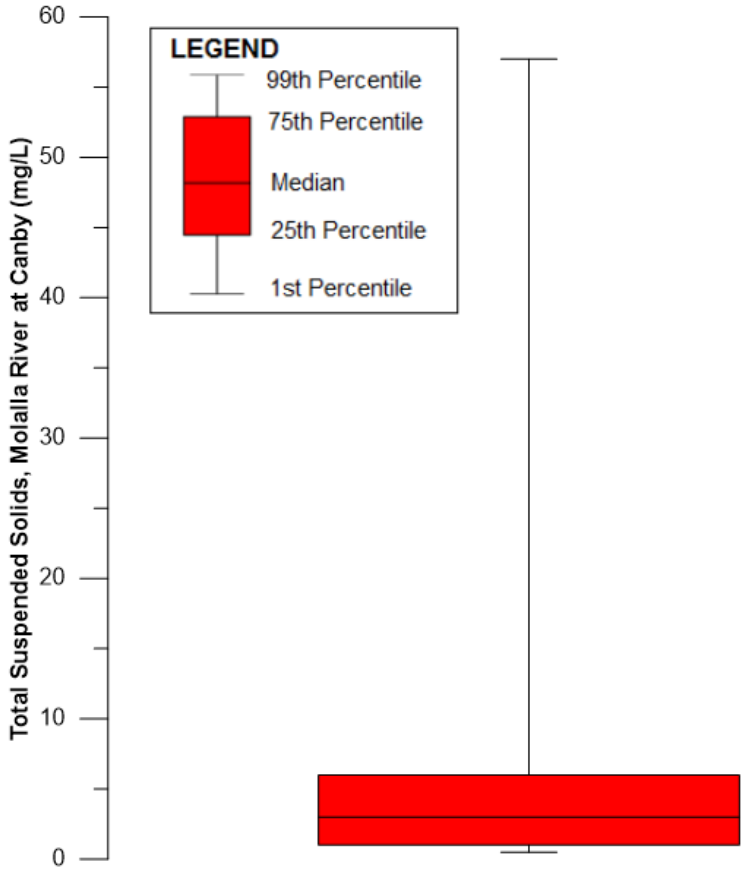

Figure 2. Box-and-whisker plot displaying variability of TSS in the Molalla River.

Table 2 shows how much the TSS concentration in the Molalla River would be expected to increase, as a function of ambient river flow. The table is based on a mass balance calculation assuming a plant discharge of 2.3 MGD, the median river TSS concentration of 3.0 mg/L and an effluent TSS of 30 mg/L. Table 2 demonstrates the increase in river TSS concentration due to the WWTP would be small—even at a low river flow of 150 cfs at Canby (well below the flow at which Molalla will be required to cease discharge) and median ambient TSS in the river (3.0 mg/L), the WWTP would only increase the TSS concentration in the river by 1.0 mg/L, well within the natural variability of river TSS concentration.

Table 2. Expected Increase in Molalla River TSS due to WWTP, as a Function of Ambient Molalla River Flow.

Molalla River Flow at USGS Gauge at Canby (#14200000), cfs	Expected TSS Concentration Downstream of WWTP (mg/L)	Increase in TSS Due to WWTP (mg/L), Relative to Median River TSS
350	3.2	0.4
300	3.2	0.5
250	3.3	0.6
200	3.3	0.7
150	3.3	1.0

SUMMARY

Overall, the analyses presented here support the requested permit criteria and demonstrate that the proposed new permit conditions will not degrade the river.

REFERENCES

ODEQ, 2008. Molalla-Pudding Subbasin TMDL & WQMP. December.

ODEQ, 2014. National Pollutant Discharge Elimination System Waste Discharge Permit #101514.

United States Geological Survey (2010). Geomorphic Setting, Aquatic Habitat and Water-Quality Conditions of the Molalla River, Oregon, 2009-2010.

ATTACHMENT B

Implementation of Water Quality Standards for Temperature in NPDES Permits
March 19, 2018
ODEQ

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WQ Permitting Policy

Implementation of Water Quality Standards for Temperature in NPDES Permits

Policy Number: WQP-007	Version: 1.1
Effective Date: March 19, 2018	Next Scheduled Revision Date: As needed
Approval: Ron Doughten	Title: WQ Manager
Section: WQ Permitting and Program Development	Division: Operations

State of Oregon Department of Environmental Quality

Intent/Purpose/ Statement of Need	DEQ's water quality standards for temperature and temperature total maximum daily loads (TMDLs) have been the subject of litigation for many years. The intent of this document is to provide guidance to permit writers on how to apply the temperature criterion in permitting given the status of that litigation. On Feb. 28, 2012, the U.S. District Court for the District of Oregon invalidated EPA's approval of DEQ's natural conditions criterion for water temperature. As a result of the court's decision, in August 2013, EPA disapproved Oregon's natural conditions criterion (NCC) at OAR 340-041-0028(8), leaving the remainder of the temperature standard effective. Also as a result of the court decision, the Environmental Quality Commission repealed portions of the narrative criteria in the temperature standard relating to agriculture and forestry. The NCC is not effective for purposes of National Pollutant Discharge Elimination System (NPDES) permitting. Following the decision on the NCC, a petition was filed challenging temperature TMDLs based on the NCC. On April 11, 2017, the U.S. District Court for the District or Oregon ordered that EPA's decision approving TMDLs based on the NCC on or after 9/27/2006 was "arbitrary and capricious." The order based this holding on the conclusion in the 2012 case that EPA's decision to approve the Natural Conditions Criteria under CWA 303(c) was arbitrary and capricious. To reach this decision the court concluded that the invalidation of the NCC in the temperature standard applied retroactively (i.e. the NCC was never valid). The decision concluded these TMDLs could not have been properly approved by EPA because they were not based on the proper criteria and reflected an invalid change in the standard. Litigation is ongoing as of the date of this document (March 19, 2018). The temperature TMDLs that are subject to the TMDL litigation are still in effect and should be implemented until the Court orders otherwise. NPDES permits need to meet the more stringent of either the TMDL waste load allocation (WLA) or the pre-TMDL condition based on the biologically based numeric criteria (BBNC). 401 certification of projects take a similar apporach as described in this document. Where applicable, 401 certifications would need to meet the more stringent of their NCC TMDL allocation or the temperature water quality standard based on BBNC.
Authority	ORS 468.020, 468B.030, 468B.035 & 468B.048 OAR 340-041-0028
Applicability	All NPDES permits
POLICY	Until such time as DEQ revises the water quality standard for temperature, permit writers will issue NPDES permits that ensure compliance with the currently effective temperature standard at OAR 340-041-0028 (see attached), which includes (4) biologically based numeric criteria (BBNC), (9) protection of cool water species, (11) the protecting cold water criteria and (12)(b) the human use allowance, and all other sections of 340-041-0028 except (8) the natural conditions criterion, as well as any waste load allocation that remains in effect.

This memo describes five scenarios listed below and discusses how the remaining criteria apply. Attached to this memo is a table showing all the currently effective TMDLs for temperature and which scenario most likely applies for each TMDL.

Scenario A. The receiving stream is not impaired by temperature.
Permit writers will continue to issue or reissue NPDES permits and effluent limits for temperature as appropriate to ensure compliance with the still effective portions of OAR 340-041-0028 described above, and the additional mixing zone requirements in OAR 340-041-0053(2)(d) (Temperature Thermal Plume Limitations).

Scenario B. The receiving stream is impaired, but there is no TMDL in place.
Permit writers will issue and reissue permits to ensure compliance with the applicable BBNC, and the human use allowance as described in OAR 340-041-0028(12)(b)(A), and the additional mixing zone requirements in OAR 340-041-0053(2)(d) (Temperature Thermal Plume Limitations).

Scenario C. The receiving stream is impaired for temperature and there is a TMDL based on the biologically based numeric criteria.
Permit writers will continue to issue and reissue permits developed to be consistent with waste load allocations in accordance with OAR 340-041-0028(12)(b)(B) and the additional mixing zone requirements in OAR 340-041-0053(2)(d).

Scenario D. The receiving stream is impaired for temperature and there is a TMDL based on natural conditions criteria (or natural thermal potential).
For permit renewals, permit writers will determine the thermal loads that are consistent with TMDL waste load allocations and compare it to the thermal loads based on BBNC with the human use allowance of 0.3°C (see OAR 340-041-0028(12)(b)(A)). The more stringent of the two loads must be addressed in the permit. The permit evaluation report should clearly describe how the temperature limits were developed. The additional mixing zone requirements in OAR 340-041-0053(2)(d) also will be applied to the permit.

For new sources, permit writers will need to consult with DEQ Headquarters staff.

Scenario E: The receiving stream is impaired for temperature and the TMDL was developed and approved with temperature criteria effective before December 2003.
Some of these TMDLs include waste load allocations based on site potential or system potential temperatures rather than BBNC. As permits are renewed, DEQ must demonstrate that permits are consistent with current water quality standards. Permits will be consistent with waste load allocations or include effluent limits based on BBNC and human use allowance, as in scenario C or D above.

Meeting WQBELs
Some NPDES sources will not be able to comply with WQBELs for temperature at the time of permit reissuance. Measures for reducing temperature impacts (i.e. heat loads) to the receiving water that may be available to point sources include, but are not limited to, the following: natural treatment systems, indirect discharge, riparian restoration via trading, cooling technology (i.e. cooling towers), effluent reuse or land application (non-discharge) and/or flow augmentation.

Permit holders who cannot meet permit limits for temperature in the short term, but are reasonably likely to meet the limits in a certain timeframe after taking identified steps, may qualify for a compliance schedule. OAR 340-041-0061(15) allows compliance schedules for WQBELS that are newly applicable to the permit.

If it is not reasonably certain when or if a permit holder can meet a permit limit even after implementing pollutant control programs, the permit holder may discuss with DEQ whether a variance is available under OAR 340-041-0059. That rule allows a variance from the requirement

	to meet a water quality standard when one or more circumstances described in the rule exists (e.g., pollutant control measures would cause more environmental damage than caused by the exceedance; natural conditions prevent attainment of the standard; or when controls to reduce the pollutant would cause substantial and widespread economic and social impact). Permit holders seeking variances must submit pollution reduction plans subject to DEQ approval and incorporation into the permit. Measures for reducing temperature that DEQ may consider include, but are not limited, to natural treatment systems, indirect discharge, riparian restoration via trading, and flow augmentation. All variances granted by DEQ must be approved by EPA, in consultation with the National Marine Fisheries Services and/or the U.S. Fish & Wildlife Service, similar to the process used when the EQC adopts a new water quality standard. **Currently Effective Temperature TMDLs** Below is a list of all the currently effective temperature TMDLs, and which of the scenarios described in the memo applies. Permit writers should verify the approach used to develop each WLA with the basin coordinator, as some TMDLs incorporate NCC as well as BBNC depending on data availability and modeling approaches.

Basin	TMDL	Date approved by EPA	Basis for WLA	Permitting Scenarios
Grande Ronde	Lower Grande Ronde	September 2010	NCC	D
	Upper Grande Ronde	March 2000	Pre-12/2003 criteria	E
John Day	John Day	December 2010	BBNC	C
Klamath	Upper Klamath Lake	August 2002	Pre-Dec. 2003 criteria	E
	Upper Klamath and Lost River	December 2010	NCC	See note 1.
Malheur	Malheur River Basin	September 2010	BBNC	N/A See note 2.
Middle Columbia – Hood	Miles Creek	December 2008	BBNC	C
	Western Hood	December 2001	Pre-12/2003 criteria	E
North Coast/Lower Columbia	North Coast	November 2006 Addendum	Addendum issued 11/2006 modifies TMDLs for North Coast Subbasins, Tillamook Bay and Nestucca Bay. The revised WLAs are all based on the applicable BBNC.	C
Oregon Closed Lake Basins	Alvord Lake		Pre-2003 criteria, but no point sources in basin.	N/A
Rogue	Rogue	December 2008	NCC	D
	Applegate	February 2004	NCC (site potential), but no point sources in basin.	N/A
	Bear Creek	October 2007	BBNC (Ashland POTW)	C
Sandy	Sandy	April 2005	NCC	See note 3.
Snake	Snake River/Hells Canyon	September 2004 Revised	BBNC	See note 4.
Umatilla	Umatilla	March 2001	Original TMDL based on criteria that were replaced Dec.2003. A document issued 9/07 states that the system potential temperature profile of the TMDL meets the definition of the NCC in the post-12/03 standard. It also lists WLAs based on a HUA of 0.3C.	D
	Walla Walla	September 2005	NCC however there are no point sources discharging during the critical period.	N/A
	Willow Creek	February 2008	NCC same as BBNC	C
Umpqua	Umpqua	April 2007	NCC	D
	Little River	January 2002	Pre-12/03 criteria	E

Willamette	Willamette – Mainstem Only	September 2006	BBNC and NCC	D
	Mollala-Pudding	December 2008	NCC	D
	Tualatin	August 2001	Original TMDL based on pre-12/03 criteria.	E

Notes:

1. WLAs for point sources in the Klamath River are defined in the OAR 340-041-0185.
2. Page 9-44 of the Malheur Basin TMDL report shows only 2 individual point sources in the basin and they are both for irrigation districts.
3. There are 3 point sources in the Sandy basin and the TMDL effectively provides permit limits for them in Table 3-10 on page 65 of the TMDL report.
4. The TMDL for Snake River/Hells Canyon does not include a table with explicit WLAs for temperature for individual point sources. Instead, the Executive Summary states on page r, that "Point sources discharging directly to the Snake River within the SR-HC TMDL reach have been allocated heat loads corresponding to discharge loads applied to design flows to ensure that no measurable increase requirements will not be exceeded." The following rationale is given on page 394:

> The point source discharges represent no-measurable-increase in the water temperature of the mainstem Snake River within the SR-HC TMDL reach. (No-measurable-increase is defined by the State of Oregon as 0.25 °F (0.14 °C), and by the State of Idaho as 0.3 °C.) The point source discharges are calculated to contribute less than 0.012 °F (0.0066 °C) increase in mainstem water temperature in the Upstream Snake River segment (RM 409 to 335).

Under the current temperature standard for Oregon, the HUA is 0.3C rather than 0.14C.

Definitions

History

Version	Author	Comments
1.0	Jane Hickman	New policy – never finalized
1.1	Rob Burkhart	Minor changes to 1.0

Attachments OAR 340-041-0028 Temperature (Water Quality Standards)

Attachment

OAR 340-041-0028

Temperature

(1) Background. Water temperatures affect the biological cycles of aquatic species and are a critical factor in maintaining and restoring healthy salmonid populations throughout the State. Water temperatures are influenced by solar radiation, stream shade, ambient air temperatures, channel morphology, groundwater inflows, and stream velocity, volume, and flow. Surface water temperatures may also be warmed by anthropogenic activities such as discharging heated water, changing stream width or depth, reducing stream shading, and water withdrawals.

(2) Policy. It is the policy of the Commission to protect aquatic ecosystems from adverse warming and cooling caused by anthropogenic activities. The Commission intends to minimize the risk to cold-water aquatic ecosystems from anthropogenic warming, to encourage the restoration and protection of critical aquatic habitat, and to control extremes in temperature fluctuations due to anthropogenic activities. The Commission recognizes that some of the State's waters will, in their natural condition, not provide optimal thermal conditions at all places and at all times that salmonid use occurs. Therefore, it is especially important to minimize additional warming due to anthropogenic sources. In addition, the Commission acknowledges that control technologies, best management practices and other measures to reduce anthropogenic warming are evolving and that the implementation to meet these criteria will be an iterative process. Finally, the Commission notes that it will reconsider beneficial use designations in the event that man-made obstructions or barriers to anadromous fish passage are removed and may justify a change to the beneficial use for that water body.

(3) Purpose. The purpose of the temperature criteria in this rule is to protect designated temperature-sensitive, beneficial uses, including specific salmonid life cycle stages in waters of the State.

(4) Biologically Based Numeric Criteria. Unless superseded by the natural conditions criteria described in section (8) of this rule, or by subsequently adopted site-specific criteria approved by EPA, the temperature criteria for State waters supporting salmonid fishes are as follows:

(a) The seven-day-average maximum temperature of a stream identified as having salmon and steelhead spawning use on subbasin maps and tables set out in OAR 340-041-0101 to 340-041-0340: Tables 101B, and 121B, and Figures 130B, 151B, 160B, 170B, 220B, 230B, 271B, 286B, 300B, 310B, 320B, and 340B, may not exceed 13.0 degrees Celsius (55.4 degrees Fahrenheit) at the times indicated on these maps and tables;

(b) The seven-day-average maximum temperature of a stream identified as having core cold water habitat use on subbasin maps set out in OAR 340-041-101 to 340-041-340: Figures 130A, 151A, 160A, 170A, 180A, 201A, 220A, 230A, 271A, 286A, 300A, 310A, 320A, and 340A, may not exceed 16.0 degrees Celsius (60.8 degrees Fahrenheit);

(c) The seven-day-average maximum temperature of a stream identified as having salmon and trout rearing and migration use on subbasin maps set out at OAR 340-041-0101 to 340-041-0340: Figures 130A, 151A, 160A, 170A, 220A, 230A, 271A, 286A, 300A, 310A, 320A, and 340A, may not exceed 18.0 degrees Celsius (64.4 degrees Fahrenheit);

(d) The seven-day-average maximum temperature of a stream identified as having a migration corridor use on subbasin maps and tables OAR 340-041-0101 to 340-041-0340: Tables 101B, and 121B, and Figures 151A, 170A, 300A, and 340A, may not exceed 20.0 degrees Celsius (68.0 degrees Fahrenheit). In addition, these water bodies must have coldwater refugia that are sufficiently distributed so as to allow salmon and steelhead migration without significant adverse effects from higher water temperatures elsewhere in the water body. Finally, the seasonal thermal pattern in Columbia and Snake Rivers must reflect the natural seasonal thermal pattern;

(e) The seven-day-average maximum temperature of a stream identified as having Lahontan cutthroat trout or redband trout use on subbasin maps and tables set out in OAR 340-041-0101 to 340-041-0340: Tables 121B, 140B, 190B, and 250B, and Figures 180A, 201A, 260A and 310A may not exceed 20.0 degrees Celsius (68.0 degrees Fahrenheit);

(f) The seven-day-average maximum temperature of a stream identified as having bull trout spawning and juvenile rearing use on subbasin maps set out at OAR 340-041-0101 to 340-041-0340: Figures 130B, 151B, 160B, 170B, 180A, 201A, 260A, 310B, and 340B, may not exceed 12.0 degrees Celsius (53.6 degrees Fahrenheit). From August 15 through May 15, in bull trout spawning waters below Clear Creek and Mehlhorn reservoirs on Upper Clear Creek (Pine Subbasin), below Laurance Lake on the Middle Fork Hood River, and below Carmen reservoir on the Upper McKenzie River, there may be no more than a 0.3 degrees Celsius (0.5 Fahrenheit) increase between the water temperature immediately upstream of the reservoir and the water temperature immediately downstream of the spillway when the ambient seven-day-average maximum stream temperature is 9.0 degrees Celsius (48 degrees Fahrenheit) or greater, and no more than a 1.0 degree Celsius (1.8 degrees Fahrenheit) increase when the seven-day-average stream temperature is less than 9 degrees Celsius.

(5) Unidentified Tributaries. For waters that are not identified on the “Fish Use Designations” maps referenced in section (4) of this rule, the applicable criteria for these waters are the same criteria as is applicable to the nearest downstream water body depicted on the applicable map. This section (5) does not apply to the “Salmon and Steelhead Spawning Use Designations” maps.

(6) Natural Lakes. Natural lakes may not be warmed by more than 0.3 degrees Celsius (0.5 degrees Fahrenheit) above the natural condition unless a greater increase would not reasonably be expected to adversely affect fish or other aquatic life. Absent a discharge or human modification that would reasonably be expected to increase temperature, DEQ will presume that the ambient temperature of a natural lake is the same as its natural thermal condition.

(7) Oceans and Bays. Except for the Columbia River above river mile 7, ocean and bay waters may not be warmed by more than 0.3 degrees Celsius (0.5 degrees Fahrenheit) above the natural condition unless a greater increase would not reasonably be expected to adversely affect fish or other aquatic life. Absent a discharge or human modification that would reasonably be expected to increase temperature, DEQ will presume that the ambient temperature of the ocean or bay is the same as its natural thermal condition.

(8) Natural Conditions Criteria. Where the department determines that the natural thermal potential of all or a portion of a water body exceeds the biologically-based criteria in section (4) of this rule, the natural thermal potential temperatures supersede the biologically-based criteria, and are deemed to be the applicable temperature criteria for that water body.

NOTE: On August 8, 2013, the Environmental Protection Agency disapproved rule section OAR 340-041-0028(8). Consequently, section (8) is no longer effective as a water quality criterion for purposes of CWA Section 303(c) and it cannot be used for issuing certifications under CWA Section 401, permits under CWA Section 402, or total maximum daily loads under CWA section 303(d).

(9) Cool Water Species.

(a) No increase in temperature is allowed that would reasonably be expected to impair cool water species. Waters of the State that support cool water species are identified on subbasin tables and figures set out in OAR 340-041-0101 to 340-041-0340; Tables 140B, 190B and 250B, and Figures 180A, 201A and 340A.

(b) See OAR 340-041-0185 for a basin specific criterion for the Klamath River.

(10) Borax Lake Chub. State waters in the Malheur Lake Basin supporting the Borax Lake chub may not be cooled more than 0.3 degrees Celsius (0.5 degrees Fahrenheit) below the natural condition.

(11) Protecting Cold Water.

(a) Except as described in subsection (c) of this rule, waters of the State that have summer seven-day-average maximum ambient temperatures that are colder than the biologically based criteria in section (4) of this rule, may not be warmed by more than 0.3 degrees Celsius (0.5 degrees Fahrenheit) above the colder water ambient temperature. This provision applies to all sources taken together at the point of maximum impact where salmon, steelhead or bull trout are present.

(b) A point source that discharges into or above salmon & steelhead spawning waters that are colder than the spawning criterion, may not cause the water temperature in the spawning reach where the physical habitat for spawning exists during the time spawning through emergence use occurs, to increase more than the following amounts after complete mixing of the effluent with the river:

(A) If the rolling 60 day average maximum ambient water temperature, between the dates of spawning use as designated under subsection (4)(a) of this rule, is 10 to 12.8 degrees Celsius, the allowable increase is 0.5 Celsius above the 60 day average; or

(B) If the rolling 60 day average maximum ambient water temperature, between the dates of spawning use as designated under subsection (4)(a) of this rule, is less than 10 degrees Celsius, the allowable increase is 1.0 Celsius above the 60 day average, unless the source provides analysis showing that a greater increase will not significantly impact the survival of salmon or steelhead eggs or the timing of salmon or steelhead fry emergence from the gravels in downstream spawning reach.

(c) The cold water protection narrative criteria in subsection (a) do not apply if:

(A) There are no threatened or endangered salmonids currently inhabiting the water body;

(B) The water body has not been designated as critical habitat; and

(C) The colder water is not necessary to ensure that downstream temperatures achieve and maintain compliance with the applicable temperature criteria.

(12) Implementation of the Temperature Criteria.

(a) Minimum Duties. There is no duty for anthropogenic sources to reduce heating of the waters of the State below their natural condition. Similarly, each anthropogenic point and nonpoint source is responsible only for controlling the thermal effects of its own discharge or activity in accordance with its overall heat contribution. In no case may a source cause more warming than that allowed by the human use allowance provided in subsection (b) of this rule.

(b) Human Use Allowance. Insignificant additions of heat are authorized in waters that exceed the applicable temperature criteria as follows:

(A) Prior to the completion of a temperature TMDL or other cumulative effects analysis, no single NPDES point source that discharges into a temperature water quality limited water may cause the temperature of the water body to increase more than 0.3 degrees Celsius (0.5 Fahrenheit) above the applicable criteria after mixing with either twenty five (25) percent of the stream flow, or the temperature mixing zone, whichever is more restrictive; or

(B) Following a temperature TMDL or other cumulative effects analysis, waste load and load allocations will restrict all NPDES point sources and nonpoint sources to a cumulative increase of no greater than 0.3 degrees Celsius (0.5 Fahrenheit) above the applicable criteria after complete mixing in the water body, and at the point of maximum impact.

(C) Point sources must be in compliance with the additional mixing zone requirements set out in OAR 340-041-0053(2)(d).

(D) A point source in compliance with the temperature conditions of its NPDES permit is deemed in compliance with the applicable criteria.

(c) Air Temperature Exclusion. A water body that only exceeds the criteria set out in this rule when the exceedance is attributed to daily maximum air temperatures that exceed the 90th percentile value of annual maximum seven-day average maximum air temperatures calculated using at least 10 years of air temperature data, will not be listed on the section 303(d) list of impaired waters and sources will not be considered in violation of this rule.

(d) Low Flow Conditions. An exceedance of the biologically-based numeric criteria in section (4) of this rule, or an exceedance of the natural condition criteria in section (8) of this rule will not be considered a permit violation during stream flows that are less than the 7Q10 low flow condition for that water body.

(e) Other Nonpoint Sources. The department may, on a case-by-case basis, require nonpoint sources (other than forestry and agriculture), including private hydropower facilities regulated by a 401 water quality certification, that may contribute to warming of State waters beyond 0.3 degrees Celsius (0.5 degrees Fahrenheit), and are therefore designated as water-quality limited, to develop and implement a temperature management plan to achieve compliance with applicable temperature criteria or an applicable load allocation in a TMDL pursuant to OAR 340-042-0080.

(A) Each plan must ensure that the nonpoint source controls its heat load contribution to water temperatures such that the water body experiences no more than a 0.3 degrees Celsius (0.5 degree Fahrenheit) increase above the applicable criteria from all sources taken together at the maximum point of impact.

(B) Each plan must include a description of best management practices, measures, effluent trading, and control technologies (including eliminating the heat impact on the stream) that the nonpoint source intends to use to reduce its temperature effect, a monitoring plan, and a compliance schedule for undertaking each measure.

(C) The Department may periodically require a nonpoint source to revise its temperature management plan to ensure that all practical steps have been taken to mitigate or eliminate the temperature effect of the source on the water body.

(f) Compliance Methods. Anthropogenic sources may engage in thermal water quality trading in whole or in part to offset its temperature discharge, so long as the trade results in at least a net thermal loading decrease in anthropogenic warming of the water body, and does not adversely affect a threatened or endangered species. Sources may also achieve compliance, in whole or in part, by flow augmentation, hyporheic exchange flows, outfall relocation, or other measures that reduce the temperature increase caused by the discharge.

(g) Release of Stored Water. Stored cold water may be released from reservoirs to cool downstream waters in order to achieve compliance with the applicable numeric criteria. However, there can be no significant adverse impact to downstream designated beneficial uses as a result of the releases of this cold water, and the release may not contribute to violations of other water quality criteria. Where the Department determines that the release of cold water is resulting in a significant adverse impact, the Department may require the elimination or mitigation of the adverse impact.

(13) Site-Specific Criteria. The Department may establish, by separate rulemaking, alternative site-specific criteria for all or a portion of a water body that fully protects the designated use.

(a) These site-specific criteria may be set on a seasonal basis as appropriate.

(b) The Department may use, but is not limited by the following considerations when calculating site-specific criteria:

(A) Stream flow;

(B) Riparian vegetation potential;

(C) Channel morphology modifications;

(D) Cold water tributaries and groundwater;

(E) Natural physical features and geology influencing stream temperatures; and

(F) Other relevant technical data.

(c) DEQ may consider the thermal benefit of increased flow when calculating the site-specific criteria.

(d) Once established and approved by EPA, the site-specific criteria will be the applicable criteria for the water bodies affected.

[ED. NOTE: Tables referenced are available from the agency.]

Stat. Auth.: ORS 468.020, 468B.030, 468B.035 & 468B.048
Stats. Implemented: ORS 468B.030, 468B.035 & 468B.048
Hist.: DEQ 17-2003, f. & cert. ef. 12-9-03; DEQ 1-2007, f. & cert. ef. 3-14-07; DEQ 2-2007, f. & cert. ef. 3-15-07; DEQ 10-2011, f. & cert. ef. 7-13-11; DEQ 5-2013, f. & cert. ef. 6-21-13; DEQ 1-2015, f. & cert. ef. 1-7-15

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
WASTE DISCHARGE PERMIT

Oregon Department of Environmental Quality
Northwest Region – Portland Office
700 NE Multnomah St., Suite 600
Telephone: 503-229-5263

Issued pursuant to ORS 468B.050 and The Federal Clean Water Act (The Clean Water Act)

ISSUED TO:

City of Molalla
PO Box 248
Molalla, OR 97038

SOURCES COVERED BY THIS PERMIT:

Type of Waste	Outfall Number	Outfall Location
Treated Wastewater	001	Molalla River 45.15°N -122.54085°W River Mile 20
Recycled Water Reuse	002	Specified in Recycled Water Use Plan
Biosolids	N/A	Specified in Biosolids Management/Land Application Plan

FACILITY[1] LOCATION:

Molalla STP, 12424 Toliver Road
Molalla, OR 97038

Treatment System Class: Level III
Collection System Class: II

RECEIVING STREAM INFORMATION:

WRD Basin[2]: Willamette
USGS Sub-Basin[3]: Molalla-Pudding
Receiving Stream name: Molalla River
LLID: 1227171452976-20.0-D

County: Clackamas

EPA REFERENCE NO. [4]: OR-002238-1

Issued in response to Application No. insert received insert date. This permit is issued based on the land use findings in the permit record.

name, title region	Signature Date	Effective Date[5]

PERMITTED ACTIVITIES[6]

Until this permit expires or is modified or revoked, the permittee is authorized to: 1) operate a wastewater collection, treatment, control and disposal system; and 2) discharge treated wastewater to waters of the state only

from the authorized discharge point or points in Schedule A in conformance with the requirements, limits, and conditions set forth in this permit[7,8].

Unless specifically authorized by this permit, by another NPDES permit, or by Oregon statute or administrative rule, any other direct or indirect discharge of pollutants to waters of the state is prohibited.

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SCHEDULE A: WASTE DISCHARGE LIMITS

1. Outfall 001 – Interim Permit Limits per Schedule C

a. May 1 – October 31: During this period the permittee must comply with the limits in Table A1 while discharging to waters of the state.

b. November 1 – April 30: During this period the permittee must comply with the limits in Table A1 while discharging to waters of the state.

c. During the term of this permit, the effluent quality must comply with the limits in the following table:

Table A1: Permit Limits

Parameter	Units	Average Monthly	Average Weekly	Daily Maximum
BOD_5 (May 1 – October 31)	mg/L	10	15	-
	lbs/day	190	290	380
	% removal	85	-	-
TSS (May 1 – October 31)	mg/L	10	15	-
	lbs/day	190	290	380
	% removal	85	-	-
BOD_5 (November 1 – April 30)	mg/L	30	45	-
	lbs/day	1000	1500	2000
	%	85	-	-
TSS (November 1 – April 30)	mg/L	30	45	-
	lbs/day	1000	1500	2000
	%	85	-	-
pH[b]	SU	Between 6.0 and 9.0		
Design Effluent Flow Dry Season	MGD	2.30	-	-
Design Effluent Flow Wet Season	MGD	4.10		
Total Residual Chlorine[c]	mg/L	0.07	-	0.18
E. coli[ad]	MPN/100 ml	126	-	406
Ammonia	mg/L	16.7	-	25.9
Dilution	Discharge may not commence until gauged stream flow exceeds 350-cfs and will cease when the average stream flow for the previous seven-day-period is less than-350-cfs.			
Excess Thermal Load (May)[e]	Shall not exceed a 7-day moving average of the daily excess thermal loads of 77.95 million kcals/day.			
Excess Thermal Load (June)[e]	Shall not exceed a 7-day moving average of the daily excess thermal loads of 72.38 million kcals/day.			
Excess Thermal Load (July, August, September)	No Thermal Load Available – Effluent temperature must be less than 16°C.			
Excess Thermal Load (October)[e]	Shall not exceed a 7-day moving average of the daily excess thermal loads of 42.43 million kcals/day.			

Notes:
a. No single *E. coli* sample may exceed 406 organisms per 100 mL; The permittee may take at least 5 consecutive re-samples at 4-hour intervals beginning within 48 hours after the original sample. was taken and the geometric mean of the 5 re-samples is less than or equal to 126 *E. coli* organisms/100 mL to demonstrate compliance with the limit.
b. May not be outside the range of 6.0 to 9.0 S.U.
c. DEQ has established a minimum Quantitation Limit of 0.05 mg/L for Total Residual Chlorine. In cases where the average monthly or maximum daily limit for Total Residual Chlorine is lower than the Quantitation Limit, DEQ will use the reported Quantitation Limit as the compliance evaluation level.
d. Reported as a monthly geometric mean
e. Refer to Table B3 for formula to calculate Excess Thermal Load.

d. Additional information for the limits in Table A1 above.

i. Average dry weather design flow to the facility equals 2.3 MGD and mass load limits from May 1 to October 31 are based on 2.30 MGD. Average wet weather design flow to the facility equals 4.1 MGD and mass load limits from November 1 to April 30 are based on 4.10 MGD

2. Regulatory Mixing Zone

Pursuant to OAR 340-041-0053, the permittee is granted a regulatory mixing zone as described below:

The allowable mixing zone includes that portion of the Molalla River with boundary dimensions equal to the length of the effluent diffuser plus 10-feet on each end with the mixing zone extending 5-feet upstream and 50-feet downstream of the diffuser. The Zone of Immediate Dilution (ZID) is defined as that portion of the allowable mixing zone within 5-feet of the diffuser.

3. Groundwater Protection

The permittee may not cause an adverse impact on existing or potential beneficial uses of groundwater. All wastewater and process related residuals must be managed and disposed of in a manner that will not cause a violation of the Groundwater Quality Protection Rules (OAR Chapter 340, Division 40).

4. Use of Recycled Water

The permittee is authorized to distribute recycled water if it is:

b. Treated and used according to the criteria listed in Table A4.

c. Managed in accordance with its DEQ-approved Recycled Water Use Plan unless exempt as provided in Schedule D, condition 5.

d. Used in a manner and applied at a rate that does not have the potential to adversely impact groundwater quality[9].

e. Applied at a rate and in accordance with site management practices that ensure continued agricultural, horticultural, or silvicultural production and does not reduce the productivity of the site[10].

f. Irrigated using sound irrigation practices to prevent:

i. Offsite surface runoff or subsurface drainage through drainage tile;

ii. Creation of odors, fly and mosquito breeding, or other nuisance conditions; and

iii. Overloading of land with nutrients, organics, or other pollutants[11].

Table A2: Recycled Water Limits

Class	Level of Treatment (after disinfection unless otherwise specified)	Beneficial Uses
A.	Class A recycled water must be oxidized, filtered and disinfected. Before disinfection, turbidity may not exceed: • An average of 2 NTUs within a 24-hour period. • 5 NTUs more than five percent of the time within a 24-hour period. • 10 NTUs at any time. After disinfection, total coliform may not exceed: • A median of 2.2 organisms per 100 mL based on daily sampling over the last 7 days that analyses have been completed. • 23 organisms per 100 mL in any single sample.	Class A recycled water may be used for: • Class B, Class C, Class D, and nondisinfected uses. • Irrigation for any agricultural or horticultural use. • Landscape irrigation of parks, playgrounds, school yards, residential landscapes, or other landscapes accessible to the public. • Commercial car washing or fountains when the water is not intended for human consumption. • Water supply source for non-restricted recreational impoundments.
B.	Class B recycled water must be oxidized and disinfected. Total coliform may not exceed: • A median of 2.2 organisms per 100 mL, based on the last 7 days that analyses have been completed. • 23 total coliform organisms per 100 mL in any single sample.	Class B recycled water may be used for: • Class C, Class D, and nondisinfected uses. • Stand-alone fire suppression systems in commercial and residential building, non-residential toilet or urinal flushing, or floor drain trap priming. • Water supply source for restricted recreational impoundments.

Class	Level of Treatment (after disinfection unless otherwise specified)	Beneficial Uses
C.	Class C recycled water must be oxidized[12] and disinfected. Total coliform may not exceed: • A median of 23 total coliform organisms per 100 mL, based on results of the last 7 days that analyses have been completed. • 240 total coliform organisms per 100 mL in any two consecutive samples.	Class C recycled water may be used for: • Class D and nondisinfected uses. • Irrigation of processed food crops; irrigation of orchards or vineyards if an irrigation method is used to apply recycled water directly to the soil. • Landscape irrigation of golf courses, cemeteries, highway medians, or industrial or business campuses. • Industrial, commercial, or construction uses limited to: industrial cooling, rock crushing, aggregate washing, mixing concrete, dust control, nonstructural fire fighting using aircraft, street sweeping, or sanitary sewer flushing.
D.	Class D recycled water must be oxidized and disinfected. *E. coli* may not exceed: • A 30-day geometric mean of 126 organisms per 100 mL. • 406 organisms per 100 mL in any single sample.	Class D recycled water may be used for: • Nondisinfected uses. • Irrigation of firewood, ornamental nursery stock, Christmas trees, sod, or pasture for animals.

5. Biosolids

The permittee may land apply biosolids or provide biosolids for sale or distribution, subject to the following conditions:

g. The permittee must manage biosolids in accordance with its DEQ-approved Biosolids Management Plan and Land Application Plan.

h. Except when used for land reclamation and approved by DEQ, biosolids must be applied at or below the agronomic rate required for maximum crop yield.

i. The permittee must obtain written site authorization from DEQ for each land application site prior to land application (see Schedule D, Condition 7) and follow the site-specific management conditions in the DEQ-issued site authorization letter.

j. Biosolids must 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.

k. Pollutants in biosolids may not exceed the ceiling concentrations shown in Table A3 below. Biosolids exceeding the pollutant concentrations in Table A3 must be applied at a rate that does not exceed the corresponding cumulative pollutant loading rates.

Table A3: Biosolids Limits

Pollutant	Ceiling concentrations[1] (mg/kg)	Pollutant concentrations[1] (mg/kg)	Cumulative pollutant loading rates[1] (kg/ha)
Arsenic	75	41	41
Cadmium	85	39	39
Copper	4300	1500	1500
Lead	840	300	300
Mercury	57	17	17
Molybdenum	75	N/A	N/A
Nickel	420	420	420
Selenium	100	100	100
Zinc	7500	2800	2800

Note:

1. Biosolids pollutant limits are described in 40 CFR Part 503.13, which uses the terms *ceiling concentrations*, *pollutant concentrations*, and *cumulative pollutant loading rates*. Biosolids containing pollutants in excess of the ceiling concentrations may not be applied to the land. Biosolids containing pollutants in excess of the pollutant concentrations, but below the ceiling concentrations, may be applied to the land; however, the total quantity of biosolids applied may not exceed the cumulative pollutant loading rates.

SCHEDULE B: MINIMUM MONITORING AND REPORTING REQUIREMENTS

1. Monitoring and Reporting Protocols

a. Paper Submissions. The permittee must submit to DEQ the results in Schedule B in a paper format as specified below.

i. Prior to December 21, 2016, and until directed by DEQ, the permittee must submit all monitoring results required in this permit via DEQ-approved Discharge Monitoring Report (DMR) forms until directed by DEQ to do otherwise.

ii. The reporting period is the calendar month.

iii. Any monitoring results required in this permit must be submitted by the permittee to DEQ by the 15th day of the month following the reporting period unless specified otherwise in this permit or as specified in writing by DEQ.

iv. Prior to December 21, 2020, and until directed by DEQ, the permittee must submit any Pretreatment Program Reports, Biosolids/Sewage Sludge, Sewer Overflow/Bypass Event Reports, and other required information to DEQ.

v. The permittee must sign and certify submittals of DMRs, reports, and other information in accordance with the requirements of Section D8 within Schedule F of this permit.

b. Electronic Submissions. The permittee must submit to DEQ the results in Schedule B in an electronic format as specified below.

i. After December 21, 2016, and when directed by DEQ, the permittee must submit monitoring results required by this permit via DEQ-approved web-based Discharge Monitoring Report (DMR) forms to the NetDMR webpage at: https://netdmr.zendesk.com/home.

ii. The reporting period is the calendar month.

iii. The permittee must submit monitoring data and other information required by this permit for all compliance points by the 15th day of the month following the reporting period unless specified otherwise in this permit or as specified in writing by DEQ.

iv. The permittee must report all of the monitoring requirements listed in Schedule B of this permit via NetDMR beginning after December 21, 2016 and when directed by DEQ. Any data used to calculate summary statistics must be submitted as a separate attachment approved by DEQ via NetDMR

v. Beginning after December 21, 2020, or when directed by DEQ, the permittee must submit electronic reports for Pretreatment Program Reports, Biosolids/Sewage Sludge, Sewer Overflow/Bypass Event Reports, and other required information to DEQ via NetDMR.

vi. The permittee must sign and certify all electronic submissions in accordance with the requirements of Section D8 within Schedule F of this permit.

The permittee must submit to DEQ monitoring reports as listed below.

Table B1: Schedule for Reporting Requirements

Reporting Requirement	Frequency	Due Date (see Note a.)	Report Form[13] (unless otherwise specified in writing)[14]	Submit To:
Influent Monitoring and Effluent Monitoring	Monthly	15th day following the completed monitoring period	Specified in Schedule B. Section 1 of this permit	DEQ Regional Office DMR Processing Unit DEQ Water Quality Division 811 SW Sixth Avenue Portland, OR 97204
Tables B4 – B10: Effluent Toxics Characterization	Once (see Note e.)	End of the 25th month of permit effective date	1 hard copy and electronic copy in DEQ-approved format	DEQ Regional Office
Condition B.4: Ambient and Additional Effluent Toxics Characterization Data	Once (see Note e.)	If required, by 24th month following DEQ Notification of need for Level II Toxics Analysis	1 hard copy and electronic copy in DEQ-approved format	DEQ Regional Office
Table B5: WET Test Monitoring	See Table B11	Within 60 days of performance of the test.	1 hard copy, electronic copy in DEQ-approved format as per Table B11(electronic copy must include bench sheets)	DEQ Regional Office
Recycled water annual report describing effectiveness of recycled water system in complying with the DEQ-approved recycled water use plan, OAR 340-055, and this permit. (see Schedule D for more detail) Table B13: Recycled Water Monitoring	Annually	January15	2 hard copies and electronic copy in DEQ-approved format	One each to: DEQ Regional Office DEQ Water Reuse Program Coordinator

Reporting Requirement	Frequency	Due Date (see Note a.)	Report Form[13] (unless otherwise specified in writing)[14]	Submit To:
Wastewater solids annual report describing quality, quantity, and use or disposal of wastewater solids generated at the facility.	Annually	February 19[15]	2 hard copies and electronic copy in DEQ-approved format	One each to: DEQ Regional Office DEQ Biosolids Program Coordinator
Biosolids land application annual report describing solids handling activities for the previous year and includes the information described in OAR 340-050-0035(6)(a)-(e). Table B15: Biosolids Monitoring	Annually	February 19[16]	3 hard copies and electronic copy in DEQ-approved format	One each to: DEQ Regional Office DEQ Biosolids Program Coordinator EPA Region 10 *(for Class I facilities)*
Inflow and infiltration report (see Schedule D, Section 1 for description)	Annually	February 1	1 hard copy and electronic copy in DEQ-approved format	DEQ Regional Office
Hauled Waste Control Plan (for description, see Schedule D, Condition 9.	One time	Within 60 days of permit effective date	1 hard copy and electronic copy in DEQ-approved format	DEQ Regional Office
Mixing Zone Study (see Schedule D, Section 2.	One time	Within 180 days of permit effective date.	1 hard copy and electronic copy in DEQ-approved format	DEQ Regional Office
Significant Industrial User Survey (see Schedule D, Section 14.	One time	Within 36 months of permit effective date.	1 hard copy and electronic copy in DEQ-approved format	DEQ Pretreatment Coordinator
Outfall Inspection Report (see Schedule B, Section? for description)	Once per permit cycle	In 3rd year of permit cycle.	1 hard copy and electronic copy in DEQ-approved format	DEQ Regional Office

Reporting Requirement	Frequency	Due Date (see Note a.)	Report Form[13] (unless otherwise specified in writing)[14]	Submit To:
Notes: a. For submittals that are provided to DEQ by mail, the postmarked date must not be later than the due date. b. Name, certificate classification, and grade level of each responsible principal operator as well as identification of each system classification must be included on DMRs. Font size must not be less than 10 pt. c. Equipment breakdowns and bypass events must be noted on DMRs. **d.** DEQ anticipates implementing an electronic reporting system for DMRs. **After December 21, 2016, the permittee is required to submit DMRs electronically. Until Otherwise, the permittee must submit a hard copy of the DMR.** e. Though the overall characterization only needs to be performed once during the permit cycle, a particular characterization may include multiple sampling events.				

c. Test Methods

i. Test Methods – monitoring must be conducted according to test procedures in 40 CFR Part 136 and 40 CFR 503 for biosolids or other approved procedures as per Schedule F.

d. Detection and Quantitation Limits

i. Detection Level (DL) – The DL is defined as the minimum measured concentration of a substance that can be distinguished from method blank results with 99% confidence. The DL is derived using the procedure in 40 CFR Part 136 Appendix B and evaluated for reasonableness relative to method blank concentrations to ensure results reported above the DL are not a result of routine background contamination. The DL is also known as the Method Detection Limit (MDL) or Limit of Detection (LOD).

ii. Quantitation Limits (QLs)[17] – The QL is the minimum level, concentration or quantity of a target analyte that can be reported with a specified degree of confidence. It is the lowest level at which the entire analytical system gives a recognizable signal and acceptable calibration for the analyte. It is normally equivalent to the concentration of the lowest calibration standard adjusted for sample weights, volumes, preparation and cleanup procedures employed. The QL as reported by a laboratory is also sometimes referred to as the Method Reporting Limit (MRL) or Limit of Quantitation (LOQ).

iii. For compliance and characterization purposes, the maximum acceptable QL is stated in this permit.

e. Implementation

i. The Laboratory QLs (adjusted for any dilutions) for analyses performed to demonstrate compliance with permit limits or as part of effluent characterization, must be at or below the QLs specified in the permit unless one of the conditions below is met.

(A) The monitoring result shows a detect above the laboratory reported QL.

(B) The monitoring result indicates nondetect at a DL which is less than the QL.

(C) Matrix effects are present that prevent the attainment of QLs and these matrix effects are demonstrated according to procedures described in EPA's "Solutions to Analytical Chemistry Problems with Clean Water Act Methods", March 2007. If using alternative methods and taking appropriate steps to eliminate matrix effects does not eliminate the matrix problems, DEQ may authorize re-sampling or allow a higher QL to be reported. In the case of effluent characterization monitoring, DEQ may allow the re-sampling to be done as part of Tier 2 monitoring. Sections B.3 and B.4 contain more information on Tier 1 and Tier 2 monitoring.

f. Laboratory Quality Assurance and Quality Control

i. Laboratory Quality Assurance and Quality Control (QA/QC) – The permittee must develop and implement a written QA/QC program that conforms to the requirements of 40 CFR Part 136.7.

ii. If QA/QC requirements are not met for any analysis, the permittee must re-analyze the sample. If the sample cannot be re-analyzed, the permittee must re-sample and analyze at the earliest opportunity. If the permittee is unable to collect a sample that meeting QA/QC requirements, then the permittee must include the result in the discharge monitoring report (DMR) along with a notation (data qualifier). In addition, the permittee must explain how the sample does not meet QA/QC requirements. The permittee may not use the result that failed the QA/QC requirements in any calculation required by the permit unless authorized by DEQ.

g. Reporting Sample Results - The permittee must follow the procedures listed below when reporting sampling results.

i. The permittee must report the laboratory DL and QL as defined above for each analyte, with the following exceptions: pH, temperature, BOD, CBOD, TSS, O&G, hardness, alkalinity, bacteriological analytes and nitrate-nitrite. For temperature and pH, neither the QL nor the DL need to be reported. For the other parameters, the permittee is only required to report the QL and only when the result is ND.

ii. The permittee must report the same number of significant digits as the permit limit for a given parameter[18].

iii. CAS Numbers. CAS numbers (where available) must be reported along with monitoring results.

iv. (for Discharge Monitoring Reports) If a sample result is above the DL but below the QL, the permittee must report the result as the DL preceded by DEQ's data code "e". For example, if the DL is 1.0 µg/l, the QL is 3.0 µg/L and the result is estimated to be between the DL and QL, the permittee must report "e1.0 µg/L" on the DMR. This requirement does not apply in the case of parameters for which the DL does not have to be reported.

v. (for Discharge Monitoring Reports) If the sample result is below the DL, the permittee must report the result as less than the specified DL. For example, if the DL is 1.0 µg/L and

the result is ND, report "<1.0" on the discharge monitoring report (DMR). This requirement does not apply in the case of parameters for which the DL does not have to be reported.

h. Calculating and Reporting Mass Loads

The permittee must calculate mass loads on each day the parameter is monitored using the following equation:

Flow (in MGD) X Concentration (in mg/L) X 8.34 = Pounds per day

i. Mass load limits all have two significant figures unless otherwise noted.

ii. When concentration data are below the QL: To calculate the mass load from this result, use the DL. Report the mass load as less than the calculated mass load. For example, if flow is 2 MGD and the reported sample result is <1.0 µg/L, report "<0.02 lb/day" for mass load on the DMR (1.0 µg/L x 2 MGD x conversion factor = 0.017 lb/day, round off to 0.02 lb/day).

iii. When concentration data are above the DL, but below the QL: To calculate the mass load from this result, use the detection level. Report the mass load as the calculated mass load preceded by "e". For example, if flow is 2 MGD and the reported sample result is e1.0 µg/L, report "e0.02 lb/day" for mass load on the DMR (1.0 µg/L x 2 MGD x conversion factor = 0.017 lb/day, round off to 0.02 lb/day).

2. Monitoring and Reporting Requirements

The permittee must monitor influent at the plant headworks, effluent at Outfall 001 at the effluent monitoring station, and the ambient river conditions upstream of the outfall and report results in accordance with the table below:

Table B2: Base Monitoring Requirements

Item or Parameter	Location	Units	Time Period	Minimum Frequency[a]	Sample Type/Required Action	Summary Statistic
Total Flow	Influent, and Effluent	MGD	Year-round	Daily	Continuous	1. Daily totals (MG) 2. Monthly max (MGD) 3. Monthly average (MGD) 4. Monthly min (MGD) 5. Monthly total (MG)

Item or Parameter	Location	Units	Time Period	Minimum Frequency[a]	Sample Type/Required Action	Summary Statistic
$CBOD_5$	Influent and Effluent	mg/L	Year-round	2/week	24-hour flow-based composite	1. Daily values (mg/L) 2. Monthly average (mg/L) 3. Weekly averages (mg/L) 4. Max weekly average (mg/L) 5. Monthly maximum (mg/L)
$CBOD_5$	Influent and Effluent	lbs/day	Year-round	2/week	Calculation	1. Daily values (lbs/day) 2. Monthly average (lbs/day) 3. Weekly averages (lbs/day) 4. Max weekly average (lbs/day) 5. Monthly max (lbs/day)
BOD_5 Percent Removal	Influent and Effluent	%		2/week	Calculation based on monthly average $cBOD_5$ concentration values	1. Average Monthly (%)
TSS	Influent and Effluent	mg/L	Year-round	2/week	24-hour flow-based composite	1. Daily values (mg/L) 2. Monthly average (mg/L) 3. Weekly averages (mg/L) 4. Max weekly average (mg/L) 5. Monthly maximum (mg/L)

Item or Parameter	Location	Units	Time Period	Minimum Frequency[a]	Sample Type/Required Action	Summary Statistic
TSS	Influent and Effluent	lb/day	Year-round	2/week or 3/week	Calculation	1. Daily values (lbs/day) 2. Monthly average (lbs/day) 3. Weekly averages (lbs/day) 4. Max weekly average (lbs/day) 5. Monthly max (lbs/day)
pH	Effluent	Standard Units (SU)	Year-round	Daily	Continuous/Grab	1. Daily max (SU) 2. Daily min (SU) 3. Monthly max (SU) 4. Monthly min (SU)

Item or Parameter	Location	Units	Time Period	Minimum Frequency[a]	Sample Type/Required Action	Summary Statistic
Ammonia	Effluent	mg/L	When discharging	1/week	24-hour flow-based composite	1. Daily values (mg/L) 2. Monthly average (mg/L)
Temperature [c]	Effluent	ºC	When discharging	Daily	Continuous	1. Daily max 2. Daily min 3. Monthly max 4. Monthly min
Excess Thermal Load [d]	Effluent	Mkcal/day	When discharging May 1 – October 31	Daily	Calculation	1. Daily max 2. Daily min 3. Monthly max 4. Monthly min
Excess thermal Load as 7-day moving average [e]	Effluent	Mkcal/day	When discharging May 1 – October 31	Daily	Calculation	1. Daily max 2. Daily min 3. Monthly max 4. Monthly min
E. coli	Effluent to River	MPN/100 mL or # organisms/100 ml	When discharging	2/week	Grab	1. Daily values 2. Monthly maximum 3. Monthly Geometric Mean
Total Coliform	Effluent to Reuse	MPN/100 mL or # organisms/100 ml	When going to Land Application	Daily	Grab	1. Daily values
Alkalinity	Effluent	(mg/L)	When discharging	1/week	24-hour flow-based compo-site	1. Daily values (mg/L)
Hardness	Effluent	(mg/L)	When discharging	1/week	24-hour flow-based compo-site	1. Daily values (mg/L)

Item or Parameter	Location	Units	Time Period	Minimum Frequency[a]	Sample Type/Required Action	Summary Statistic
Stream Flow	Canby Meter	cfs	When discharging	daily	-	*1. Daily*

Notes:

a. In the event of equipment failure or loss, the permittee must notify DEQ and deploy new equipment to minimize interruption of data collection. If new equipment cannot be immediately deployed, Permittee must monitor grab measurements daily between 7 am and 3 pm until continuous monitoring equipment is redeployed.

b. Percent Removal shall be calculated on a monthly basis using the following formula:

$$Percent\ Removal = \frac{[Influent\ Concentration] - [Effluent\ Concentration]}{[Influent\ Concentration]} \times 100$$

. Where:
Influent Concentration = Corresponding 30-Day average influent concentration based on the analytical results of the reporting period.
Effluent Concentration = Corresponding 30-Day average effluent concentration based on the analytical results of the reporting period.

c. Effluent temperature shall be measured using a continuous temperature monitor. Temperature shall be recorded at intervals no longer than 30-minutes. The daily maximum effluent temperature is the maximum 1-hour average from the continuous monitoring data. The daily maximum effluent temperature and the daily average effluent flow shall be used to calculate the daily excess thermal load.

d. The daily excess thermal load must be calculated using the daily maximum effluent temperature and the daily average effluent flow. The daily excess thermal load must be calculated using the formula below. If the calculation results in an excess thermal load value less than zero, the results must be recorded as zero.

The ETL is calculated as follows: $ETL = 3785 * Qe * \Delta T * Cp * \rho$
Where:
ETL = Excess Thermal Load (Kcal/day)
Qe = Daily Average Effluent flow (MGD)
ΔT = Daily Maximum Effluent temperature (°C) minus ambient criterion (18°C)
Cp = Specific Heat of Water = 1 Kcal/1 Kg °C
ρ = Density of Water = 1000 Kg/m3
3785= Conversion from MGD to m3/day (1 MGD = 3785 m3/day)

e. Calculated as a 7-day moving average of the daily excess thermal loads. This value must be used to determine compliance with the Excess Thermal Load limit in Table A1 of Schedule A.

3. Tier 1 Monitoring: Effluent Toxics Characterization Monitoring

The permittee must analyze effluent samples for the parameters listed in tables B4-B8. The permittee must collect samples at the effluent sampling box on a quarterly basis in the first year following permit issuance. Samples must be 24 hour composites except as noted in Tables B2 and B3 for Total Cyanide, Free Cyanide and Volatile Organic Compounds. Additional monitoring may be required based on the results of this monitoring. This additional monitoring is referred to as Tier 2 monitoring and is described in more detail in condition 4: Ambient and Additional Effluent Characterization Monitoring. Sample results must be sub-

mitted to DEQ using DEQ's Electronic Data Delivery (EDD) system. For more information, go to: http://www.oregon.gov/deq/WQ/Pages/toxics/eddtoxics.aspx.

Table B4: Metals, Cyanide, Nitrates, Ammonia and Hardness

(µg/L unless otherwise specified)

Pollutant[a]	CAS[b]	QL	Pollutant[a]	CAS[b]	QL
Aluminum (Total)	7429905	50.0	Lead (total and dissolved)	7439921	1.0
Antimony (total)	7440360	0.10	Mercury (total)	7439976	0.001[19]
Arsenic (total)	7440382	0.50	Nickel (total and dissolved)	7440020	1.0
Arsenic (Total Inorganic)	7440382	1.0	Selenium (total and dissolved)	7782492	1.0
Arsenic (Total Inorganic Dissolved)	22541544	1.0	Silver (total and dissolved)	7440224	1.0
Beryllium (total)	7440417	0.10	Thallium (total)	7440280	0.10
Cadmium (total and dissolved)	7440439	0.10	Zinc (total and dissolved)	7440666	5.0
Chromium (total)	7440473	0.40	Cyanide (Free)[c]	57125	5.0
Chromium III (total and dissolved)	16065831	2.0	Cyanide (Total)[d]	57125	5.0
Chromium VI (total and dissolved)	18540299	2.0	Nitrate-Nitrite as N[20]	14797558	100
Copper[e] (Total and Dissolved)	7440508	2.0	Ammonia as N	7664417	1000
Iron	7439896	100	Hardness (Total as CaCO3)		

Notes:

a. The term "total" used in reference to metals is intended to cover all EPA-accepted standard digestion methods and is considered to be equivalent to the term "total recoverable".
b. Chemical Abstract Service
c. There are multiple approved methods for testing for free cyanide. For more information, refer to DEQ's analytical memo on the subject of cyanide monitoring at http://www.deq.state.or.us/wq/standards/docs/toxics/cyanide.pdf
d. When sampling for Total Cyanide, the permittee must collect at least six discrete grab samples over the operating day with samples collected no less than one hour apart. The aliquot must be at least 100 mL and collected and composited into a larger container that has been preserved with sodium hydroxide to insure sample integrity. [21]
e. Use Table B5 if the facility meets the criteria for the copper BLM listed above Table B5
f. Use Table B6 if the facility meets the criteria for the aluminum requirements listed above Table B6

Table B6: Volatile Organic Compounds

(µg/L unless otherwise specified)

Pollutant[a]	CAS	QL	Pollutant[a]	CAS	QL
Acrolein[k]	107028	5.0	1,2-trans-dichloroethylene[d]	156605	0.50
Acrylonitrile[k]	107131	5.0	1,1-dichloroethylene[f]	75354	0.50
Benzene	71432	0.50	1,2-dichloropropane	78875	0.50
Bromoform	75252	0.50	1,3-dichloropropylene[g]	542756	0.50
Carbon Tetrachloride	56235	0.50	Ethylbenzene	100414	0.50
Chlorobenzene	108907	0.50	Methyl Bromide[h]	74839	0.50
Chlorodibromomethane[b]	124481	0.50	Methyl Chloride[h]	74873	0.50
Chloroethane	75003	0.50	Methylene Chloride	75092	0.50
2-Chloroethylvinyl Ether[k]	110758	10	1,1,2,2-tetrachloroethane	79345	0.50
Chloroform	67663	0.50	Tetrachloroethylene[i]	127184	0.50
Dichlorobromomethane[c]	75274	0.50	Toluene	108883	0.50
1,2-Dichlorobenzene (o)	95501	0.50	1,1,1-trichloroethane	71556	0.50
1,3-Dichlorobenzene (m)	541731	0.50	1,1,2-trichloroethane	79005	0.50
1,4-Dichlorobenzene (p)	106467	0.50	Trichloroethylene[j]	79016	0.50
1,1-dichloroethane	75343	0.50	Vinyl Chloride	75014	0.50
1,2-dichloroethane	107062	0.50			

Notes:

a. The permittee must collect six discrete samples[22] (not less than 40 mL) over the operating day at intervals of at least one hour. The samples may be analyzed separately or composited. If analyzed separately, the analytical results for all samples must be averaged for reporting purposes. If composited, they must be composited in the laboratory at the time of analysis in a manner that maintains the integrity of the samples and prevents the loss of volatile analytes. The quantitation limits listed above remain in effect for composite samples.
b. Chlorodibromomethane is identified as Dibromochloromethane in 40 CFR Part 136.3, Table 1C.
c. Dichlorobromomethane is identified as Bromodichloromethane in 40 CFR Part 136.3, Table 1C.
d. 1,2-trans-dichloroethylene is identified as trans-1,2-dichloroethene in 40 CFR Part 136.3, Table 1C.
e. 1,1-dichloroethylene is identified as 1,1-dichloroethene in 40 CFR Part 136.3, Table 1C.
f. 1,3-dichloropropylene consists of both cis-1,3-dichloropropene and trans-1,3-dichloropropene. Both should be reported individually.
g. Methyl bromide is identified as Bromomethane in 40 CFR Part 136.3, Table 1C.
h. Methyl chloride is identified as chloromethane in 40 CFR Part 136.3, Table 1C.
i. Tetrachloroethylene is identified as tetrachloroethene in 40 CFR Part 136.3, Table 1C.
j. Trichloroethylene is identified as trichloroethene in 40 CFR Part 136.3, Table 1C.
k. Acrolein, Acrylonitrile, and 2-Chloroethylvinyl ether must be tested from an unacidified sample.

Table B7: Acid-Extractable Compounds

(µg/L unless otherwise specified)

Pollutant	CAS	QL[a]	Pollutant	CAS	QLa
p-chloro-m-cresol[b]	59507	1.0	2-nitrophenol	88755	2.0
2-chlorophenol	95578	1.0	4-nitrophenol	100027	5.0
2,4-dichlorophenol	120832	1.0	Pentachlorophenol	87865	1.0
2,4-dimethylphenol	105679	5.0	Phenol	108952	1.0
4,6-dinitro-o-cresol[c]	534521	2.0	2,4,5-trichlorophenol[d]	95954	2.0

Pollutant	CAS	QL[a]	Pollutant	CAS	QLa
2,4-dinitrophenol	51285	5.0	2,4,6-trichlorophenol	88062	1.0

a. Some QLs may need methods with modification allowed in 40 CFR Part 136.6 or EPA's Solutions for Analytical Chemistry Problems w/Clean Water Methods, March 2007. (url: http://water.epa.gov/scitech/methods/cwa/atp/upload/2008_02_06_methods_pumpkin.pdf)
b. p-chloro-m-cresol is identified as 4-Chloro-3-methylphenol in 40 CFR Part 136.3, Table 1C.
c. 4,6-dinitro-o-cresol is identified as 2-Methyl-4,6-dinitrophenol in 40 CFR Part 136.3, Table 1C.
d. To monitor for 2,4,5-trichlorophenol, use EPA Method 625.

Table B8: Base-Neutral Compounds

(µg/L unless otherwise specified)

Pollutant	CAS	QL[a]	Pollutant	CAS	QL
Acenaphthene	83329	1.0	Dimethyl phthalate	131113	1.0
Acenaphthylene	208968	1.0	2,4-dinitrotoluene	121142	1.0
Anthracene	120127	1.0	2,6-dinitrotoluene	606202	1.0
Benzidine	92875	10	1,2-diphenylhydrazine[d]	122667	2.0
Benzo(a)anthracene	56553	0.5	Fluoranthene	206440	2.0
Benzo(a)pyrene	50328	0.5	Fluorene	86737	1.0
3,4-benzofluoranthene[b]	205992	0.5	Hexachlorobenzene	118741	1.0
Benzo(ghi)perylene	191242	1.0	Hexachlorobutadiene	87683	2.0
Benzo(k)fluoranthene	207089	0.5	Hexachlorocyclopentadiene	77474	2.0
Bis(2-chloroethoxy)methane	111911	2.0	Hexachloroethane	67721	1.0
Bis(2-chloroethyl)ether	111444	1.0	Indeno(1,2,3-cd)pyrene	193395	0.5
Bis(2-chloroisopropyl)ether[c]	108601	2.0	Isophorone	78591	5.0
Bis (2-ethylhexyl)phthalate	117817	1.0	Napthalene	91203	1.0
4-bromophenyl phenyl ether	101553	1.0	Nitrobenzene	98953	1.0
Butylbenzyl phthalate	85687	1.0	N-nitrosodi-n-propylamine	621647	2.0
2-chloronaphthalene	91587	1.0	N-nitrosodimethylamine	62759	1.0
4-chlorophenyl phenyl ether	7005723	1.0	N-nitrosodiphenylamine	86306	1.0
Chrysene	218019	0.5	Pentachlorobenzene	608935	1.0
Di-n-butyl phthalate	84742	1.0	Phenanthrene	85018	1.0
Di-n-octyl phthalate	117840	1.0	Pyrene	129000	1.0
Dibenzo(a,h)anthracene	53703	0.5	1,2,4-trichlorobenzene	120821	1.0
3,3-Dichlorobenzidine	91941	1.0	Tetrachlorobenzene,1,2,4,5[e]	95943	1.0
Diethyl phthalate	84662	1.0			

a. Some QLs may need methods with modification allowed in 40 CFR Part 136.6 or EPA's *Solutions for Analytical chemistry Problems w/Clean Water Methods, March 2007*.
b. 3,4-benzofluoranthene is listed as Benzo(b)fluoranthene in 40 CFR Part 136.
c. Bis(2-chloroisopropyl)ether is listed as 2,2'-oxybis(2-chloro-propane in 40 CFR Part 136.
d. 1,2-diphenylhydrazine is difficult to analyze given its rapid decomposition rate in water. Azobenzene (a decomposition product of 1,2-diphenylhydrazine), should be analyzed as an estimate of this chemical.23
e. To analyze for Pentachlorobenzene and Tetrachlorobenzene 1,2,4,5, use EPA 625.

4. Ambient and Additional Effluent Characterization Monitoring (Tier 2 Monitoring)

DEQ will evaluate the results of monitoring required under Schedule B condition 3: Effluent Toxics Characterization Monitoring (also referred to as Tier 1 monitoring) to determine whether the permittee will be required to conduct additional ambient water quality and/or effluent monitoring (also referred to as Tier 2 monitoring). DEQ will notify the permittee of its determination through a written "Monitoring Action Letter."

5. Whole Effluent Toxicity (WET) Testing Requirements

The permittee must monitor final effluent for whole effluent toxicity as described in Table B11 using the testing protocols specified in Schedule D, condition 11, Whole Effluent Toxicity Testing for Freshwater for Outfall 001 must be collected at the location specified below.

Table B11: WET Test Monitoring

Parameter	Minimum Frequency	Sample Type/Location	Report
Acute toxicity	The permittee must monitor 4 times over the permit cycle with each sample collected during a different quarter (modify as needed for seasonal discharges). All four samples may be collected in the first year of the permit or they may be collected during a different quarter each year over 4 years during a discharge period (i.e., Year 1, Qtr 1) When possible, conduct WET testing concurrent with Effluent Toxics Characterization Monitoring as described in Schedule D, Condition 11. If a particular test shows toxicity at the acute (ZID) or the chronic (RMZ) dilutions, the permittee must re-test and if necessary evaluate the cause of toxicity as described in Schedule D, Condition 11.	For acute toxicity: Composite taken *at the effluent sample station.*	Report must include test results and backup information such as bench sheets sufficient to demonstrate compliance with permit requirements. Report must include a statement certifying that the results do or do not show toxicity at dilutions corresponding to the edge of the ZID and the mixing zone. The corresponding dilutions are as follows for the wet season (November – April): ZID: 5 Mixing zone: 12 The corresponding dilutions are as follows for the dry season (May - October): ZID: 8 Mixing zone: 18 A template for providing WET test results is provided below.
Chronic toxicity		For chronic toxicity: 24-hr composite taken at the effluent sample station.	

The permittee must submit the results of WET tests using the template below, along with laboratory reports.

Table B12: Template for Reporting WET Test Results

Date of Test	Organism	Type of Test (chronic or acute)	% Effluent at ZID and/or RMZ	Result	% Effluent at Endpoint (NOEC, LOEC or IC25)
1/1/2022	Water Flea	Acute	40% at ZID	Pass	NOEC = 50%
1/1/2022	Fathead Minnow	Chronic	20% at RMZ	Pass	IC25 = 40%
1/1/2022	Green Algae	Chronic	20% at RMZ	Pass	LOEC = 25%

6. Recycled Water Monitoring Requirements: Outfall 002

The permittee must monitor recycled water for outfall 002 as listed below. The samples must be representative of the recycled water delivered for beneficial reuse at a location identified in the Recycled Water Use Plan.

Table B13: Recycled Water Monitoring

Item or Parameter	Time Period	Minimum Frequency	Sample Type/Required Action	Report
Total Flow (MGD) or Quantity Irrigated (inches/acre)		Daily	Measurement	
Quantity Chlorine Used (lbs)		Daily	Measurement	
Chlorine, Total Residual (mg/L)		Daily	Grab	
pH		2/Week	Grab	
Total Coliform		Daily (Class A) 3/Week (Class B) Weekly (Class C)	Grab	
Turbidity		Hourly (Class A only)	Measurement	
Nitrogen Loading Rate (lbs/acre-year)		Annually	Calculation	
Nutrients (TKN, NO2+NO3-N, NH3, Total Phosphorus[24])		Quarterly	Grab	

7. Biosolids Monitoring Requirements

The permittee must monitor biosolids land applied or produced for sale or distribution as listed below. The samples must be representative of the quality and quantity of biosolids generated and undergo the same treatment process used to prepare the biosolids[25].

Table B14: Biosolids Monitoring

Item or Parameter	Minimum Frequency	Sample Type
Nutrient and conventional parameters[26] (% dry weight unless otherwise specified): Total Kjeldahl Nitrogen (TKN) Nitrate-Nitrogen (NO_3-N) Ammonium Nitrogen (NH_4-N) Total Phosphorus (P) Potassium (K) pH (S.U.) Total Solids Volatile Solids	As described in the DEQ-approved Biosolids Management Plan, but not less than the frequency in Table B15	As described in the DEQ-approved Biosolids Manage-ment Plan
Pollutants[27]: As, Cd, Cu, Hg, Pb, Mo, Ni, Se, Zn, mg/kg dry weight	As described in the DEQ-approved Biosolids Management Plan, but not less than the frequency in Table B15.	As described in the DEQ-approved Biosolids Manage-ment Plan
Pathogen reduction	As described in the DEQ-approved Biosolids Management Plan, but not less than the frequency in Table B15.	As described in the DEQ-approved Biosolids Manage-ment Plan
Vector attraction reduction	As described in the DEQ-approved Biosolids Management Plan, but not less than the frequency in Table B15.	As described in the DEQ-approved Biosolids Manage-ment Plan
Record of biosolids land application: date, quantity, location.	Each event	Record the date, quantity, and location of biosolids land applied on site location map or equivalent electronic system, such as GIS.

Table B15: Biosolids Minimum Monitoring Frequency

Quantity of biosolids land applied or produced for sale or distribution per calendar year		Minimum Sampling Frequency
(dry metric tons)	(dry U.S. tons)	

Quantity of biosolids land applied or produced for sale or distribution per calendar year		Minimum Sampling Frequency
(dry metric tons)	(dry U.S. tons)	
Less than 290	Less than 320	Once per year
290 to 1,500	320 to 1,653	Once per quarter (4x/year)
1500 to 15,000	1,653 to 16,535	Once per 60 days (6x/year)
15,000 or more	16,535 or more	Once per month (12x/year)

8. Permit Application Monitoring Requirements[28]

The permittee must submit a minimum of four results for the following pollutants and submit the data with their monthly DMR and as part of their next permit renewal application. Samples must be collected in May (Year 3 of the permit), November (Year 3 of the permit), May (Year 4 of the permit), and November (Year 4 of the permit).

Table B16: Effluent Monitoring Required for NPDES Permit Application

Parameters that are already monitored on a regular basis under Table B-2 should be deleted.

Parameter	Units	Minimum Sampling Frequency	Sample Type
Dissolved Oxygen	mg/L	Annual	
Total Kjeldahl Nitrogen (TKN)	mg/L	Annual	
Nitrate Plus Nitrite Nitrogen	mg/L	Annual	
Oil and Grease	mg/L	Annual	Grab
Alkalinity	mg/L	Annual	
Total Hardness	mg/L	Annual	
Total Dissolved Solids	mg/L	Annual	
Total Phosphorus	mg/L	Annual	

9. Outfall Inspection

During the year XXXX (3rd year of permit issuance), the permittee must inspect outfall 001 including the submerged portion of the outfall line and diffuser to document its integrity and to determine whether it is functioning as designed. The inspection should include ensuring diffuser ports are intact, clear and fully functional. The permittee must submit a written report to DEQ regarding the results of the outfall inspection by no later than December 31, XXXX (same year as inspection). The report should include a description of the outfall as originally constructed, the condition of the current outfall and a discussion of any repairs that may need to be performed to return the outfall to satisfactory condition.

SCHEDULE C: COMPLIANCE SCHEDULE

1. Compliance Schedule to Meet Final Effluent Limitations

a. Final Compliance Date

The permittee must meet the final effluent limits for river discharge in Schedule A by date.

b. Interim Compliance Date(s)

In the interim, the permittee must take the following actions:

i. Submit the final facility plan for the upgraded wastewater treatment plant to DEQ for review and approval by xxxxxx The plan must identify alternatives and indicate the selected alternative(s) that will enable the facility to meet final river discharge and land application effluent limits.

ii. Submit the final plans and specifications for the upgraded wastewater treatment plant to DEQ for review and approval by date.

iii. Submit a report of progress toward construction of the upgraded wastewater treatment plant by date.

iv. Submit a proposed construction schedule with dates for construction milestones that are not more than 12 months apart.

v. Submit progress reports at a frequency of not less than once per year, beginning with the start of construction. These progress reports must document progress on construction relative to the dates named in the construction schedule.

vi. Complete construction of the upgraded wastewater treatment plant by date.

2. Interim Permit Limits

Interim permit limits have been established in Schedule A.2 for operation of the existing treatment facilities until the upgraded wastewater treatment plant is commissioned.

3. Responsibility to Meet Compliance Dates

No later than 14 days following each milestone, the permittee must notify DEQ in writing of its compliance or noncompliance with the interim requirements.

Any reports of noncompliance must include the cause of noncompliance, any remedial actions taken, and a discussion of the likelihood of meeting the next scheduled requirements.

4. Re-opener Clause

This permit may be re-opened and modified to be consistent with conditions or mitigation measures imposed as a result of EPA's Endangered Species Act consultation with NMFS and USF&WS on DEQ's rule authorizing the use of this compliance schedule. If necessary, DEQ will commence modification of this permit by notifying the permittee and seeking public comment on the proposed modifications within two

years after the later of (1) the date EPA's re-approval of Oregon's compliance schedules rule becomes final, or (2) the date DEQ completes any required implementation of EPA re-approval, unless the date for completion of implementation exceeds two years from the date of EPA's action, in which case the modifications must commence within a period of four years from the date of EPA's re-approval[29].

SCHEDULE D: SPECIAL CONDITIONS

1. Inflow Removal

a. Within 180 days of the effective date of the permit, the permittee must submit to DEQ for approval an updated Inflow Removal Program. The program must consist of the following:

i. Identification of all overflow points.

ii. Verification that sewer system overflows are not occurring up to a 24-hour, 5-year storm event or equivalent.

iii. Monitoring of all pump station overflow points.

iv. A process for identifying and removing all inflow sources into the permittee's sewer system over which the permittee has legal control, including a time schedule for identifying and reducing inflow.

v. If the permittee does not have the necessary legal authority for all portions of the sewer system or treatment facility, a strategy and schedule for gaining legal authority to require inflow reduction and a process and schedule for identifying and removing inflow sources once legal authority has been obtained.

b. Within 60 days of receiving written DEQ comments, the permittee must submit a final approvable program and time schedule.

c. A copy of the program must be kept at the wastewater treatment facility for review upon request by DEQ.

d. An annual inflow and infiltration report must be submitted to the DEQ as directed in Schedule B. The report must include the following:

i. Details of activities performed in the previous year to identify and reduce inflow and infiltration.

ii. Details of activities planned for the following year to identify and reduce inflow and infiltration.

iii. A summary of sanitary sewer overflows that occurred during the previous year.

iv. Information that demonstrates compliance with the DEQ-approved Inflow Removal Plan required by condition 1.a above.

2. Mixing Zone Study

The permittee shall complete a mixing zone study following the guidelines of the following the guidelines outlined in the IMD. The study must provide mixing zone dilutions for both wet season and dry season shoulder month conditions using the minimum river flow established for discharge in Schedule A Table A1.

3. Emergency Response and Public Notification Plan

The permittee must develop and maintain an Emergency Response and Public Notification Plan (the Plan) per Schedule F, Section B, and Conditions 7 & 8. The permittee must develop the plan within six months of permit issuance and update the Plan annually to ensure that telephone and email contact information for applicable public agencies (permit writer should include specific contacts here as needed) are current and accurate. An updated copy of the plan must be kept on file at the wastewater treatment facility for DEQ review. The latest plan revision date must be listed on the Plan cover along with the reviewer's initials or signature.

4. Recycled Water Use Plan

a. In order to distribute recycled water for reuse, the permittee must have and maintain a DEQ-approved Recycled Water Use Plan meeting the requirements in OAR 340-055-0025. The permittee must submit substantial modifications to an existing plan to DEQ for approval at least 60 days prior to making the proposed changes. Conditions in the plan are enforceable requirements under this permit.

b. Recycled Water Annual Report – The permittee must submit a recycled water annual report by the date specified in Table B13: Reporting Requirements and Due Dates. This report must describe the effectiveness of the system in complying with the approved recycled water use plan, the rules included in OAR 340-055, and the permit limits and conditions for recycled water contained in Schedule A, Condition 4. The plan must also include the monitoring data for the previous year required under Schedule B, Condition 6.

5. Exempt Wastewater Reuse at the Treatment System

The permittee is exempt from the recycled water use requirements in OAR 340-055 when recycled water is used for landscape irrigation within the property boundary or in-plant processes at the wastewater treatment system and all of the following conditions are met:

a. The recycled water is an oxidized and disinfected wastewater.

b. The recycled water is used at the wastewater treatment system site where it is generated or at an auxiliary wastewater or sludge treatment facility that is subject to the same NPDES or WPCF permit as the wastewater treatment system. Land that is contiguous to the property upon which the treatment system is located is considered to be part of the wastewater treatment system site if under the same ownership.

c. Spray and/or drift from the use does not occur off the site.

d. Public access to the site is restricted.

6. Biosolids Management Plan

The permittee must maintain a Biosolids Management Plan meeting the requirements in OAR 340-050-0031(5). The permittee must keep the plan updated and submit substantial modifications to an existing plan to DEQ for approval at least 60 days prior to making the proposed changes. Conditions in the plan are enforceable requirements under this permit.

7. Land Application Plan

a. Plan Contents

The permittee must maintain a land application plan that contains the information listed below.[30,31]. The land application plan may be incorporated into the Biosolids Management Plan.

i. All known DEQ-approved sites that will receive biosolids while the permit is effective.

ii. The geographic location, identified by county or smaller unit, of new sites which are not specifically listed at the time of permit application.

iii. Criteria that will be used in the selection of new sites.

iv. Management practices that will be implemented at new sites authorized by the DEQ.

v. Procedures for notifying property owners adjacent to proposed sites of the proposed activity prior to the start of application[32].

b. Site Authorization

The permittee must obtain written authorization from DEQ for each land application site prior to its use. Conditions in site authorizations are enforceable requirements under this permit[33]. The permittee may land apply biosolids to a DEQ-approved site only as described in the site authorization, while this permit is effective and with the written approval of the property owner. DEQ may modify or revoke a site authorization following the procedures for a permit modification described in OAR 340-045-0055.

c. Public Participation

i. No DEQ-initiated public notice is required for continued use of sites identified in the DEQ-approved land application plan.

ii. For new sites that fail to meet the site selection criteria in the land application plan or that are deemed by DEQ to be sensitive with respect to residential housing, runoff potential, or threat to groundwater, DEQ will provide an opportunity for public comment as directed by OAR 340-050-0015(10)[34].

iii. For all other new sites, the permittee must provide for public participation following procedures in its DEQ-approved land application plan.

d. Exceptional Quality (EQ) Biosolids

The permittee is exempt from the requirements in condition 7.b.-c. above if:

i. Pollutant concentrations of biosolids are less than the pollutant concentration limits in Schedule A, Table A3;

ii. Biosolids meet one of the Class A pathogen reduction alternatives in 40 CFR §503.32(a); and

iii. Biosolids meet one of the vector attraction reduction options in 40 CFR §503.33(b)(1) through (8).

8. Wastewater Solids Transfers

a. *Within state.* The permittee may transfer wastewater solids including Class A and Class B biosolids, to another facility permitted to process or dispose of wastewater solids, including but not limited to: another wastewater treatment facility, landfill, or incinerator. The permittee must monitor, report, and dispose of solids as required under the permit of the receiving facility.

b. *Out of state.* If wastewater solids, including Class A and Class B biosolids, are transferred out of state for use or disposal, the permittee must obtain written authorization from DEQ, meet Oregon requirements for the use or disposal of wastewater solids, notify in writing the receiving state of the proposed use or disposal of wastewater solids, and satisfy the requirements of the receiving state.

9. Hauled Waste Control

The permittee may accept hauled wastes at discharge points designated by the POTW after receiving written DEQ approval of a hauled waste control plan. Hauled wastes may include wastewater solids from another wastewater treatment facility, septage, grease trap wastes, portable and chemical toilet wastes, landfill leachate, groundwater remediation wastewaters and commercial/industrial wastewaters.

10. Lagoon Solids

At least 60 days and preferably six months prior to the removal of accumulated solids from the lagoon, the permittee must submit to DEQ a biosolids management plan and land application plan as required in conditions 6 and 7 respectively. DEQ will provide an opportunity for comment on the biosolids management plan and land application plan as directed by OAR 340-050-0015(8). The permittee must follow the conditions in the approved plan.

11. Whole Effluent Toxicity Testing for Freshwater

a. The permittee must conduct whole effluent toxicity (WET) tests as specified here and in Schedule B of this permit.

b. Acute Toxicity Testing - Organisms and Protocols

i. The permittee must conduct 48-hour static renewal tests with *Ceriodaphnia dubia* (water flea) and 96-hour static renewal tests with *Pimephales promelas* (fathead minnow).

ii. All test methods and procedures must be in accordance with *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, Fifth Edition, EPA-821-R-02-012, October 2002*. If the permittee wants to deviate from the bioassay procedures outlined in this method, the permittee must submit a written request to DEQ for review and approval prior to use.

iii. Treatments to the final effluent samples (for example, dechlorination), except those included as part of the methodology, may not be performed by the laboratory unless approved by DEQ prior to analysis.

iv. Unless otherwise approved by DEQ in writing, acute tests must be conducted on a control (0%) and the following dilution series: 6.25%, 12.5%, 25%, 50%, and 100% effluent. The dilution series should include effluent percentage (equal to 100/dilution) that is expected at the edge of the ZID, as well as effluent percentages above and below this value. For ex-

ample, if the expected dilution is 2.5, the effluent percentage at the ZID is 40%, and an appropriate dilution series would be 100%, 70%, 40%, 20%, 10% and 0% effluent.

v. An acute WET test will be considered to show toxicity if there is a statistically significant difference in survival between the control and 25% reported as the NOEC <10%.

c. Chronic Toxicity Testing - Organisms and Protocols

i. The permittee must conduct tests with *Ceriodaphnia dubia* (water flea) for reproduction and survival test endpoint, *Pimephales promelas* (fathead minnow) for growth and survival test endpoint, and *Raphidocelis subcapitata* (green alga formerly known as *Selanastrum capricornutum*) for growth test endpoint.

ii. All test methods and procedures must be in accordance with *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, Fourth Edition, EPA-821-R-02-013, October 2002*. If the permittee wants to deviate from the bioassay procedures outlined in the applicable method, the permittee must submit a written request to DEQ for review and approval prior to use.

iii. Treatments to the final effluent samples (for example, dechlorination), except those included as part of the methodology, may not be performed by the laboratory unless approved by DEQ prior to analysis.

iv. Unless otherwise approved by DEQ in writing, chronic tests must be conducted on a control (0%) and the following dilution series: 2.5%, 5.0%, 20%, 35%, and 100% effluent.

v. A chronic WET test will be considered to show toxicity if the IC25 (25% inhibition concentration) occurs at dilutions equal to or less than the dilution that is known to occur at the edge of the mixing zone, that is, IC25 $\leq$ 25%.

d. Dual End-Point Tests

i. WET tests may be dual end-point tests in which both acute and chronic end-points can be determined from the results of a single chronic test. The acute end-point will be based on 48-hours for the *Ceriodaphnia dubia* (water flea) and 96-hours for the *Pimephales promelas* (fathead minnow).

ii. All test methods and procedures must be in accordance with *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, Fourth Edition, EPA-821-R-02-013, October 2002*. If the permittee wants to deviate from the bioassay procedures outlined in this method, the permittee must submit a written request to DEQ for review and approval prior to use.

iii. Unless otherwise approved by DEQ in writing, tests run as dual end-point tests must be conducted on a control (0%) and the following dilution series: 6.25%, 12.5%, 25%, 50%, and 100% effluent.

iv. Toxicity determinations for dual end-point tests must correspond to the acute and chronic tests described in conditions 10.b.v and 10.c.v above.

e. Sampling Requirements

At the time of WET sampling, the permittee must collect and analyze effluent samples for ammonia.

f. Evaluation of Causes and Exceedances

i. If any test exhibits toxicity as described in conditions 11.b.v. and 11.c.v. above, the permittee must conduct another toxicity test using the same species and DEQ-approved methodology within two weeks unless otherwise approved by DEQ.

ii. If two consecutive WET test results indicate acute or chronic toxicity as described in conditions 11.b.v. and 11.c.v. above, the permittee must immediately notify DEQ of the results. DEQ will work with the permittee to determine the appropriate course of action to evaluate and address the toxicity.

g. Quality Assurance and Reporting

i. Quality assurance criteria, statistical analyses, and data reporting for the WET tests must be in accordance with the EPA documents stated in this condition.

ii. For each test, the permittee must provide a bioassay laboratory report according to the EPA method documents referenced in this Schedule. The report must include all QA/QC documentation, statistical analysis for each test performed, standard reference toxicant test (SRT) conducted on each species required for the toxicity tests, and completed Chain of Custody forms for the samples including time of sample collection and receipt. The permittee must submit reports to DEQ within 60 days of test completion.

iii. The report must include all endpoints measured in the test: NOEC (No Observed Effects Concentration), LOEC (Lowest Observed Effects Concentration), and IC_{25} (chronic effect 25% inhibition concentration).

iv. The permittee must make available to DEQ upon request the written standard operating procedures they, or the laboratory performing the WET tests, use for all toxicity tests required by DEQ.

h. Reopener

DEQ may reopen and modify this permit to include new limits, monitoring requirements, and/or conditions as determined by DEQ to be appropriate, and in accordance with procedures outlined in OAR Chapter 340, Division 45 if:

i. WET testing data indicate acute and/or chronic toxicity.

ii. The facility undergoes any process changes.

iii. Discharge monitoring data indicate a change in the reasonable potential to cause or contribute to an exceedance of a water quality standard.

12. Operator Certification

a. Definitions

i. "Supervise" means to have full and active responsibility for the daily on site technical operation of a wastewater treatment system or wastewater collection system.[35]

ii. "Supervisor" or “designated operator”[36], means the operator delegated authority by the permittee for establishing and executing the specific practice and procedures for operating

the wastewater treatment system or wastewater collection system in accordance with the policies of the owner of the system and any permit requirements.[37]

iii. "Shift Supervisor" means the operator delegated authority by the permittee for executing the specific practice and procedures for operating the wastewater treatment system or wastewater collection system when the system is operated on more than one daily shift.[38]

iv. "System" includes both the collection system and the treatment systems.

b. The permittee must comply with OAR Chapter 340, Division 49, "Regulations Pertaining to Certification of Wastewater System Operator Personnel" and designate a supervisor whose certification corresponds with the classification of the collection and/or treatment system as specified on p. 1 of this permit.

c. The permittee must have its system supervised full-time by one or more operators who hold a valid certificate for the type of wastewater treatment or wastewater collection system, and at a grade equal to or greater than the wastewater system's classification[39] as specified on p. 1 one of this permit.

d. The permittee's wastewater system may not be without the designated supervisor for more than 30 days. During this period, there must be another person available to supervise who is certified at no more than one grade lower than the classification of the wastewater system. The permittee must delegate authority to this operator to supervise the operation of the system.[40]

e. If the wastewater system has more than one daily shift, the permittee must have another properly certified operator available to supervise operation of the system. Each shift supervisor must be certified at no more than one grade lower than the system classification.[41]

f. The permittee is not required to have a supervisor on site at all times; however, the supervisor must be available to the permittee and operator at all times.[42]

g. The permittee must notify DEQ in writing of the name of the system supervisor. The permittee may replace or re-designate the system supervisor with another properly certified operator at any time and must notify DEQ in writing within 30 days of replacement or re-designation of operator in charge.[43] As of this writing, the notice of replacement or re-designation must be sent to Water Quality Division, Operator Certification Program, 700 NE Multnomah St, Suite 600, Portland, OR 97232-4100. This address may be updated in writing by DEQ during the term of this permit.

h. When compliance with item (e) of this section is not possible or practicable because the system supervisor is not available or the position is vacated unexpectedly, and another certified operator is not qualified to assume supervisory responsibility, the Director may grant a time extension for compliance with the requirements in response to a written request from the system owner. The Director will not grant an extension longer than 120 days unless the system owner documents the existence of extraordinary circumstances.

13. Industrial User Survey

The permittee must conduct an industrial user survey to determine the presence of any industrial users discharging wastewaters subject to pretreatment and submit a report on the findings to DEQ within 24 months of the permit effective date. 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 to state wa-

ters. If the POTW has already completed a baseline IU Survey the results of this survey are to be provided to DEQ within two months of the permit effective date.

Guidance on conducting IU Surveys can be found at
http://www.deq.state.or.us/wq/pretreatment/docs/guidance/IUSurveyGuidance.pdf

Once an initial baseline IU Survey is conducted it is to be maintained by the POTW and made available for inspection by DEQ. Every 5 years from the effective date of the permit, the permittee must submit an updated IU survey.

The permittee must conduct an industrial user survey to determine the presence of any industrial users discharging wastewaters subject to pretreatment and submit two copies of the report; one to the DEQ permit writer and one to pretreatment coordinator (include address) within 24 months of the permit effective date. 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 to state waters. If the POTW has already completed a baseline IU Survey the results of this survey are to be provided to DEQ within two months of the permit effective date.

Guidance on conducting IU Surveys can be found at
http://www.deq.state.or.us/wq/pretreatment/docs/guidance/IUSurveyGuidance.pdf

Once an initial baseline IU Survey is conducted it is to be maintained by the POTW and made available for inspection by DEQ. Every 5 years from the effective date of the permit, the permittee must submit an updated IU survey.

SCHEDULE F

NPDES GENERAL CONDITIONS – DOMESTIC FACILITIES
October 1, 2015 Version *(do not delete the date)*

SECTION A. STANDARD CONDITIONS

A1. Duty to Comply with Permit

The permittee must comply with all conditions of this permit. Failure to comply with any permit condition is a violation of Oregon Revised Statutes (ORS) 468B.025 and the federal Clean Water Act and is grounds for an enforcement action. Failure to comply is also grounds for DEQ to terminate, modify and reissue, revoke, or deny renewal of a permit.

A2. Penalties for Water Pollution and Permit Condition Violations

The permit is enforceable by DEQ or EPA, and in some circumstances also by third-parties under the citizen suit provisions of 33 USC § 1365. DEQ enforcement is generally based on provisions of state statutes and Environmental Quality Commission (EQC) rules, and EPA enforcement is generally based on provisions of federal statutes and EPA regulations.

ORS 468.140 allows DEQ to impose civil penalties up to $25,000 per day for violation of a term, condition, or requirement of a permit. The federal Clean Water Act provides for civil penalties not to exceed $37,500 and administrative penalties not to exceed $16,000 per day for each violation of any condition or limitation of this permit.

Under ORS 468.943, unlawful water pollution in the second degree, is a Class A misdemeanor and is punishable by a fine of up to $25,000, imprisonment for not more than one year, or both. Each day on which a violation occurs or continues is a separately punishable offense. The federal Clean Water Act provides for criminal penalties of not more than $50,000 per day of violation, or imprisonment of not more than 2 years, or both for second or subsequent negligent violations of this permit.

Under ORS 468.946, unlawful water pollution in the first degree is a Class B felony and is punishable by a fine of up to $250,000, imprisonment for not more than 10 years, or both. The federal Clean Water Act provides for criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment of not more than 3 years, or both for knowing violations of the permit. In the case of a second or subsequent conviction for knowing violation, a person is subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both.

A3. Duty to Mitigate

The permittee must take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit. In addition, upon request of DEQ, the permittee must correct any adverse impact on the environment or human health resulting from noncompliance with this permit, including such accelerated or additional monitoring as necessary to determine the nature and impact of the noncomplying discharge.

A4. Duty to Reapply

If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and have the permit renewed. The application must be submitted at least 180 days before the expiration date of this permit.

DEQ may grant permission to submit an application less than 180 days in advance but no later than the permit expiration date.

A.5. Permit Actions

This permit may be modified, revoked and reissued, or terminated for cause including, but not limited to, the following:

a. Violation of any term, condition, or requirement of this permit, a rule, or a statute.
b. Obtaining this permit by misrepresentation or failure to disclose fully all material facts.
c. A change in any condition that requires either a temporary or permanent reduction or elimination of the authorized discharge.
d. The permittee is identified as a Designated Management Agency or allocated a wasteload under a total maximum daily load (TMDL).
e. New information or regulations.
f. Modification of compliance schedules.
g. Requirements of permit reopener conditions
h. Correction of technical mistakes made in determining permit conditions.
i. Determination that the permitted activity endangers human health or the environment.
j. Other causes as specified in 40 CFR §§ 122.62, 122.64, and 124.5.
k. For communities with combined sewer overflows (CSOs):
   (1) To comply with any state or federal law regulation for CSOs that is adopted or promulgated subsequent to the effective date of this permit.
   (2) If new information that was not available at the time of permit issuance indicates that CSO controls imposed under this permit have failed to ensure attainment of water quality standards, including protection of designated uses.
   (3) Resulting from implementation of the permittee's long-term control plan and/or permit conditions related to CSOs.

The filing of a request by the permittee for a permit modification, revocation or reissuance, termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

A6. Toxic Pollutants

The permittee must comply with any applicable effluent standards or prohibitions established under Oregon Administrative Rule (OAR) 340-041-0033 and section 307(a) of the federal Clean Water Act for toxic pollutants, and with standards for sewage sludge use or disposal established under section 405(d) of the federal Clean Water Act, within the time provided in the regulations that establish those standards or prohibitions, even if the permit has not yet been modified to incorporate the requirement.

A7. Property Rights and Other Legal Requirements

The issuance of this permit does not convey any property rights of any sort, or any exclusive privilege, or

authorize any injury to persons or property or invasion of any other private rights, or any infringement of federal, tribal, state, or local laws or regulations.

A8. Permit References

Except for effluent standards or prohibitions established under section 307(a) of the federal Clean Water Act and OAR 340-041-0033 for toxic pollutants, and standards for sewage sludge use or disposal established under section 405(d) of the federal Clean Water Act, all rules and statutes referred to in this permit are those in effect on the date this permit is issued.

A9. Permit Fees

The permittee must pay the fees required by OAR.

SECTION B. OPERATION AND MAINTENANCE OF POLLUTION CONTROLS

B1. Proper Operation and Maintenance

The permittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of the permit.

B2. Need to Halt or Reduce Activity Not a Defense

For industrial or commercial facilities, upon reduction, loss, or failure of the treatment facility, the permittee must, to the extent necessary to maintain compliance with its permit, control production or all discharges or both until the facility is restored or an alternative method of treatment is provided. This requirement applies, for example, when the primary source of power of the treatment facility fails or is reduced or lost. It is not a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

B3. Bypass of Treatment Facilities

a. Definitions

(1) "Bypass" means intentional diversion of waste streams from any portion of the treatment facility. The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, provided the diversion is to allow essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of paragraphs b and c of this section.

(2) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources that can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

b. Prohibition of bypass.

(1) Bypass is prohibited and DEQ may take enforcement action against a permittee for bypass unless:

i. Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;

ii. There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate backup equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass that occurred during normal periods of equipment downtime or preventative maintenance; and

iii. The permittee submitted notices and requests as required under General Condition B3.c.

(2) DEQ may approve an anticipated bypass, after considering its adverse effects and any alternatives to bypassing, if DEQ determines that it will meet the three conditions listed above in General Condition B3.b.(1).

c. Notice and request for bypass.

(1) Anticipated bypass. If the permittee knows in advance of the need for a bypass, a written notice must be submitted to DEQ at least ten days before the date of the bypass.

(2) Unanticipated bypass. The permittee must submit notice of an unanticipated bypass as required in General Condition D5.

B4. Upset

a. Definition. "Upset" means an exceptional incident in which there is unintentional and temporary non-compliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operation error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventative maintenance, or careless or improper operation.

b. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology-based permit effluent limitations if the requirements of General Condition B4.c are met. No determination made during administrative review of claims that noncompliance was caused by up-set, and before an action for noncompliance, is final administrative action subject to judicial review.

c. Conditions necessary for a demonstration of upset. A permittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other rel-evant evidence that:

(1) An upset occurred and that the permittee can identify the causes(s) of the upset;

(2) The permitted facility was at the time being properly operated;

(3) The permittee submitted notice of the upset as required in General Condition D5, hereof (24-hour notice); and

(4) The permittee complied with any remedial measures required under General Condition A3 hereof.

d. Burden of proof. In any enforcement proceeding the permittee seeking to establish the occurrence of an upset has the burden of proof.

B5. Treatment of Single Operational Upset

For purposes of this permit, a single operational upset that leads to simultaneous violations of more than one pollutant parameter will be treated as a single violation. A single operational upset is an exceptional incident that causes simultaneous, unintentional, unknowing (not the result of a knowing act or omission), temporary noncompliance with more than one federal Clean Water Act effluent discharge pollutant pa-

rameter. A single operational upset does not include federal Clean Water Act violations involving discharge without a NPDES permit or noncompliance to the extent caused by improperly designed or inadequate treatment facilities. Each day of a single operational upset is a violation.

B6. Overflows from Wastewater Conveyance Systems and Associated Pump Stations

a. Definition. "Overflow" means any spill, release or diversion of sewage including:

(1) An overflow that results in a discharge to waters of the United States; and

(2) An overflow of wastewater, including a wastewater backup into a building (other than a backup caused solely by a blockage or other malfunction in a privately owned sewer or building lateral), even if that overflow does not reach waters of the United States.

b. Reporting required. All overflows must be reported orally to DEQ within 24 hours from the time the permittee becomes aware of the overflow. Reporting procedures are described in more detail in General Condition D5.

B7. Public Notification of Effluent Violation or Overflow

If effluent limitations specified in this permit are exceeded or an overflow occurs that threatens public health, the permittee must take such steps as are necessary to alert the public, health agencies and other affected entities (for example, public water systems) about the extent and nature of the discharge in accordance with the notification procedures developed under General Condition B8. Such steps may include, but are not limited to, posting of the river at access points and other places, news releases, and paid announcements on radio and television.

B8. Emergency Response and Public Notification Plan

The permittee must develop and implement an emergency response and public notification plan that identifies measures to protect public health from overflows, bypasses, or upsets that may endanger public health. At a minimum the plan must include mechanisms to:

a. Ensure that the permittee is aware (to the greatest extent possible) of such events;

b. Ensure notification of appropriate personnel and ensure that they are immediately dispatched for investigation and response;

c. Ensure immediate notification to the public, health agencies, and other affected public entities (including public water systems). The overflow response plan must identify the public health and other officials who will receive immediate notification;

d. Ensure that appropriate personnel are aware of and follow the plan and are appropriately trained;

e. Provide emergency operations; and

f. Ensure that DEQ is notified of the public notification steps taken.

B9. Removed Substances

Solids, sludges, filter backwash, or other pollutants removed in the course of treatment or control of wastewaters must be disposed of in such a manner as to prevent any pollutant from such materials from entering waters of the state, causing nuisance conditions, or creating a public health hazard.

SECTION C. MONITORING AND RECORDS

C1. Representative Sampling

Sampling and measurements taken as required herein must be representative of the volume and nature of the monitored discharge. All samples must be taken at the monitoring points specified in this permit, and

must be taken, unless otherwise specified, before the effluent joins or is diluted by any other waste stream, body of water, or substance. Monitoring points must not be changed without notification to and the approval of DEQ. Samples must be collected in accordance with requirements in 40 CFR part 122.21 and 40 CFR part 403 Appendix E.

C2. Flow Measurements

Appropriate flow measurement devices and methods consistent with accepted scientific practices must be selected and used to ensure the accuracy and reliability of measurements of the volume of monitored discharges. The devices must be installed, calibrated and maintained to insure that the accuracy of the measurements is consistent with the accepted capability of that type of device. Devices selected must be capable of measuring flows with a maximum deviation of less than ± 10 percent from true discharge rates throughout the range of expected discharge volumes.

C3. Monitoring Procedures

Monitoring must be conducted according to test procedures approved under 40 CFR part 136 or, in the case of sludge (biosolids) use and disposal, approved under 40 CFR part 503 unless other test procedures have been specified in this permit.

For monitoring of recycled water with no discharge to waters of the state, monitoring must be conducted according to test procedures approved under 40 CFR part 136 or as specified in the most recent edition of Standard Methods for the Examination of Water and Wastewater unless other test procedures have been specified in this permit or approved in writing by DEQ.

C4. Penalties for Tampering

The federal Clean Water Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit may, upon conviction, be punished by a fine of not more than $10,000 per violation, imprisonment for not more than two years, or both. If a conviction of a person is for a violation committed after a first conviction of such person, punishment is a fine not more than $20,000 per day of violation, or by imprisonment of not more than four years, or both.

C5. Reporting of Monitoring Results

Monitoring results must be summarized each month on a discharge monitoring report form approved by DEQ. The reports must be submitted monthly and are to be mailed, delivered or otherwise transmitted by the 15th day of the following month unless specifically approved otherwise in Schedule B of this permit. Click **Select**, then **Select All**.

C6. Additional Monitoring by the Permittee

If the permittee monitors any pollutant more frequently than required by this permit, using test procedures approved under 40 CFR part 136 or, in the case of sludge (biosolids) use and disposal, approved under 40 CFR part 503, or as specified in this permit, the results of this monitoring must be included in the calcula-

tion and reporting of the data submitted in the discharge monitoring report. Such increased frequency must also be indicated. For a pollutant parameter that may be sampled more than once per day (for example, total residual chlorine), only the average daily value must be recorded unless otherwise specified in this permit.

C7. Averaging of Measurements

Calculations for all limitations that require averaging of measurements must utilize an arithmetic mean, except for bacteria which must be averaged as specified in this permit.

C8. Retention of Records

Records of monitoring information required by this permit related to the permittee's sewage sludge use and disposal activities must be retained for a period of at least 5 years (or longer as required by 40 CFR part 503). Records of all monitoring information including all calibration and maintenance records, all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit and records of all data used to complete the application for this permit must be retained for a period of at least 3 years from the date of the sample, measurement, report, or application. This period may be extended by request of DEQ at any time.

C9. Records Contents

Records of monitoring information must include:

a. The date, exact place, time, and methods of sampling or measurements;
b. The individual(s) who performed the sampling or measurements;
c. The date(s) analyses were performed;
d. The individual(s) who performed the analyses;
e. The analytical techniques or methods used; and
f. The results of such analyses.

C10. Inspection and Entry

The permittee must allow DEQ or EPA upon the presentation of credentials to:

a. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;
b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and
d. Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by state law, any substances or parameters at any location.

C11. Confidentiality of Information

Any information relating to this permit that is submitted to or obtained by DEQ is available to the public unless classified as confidential by the Director of DEQ under ORS 468.095. The permittee may request that information be classified as confidential if it is a trade secret as defined by that statute. The name and address of the permittee, permit applications, permits, effluent data, and information required by NPDES application forms under 40 CFR § 122.21 are not classified as confidential [40 CFR § 122.7(b)].

SECTION D. REPORTING REQUIREMENTS

D1. Planned Changes

The permittee must comply with OAR 340-052, "Review of Plans and Specifications" and 40 CFR § 122.41(l)(1). Except where exempted under OAR 340-052, no construction, installation, or modification involving disposal systems, treatment works, sewerage systems, or common sewers may be commenced until the plans and specifications are submitted to and approved by DEQ. The permittee must give notice to DEQ as soon as possible of any planned physical alternations or additions to the permitted facility.

D2. Anticipated Noncompliance

The permittee must give advance notice to DEQ of any planned changes in the permitted facility or activity that may result in noncompliance with permit requirements.

D3. Transfers

This permit may be transferred to a new permittee provided the transferee acquires a property interest in the permitted activity and agrees in writing to fully comply with all the terms and conditions of the permit and EQC rules. No permit may be transferred to a third party without prior written approval from DEQ. DEQ may require modification, revocation, and reissuance of the permit to change the name of the permittee and incorporate such other requirements as may be necessary under 40 CFR § 122.61. The permittee must notify DEQ when a transfer of property interest takes place.

D4. Compliance Schedule

Reports of compliance or noncompliance with, or any progress reports on interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date. Any reports of noncompliance must include the cause of noncompliance, any remedial actions taken, and the probability of meeting the next scheduled requirements.

D5. Twenty-Four Hour Reporting

The permittee must report any noncompliance that may endanger health or the environment. Any information must be provided orally (by telephone) to the DEQ regional office or Oregon Emergency Response System (1-800-452-0311) as specified below within 24 hours from the time the permittee becomes aware of the circumstances.

a. Overflows.

(1) Oral Reporting within 24 hours.

i. For overflows other than basement backups, the following information must be reported to the Oregon Emergency Response System (OERS) at 1-800-452-0311. For basement backups, this information should be reported directly to the DEQ regional office.

(a) The location of the overflow;

(b) The receiving water (if there is one);

(c) An estimate of the volume of the overflow;

(d) A description of the sewer system component from which the release occurred (for example, manhole, constructed overflow pipe, crack in pipe); and

(e) The estimated date and time when the overflow began and stopped or will be stopped.

ii. The following information must be reported to the DEQ regional office within 24 hours, or during normal business hours, whichever is earlier:

(a) The OERS incident number (if applicable); and

(b) A brief description of the event.

(2) Written reporting postmarked within 5 days.

i. The following information must be provided in writing to the DEQ regional office within 5 days of the time the permittee becomes aware of the overflow:

(a) The OERS incident number (if applicable);

(b) The cause or suspected cause of the overflow;

(c) Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the overflow and a schedule of major milestones for those steps;

(d) Steps taken or planned to mitigate the impact(s) of the overflow and a schedule of major milestones for those steps; and

(e) For storm-related overflows, the rainfall intensity (inches/hour) and duration of the storm associated with the overflow.

DEQ may waive the written report on a case-by-case basis if the oral report has been received within 24 hours.

b. Other instances of noncompliance.

(1) The following instances of noncompliance must be reported:

i. Any unanticipated bypass that exceeds any effluent limitation in this permit;

ii. Any upset that exceeds any effluent limitation in this permit;

iii. Violation of maximum daily discharge limitation for any of the pollutants listed by DEQ in this permit; and

iv. Any noncompliance that may endanger human health or the environment.

(2) During normal business hours, the DEQ regional office must be called. Outside of normal business hours, DEQ must be contacted at 1-800-452-0311 (Oregon Emergency Response System).

(3) A written submission must be provided within 5 days of the time the permittee becomes aware of the circumstances. The written submission must contain:

i. A description of the noncompliance and its cause;

ii. The period of noncompliance, including exact dates and times;

iii. The estimated time noncompliance is expected to continue if it has not been corrected;

iv. Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance; and

v. Public notification steps taken, pursuant to General Condition B**7.**

(4) DEQ may waive the written report on a case-by-case basis if the oral report has been received within 24 hours.

D6. Other Noncompliance

The permittee must report all instances of noncompliance not reported under General Condition D4 or D5 at the time monitoring reports are submitted. The reports must contain:

a. A description of the noncompliance and its cause;

b. The period of noncompliance, including exact dates and times;

c. The estimated time noncompliance is expected to continue if it has not been corrected; and

d. Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

D7. Duty to Provide Information

The permittee must furnish to DEQ within a reasonable time any information that DEQ may request to de-

termine compliance with the permit or to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit. The permittee must also furnish to DEQ, upon request, copies of records required to be kept by this permit.

Other Information: When the permittee becomes aware that it has failed to submit any relevant facts or has submitted incorrect information in a permit application or any report to DEQ, it must promptly submit such facts or information.

D8. Signatory Requirements

All applications, reports or information submitted to DEQ must be signed and certified in accordance with 40 CFR § 122.22.

D9. Falsification of Information

Under ORS 468.953, any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance, is subject to a Class C felony punishable by a fine not to exceed $125,000 per violation and up to 5 years in prison per ORS chapter 161. Additionally, according to 40 CFR § 122.41(k)(2), any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit including monitoring reports or reports of compliance or non-compliance will, upon conviction, be punished by a federal civil penalty not to exceed $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.

D10. Changes to Indirect Dischargers

The permittee must provide adequate notice to DEQ of the following:

a. Any new introduction of pollutants into the POTW from an indirect discharger which would be subject to section 301 or 306 of the federal Clean Water Act if it were directly discharging those pollutants and;

b. Any substantial change in the volume or character of pollutants being introduced into the POTW by a source introducing pollutants into the POTW at the time of issuance of the permit.

c. For the purposes of this paragraph, adequate notice must include information on (i) the quality and quantity of effluent introduced into the POTW, and (ii) any anticipated impact of the change on the quantity or quality of effluent to be discharged from the POTW.

SECTION E. DEFINITIONS

E1. *BOD* or *BOD$_5$* means five-day biochemical oxygen demand.

E2. *CBOD* or *CBOD$_5$* means five-day carbonaceous biochemical oxygen demand.

E3. *TSS* means total suspended solids.

E4. *Bacteria* means but is not limited to fecal coliform bacteria, total coliform bacteria, *Escherichia coli* (*E. coli*) bacteria, and *Enterococcus* bacteria.

E5. *FC* means fecal coliform bacteria.

E6. *Total residual chlorine* means combined chlorine forms plus free residual chlorine

E7. *Technology based permit effluent limitations* means technology-based treatment requirements as defined in 40 CFR § 125.3, and concentration and mass load effluent limitations that are based on minimum design criteria

specified in OAR 340-041.

E8. *mg/l* means milligrams per liter.

E9. *µg/l* means microgram per liter.

E10. *kg* means kilograms.

E11. *m^3/d* means cubic meters per day.

E12. *MGD* means million gallons per day.

E13. *Average monthly effluent limitation* as defined at 40 CFR § 122.2 means the highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month.

E14. *Average weekly effluent limitation* as defined at 40 CFR § 122.2 means the highest allowable average of daily discharges over a calendar week, calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week.

E15. *Daily discharge* as defined at 40 CFR § 122.2 means the discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the daily discharge must be calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurement, the daily discharge must be calculated as the average measurement of the pollutant over the day.

E16. *24-hour composite sample* means a sample formed by collecting and mixing discrete samples taken periodically and based on time or flow.

E17. *Grab sample* means an individual discrete sample collected over a period of time not to exceed 15 minutes.
E18. *Quarter* means January through March, April through June, July through September, or October through December.
E19. *Month* means calendar month.
E20. *Week* means a calendar week of Sunday through Saturday.
E21. *POTW* means a publicly-owned treatment works.

[1] In the past, information on the facility type has been included on the face page of the permit along with the facility location. Since this information can potentially trigger the need for a permit modification if the treatment technology changes, it is no longer included. Note that even without such a description, the permit may still need to be modified as the result of a treatment modification if the modifications mean that different TBELs (which includes basin standards) apply, or if the change(s) in process or facility create the need for different permit conditions.

[2] Oregon's water quality criteria (found in OAR 340-041-0101 through 340-041-0350) are developed for specific basins defined by the Oregon Water Resources Department (WRD). A map of these basins may be found at: http://www.deq.state.or.us/wq/rules/div041/basinmap.pdf. The LLID tool is scheduled to be modified so that it may be used to determine the WRD basin. Until this is complete, call GIS specialist at (503)229-6798.
[3]USGS subbasin names are used in TMDL development. A map of the USGS subbasins in Oregon may be found at: http://www.deq.state.or.us/wq/assessment/usgssubbasinmap.htm.

[4] This number uniquely identifies the permit to the EPA. It is assigned by SIS. Within PCS, this number indicates the permit type (e.g., Standard, General, Stormwater General).

[5] This date is to be entered by the permit coordinator, and it is 20 days from the date the permit is signed and mailed (the issuance date). This is consistent with the definition of the permit effective date in OAR 340-045-0035.

[6] Some NPDES permits issued by DEQ refer to both "waters of the state" and "public waters". Though OAR Division 45 ("Regulations Pertaining to NPDES and WPCF Permits") uses these terms interchangeably, the permit template uses the term "waters of the state" exclusively to reduce the potential for confusion.

[7] See OAR 340-045-0015 entitled "Permit Required".

[8] See OAR 340-0045-0080 entitled "Effect of a Permit".
[9] This is required to comply with OAR 340-055-0020.
[10] See ORS 215.246(a). The complete reference is as follows:

> **215.246 Approval of land application of certain substances; subsequent use of tract of land; consideration of alternatives.** (1) The uses allowed under ORS 215.213 (1)(y) and 215.283 (1)(v):
>
> (a) Require a determination by the Department of Environmental Quality, in conjunction with the department's review of a license, permit or approval, that the application rates and site management practices for the land application of reclaimed water, agricultural or industrial process water or biosolids ensure continued agricultural, horticultural or silvicultural production and do not reduce the productivity of the tract.

[11] These are good management practices to prevent water quality impacts and nuisance conditions as well as meet the requirements of ORS 215.246(1)(a) that requires DEQ to determine that the application rates and site management practices "ensure continued agricultural, horticultural or silvicultural production and do not reduce the productivity of the tract."

[12] The rules don't specify what "oxidized" means. The term is not intended to prescribe a form of treatment, instead it is intended to ensure recycled water is treated to the point that it is not putrid.

[13] Language stating that reports must be in a DEQ-approved format is intended to allow DEQ to specify a format after the permit has been issued without having to modify the permit.

[14] Though DEQ has not been requiring electronic versions in the past and DOJ says we can start requiring electronic reporting (with a significant grace period) even if the permit does not specify that reports be submitted electronically.

[15] No date is given in rule. This date was selected to coordinate with the biosolids annual report.

[16] The February 19th date is specified in OAR 340-050-0035(6) and 40 CFR §503.18.

[17] DEQ recognizes that high TSS levels in influent can make achievement of QLs difficult, and at this time DEQ is not requiring that influent monitoring be performed using the QLs listed in the permit.

[18] For more information, refer to the Significant Figures IMD at http://www.deq.state.or.us/wq/pubs/imds/SigFigsIMD.pdf

[19] Previous versions of the template have stated that the QL for mercury may need to be modified for permittees located in the Willamette, Monitoring results by various municipalities indicate that a QL of 0.005 ug/L is sufficient to detect the presence of mercury. There is no rule language regarding QLs, and TSD states that the setting of QLs is a state prerogative.

[20] Oregon's water quality criterion is for nitrates however the permit requires monitoring for nitrate-nitrate. This is because of the difference in holding times for the two tests: 48 hours for nitrates as opposed to 28 days for nitrate-nitrate. The holding time of only 48 hours for nitrates poses logistical challenges. Furthermore, nitrite is almost always not detected or is detected at very low concentrations, so running nitrate-nitrite as N gives pretty much the same result.

[21] In the event that it IS necessary to test for free cyanide, note that there are multiple approved methods for doing so, and that the permittee may prefer one over another. For more information, refer to DEQ's analytical memo on the subject of cyanide monitoring at http://www.deq.state.or.us/wq/standards/docs/toxics/cyanide.pdf

[22] Taking one sample over a 24 hour period would likely result in the loss of VOCs before the sample is analyzed. To reduce this likelihood, the permit therefore requires the collection of 6 separate samples.

[23] For more background, refer to DEQ's analytical memo on the subject of 1,2 Diphenylhydrazine at http://www.deq.state.or.us/wq/standards/docs/toxics/diphenylhydrazine.pdf

[24] Other monitoring parameters may be added as necessary for a particular facility. This should be determined based on the screening information provided with the permit application, sources of wastewater collected, and the end use (as necessary to protect public health, the environment, and continued agricultural productivity of soils).

[25]See OAR 340-050-0035(2)(c).

[26] See OAR 340-050-0035(2)(a).

[27] See OAR 340-050-0035(2)(a). Note that though some older permits require monitoring for Ag and Cr, the OAR does not require this. It does however require monitoring for Mo.

[28] The language from the EPA permit application form is as follows: "Applicants that discharge to waters of the US must provide effluent testing data for the following parameters. Provide the indicated effluent testing for each outfall through which effluent is discharged. All information reported must be based on data collected through analysis conducted using 40 CFR Part 136 methods. In addition, this data must comply with QA/QC requirements of 40 CFR Part 136 and other appropriate QA/QC requirements for standard methods for analytes not addressed by 40 CFR Part 136. At a minimum, effluent testing data must be based on at least three pollutant scans and must be no more than four and one-half years old."

[29] This language must be included in the permit as per the Compliance Schedule IMD. This IMD may be found at: http://www.deq.state.or.us/wq/pubs/imds/ComplianceSchedule.pdf

[30] See OAR 340-050-0031(7).

[31] OAR 340-050 requires a land application plan regardless of the Class of biosolids. However, since the land application of Class A biosolids are not subject to the same conditions as Class B biosolids, the land application plan may not require the same level of detail. In any case, Class A facilities may want to maintain a land application plan that allows them the option of land applying Class B biosolids. See the Biosolids IMD for more information.

[32] See 40CFR122.21(q)(9)(v)(D).

[33] See OAR 340-050-0030(1).

[34] See OAR 340-050-0030(2).

[35] See OAR 340-049-0010(17).

[36] The term "designated operator" is included to provide clarity for operators who may otherwise interpret "supervisor" to be the person within their organization that they report to, such as the city manager.

[37]See OAR 340-049-0010(18).

[38] See OAR 340-049-0010(16).

[39] See OAR 340-049-0015(1).

[40] See OAR 340-049-0015(9).

[41] See OAR 340-049-0015(2).

[42] See OAR 340-049-0015(6).

[43] See OAR 340-049-0015(8).

City of Molalla
NPDES Permit Modification Request
Mass Load Limit Evaluation

Prepared by
Richwine Environmental, Inc.
16360 NW Paisley Drive
Beaverton, Oregon 97006

December 2018

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ATTACHMENTS

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EXECUTIVE SUMMARY

A review of the decisions made by DEQ in the 2002, 2008 and 2013 permit renewals showed no clean technical basis for implementing concentration limits more stringent than the Willamette Basin minimum design standards, the wet season design flow, the minimum flow of 350-cfs for discharge and the limitation for no discharge during the summer season. The new outfall changed the point of discharge from Bear Creek, a tributary to the Pudding River, to the Molalla River should have been treated as a new source and given permit limits accordingly. This includes the ability to discharge during the summer season as there was not a TMDL established on the Molalla river until December 2008. DEQ's mistake resulted in a design flow and stringent concentration limits which place the City in a position where they are predestined for non-compliance. Currently, during max month flow events, and in the future, as a result of population growth, the City's WWTP cannot comply with the discharge requirements. The City will be required to make unnecessary expenditure to meet unnecessary permit limits which will place a significant financial burden on the ratepayers of the City of Molalla. As a frame of reference, the City's population in 2000 was 5,962, compared to 9,939 in 2017. The design population for 2043 is 16,977, which is 71% higher than the current population.

The existing treatment plant has been able to meet the existing permit limits during a dry wet weather season, but the limited processing capacity of the exiting effluent polishing processes limits the volume that can be discharged. This requires wastewater to be stored in the treatment lagoons. The limited storage volume has resulted in the need to discharge during the shoulder months of May, June and October when the irrigation sites are not suitable for recycled water application. There is a balance that the operations staff must manage between the effluent quality from the effluent polishing process, the available lagoon storage and the flow that can be discharged to meet the effluent mass limits. On all but two of the last nine years, the treatment plant has violated its permit by discharging outside of the permitted wet weather season or did not meet the effluent BOD_5 or TSS concentration or mass limits when treating and discharging flows in excess of the capabilities of the effluent polishing process.

The City of Molalla is requesting changes to their wastewater treatment plant discharge permit during the wet weather season of November 1 – April 30. These changes are:

- Change the concentration limits to 30-mg/L BOD_5 and 30-mg/L TSS per the Willamette Basin Standards
- Change the design flow to the actual wet weather design flow in the 2007 design documents
- Recalculate the effluent mass limits for BOD_5 and TSS based on the Willamette Basin Standards and the documented design flow

In addition, the City is requesting that the permit be modified to allow discharge to the Molalla River in the dry weather season shoulder months when the river flow is greater than 350-cfs.

The City is requesting the changes in the wet weather season mass limits based on the following errors made when issuing the previous permits:

- The permit limits were not changed when the outfall was relocated from the Pudding to the Molalla River. The new outfall should have been treated as a new source at that time. With

no TMDL on the Molalla River for dissolved oxygen, the effluent BOD_5 and TSS concentrations and mass loads should have been changed in the permit to the Willamette River Water Quality Standards. For some reason, this was not done.

- There was an error when selecting the concentration limits for the permit. The fact sheet cited and used the water quality criteria for the discharge period of low stream flows from May 1 to October 31 as referenced in OAR 340-041-0345(3)(a)(A). The Molalla WWTP NPDES permit can only discharge during the period of high stream flows from November 1 to April 30. Therefore, the Willamette Basin water quality standards that should have been used in the permit are for the high stream flow period cited in 340-041-0345(3)(a)(B).

The City received a letter from DEQ dated August 28, 2018 stating the steps required to facilitate the request for the permit changes. This report provides the background material requested by DEQ to evaluate the requirements for the permit modifications.

The letter stated a number of steps the City needs to perform as part of their request. As specified in OAR 340-041-0004(2) Antidegradation, the city must show that the increased discharge does not significantly impact the water quality of the Molalla River. The letter stated that Step 1 would be to perform an antidegradation review as described in OAR 340-041-0004(2). The mass load increase that is being requested by the City of the Molalla should not require an antidegradation review as it meets the criteria specified in OAR 340-041-004(3) Nondegradation Discharges. Even if it didn't meet this requirement, the mass load increase request also meets the requirements for an exception as stated in the rule. The basis for the exception is as follows:

- The increased discharged load for BOD_5 and TSS will not cause water quality standards to be violated
- Per page 27 of the DEQ Antidegradation Policy Implementation IMD the following conditions are met:
    - 1) The discharge will result in less than 1.0°F increase at the edge of the mixing zone;
    - 2) No designated beneficial uses will be adversely impacted
    - 3) All reasonable management practices are being implemented with the planning, design and construction of a new treatment plant.
    - 4) The increased mass load will not affect beneficial uses
    - 5) The water quality standards for the Willamette Basin for BOD_5 and TSS will be met
    - 6) The cost of treating for BOD_5 and TSS without the mass load increase to the level necessary to assure full protection outweighs the risk to the resource
- The new or increased discharged load will not unacceptably threaten or impair any recognized beneficial uses or adversely affect threatened or endangered species
- The Molalla River has been classified as water quality limited, but not for dissolved oxygen which is the water quality parameter that can be affected by an increase in mass load for BOD_5 and TSS
- The increased mass load for BOD_5 and TSS will result in no measurable reduction of dissolved oxygen (DO)
- The plant expansion is necessitated by growth and the increased discharge load is consistent with the acknowledged local land use plans as evidenced by a statement of land use compatibility from the appropriate local planning agency.
- The mass load increase and shoulder season discharge will not minimize the current dry weather season recycled water land application program.

- The cost of treating wet weather flows to meet the existing mass load limits is excessive and places and undue financial burden on the residents of the City of Molalla
- The cost of effluent storage during the dry weather season shoulder months when land application is not possible is excessive and places and undue financial burden on the residents of the City of Molalla

The antidegradation rules provide the basis for increasing mass load limits in NPDES permits. A water quality evaluation was performed by Geosyntec Consulting and demonstrated that there would be no significant impact to water quality with the requested increase in mass limits. This evaluation is included as Attachment E.

Step 2 in the letter stated that the City must show there is no possible way to meet the current load limits (*which were mistakenly based on discharge to Bear Creek*) with the expected increased flows with the current technology. The 2018 Wastewater Master Plan shows that the flows are projected to increase significantly through 2043. The current pond treatment system is not an appropriate technology for the future. The existing treatment system has met permit limits when there is not a significant wet weather season, but to do so, it has been necessary to discharge treated effluent outside of the wet weather permit period in October, May and June.

There are available technologies for meeting the current permit limits, but implementation of those technologies will place an unreasonable additional financial burden on the ratepayers. The analysis of alternative technologies provided by Dyer Partnership when developing the 2018 Wastewater Master Plan estimated the monthly sewer rate if no permit modification was provided at $135 per month. This is 2.94% of the service area median income. The estimated monthly sewer rate if the permit is modified to allow both new mass limits and summer season discharge during the shoulder months was between $100 and $107 per month. This is still above the 2% EPA affordability index at 2.18%. The analysis of estimated project costs and monthly sewer rates provided in this report demonstrate that not obtaining the mass load limit increase and the ability to discharge during the shoulder season will place an impossible financial burden on the City ratepayers.

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1. BACKGROUND

This Technical Memorandum (TM) will provide the basis for a mass load increase to be incorporated into the new permit limits. The existing treatment plant prior to January 2007 discharged treated effluent during the wet weather permit season to Bear Creek located next to the plant site. Bear Creek is a tributary of the Pudding River at River Mile (R.M.) 10. A TMDL was established for the Pudding River in August 1993[1]. The following description of the Molalla point source was provided on page D-1 of the TMDL report:

> *MOLALLA* — The City of Molalla discharges to Bear Creek, a tributary to the Pudding River. DEQ has little or no information on the impact of this discharge on Bear Creek. The City has two options in its discharge permit: discharge to Bear Creek or use the effluent for irrigation water (land apply). Molalla currently land applies its effluent during the critical summer months. There does not appear to be a reason to discontinue land application, and as long as application continues, no wasteload allocation is required for Molalla.

The TMDL report, as noted above, stated, "There does not appear to be a reason to discontinue land application, and as long as application continues, no wasteload allocation is required for Molalla." The point made in this statement is that no allocation is required as long as application continues. This statement also means that if application is not possible, then there should be an allocation provided.

In 2006 a pipeline was completed and an outfall structure was built that allowed the effluent to be discharged at a new location on the Molalla River nearly five miles from the plant site. The discharge point on Bear Creek was abandoned in January 2007 when the new outfall to the Molalla River was placed into service.

A new TMDL was developed for the Molalla-Pudding Subbasin[2] in December 2008. The following text in Chapter 1 – Overview states:

> In 1993, DEQ completed a TMDL to address dissolved oxygen impairment in the Pudding River. DEQ assigned wasteload allocations for biochemical oxygen demand (BOD), ammonia, and total suspended solids to two facilities discharging to the Pudding River. DEQ incorporated the resulting wasteload allocations into the wastewater permits for the City of Woodburn wastewater treatment plant (WWTP) and Agripac (since purchased by JLR, Inc.). The 1993 TMDL was not reviewed or changed as part of this TMDL and the allocations established in that TMDL and incorporated into facility permits remain in effect.

[1] "Pudding River Water Quality Report Total Maximum Daily Load Program", Department of Environmental Quality Standards & Assessments Section, August 1993.
[2] "Molalla-Pudding Subbasin TMDL & WQMP", Oregon Department of Environmental Quality, December 2008.

This text shows that there were no changes made from the 1993 TMDL for the Pudding River. On December 2008, the Molalla WWTP had been discharging to the Molalla River for almost two years and the Pudding River TMDL no longer applied.

The new December 2008 TMDL addressed a number of water quality issues for the Molalla and Pudding Rivers. These issues are summarized in Table 1 of Chapter 1 of the TMDL as shown below for the Molalla River:

Table 1 – 1: Name and location of listed Molalla-Pudding Subbasin waterbodies.

Water Body	Listed River Mile	Parameter	Season – Criteria	Assessment Year	Action
Molalla River	0 to 25	Fecal Coliform	Fall/Winter/Spring	1998	Delisted 2004, but still showing impairment TMDL Completed
Molalla River	19.7 to 44.7	Temperature	August 15 – June 15 – Salmon and steelhead spawning: 13.0 ºC.	2004	TMDL Completed
Molalla River	18.2 to 48.3	Temperature	Year Around (Non- spawning) – Core cold water habitat: 16.0 ºC.	2004	TMDL Completed
Molalla River	0 to 25	Temperature	Summer	1998	Delisted 2004, but still showing impairment TMDL Completed

The information in Table 1 shows that there is not a water quality issue with dissolved oxygen that would require a TMDL for either biochemical oxygen demand (BOD_5) or total suspended solids (TSS) on the Molalla River.

The permit was not changed when the outfall was relocated from Bear Creek/Pudding River Basin to the Molalla River. ***The new outfall should have been treated as a new source at that time***. With no TMDL on the Molalla River for dissolved oxygen, the effluent BOD_5 and TSS concentrations and mass loads should have been changed in the permit to the Willamette River Water Quality Standards. For some reason, this was not done.

The City of Molalla's request for a mass load increase satisfies the definition of a non-degradation discharge. However, even if the Oregon Department of Environmental Quality (DEQ) subjects the mass load increase and discharge to the receiving stream to a full antidegradation review, the request satisfies the criteria required by OAR 340-041-0004(9). This section titled Exceptions state:

> (9) Exceptions. The commission or department may grant exceptions to this rule so long as the following procedures are met:
>
> (a) In allowing new or increased discharged loads, the commission or department must make the following findings:
>
> (A) The new or increased discharged load will not cause water quality standards to be violated;
>
> (B) The action is necessary and benefits of the lowered water quality outweigh the environmental costs of the reduced water quality. This evaluation will be conducted in accordance with DEQ's "Antidegradation Policy Implementation Internal Management Directive for NPDES Permits and section 401 water quality certifications," pages 27, and 33-39 (March 2001) incorporated herein by reference; and
>
> (C) The new or increased discharged load will not unacceptably threaten or impair any recognized beneficial uses or adversely affect threatened or endangered species. In making this determination, the commission or department may rely on the presumption that, if the numeric criteria established to protect specific uses are met, the beneficial

uses they were designed to protect are protected. In making this determination the commission or department may also evaluate other state and federal agency data that would provide information on potential impacts to beneficial uses for which the numeric criteria have not been set;

(D) The new or increased discharged load may not be granted if the receiving stream is classified as being water quality limited under sub-section (a) of the definition of "Water Quality Limited" in OAR 340-041-0002, unless certain conditions apply.

Molalla's request satisfies these criteria and provides the basis for the following two changes in the Molalla WWTP discharge permit.

1. Increase in the wet weather season concentration and mass load limits to the Willamette River Basin Water Quality Standards.
2. Allow for dry weather season discharge when river flows are above 350-cfs.

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2. PERMIT AND WATER QUALITY REQUIREMENTS

The Molalla WWTP was issued NPDES Permit Number 101514 on May 12, 2014 to discharge treated wastewater into the Molalla River from outfall number 001 for the periods November 1 through April 30. The permit provides for the land application of recycled water from outfall number 002 between May 1 and October 31 according to the City's approved Recycle Water Use Plan. The permit will expire on June 1, 2019.

2.1. Discharge Permit Limits

The permit limits are provided in Schedule A Table A1 of the permit. These are summarized in ***Table 2-1***. A copy of the current NPDES permit is provided in ***Attachment A***. This shows that the effluent concentration is 10-mg/L BOD_5 and 10-mg/L TSS. The mass limits have been determined using a design wet weather flow of 1.92-mgd.

Table 2-1
Current NPDES Permit Limits

Parameter	Average Effluent Concentration, mg/L		Monthly Average (lbs./day)	Weekly Average (lbs./day)	Daily Maximum (lbs.)
	Monthly	Weekly			
BOD_5	10	15	160	240	320
TSS	10	15	160	240	320

Mass load limits are based on the average wet weather design flow to the facility which equals 1.92-mgd

In addition to the BOD_5 and TSS limits the plant must also meet the requirements provided in Schedule A Table A2 of the permit. These are summarized in ***Table 2-2***.

Table 2-2
Limits for Additional Parameters

November – April	Limits
BOD_5 and TSS Removal Efficiency	May not be less than 85% monthly average for BOD_5 and TSS
E. coli Bacteria(see Note 1.)	Monthly geometric mean may not exceed 126 organisms per l 00 mi. No single sample may exceed 406 organisms per 100 mi.
pH	May not be outside the range of 6.0 to 9.0 S.U.
Total Residual Chlorine	Monthly average concentration may not exceed 0.07 mg/L. Daily maximum concentration may not exceed 0.18 mg/L
Ammonia (NH_3-N)	Monthly average concentration may not exceed 16.7 mg/L. Daily maximum concentration may not exceed 25.9 mg/L.
Dilution	Discharge may not commence until ganged stream flow exceeds 350 cfs and will cease when the average stream flow for the previous seven-day-period is less than 350 cfs.
Temperature	Effluent discharge will cease when the 7-day moving average effluent temperature exceeds 18.0 degrees C.
Notes 1. No single E. coli sample may exceed 406 organisms per 100 mL; however, no violation has occurred if the permittee takes at least 5 consecutive re-samples at 4-hour intervals beginning within 28 hours after the original sample was taken and the log mean of the 5 re-samples is less than or equal to 126 E. coli organisms/100 mL.	

2.2. Dilution Requirements

There is not a clear record as to how the dilution requirement of a flow of at least 350-cfs was determined for discharge to the river. There are three fact sheets that provided information as the current permit was developed with each renewal.

2.2.1. 2002 Fact Sheet

The Fact Sheet for the 2002 permit[3] states how the permit limits were developed for the transfer of the effluent discharge from Bear Creek, a tributary of the Pudding River, to the Molalla River. Only the 2002 Fact Sheet was available for development of this report as provided in ***Attachment G***. There are number of attachments that were part of this fact sheet that are not available. The fact sheet showed a dilution equation that was used to evaluate temperature compliance as well as dissolved oxygen. The 2002 permit was not available for review, but the fact sheet stated the following:

> Dissolved Oxygen (DO)
> Schedule-A of the permit states that discharge at Molalla River Outfall 001 must comply with the dilution equation
>
> $(DR_{DO} = 481.42X^{-0.2765})$
>
> Where x = Molalla River flow in cfs, and DR_{DO} = DO Dilution Ratio = (river flow)/(effluent flow).
>
> DR_{DO} complies with the DO reduction criterion both near- and far-field, i.e. ensures that effluent will not cause a DO deficit anywhere in the river greater than 0.1 mg/L.

This equation shows that the volume that could be discharged was based on river flow. The basis for the dilution equation was not noted in the fact sheet. There were dilution issues with the discharge to Bear Creek, but the backup to show the need for the dilution equation for discharge to the Molalla River was not provided or available.

2.2.2. 2008 Fact Sheet

The limits in ***Table 2*** is standard permit language with the exception of the dilution requirement. This requirement limits flow only to periods when the stream flow is greater than 350-cfs as measured at the Canby station. There is no basis for this stream flow rate as documented in the fact sheet[4]. A copy of the Permit Evaluation and Fact Sheet is provided in ***Attachment B***. This requirement was added to the fact sheet during the last permit renewal as stated on Page 14 of the fact sheet as follows:

> The previous permit relied on a staged flow to allow the operator the ability to determine the quantity to be discharged, based on a dilution ratio. The intent was to maximize protection while allowing flexibility on the discharge side. Actual practice has seen that given adequate stream flow, discharge volume does not need to be as closely monitored. What the draft permit proposes is that if the gauged flow is above 350 cfs, discharge can occur. Under all other stream flow circumstances, the plant will hold effluent in the lagoons. This change should ease the operator's decision on discharging, based on the gauged stream flow.

[3] "Fact Sheet and NPDES Wastewater Discharge Permit Evaluation for City of Molalla", Department of Environmental Quality Northwest Region – Portland Office, File Number 57613, Permit Application Number 988627.
[4] "National Pollutant Discharge Elimination System Permit Evaluation and Fact Sheet", Oregon Department of Environmental Quality, City of Molalla, File Number: 57613, Permit Number: 101514, EPA Reference Number: OR-002238-1.

This was added to the permit with no explanation as to why the value of 350-cfs was selected. The 7Q10 steam flow used in the Molalla River Temperature TMDL was 44-cfs. This is 7.95 times higher than that value. There is no source of modeling performed to determine this value of 350-cfs. The minimum design criteria concerning dilution is specified in OAR 340-041-0007(17)((a)(A)(i) as follows:

> Effluent BOD concentrations in mg/l, divided by the dilution factor (ratio of receiving stream flow to effluent flow) may not exceed one unless otherwise approved by the Commission;

Using a plant effluent flow of 1.92-mgd, the dilution factor is 117.8 with a BOD factor of 0.085 at a BOD_5 of 10-mg/L. This is well below the required dilution requirement of 1. The required minimum design criteria for dilution was obviously not used in establishing the minimum river flow for dilution. There appears to be no basis for selection of 350-cfs noted in the permit fact sheet.

2.3. Discharge Periods

The plant is also limited to discharge only during the period from November 1 through April 30. The following requirements are stated in Schedule A of the permit.

- May 1 – October 31: During this time period the permittee may not discharge to waters of the state.
- November 1 – April 30: During this time period the permittee must comply with the limits in Table 1 while discharging to the waters of the state.

The limitation of discharge to a specified time period is redundant with the dilution requirement in permit Table A2 of the minimum steam flow for discharge of 350-cfs. The goal of the permit should be to protect the water quality in the stream. The dilution requirement of 350-cfs provides this protection. If discharge were to occur during the period between May 1 and October 31, the Willamette Basin water quality criteria would require a limit of 10-mg/L BOD_5 and 10-mg/L TSS.

2.4. Willamette Basin Standards

The treatment plant discharges to the Molalla River that is a tributary to the Willamette River. The water quality standards for discharge are specified in the Willamette Basin water quality standards that are provided in OAR 340-041-0345. These standards are the guidelines for treatment plant discharges and can only be modified by an approved Total Maximum Daily Load (TMDL). There is a TMDL on the Molalla River that addresses temperature and some toxics. The only standard in the TMDL that applies to the City of Molalla WWTP discharge is temperature. At this time, the Molalla WWTP discharge was not given a temperature allocation due to their restriction for discharge during the period May 1 – November 30. Temperature will not be discussed in this report.

The Willamette Basin does have minimum design criteria for Treatment and Control of Sewage Wastes specified in OAR 340-041-0345(3). These are stated as follows:

> Minimum Design Criteria for Treatment and Control of Sewage Wastes:
>
> (a) Willamette River and tributaries except Tualatin River Subbasin:

(A) During periods of low stream flows (approximately May 1 to October 31): Treatment resulting in monthly average effluent concentrations not to exceed 10 mg/l of BOD and 10 mg/l of SS or equivalent control;
(B) During the period of high stream flows (approximately November 1 to April 30): A minimum of secondary treatment or equivalent control and unless otherwise specifically authorized by the Department, operation of all waste treatment and control facilities at maximum practical efficiency and effectiveness so as to minimize waste discharges to public waters.

This criteria state that the effluent must meet a stricter effluent limit of 10-mg/L BOD_5 and 10-mg/L TSS during the summer season of May 1 to October 31 and must meet the secondary treatment standard of 30-mg/L BOD_5 and 30-mg/L TSS during the winter season of November 1 – April 30.

These criteria can be changed if there is a water quality issue in the river due to BOD_5 of TSS resulting in the dissolved oxygen criteria not being met. If this were the case, there would be a TMDL for BOD_5 and TSS on the Molalla River. The TMDL on the Molalla River does not address either BOD_5 or TSS, so the minimum design criteria should apply for all discharges.

2.5. Determination of Permit Limits

The new permit limits were established in the 2002 Fact Sheet when the plant discharge was changed from the outfall to Bear Creek to the Molalla River. The fact sheets provides some information on how the permit limits were determined for the new discharge to the Molalla River, but a complete explanation for the rationale behind the lower permit limits was not provided.

2.5.1. 2002 Fact Sheet

The 2002 permit fact sheet provides a summary of the BOD_5 and TSS concentration and mass limits were determined for the permit. The information provided on page 8 of the fact sheet is as follows:

> BOD and TSS concentration and mass limits
>
> Based on the Willamette Basin minimum design criteria, wastewater treatment resulting in a monthly average effluent concentration of 10 mg/L for BOD_5 and TSS must be provided from May 1 - October 31. From November 1 - April 30, a minimum of secondary treatment or equivalent control is required. Secondary treatment for this facility is defined as monthly average concentration limit of 30 mg/L for BOD_5 (or 25 mg/L for $CBOD_5$) and 50 mg/L for TSS.
>
> The Department proposes winter season concentration limits more stringent than the basin minimum design criteria. The limits are unchanged from the previous permit. The proposed monthly average BOD_5 concentration limit is 10 mg/L with a weekly average limit of 15 mg/L. The proposed monthly average TSS concentration limit is 10 mg/L with a weekly average limit of 15 mg/L.
>
> Winter mass load limits for the facility at Outfall 001 are based on the design AWWF = 1.92 MGD and the monthly average BOD_5 or TSS concentration limits of 10 mg/L and 10 mg/L, respectively. Winter mass load limits at Outfall 001A are based on the design ADWF = 0.79 MGD and the monthly average BOD_5 or TSS concentration limits of 10 mg/L and 10 mg/L, respectively. These limits are in accordance with OAR 340-041-0120 (9) (a) (B) and (D), and all mass load limitations are rounded to two significant figures.

This language states that the Department proposes to not use the Willamette Basin minimum design criteria, but to use more stringent limits than the minimum design criteria. There is no basis for provided for this decision. This was a new source to the Molalla River and should have been treated as such. There is absolutely no basis for arbitrarily selecting a BOD_5 and TSS effluent

concentration limit. If there was a basis, this should have been stated. There is a substantial difference between the assimilative capacity of Bear Creek, a tributary of the Pudding River that had a TMDL, and the Molalla River that had no TMDL at that time. In fact when the Molalla River TMDL was developed, dissolved oxygen was not incorporated as a parameter of concern. The fact sheet on page 2 states the following:

> The primary cause of past permit violations by the Facility is the lack of adequate dilution in the receiving stream (Bear Creek) during the winter season.

It is clear that the issue on discharge to Bear Creek was dilution. The City moved the outfall to the Molalla River where proper dilution is available. The permit limits for BOD_5 and TSS concentration were not adjusted to the Willamette River minimum design criteria as they should have. The question is, "Why was the 10-mg/L standard selected?" Why not 15-mg/L or 20-mg/L. This shows the decision had no technical basis based on water quality.

2.5.2. 2008 Fact Sheet

This 2008 permit was renewed with no changes in the effluent limits from the prior permit. Page 12 of the permit fact sheet states the following:

> The concentration limits for BOD5 and TSS are based on the Willamette Basin water quality standards, set in OAR 340-041-0345(3)(a)(A).

The fact sheet then goes on to state on Page 12 the following:

> In addition, DEQ requires that mass load limitations for BOD, and TSS must be met when discharging to surface waters. These loads are required to be reported in pounds per day and include a monthly average, weekly average and daily mass limitation, DEQ established the limits for this facility, based on a wet weather design flow of 1.92 mgd, Weekly limits are 1.5 times the monthly mass, and the daily limit is twice the monthly mass, Limits are calculated as follows:
>
> BOD, and TSS Average Monthly Limit = (1.92 mgd) x (10mg/l) x (8.34 lbs/gal) = 160 lbs/day
> Average Weekly Limit = (1.5) x (160 lbs) x (Average Monthly Limit) = 240 lbs/day
> Daily Limit= (2.0) x (160 lbs) = 320 lbs

This information is in error. These criteria are for discharge during periods of low stream flows from May 1 to October 31. These limits were applied to the Molalla WWTP NPDES permit for discharge during the period of high stream flows from November 1 to April 30. Therefore, the Willamette Basin water quality standards that should have been applied to the permit are cited in 340-041-0345(3)(a)(B) as follows:

> During the period of high stream flows (approximately November 1 to April 30): A minimum of secondary treatment or equivalent control and unless otherwise specifically authorized by the Department, operation of all waste treatment and control facilities at maximum practical efficiency and effectiveness so as to minimize waste discharges to public waters.

The calculation for mass load limitations should have been done using the high stream flow criteria in the Willamette Basin Water Quality Standards. This would have made the calculation of mass limits as follows:

BOD, and TSS Average Monthly Limit = (1.92 mgd) x (30mg/l) x (8.34 lbs/gal) = 480 lbs/day
Average Weekly Limit = (1.5) x (480 lbs) x (Average Monthly Limit) = 720 lbs/day
Daily Limit= (2.0) x (480 lbs) = 960 lbs

2.6. Plant Design Criteria

The plant is permitted for a wet weather design flow based on a value of 1.92-mgd developed in the 2002 fact sheet for the new discharge to the Molalla River. This value has no direct relationship to the design of the treatment plant.

2.6.1. 2002 Fact Sheet

The wet weather flow design flow that was used for development of the effluent mass limits was determined in the 2002 Fact Sheet. The description on how the design value of 1.92-mgd was determined is as follows:

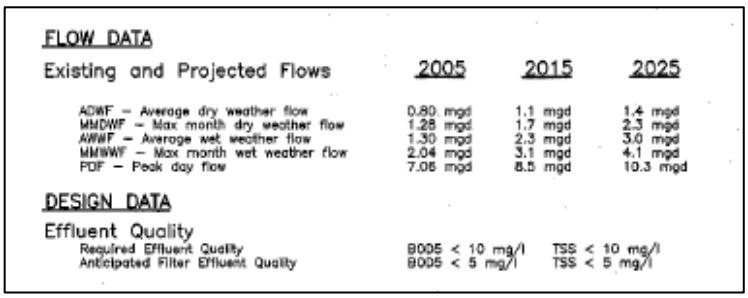
> The current actual average wet weather flow (November 1 through April 30) for the past two years is 1.31 MGD. The peak day flow over the past two years is 3.85 MGD. Given winter discharge and the lack of adequate flow in Bear Creek, the Department recommends that the Facility outfall be moved to the Molalla River at RM 20. DEQ has calculated a design Average Wet Weather Flow (AWWF) = 1.92 MGD that applies at the new discharge location (see Attachment 4). New mass load limits are allowed based on the AWWF, per Oregon Administrative Rule (OAR) 340-041-0120 (9) (B) and (D). By shifting the Facility outfall to the Molalla River and by using the AWWF as the basis for mass load calculations, the Facility can comply in all respects with renewal permit limits based on more stringent Water Quality (WQ) criteria. It is anticipated that once the above changes are made, dilution related violations of permit limits and of water quality standards and criteria should not occur.

This states that DEQ determined the new design average wet weather flow. The basis of this was provided in Attachment 4 of the 2002 Fact Sheet. This attachment was not included with the copy of the fact sheet that was available for review.

The design wet weather flow has a dramatic impact on the calculation of the effluent mass limits. It appears that this value may have been based on historical data. With this being the case, there was no allowance for growth provided in the determination of the effluent mass limits. The design flow and the stringent concentration limits placed the City in a position where they were predestined for non-compliance. Either during max month flow events, or as a result of population growth, the City's WWTP was predisposed to eventually not comply with the discharge requirements. As a frame of reference, the City's population in 2000 was 5,962, compared to 9,939 in 2017. The design population for 2043 is 16,977, which is 71% higher than the current population.

2.6.2. 2007 Design Documents

The 2007 design documents provided the last upgrade to the liquids treatment facilities. The flows from the Design Data Sheet are shown in ***Table 2-3***. The design documents do not provide any design criteria for influent BOD_5 or TSS.



FLOW DATA

Existing and Projected Flows	2005	2015	2025
ADWF – Average dry weather flow	0.80 mgd	1.1 mgd	1.4 mgd
MMDWF – Max month dry weather flow	1.28 mgd	1.7 mgd	2.3 mgd
AWWF – Average wet weather flow	1.30 mgd	2.3 mgd	3.0 mgd
MMWWF – Max month wet weather flow	2.04 mgd	3.1 mgd	4.1 mgd
PDF – Peak day flow	7.06 mgd	8.5 mgd	10.3 mgd

DESIGN DATA

Effluent Quality

Required Effluent Quality	BOD5 < 10 mg/l	TSS < 10 mg/l
Anticipated Filter Effluent Quality	BOD5 < 5 mg/l	TSS < 5 mg/l

Table 2-3: Molalla WWTP 2007 Wastewater Plant Improvements Design Criteria[5]

Using this design data as the basis for existing plant design, the dry season design flow is the 2025 MMDWF of 2.30-mgd and the wet season design flow is the 2025 MMWWF of 4.1-mgd. The design data sheet also shows that the treatment plant was designed to meet the effluent BOD_5 and TSS concentration limits of 10-mg/L. The design criteria provided no data on the ability to meet the required mass limits. For instance, at the design maximum month wet season design flow of 4.1-mgd, the effluent mass discharged at the monthly average of 10-mg/L is 350-lbs/day. This exceeds the current monthly average mass limit of 160-lbs/day. The effluent mass discharged will be 250-lbs/day at the average wet weather design flow of 3.0-mgd.

The analysis provided above shows that the plant was designed with no consideration to mass load. Only effluent BOD_5 and TSS concentration limits were considered. This shows that the plant was not designed to meet the current effluent BOD_5 and TSS mass limits. Based on the design criteria, the plant would need to limit effluent flow to 1.92-mgd as stated in the permit or to treat to less than 10-mg/L to meet the mass limits at higher flows. At the design maximum month wet weather flow of 4.1-mgd, the plant effluent will need to be 4.8-mg/L. This is not reasonable for a facultative lagoon-based treatment facility, and due to filter performance declining with increased flows. The hydraulic capacity of the effluent polishing process and the inability of sand filters to filter algae.

[5] "Construction Drawings for Wastewater Treatment Plant Improvements for the City of Molalla, Oregon", Tetra Tech/KCM, January 2007, Drawing No. G3.

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3. TREATMENT PROCESS OVERVIEW

The treatment plant is a lagoon-based treatment system. A photo of the treatment system with the lagoons is shown in ***Figure 3-1***. Following screening and flow measurement at the headworks, the wastewater is aerated in an aerated lagoon prior to being pumped to a facultative pond system. The pond effluent is then treated by flotation thickener to remove solids and algae prior to filtration through dual media filters. The effluent is then disinfected with chlorine prior to discharge. The treated wastewater is permitted to be discharged to the Molalla River during the discharge season between November 1 and April 30. The treated wastewater is permitted for land application during the irrigation season between May 1 and October 31. During periods when it is too wet for land application of the treated effluent during the irrigation season, the effluent must be stored in the treatment ponds.

3.1. Treatment Process

A process flow schematic from the 2007 design documents is provided in ***Figure 3-2***. The design data from the 2007 design documents is summarized in ***Table 3-1***. The following sections provide a brief summary of each of the major treatment processes.

3.1.1. AERATED LAGOON

Following screening, the flow goes to the aeration basin. This basin has a volume of 1,300,000-gallons and provides aeration of the wastewater to lower BOD_5 levels prior to the facultative lagoons. A photo of the aerated lagoon is shown in ***Figure 3-3***. The aeration basin was designed with six 10-Hp aerators to provide the dissolved oxygen. Only 2 of the aerators were operational for a number of years, but 4 new aerators were purchased and installed in late summer 2017.

The solids removed by the flotation thickeners are recycled back to the aerated lagoon. This has resulted in the aerated lagoon having a substantial amount of solids in the lagoon that are recycled through the system back to the facultative lagoons.

There is currently no data on the level of treatment or BOD_5 removal that is occurring in the aerated lagoon. This cannot be measured with the large volume of recirculated solids and algae from the flotation thickeners. The recirculated solids may help with BOD_5 removal acting as a low rate activated sludge.

The BOD_5 removal can be estimated using general design criteria for mechanical surface aerators. Mechanical surface aerators are rated at 1.5 – 2.1-kg/O_2/kw/hr. (3.3 – 4.6-lbs./O_2/kw/hr. It can also be assumed that 1.5-kg of O_2 will treat 1-kg of BOD_5. Therefore, with 6 mechanical surface aerators at 10-Hp each, they can provide 1074 kw-hrs. per day.

At 4.5-lbs/O_2/kw/hr. the system will produce 4830 lbs. of O_2 which will theoretically treat 3,222-lbs of BOD_5 at 100% efficiency. Assuming 50% efficiency, the aeration basin may remove 1,600-lbs of BOD_5.

Figure 3-1: Plant Aerial Photo

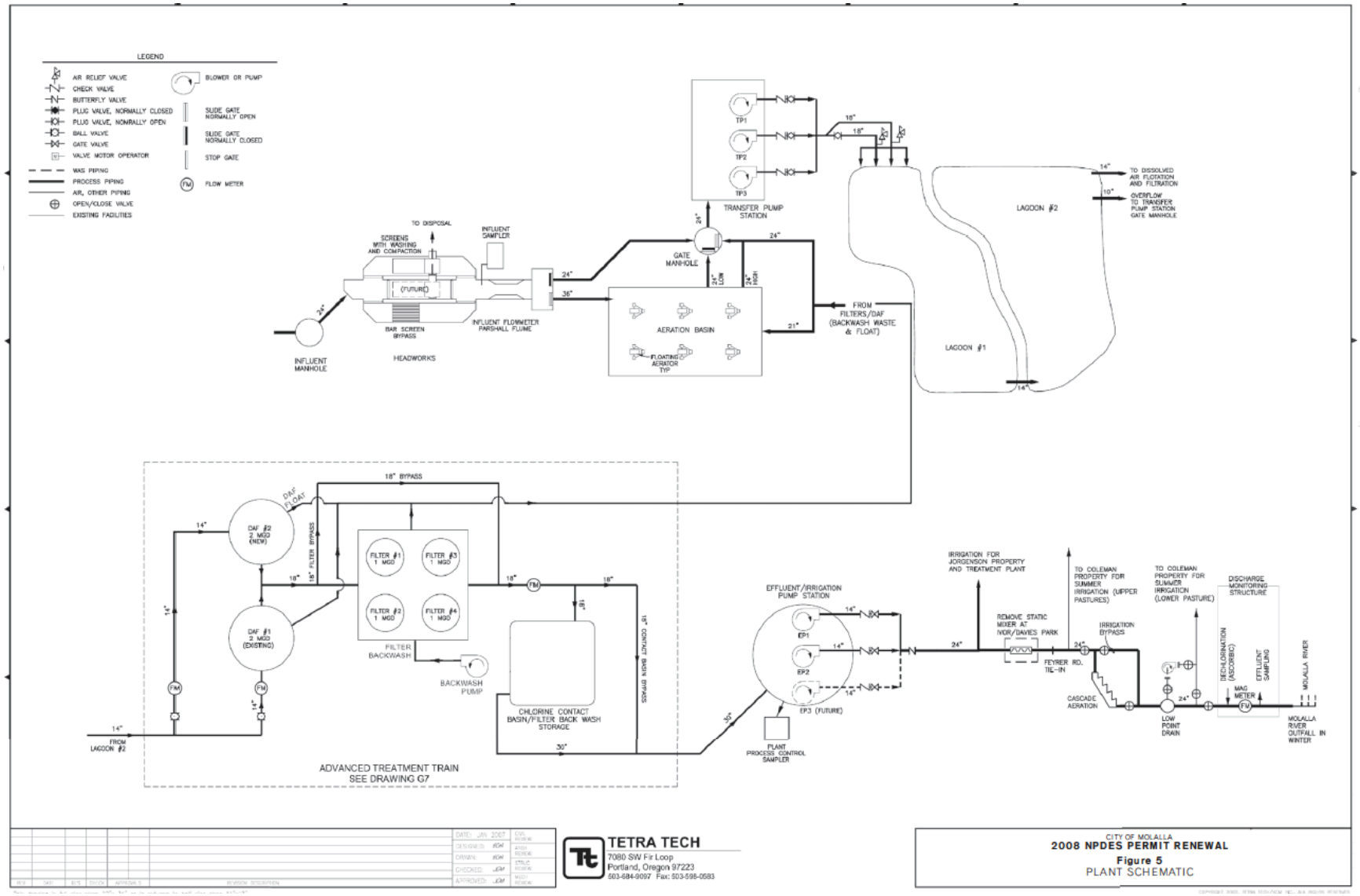

Figure 3-2: Plant Flow Schematic

Table 3-1
January 2007 Design Criteria

Design Flow

ADWF	-	mgd
MMDWF	-	mgd
AWWF	1.54	mgd
MMWWF	2.14	mgd
PDAF	3.85	mgd
PIF	9.25	mgd

Aeration Basin

Dimensions		
Size (bottom of basin)	200 ft. x 54-ft	
Side Slope	2:1	
Max. Depth	10	feet
Volume	1,300,000	gallons
Aerators		
Type	Aspirating	
Number	6	
Horsepower, each	10 Hp	

Transfer Pump Station

Pump Type	Centrifugal Submersible	
Main Pumps		
Operating	1	
Standby	1	
Main pump		
Capacity, each	5800 gpm	
TDH, each	49 feet	
Jockey Pump		
Number	1	
Capacity	2500 gpm	
TDH	49 feet	
Station Peak Capacity	7800 gpm	

Lagoon No 1

Dimensions	11.4	acres
Maximum depth	12	feet
Working depth	9	feet
Volume, maximum	137	acre-feet
Volume, maximum	45	mg
Liner	native clay	

Lagoon No 2

Dimensions	13.6	acres
Maximum depth	12	feet
Working depth	9	feet
Volume, maximum	163	acre-feet
Volume, maximum	53	mg
Liner	native clay	

Dissolved Air Flotation (1980)

Number	1	
Capacity	2.0	mgd
Tank diameter	31	ft.
Surface Area	750	ft2
Max. Surface Loading Rate	2.59	gpm/sf
Hydraulic Capacity	2.80	mgd
Chemical feed rates		
Alum	75 – 150	mg/L
Soda	37 – 75	mg/L
Polymer	0.5 – 10	mg/L
Acid	0 – 10	mg/L
Operating parameters		
Recycle flow	350 – 700	gpm
Recycle pressure	45 – 80	psi
Solids to air ratio	0.03	
Max. daily sludge	2290	lbs.
Max. daily sludge	15,300	gallons

Dissolved Air Flotation (2007)

Number	1	
Capacity	2.0	mgd
Tank diameter	38	ft.
Surface Area	1,075	ft2
Max. Surface Loading Rate	2.0	gpm/sf
Hydraulic Capacity	3.1	mgd
Chemical feed rates		
Polyaluminum Chloride	35 – 70	mg/L
Operating parameters		
Recycle flow	350 – 700	gpm
Recycle pressure	125	psi
Solids to air ratio	0.03	
Max. daily sludge	1,670	lbs.
Max. daily sludge	10,000	gallons

Gravity Filters

Capacity	4.0	mgd
Number of filters	4	
Surface area, total	573	ft2
Max. loading rate	4.85	gpm/sf
Media	Dual	

Figure 3-3: Aeration Basin

3.1.2. FACULTATIVE LAGOONS

There are two facultative lagoons that were constructed in 1980. The lagoons are operated in series with flow first going to Lagoon No. 1 and then through lagoon No. 2. Lagoon #2 is 13.6-acres with a total volume of 163-acre-feet (53-million gallons). Lagoon #1 is 11.4-acres with a total volume of 137-acre-feet (45-mllion gallons). These are the volumes of the lagoons when they are full at the maximum depth of 12-feet. A photo of the lagoons is shown in ***Figure 3-4***.

The lagoons have a minimum working volume of 9-feet per the design criteria. This is the minimum level that the operators can operate the lagoons due to the need to provide treatment. The 3-feet of freeboard provides storage when the plant cannot discharge to the river and it is too wet for land application. The 3-feet of freeboard provides a total of 24.5-million gallons of storage.

Figure 3-4: Facultative Lagoons

1.1.1.1. Facultative Lagoon Capacity

The organic design capacity of the Molalla WWTP was evaluated to determine the capacity of the system. The analysis was done using the wastewater characteristics for the year 2017.

The capacity evaluation was done using a loading rate of 35-lbs/acre/day for average conditions and 40-lbs/acre/day for maximum month conditions. These loads are at the high end for partially aerated lagoons based on the 10 State Standards[6].

The lagoons have a total surface area of 25-acres. Using an aerial loading rate of 35-lbs/acre/day for monthly average loading conditions, the system will have a capacity of 875-lbs/day. Using a loading rate of 40-lbs/acre/day for maximum month load conditions, the system will have a capacity of 1000-lbs/day.

The plant influent BOD_5 loads for the years 2014 through 2018 were calculated with the results shown in ***Table 3-2***. The 2018 influent BOD_5 loads were for the months January through July, only. This shows the average annual loads increased by about 5% over this period of time

[6] "Recommended Standards for Wastewater Facilities", Health Research, Inc., Health Education Division, 2014 Edition.

Table 3-2
Influent BOD_5 Mass Load (lbs/day)

Period	2014	2015	2016	2017	2018
Average Annual	1900	1342	1977	2196	1972
Maximum Month	2840	1871	2571	4684	5594

with the maximum month loads being highly variable ranging from 30% higher than the average annual load in 2016 to 184% higher in 2018.

These loads are significantly higher than the design loads for the ponds based on standard design aerial loading rates. There is some BOD_5 removal occurring in the aeration basin prior to the facultative lagoon. This was estimated at 1600-lbs BOD_5/day based on the amount of O_2 provided. This leaves 300 – 500-lbs/BOD_5 under average annual loading conditions and 1200 – 3000-lbs BOD_5 under maximum month load conditions that must be removed in the lagoons. The capacity at the higher aerial loading rate of 40-lbs/BOD_5/acre give a capacity of 1000-lbs/day. This shows that the ponds may be at their design loading under average annual loading conditions but are overloaded during the maximum month loading condition.

Improved performance can be achieved by increasing the operating level in the lagoons, but that results in less storage for the early spring non-discharge season. The higher loadings also result in higher effluent BOD_5 concentrations and additional algae growth. The higher concentration of algae will present a higher solids loading on the effluent treatment system resulting in poorer performance and less hydraulic capacity.

3.1.3. Flotation Thickening

The flotation thickening process removes algae and solids that are in the facultative pond effluent. The algae are difficult to remove as the algae cells are very small. Chemical addition with polyaluminum chloride is used to coagulate the finer particles to improve removals. A photo of the flotation thickener is shown in ***Figure 3-5***.

There are two dissolved flotation thickeners. One was installed in 1980 and the second was installed with the 2007 upgrades. Each thickener has a design capacity of 2.0-mgd. The operators state that they work well at 1.6-mgd for the new thickener and 1.2-mgd for the old thickener for a total acceptable working capacity of 2.8-mgd. The performance falls off above 2-mgd with much poorer performance above 2.8-mgd.

The 2017 average irrigation season influent flow was 1.14-mgd with the maximum month influent flow at 1.96-mgd. One flotation thickener can handle flow during much of the irrigation season, with the second required to treat the higher wet season flows.

Figure 3-5: Flotation Thickener Process

The flotation thickening process is rated at 4.0-mgd. The operators stated that the performance deteriorates at flows above 2.0-mgd when both systems are being operated with treatment performance dropping off significantly above 2.8-mgd. It is critical for the flotation thickener process to perform well so the solids loading on the effluent filters is lowered and the small algae particles that pass through the filters are removed. The monthly average TSS effluent mass limit is 160-lbs./day. At a maximum month flow of 3.19-mgd, the effluent must have a TSS concentration of 6-mg/L. The fixed mass limit requires the effluent TSS concentration to become lower as flows increase. Process performance in the 2016/2017 discharge season was poor due to the plant's inability to produce low TSS concentrations. The flotation thickening process has reached capacity and is not adequate to meet the current effluent mass limits during a high rainfall wet weather season.

The solids from the flotation thickening process and from filter backwashes are returned to the aeration basin and recycled back through the treatment process. This provides a continuous recirculation of solids through the plant with solids only removed if they settle in the lagoons.

3.1.4. Effluent Filtration

The effluent filtration process consists of 4 package gravity filters installed in the 2007 expansion. The design capacity of these gravity filters is 4.0-mgd. The filters use a dual media of sand and anthracite coal. The filters process the effluent from the flotation thickeners. The operators have stated the TSS removal of the filters are directly dependent on the performance of the flotation thickeners. As the flow to the flotation thickeners is increased, the solids loading on the effluent

filters increases resulting in poorer removals by the effluent filters and diminished capacity due to the additional time they are out of service for backwashing.

Single cell algae are very small and difficult to filter. Algae must be removed in the flotation thickening process to provide adequate loading on the filters. Even when loadings are within the acceptable range for good filtration of solids, the small single cell algae will pass through the filter. A photo of the chlorine contact basin is shown in ***Figure 3-6***. The green color of the plant effluent is algae that has passed through the effluent filters.

Figure 3-6: Algae in Chlorine Contact Tank

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4. FACILITY PLAN PROJECTIONS

The flows and loads to the treatment facility were projected in the Wastewater Facility and Collection System Master Plan[7] (2018 Master Plan). The increased flows and loads will have a significant impact on the level of treatment and the investment that will be required for the new facilities depending on the future permit conditions.

4.1. Current and Projected Flows

The current and projected flows that were developed in the 2018 Master Plan are summarized in ***Table 4-1***. The plan projects significant growth within the service area for the planning period through 2043. The 2043 service area population of 16,977 is 171% of the current 2017 population of 9,939.

Table 4-1
Current and Projected Flows

Parameter	Per Capita Flows (gpcd)	2017 Flow (mgd)	2043 Flow (mgd)
Population	-	9,939	16,977
Base Sewage	90	0.89	1.52
Base Infiltration	23	0.22	0.38
AAF	186	1.85	3.16
ADWF	112	1.11	1.90
AWWF	249	2.48	4.24
$MMDWF_{10}$	192	1.91	3.25
$MMWWF_5$	312	3.21	5.30
Peak Average Week	401	4.51	6.80
$PDAF_5$	524	6.62	8.91
PIF	735	9.7	12.48

With the increased population, the flows to the treatment plant will also increase substantially. The design dry season flow ($MMDWF_{10}$) is projected to increase from the current 1.91-mgd to 3.25-mgd. The design wet season flow ($MMWWF_5$) is projected to increase from the current 3.21-mgd to 5.30-mgd.

4.2. Future Treatment Requirements

The current permit requires the treatment plant to meet an effluent concentration for BOD_5 and TSS of 10-mg/L. The limits on effluent concentration will not be the determining factor in the design of the facility to meet the current permit limits. The determining factor will be the effluent mass limits as shown in ***Table 2-1***.

The current permitted monthly mass limit is 160-lbs/day of BOD_5 and TSS. The projected design monthly wet weather flow ($MMWWF_5$) is 5.30-mgd. At this flow the plant will be required to discharge an effluent BOD_5 and TSS of 3.6-mg/L on a monthly average to meet the permitted mass load. This is less than the 10-mg/L monthly average concentration limit.

[7] "DRAFT City of Molalla Wastewater Facility and Collection System Master Plan Volume 1, The Dyer Partnership Engineers & Planner, Inc., October 2018.

The projected design weekly wet weather flow (Peak Week) is 6.8-mgd. The permitted weekly mass limit is 240-lbs/day. At this flow the plant will be required to discharge an effluent BOD_5 and TSS of 4.2-mg/L. This is significantly less than the 15-mg/L weekly average concentration limit.

The projected peak day flow ($PDAF_5$) is 8.91-mgd. The permitted daily mass limit is 320-lbs/day. At this flow the plant will be required to discharge an effluent BOD_5 and TSS of 4.3-mg/L as a daily maximum to meet the permitted mass load.

As demonstrated above, the treatment plant will need to be designed to meet very stringent permit limits during peak flow events if a mass load increase is not permitted.

5. NPDES PERMIT SCENARIOS

The new treatment facilities design, capital and O&M costs, will be significantly impacted by the current permit limits. The DRAFT Wastewater Facility and Collection System Master Plan[8] (2018 Master Plan) has provided a detailed evaluation of the treatment processes and effluent storage requirements that will be required to meet various permit limits. Four permit scenarios have been developed based on potential modifications to the existing permit that the City is requesting are discussed in the section.

This analysis shows that technologies exist for a treatment plant to meet the existing permit conditions for both effluent concentration and mass load. The technologies that will be required will vary for each of the four permit scenarios as will the level of treatment and volume of effluent storage. Additional land for irrigation of the recycled water will be required for each of the scenarios. An evaluation of the cost to implement and operate each of the scenarios has been developed. ***Figure 5-1*** shows a flowchart of the decisions required for each of the four scenarios described in the next sections.

5.1. Scenario 1: No Mass Load Limit Increase & No Summer Season Discharge

Scenario 1 is the current permit with no changes. The treatment plant must be designed to meet the current stringent mass limits and produce a low effluent BOD_5 and TSS concentration of 3.6-mg/L at a maximum month flow, a 4.2-mg/L at a maximum week flow and 4.3-mg/L at a maximum day flow. To meet these strict limits under peak flow conditions, all treatment plant unit process components will need to be designed to meet these extreme conditions that will occur on a statistical one in five-year basis.

A treatment process that will meet these requirements will be either a Membrane Bioreactor (MBR) process or a Sequencing Batch Reactor (SBR) process with effluent filtration. Each process must be designed to pass and treat the wastewater under peak flow conditions. The 2018 Master Plan evaluated these two treatment processes under the design flow and loads to meet the current permit conditions. The capital and present value cost for the two processes to meet these conditions are summarized in ***Table 5-1***.

Table 5-1
Capital and Present Worth Costs
Scenario #1 and #2 Treatment Alternatives

System	Capital Cost Estimate	Present Value O&M Estimate[1]	Salvage Value	Total Present Worth
SBR w/Tertiary Filter	$9,094,000	$2,578,000	($50,000)	$11,622,000
MBR	$12,610,000	$4,796,000	($50,000)	$17,356,000

[1]Includes reserve fund for short lived assets.

[8] "Wastewater Facility and Collection System Master Plan", The Dyer Partnership Engineers & Planners, Inc., Project No. 100.26, October 2018

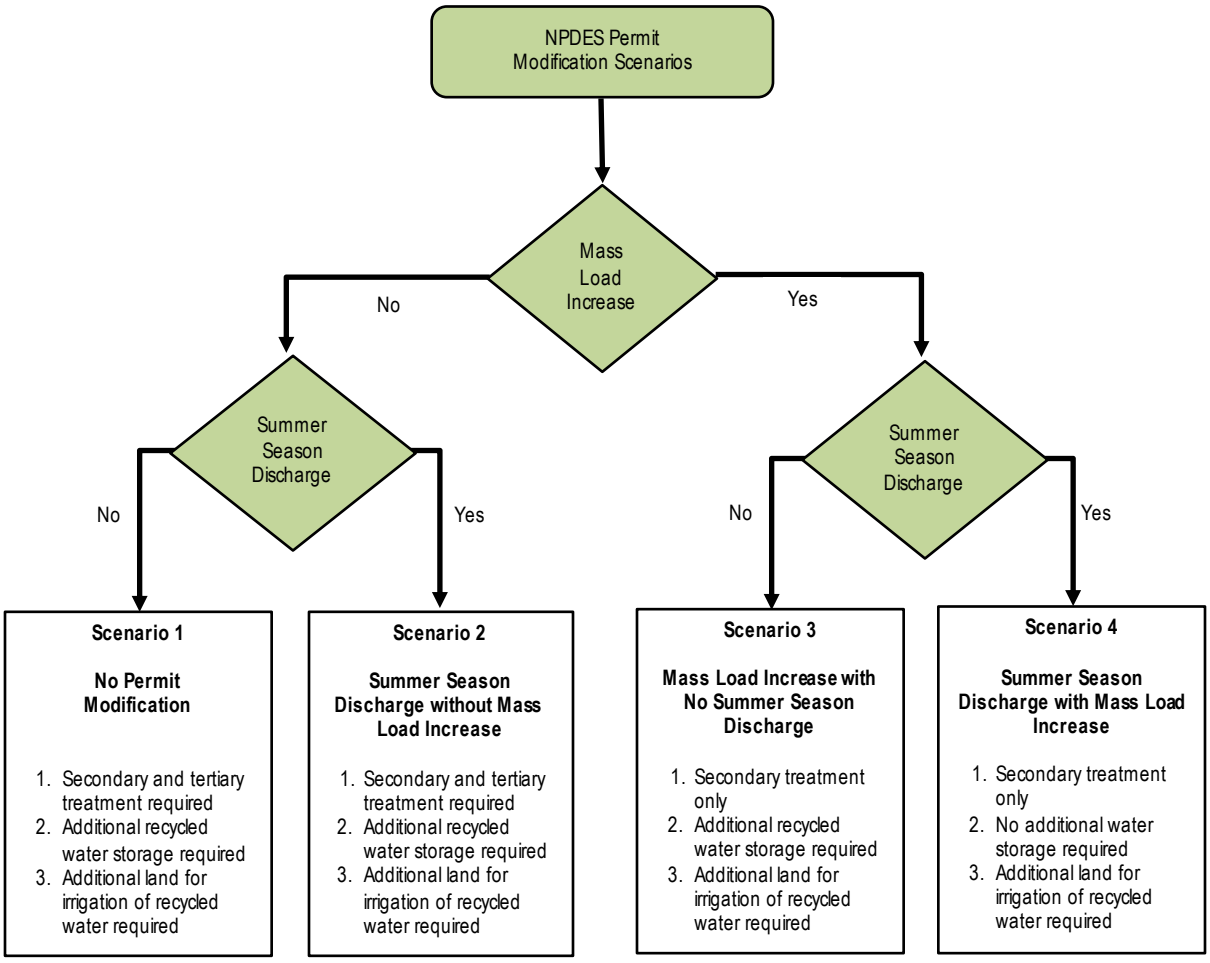

Figure 5-1: Permit Scenario Flowchart

The SBR with tertiary filtration process is preferred based on both economic and non-economic considerations. A performance guarantee, with a reasonable confidence level, will be included with the SBR and tertiary filtration option, to guarantee compliance with the existing mass load limits when discharging to the Molalla River. With this option, the effluent storage ponds could also be used as a buffer in the rare event that effluent quality (real-time turbidity measurement with TSS correlation) is not below mass load requirements.

Adequate storage and equalization are critical to accomplish summertime irrigation objectives and avoid discharging to the Molalla River in accordance with permit requirements. The liquid storage and equalization volume available within the existing lagoons is severely limited, partly because the facultative lagoons currently serve the dual purpose of operating as facultative lagoons and storage basins. When the new treatment plant is commissioned the existing facultative lagoons will serve as recycled water storage. A total of 98 MG of storage will become available in the existing lagoons. During the summer permit season, the storage ponds will receive disinfected effluent from the treatment plant. Recycled water will be stored in the ponds, before being conveyed to the effluent pump station for the application of recycled water to the approved land application sites.

A significant expansion to the recycled water storage systems will be required with this permit scenario. The recycled water storage systems must be sized to store the majority of flows during the months of May and October due to unfavorable conditions for the application of recycled water on the approved land application sites. Design assumptions assume that the storage systems will allocate satisfactory volume for maximum month dry weather flows, typically occurring in May. Additionally, because it would amplify stress onto the Molalla River outfall and mass load limits, this condition prohibits the ability to store excess flows that accumulate in recycled water storage systems (during the summer months) for eventual discharge into the Molalla River during the winter months.

An annual water balance was developed to determine the effluent storage requirements for the period between May 1 and October 31 when effluent cannot be discharged to the Molalla River due to higher than average rainfall spring and the irrigation sites are too wet for recycled water application. A copy of the water balance is shown in ***Attachment C***. This water balance considered projected 2043 influent flows, precipitation and evaporation. This assumed no leakage as the lagoons will be properly lined. A total of 35 additional acres of ponds will be required for recycled water storage. ***Table 5-2*** lists recycled water storage requirements for Scenario 1.

Table 5-2
Scenario #1 Recycled Water Storage Pond Improvements
Cost Estimate

Item	Cost Estimate
Lagoon #1 and #2 dike Stabilization & Improvements	$3,348,857
Recycled Water Storage Expansion Systems	$13,478,000
Total	$16,826,857

The existing facultative lagoons will require lining with a new hypalon liner and additional dike stabilization to address dike erosion that compromises the integrity of the ponds. ***Table 5-3*** summarizes the construction cost estimate for recycled water storage improvements related to the existing Lagoons #1 and #2. The accumulated solids within the lagoons will be removed prior to converting the ponds to recycled water storage.

Table 5-3
Scenario #1 Recycled Water Storage Pond Requirements

Item	Value
Existing Recycled Water Storage, acres	25
Additional Recycled Water Storage Required, acres	35
Total Storage Capacity, million gallons	235
Available Surge Capacity, million gallons	176

5.2. Scenario 2: No Mass Load Limit Increase with Summer Season Discharge

Scenario 2 is the current permit with no mass load increase but modifications made to allow summer season discharge when the river flows are adequate to accept the load. In this scenario, the treatment plant must still be designed to meet the stringent mass limits and produce a low effluent BOD_5 and TSS concentration of 3.6-mg/L at a maximum month flow, 4.2-mg/L at a maximum week flow and 4.3-mg/L at a maximum day flow. To meet these strict limits under peak flow conditions, all treatment plant unit process components will need to be designed to meet these extreme conditions that will occur on a statistical one in five-year basis.

The treatment process that will meet these requirements will be either an MBR process or an SBR process with effluent filters as with Scenario 1. Each process must be designed to pass and treat the wastewater under peak flow conditions. The 2018 Master Plan evaluated these two treatment processes under the design flow and loads to meet these permit conditions. The capital and present value cost for the two processes to meet these conditions are the same as Scenario 1 and are summarized in ***Table 5-1***.

If discharge to the Molalla River is allowed during the summer months when conditions allow, additional recycled water storage is still required, but the volume is less than that required in Scenario 1. The required storage will require converting the existing facultative Lagoons #1 and #2 to recycled water storage ponds and constructing an additional 10-acres of storage. A copy of the water balance is shown in ***Attachment C***. This condition assumes that the adjacent 55-acre parcel will be purchased to provide the acreage needed for new ponds. ***Table 5-4*** shows the recycled water storage requirements for Scenario 2.

Table 5-4
Scenario #2 Recycled Water Storage Pond Requirements

Item	Value
Existing Recycled Water Storage, acres	25
Additional Recycled Water Storage Required, acres	10
Total Storage Capacity, million gallons	137
Available Surge Capacity, million gallons	103

Cost estimates were developed for the recycled water storage include land acquisition for storage systems, access road, inlet/outlet structures, lining, earthwork, drainage, fencing, and ancillary systems. A cost estimate is provided in ***Table 5-5*** for Scenario #2.

Table 5-5
Scenario #2 Recycled Water Storage Pond Improvements
Cost Estimate

Item	Cost Estimate
Lagoon #1 and #2 dike Stabilization & Improvements	$3,348,857
Recycled Water Storage Expansion Systems	$4,356,000
Total	$7,704,857

This analysis shows that there is a significant cost savings to the City if they will be allowed to discharge during the summer discharge season when river flows are adequate. This change in the discharge permit will provide an estimated capital cost savings of $9,122,000 over Scenario 1 where the summer discharge is not allowed.

5.3. Scenario 3: Mass Load Increase & No Summer Season Discharge

Scenario 3 assumes that the mass load increase is granted, but the plant will not be able to discharge during the summer season between May 1 and October 31. In this scenario, the treatment plant will be designed to meet the 30-mg/L BOD_5 and 30/mg/L TSS discharge limits specified as the Willamette Basin Water Quality Standard. The permitted mass load would then be calculated based on the new treatment plant's design flows.

The treatment processes evaluated in the 2018 Master Plan that will meet these requirements are the SBR process, the conventional activated sludge process and the oxidation ditch activated sludge process with no effluent filters. In addition, the MBR process was evaluated for comparison

reasons. The process must still be designed to pass and treat the wastewater under peak flow conditions. The capital and present value cost for the four processes to meet these conditions are summarized in ***Table 5-6***. The SBR process was recommended based on both economic and non-economic considerations. The SBR process without filters to meet this permit scenario has a capital cost $2,636,000 less than the costs for treatment without a mass load increase.

Table 5-6
Capital and Present Worth Costs
Scenario #3 and #4 Treatment Alternatives

System	Capital Cost Estimate	Present Value O&M Estimate[1]	Salvage Value	Total Present Worth
SBR	$6,707,000	$2,329,000	$(50,000)	$8,986,000
Conventional Activated Sludge	$8,099,000	$2,770,000	$(50,000)	$10,819,000
Oxidation Ditch	$11,655,600	$2,409,000	$(50,000)	$14,014,600
MBR	$12,610,000	$4,796,000	($50,000)	$17,356,000

[1]Includes reserve fund for short lived assets.

If a mass load increase is approved, but discharge to the Molalla River is not allowed between May 1 and October 31, as per the existing NPDES permit, then additional recycled water storage is required. The recycled water storage requirements and cost will be identical to those in Scenario 2 shown in ***Table 5-4*** and the costs in ***Table 5-6***. A copy of the water balance is shown in ***Attachment C***.

5.4. Scenario 4: Mass Load Increase with Summer Season Discharge

Scenario 4 provides both the mass load increase and the ability to discharge during the summer season. The level of treatment for this scenario will be the same as Scenario 3. The SBR process without effluent filters will meet the revised permit limits at the cost shown in ***Table 5-6***.

Under the Scenario 4 assumptions with the mass load increase compatible with the Willamette Basin standards and future flows and discharge to the Molalla River when river conditions allow, the existing Lagoons #1 and #2 will provide adequate storage of recycled water for the planning period. Dike stabilization improvements will still be required to stabilize the dikes to maintain the integrity of the berms. Lining with a hypalon liner, along with improvements to the transfer piping will also be required. A copy of the water balance is shown in ***Attachment C***.

Table 5-7 shows the recycled water storage requirements for Scenario 4.

Table 5-7
Scenario #4 Recycled Water Storage Pond Requirements

Item	Value
Existing Recycled Water Storage, acres	25
Additional Recycled Water Storage Required, acres	0
Total Storage Capacity, million gallons	98
Available Surge Capacity, million gallons	73

Cost estimates were developed for recycled water storage are for lining the existing ponds and ancillary systems. A cost estimate is provided in ***Table 5-8*** for Scenario #4.

Table 5-8
Scenario #2 Recycled Water Storage Pond Improvements
Cost Estimate

Item	Cost Estimate
Lagoon #1 and #2 dike Stabilization & Improvements	$3,348,857
Total	$3,348,857

5.5. Total Treatment Plant Cost Comparison

The alternative cost for each of the scenarios was presented in the previous sections for the secondary process and effluent storage. These elements are just a portion of the total treatment improvements and expansion costs. The total estimated total project cost for each of the permitting scenarios are summarized in ***Table 5-9***. These costs do not include the costs for collection system and pump station improvements which will also be done as part of the system improvements. These costs show the total treatment plant costs for each scenario only.

Table 5-9
Treatment Plant Improvements and Expansion Total Project Costs

Item	Total Cost Scenario 1	Total Cost Scenario 2	Total Cost Scenario 3	Total Cost Scenario 4
Influent Screen	$485,355	$485,355	$485,355	$485,355
Grit Removal	$901,000	$901,000	$901,000	$901,000
Flow Equalization Basin	$1,190,000	$1,190,000	$1,190,000	$1,190,000
Transfer Pump Station	$844,000	$844,000	$844,000	$844,000
SBR	$6,707,000	$6,707,000	$6,707,000	$6,707,000
Tertiary Filtration	$2,387,000	$2,387,000	-	-
Lagoon Desludging & Disposal	$3,875,000	$3,875,000	$3,875,000	$3,875,000
Aerobic Digester	$3,332,000	$3,332,000	$3,332,000	$3,332,000
Biosolids Processing Facility	$1,867,000	$1,867,000	$1,867,000	$1,867,000
Disinfection (HS/UV)	$1,460,500	$1,460,500	$1,460,500	$1,460,500
Recycled Water Storage Improvements	$3,348,857	$3,348,857	$3,348,857	$3,348,857
Recycled Water Storage Expansion	$13,478,000	$4,356,000	$4,356,000	-
Recycled Water Irrigation Expansion	$2,010,000	$1,170,000	$1,110,000	$413,000
Discharge Monitoring Station	$415,000	$415,000	$415,000	$415,000
Misc. Equipment	$750,000	$750,000	$750,000	$750,000
Effluent Pump Station Upgrade and Expansion	$697,000	$697,000	$697,000	$697,000
Site Structures	$1,170,000	$1,170,000	$1,170,000	$1,170,000
Site Improvements and Yard Piping	$2,519,000	$2,519,000	$2,519,000	$2,519,000
WWTP Construction Estimate Total	**$47,437,000**	**$37,475,000**	**$35,028,000**	**$29,975,000**
Engineering - Design - Bidding Services	$4,744,000	$3,748,000	$3,503,000	$2,998,000
Engineering - Construction Services	$4,744,000	$3,748,000	$3,503,000	$2,998,000
Land Acquisition	$1,500,000	$1,500,000	$1,500,000	$-
Value Analysis and Value Engineering	$225,000	$225,000	$225,000	$225,000
Contingency (15%)	$7,116,000	$5,622,000	$5,255,000	$4,497,000
Environmental Report	$125,000	$125,000	$125,000	$100,000
Wetland Mitigation	$100,000	$100,000	$100,000	$100,000
Review Fees	$15,000	$15,000	$15,000	$15,000
Permitting	$150,000	$150,000	$150,000	$150,000
Administration & Legal	$300,000	$300,000	$300,000	$150,000
WWTP Total Project Estimate	**$66,456,000**	**$53,008,000**	**$49,704,000**	**$41,208,000**
Difference from Scenario 4	**$25,248,000**	**$11,800,000**	**$8,496,000**	**-**

This analysis shows that the there is a significant cost impact to the rate payers if a permit modification is not provided ranging from a minimum estimated cost difference of $8.5M to $25.2M.

5.6. Total Project Cost Comparison

As stated above, the costs in ***Table 5-9*** are only the cost for the treatment plant upgrade and expansion. Upgrades to the collection system and pump stations will be necessary to manage infiltration and inflow and to ensure there are no sanitary sewer overflows. The total project costs including collection system and pump station improvements are summarized in ***Table 5-10***.

Table 5-10
Total Project Costs (2018 Dollars)

Item	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Collection System Improvements – Phase I	$4,669,900	$4,669,900	$4,669,900	$4,669,900
Pump Station Improvements – Phase I	$672,500	$672,500	$672,500	$672,500
WWTP Total Project Cost Estimate	$66,456,000	$53,008,000	$49,704,000	$41,208,000
Total Project Cost Estimate	$71,798,400	$58,350,400	$55,046,400	$46,550,400

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6. OPERATING HISTORY

The current treatment plant is a lagoon treatment system with effluent treatment using flotation thickeners and dual media sand filters to provide for effluent polishing prior to discharge. As discussed in Section 3, the capacity and performance of the effluent polishing process does not meet the original design criteria. Performance of the flotation thickening process deteriorates as flows increase beyond 3.0-mgd. The effluent filtration process becomes limiting with the higher solids loading from the declining performance of the flotation thickening process requiring lower TSS removal rates, more frequent backwashing and a loss in hydraulic capacity.

There is a balance that the operations staff must manage between the effluent quality from the effluent polishing process, the available lagoon storage and the flow that can be discharged to meet the effluent mass limits. This section provides a review of the flow management issues as well as the historical effluent quality that has been discharged.

6.1. Influent Flow

The influent flow was evaluated to determine the impact of rainfall on the influent flow as well as compare the flows that the treatment plant is getting in comparison to the 1.92-mgd wet weather design flow in the permit. A summary of the influent flow statistics for the period January 2010 through July 2018 is shown in ***Table 6-1***. This analysis shows that the 75-percentile flow was greater than the 1.92-mgd wet weather design flow in the permit on four of the eight years. This means that the flow was greater than 1.92-mgd greater than 25% of the time.

Table 6-1
Molalla WWTP
January 2010 – July 2018 Influent Flow Statistics

Statistic	2010	2011	2012	2013	2014	2015	2016	2017	2018
Total	580.0	538.4	634.3	434.3	513.3	504.0	593.6	630.5	317.64
Max	5.40	5.79	7.51	3.78	6.62	5.68	4.96	6.30	4.26
Min	0.70	0.67	0.07	0.68	0.68	0.57	0.08	0.73	0.55
Average	1.59	1.48	1.73	1.19	1.41	1.38	1.62	1.73	1.50
Median	1.44	1.20	1.53	1.12	1.20	1.10	1.41	1.45	1.44
75 Percentile	1.94	1.89	2.02	1.39	1.74	1.73	2.18	2.21	2.03
90 Percentile	2.55	2.59	2.90	1.73	2.31	2.51	2.76	2.95	2.56
92 Percentile	2.67	2.83	3.12	1.83	2.51	2.76	2.87	3.17	2.62
98 Percentile	4.12	3.57	4.91	2.42	3.77	3.96	3.64	4.25	3.38
Std. Dev.	0.82	0.81	0.99	0.45	0.76	0.90	0.82	0.94	0.79
Count	365	365	366	365	365	365	366	365	212

The next step was to analyze the influent on a seasonal basis based on the permitted seasons for the irrigation season and the discharge season. In this analysis, the average, maximum month, maximum week and maximum day flows for each season was calculated as shown in ***Table 6-2***. The maximum month is important because it shows the flow for a month that the plant is required

Table 6-2
Molalla WWTP
January 2010 – July 2018 Seasonal Influent Flows

Statistic	2010	2011	2012	2013	2014	2015	2016	2017	2018
Irrigation Season									
Average	1.135	1.018	1.132	0.948	0.934	0.857	1.071	1.209	0.757
Max. Month	1.949	2.177	1.933	1.266	1.482	1.758	1.901	1.985	2.037
Max. Week	2.806	2.261	1.906	1.945	1.783	2.354	3.441	2.515	1.300
Max. Day	4.168	2.930	3.378	2.571	2.676	5.680	4.956	2.356	1.190
Discharge Season									
Average	2.050	1.940	2.341	1.436	1.886	1.913	2.179	2.514	2.067
Max. Month	2.905	2.773	3.087	1.784	3.021	3.252	2.839	3.172	2.486
Max. Week	4.313	3.513	4.358	2.668	4.307	4.303	3.441	4.509	2.983
Max. Day	5.401	5.785	7.505	3.777	6.616	5.345	4.956	6.297	4.258

to meet the effluent permit limits. This analysis shows that the maximum month influent flow for the irrigation season was greater than 1.92-mgd for 5 of the 9 years. Most importantly, the average discharge season flow was greater than the permitted wet weather design flow for 6 of the 9 years and the maximum month flow for the discharge season was greater than 1.92-mgd for 8 of the 9 seasons. This is important, in that the effluent mass limits for BOD_5 and TSS are calculated on the wet weather design flow of 1.92-mgd. When the monthly average flow is greater than this value, the plant must treat to less than the monthly concentration limit of 10-mg/L to meet the monthly mass limit. If flows less than the influent flow are discharged, then the pond storage is utilized.

The average monthly influent flow for the period from January 2010 to July 2018 is shown in ***Figure 6-1***. This figure shows the months that the flow was greater than 1.92-mgd as well how the plant influent flow varies from year to year.

Influent flows are greatly influenced by Rainfall Induced Infiltration and Inflow (RDII). This is when high groundwater leaks into the gravity sewers (infiltration) and direct connections such as storm drains, roof drains or basement sumps are directly connected to the gravity sewers (inflow). RDII results in higher flows and diluted wastewater that must be treated at the treatment plant. The effect of RDII on influent flow is shown by plotting the total monthly rainfall with the total monthly flow as shown in ***Figure 6-2***. This shows a direct relationship between monthly total rainfall and monthly total flow.

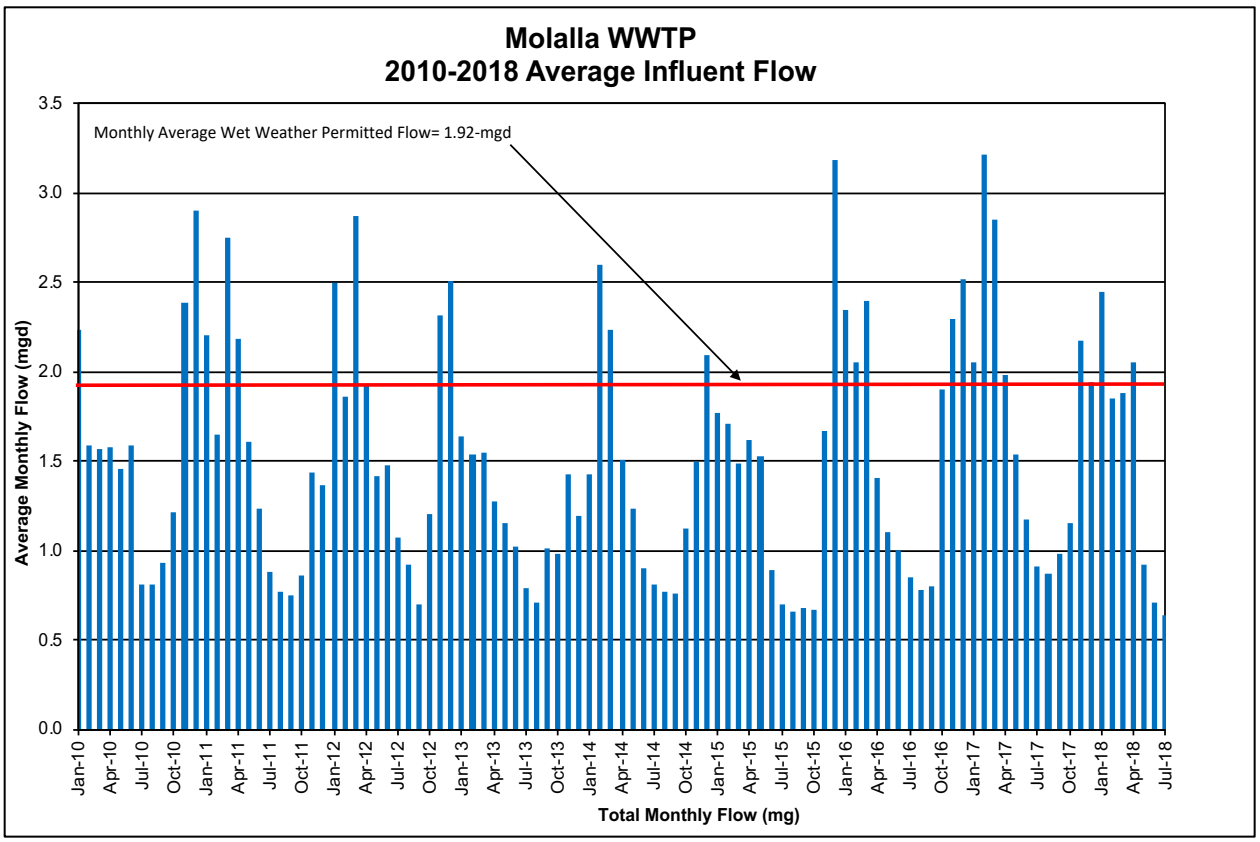

Figure 6-1 – January 2010 – July 2018 Average Monthly Influent Flow

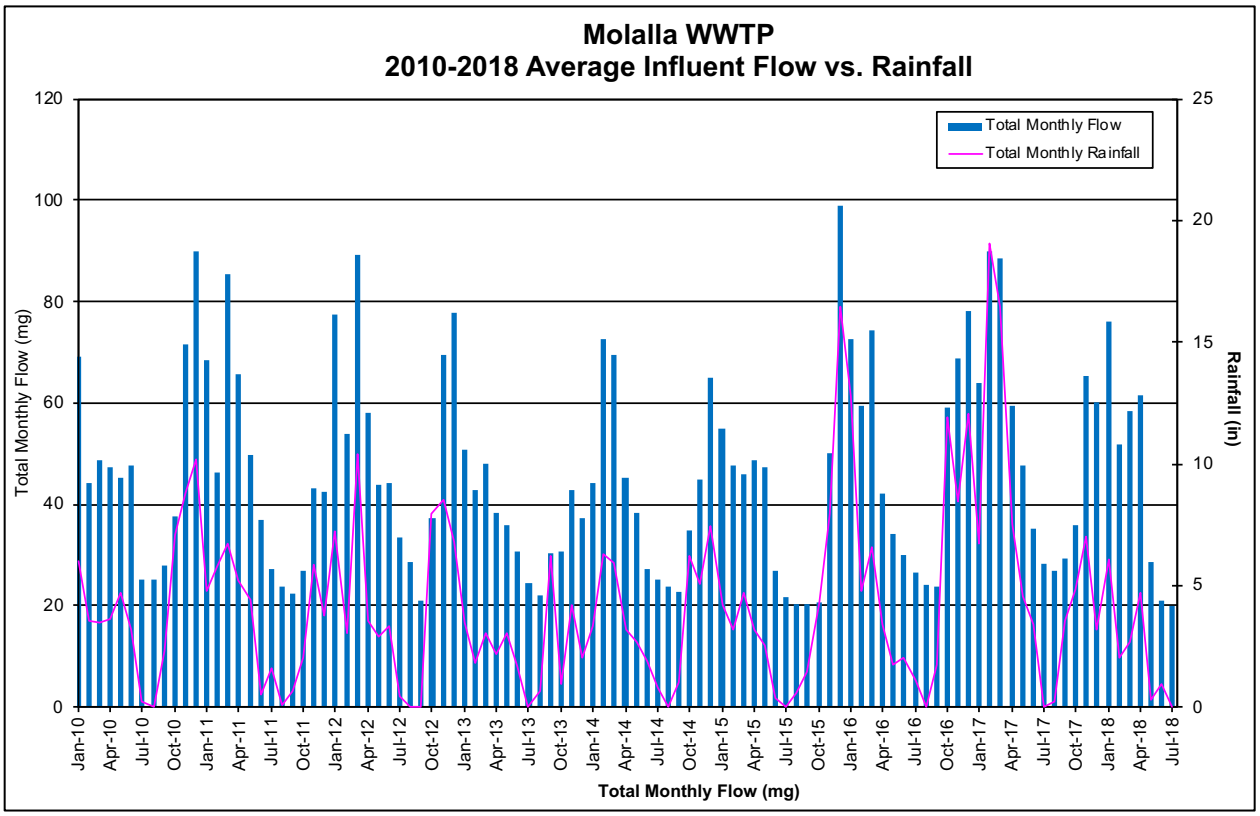

Figure 6-2 – January 2010 – July 2018 Total Monthly Influent Flow vs. Total Monthly Rainfall

The wet season can be defined as the period from October through June. The wet season total influent flow for each year was plotted against the wet season total rainfall to show the relationship between influent flow and rainfall. This is shown in ***Figure 6-3***. This plot shows a direct relationship between wet season flow and rainfall. This also shows that the 2016-2017 wet weather season had a high flow and rainfall. As shown in the next section, Effluent Flow, the plant could not handle the volume of flow received in 2016-2017 and was required to discharge outside of the permitted discharge season from November to April.

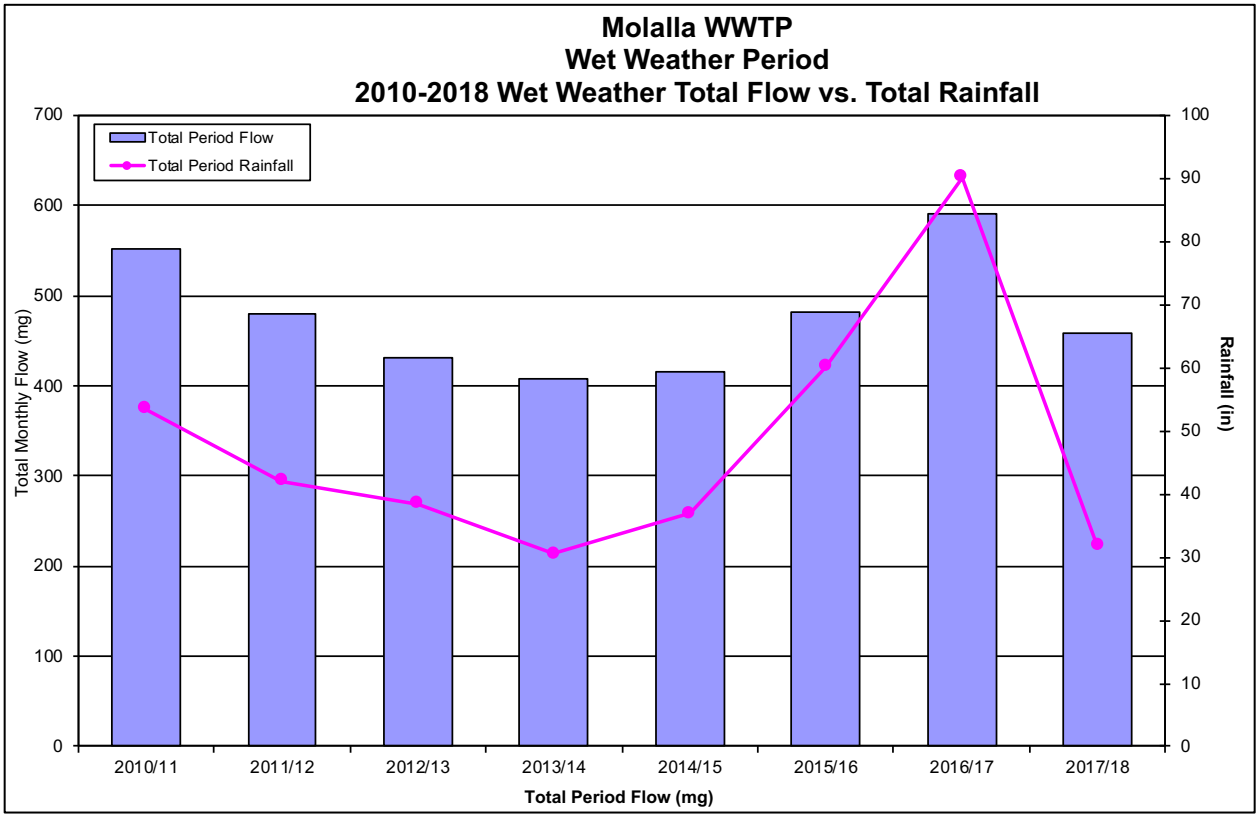

Figure 6-3 – 2010/2011 – 2017/2018 Wet Weather Season Total Flow vs. Total Rainfall

6.2. Effluent Flow

The effluent flow for the periods when flow was discharged to the river was also evaluated. The lagoon system provides storage of flows greater than can be discharged. This provides the operators the capability to manage the volume of flow that is discharged based on the performance of the effluent polishing processes to stay within the permitted mass limits.

The effluent flow is restricted to the discharge season months of November through April. The effluent flow will vary from the influent flow due to storage of wastewater in the lagoons when discharge or irrigation is not possible. The average monthly effluent flows for the period from January 2010 to July 2018 is shown in ***Figure 6-4***. On this figure, the monthly flows are shown as a bar graph. The blue bars show discharge during the permitted discharge season. The red bars show discharge outside of the permitted season when the lagoons were full and the land application sites were not available for recycled water application. This shows that the plant discharged outside of the permitted season on five of the past nine seasons.

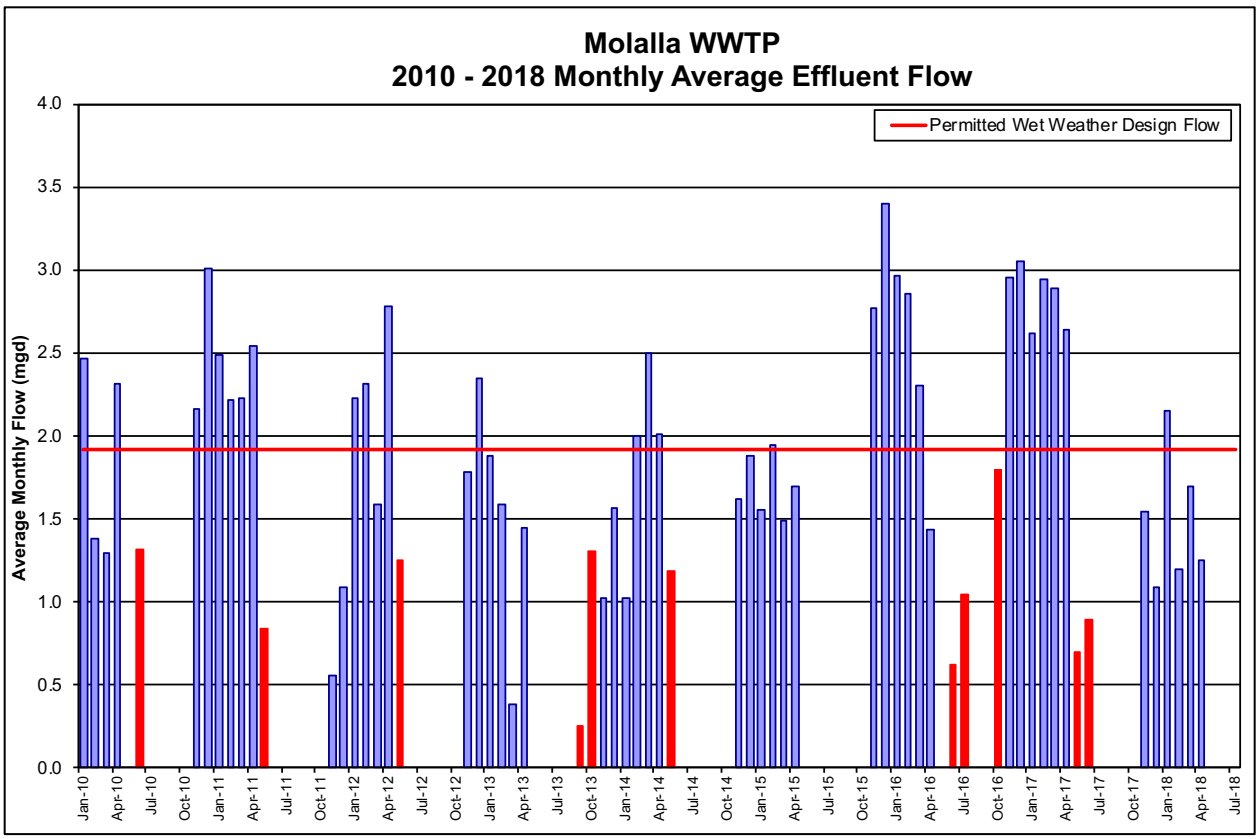

Figure 6-4 – January 2010 – July 2018 Average Monthly Effluent Flow

A summary of the effluent flow statistics for the discharge seasons between January 2010 through July 2018 is shown in ***Table 6-3***. The 2018 discharge season does not include the months of November and December. This also includes flows that were discharged outside of the permitted discharge season.

Table 6-3
Molalla WWTP
January 2010 – July 2017 Effluent Flow Statistics

Statistic	2010	2011	2012	2013	2014	2015	2016	2017	2018
Total	422.67	361.04	434.42	285.25	369.19	388.10	579.50	460.50	190.62
Max	3.308	3.030	2.930	2.223	4.537	3.745	3.364	3.043	2.376
Min	0.338	0.166	0.699	0.243	0.511	0.110	0.383	0.000	0.655
Average	2.297	2.162	2.400	1.517	1.865	2.168	2.264	2.246	1.589
Median	2.694	2.121	2.467	1.642	1.875	1.850	2.590	2.487	1.626
90 Percentile	3.054	2.789	2.807	2.028	2.638	3.587	3.170	2.983	2.358
92 Percentile	3.090	2.820	2.831	2.056	2.776	3.626	3.208	2.986	2.362
98 Percentile	3.191	2.874	2.873	2.172	3.436	3.715	3.289	2.991	2.373
Std. Dev.	0.799	0.571	0.370	0.473	0.707	0.803	0.875	0.750	0.455
Count	184	167	181	188	198	179	256	205	120

There are 185 days between November 1 and April 30 when it is not a leap year. ***Table 6-3*** shows a count of the number of days that effluent was discharged to the river each year. The shows that in the years 2014, 2016 and 2017 there was not adequate storage due to high rainfall and effluent was discharged to the river outside of the 185 days that are permitted.

The average and 92-percentile of effluent flows for each year are plotted in ***Figure 6-5***. The 92-percentile flow is representative of a maximum month flow. This figure shows that during most years the average and maximum month flows are higher than the 1.92-mgd permitted flow which the effluent mass limits are calculated. The plant is permitted to an effluent concentration of 10-mg/L and 160-lbs/day for a monthly average for BOD_5 and TSS. Whenever the monthly flow is greater than 1.92-mgd, the plant must meet a concentration limit less than 10-mg/L. For instance, when the effluent flow is 3.0-mgd, the plant must discharge a concentration less than 6.4-mg/L.

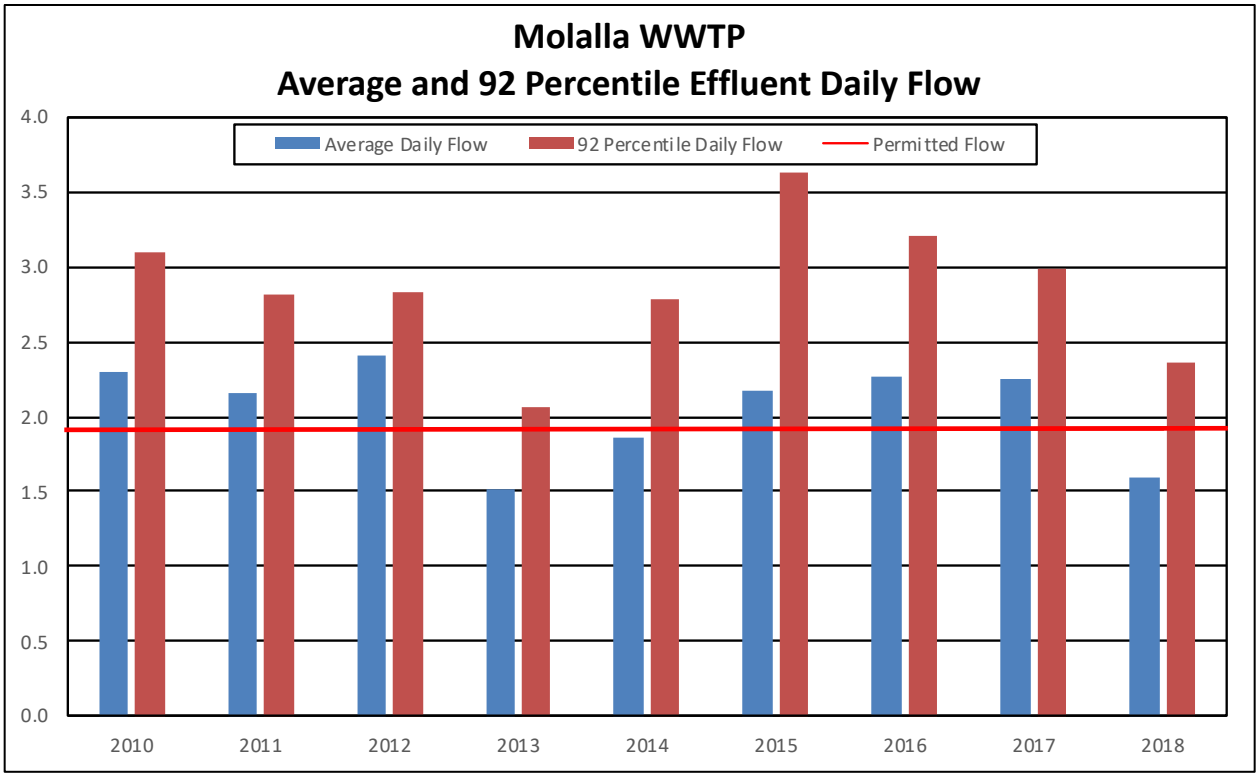

Figure 6-5 –2010 –2018 Average and 92 Percentile Effluent Daily Flow

The previous section showed how the plant influent is related to rainfall. This is also the case with the plant effluent. The lagoon system is limited on storage. This requires the plant operators to discharge as much treated effluent as possible to maintain storage and to keep the lagoons below their maximum operating level during the wet weather season. ***Figure 6-6*** is a plot of the average effluent flow for each month plotted with the total monthly rainfall. This shows that the effluent flow rate is also directly related to rainfall due to the need to maintain storage in the system. It should be noted that rainfall accumulates in the lagoons requiring additional flow to be discharged.

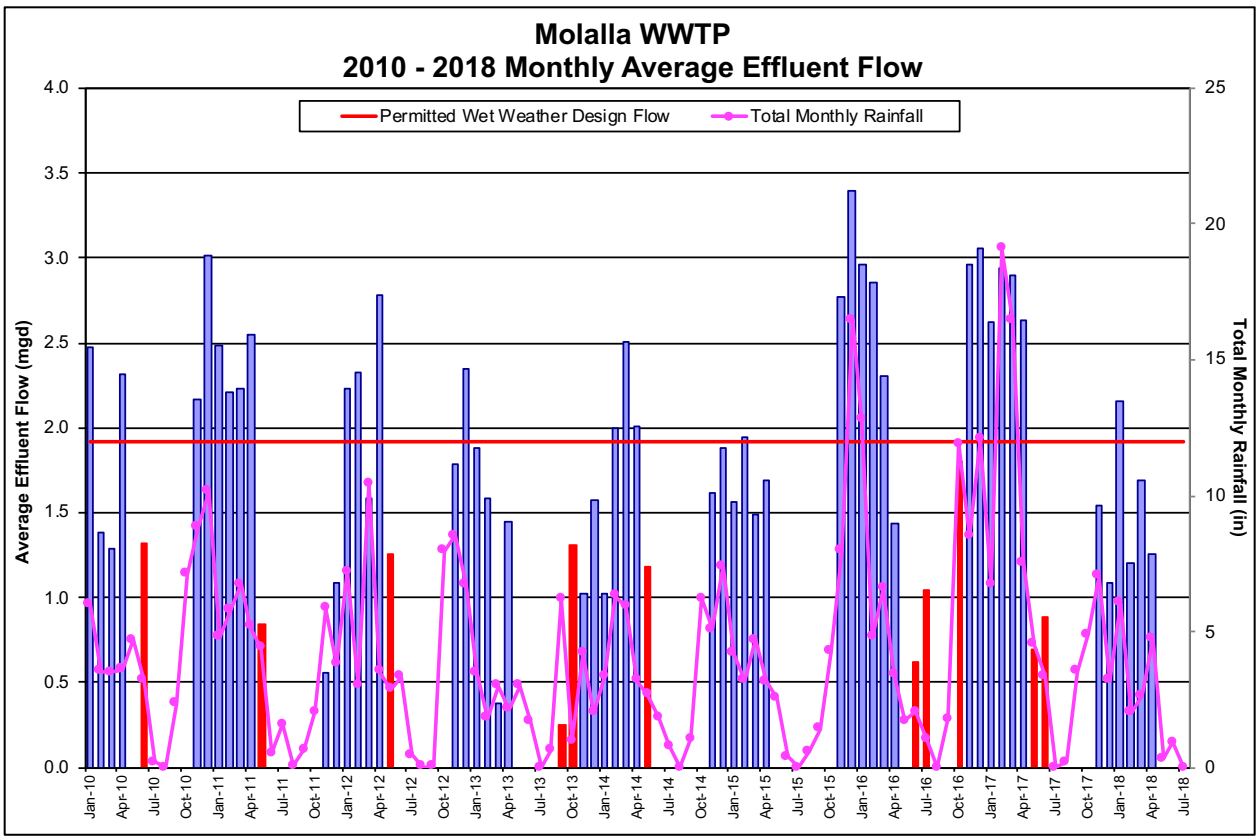

Figure 6-6: Monthly Influent Flow vs. Rainfall

Figure 6-6 is a plot of the effluent flow and rainfall on a monthly basis. The total flow and rainfall for the wet weather season from October through June each year from 2010 – 2018 was evaluated. A plot of this total wet weather season flow and rainfall is shown in ***Figure 6-7***. This shows a clear relationship between effluent flow and rainfall.

6.3. System Historical Water Balance

The months where the plant was required to discharge due to high flows and lack of storage were highlighted in red in ***Figures 6-4*** and ***6-6***. The management of the available storage is a difficult task for the operations staff as they are unable to predict the level of rainfall. An analysis of the system water balance for each wet weather season was done to evaluate how the system storage was managed.

The water balance has a number of components that must be considered. These included:

- Plant Influent Flow
- Precipitation
- Evaporation
- Pond Leakage
- Plant Effluent Flow

The plant influent flow, effluent flow and rainfall were obtained from the monthly monitoring reports. The evaporation was obtained from the Dyer water balance and was based on historical

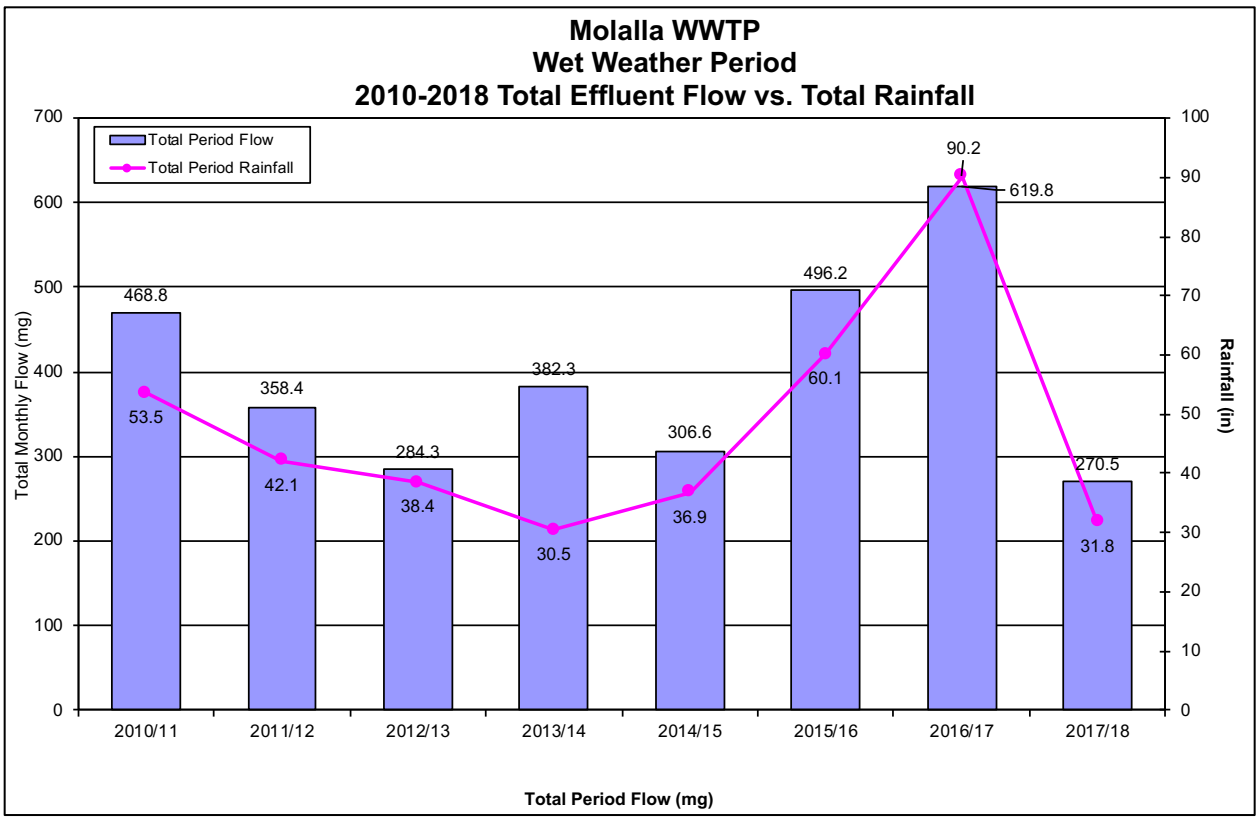

Figure 6-7: Wet Season Total Monthly Effluent Flow vs. Monthly Rainfall

means for Corvallis in the Climatology Handbook, September 1969. The pond leakage was based on the 2017 leak test performed by The Dyer Partnership that showed a leakage of 0.24 inches per day. The wet season values of these parameters for each year are shown in ***Table 6-4***.

Table 6-4
Wet Weather Period
Total Influent Flow and Rainfall

Period	Total Influent Flow (mg)	Total Rainfall (mg)	Evaporation (mg)	Leakage (mg)	Total Effluent Flow (mg)
2010/11	551.4	53.54	-9.64	-46.33	468.8
2011/12	479.2	42.12	-9.64	-46.33	358.4
2012/13	431.2	38.43	-9.64	-46.33	284.3
2013/14	407.4	30.50	-9.64	-46.33	382.3
2014/15	416.7	36.88	-9.64	-46.33	306.6
2015/16	482.6	60.09	-9.64	-46.33	496.2
2016/17	590.8	90.17	-9.64	-46.33	619.8
2017/18	457.8	31.82	-9.64	-46.33	270.5

The flows in ***Table 6-4*** were plotted on a monthly basis for each of the wet weather seasons. These plots for each year are shown in ***Attachment F***. The low rainfall wet season in the study period was the 2014/2015 wet season with a total rainfall of 36.9-inches. The water balance for this year is shown in ***Figure 6-8***. This plot shows that the plant was able to utilize the storage available

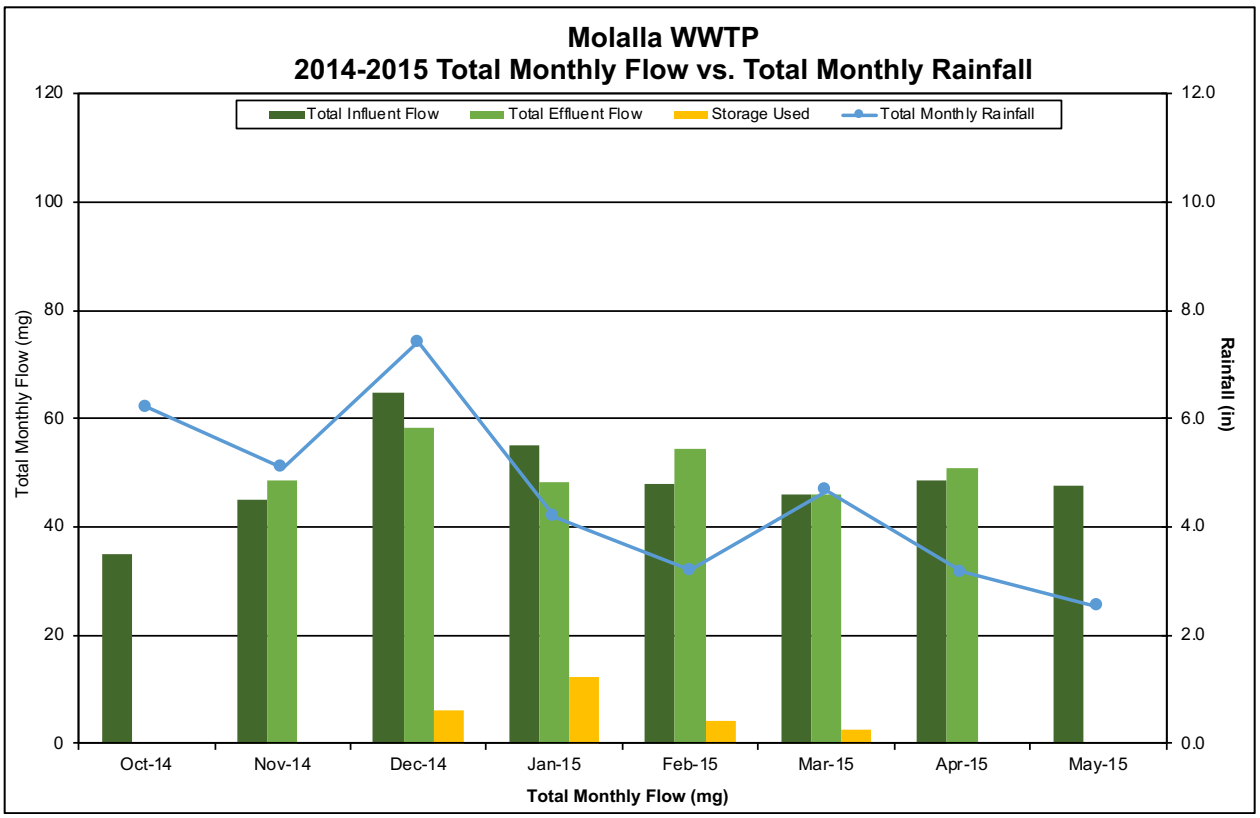

Figure 6-8: 2014-2015 Wet Weather Period Monthly Water Balance

in the ponds to manage the effluent flows. This was because the influent flows averaged less than 1.92-mgd as shown in ***Figure 6-4***. In contrast to the 2014-2015 wet season is the 2015/2016 wet season. In this wet season, the rainfall was a record high early in the season during November, December and January. The rainfall was lower in March and April. The plant was not able to discharge in October due to wet irrigation fields. The plant then lowered the ponds in November through January even with high influent flows. There was then a low rainfall April, but the land application sites were not available in May, so the effluent was stored with no May discharge. They were then able to irrigate some in June but were still required to store effluent. This water balance is shown in ***Figure 6-9***.

The 2016/2017 wet season had a record high rainfall of 90.2-inches. The water balance for this year is shown in ***Figure 6-10***. This shows that the plant was required to discharge high volumes of treated effluent throughout the winter. This also shows a wet spring during the months of May and June where rainfall limited the use of the land application sites. The high influent flows required the plant to discharge outside of the permitted discharge season in May and June.

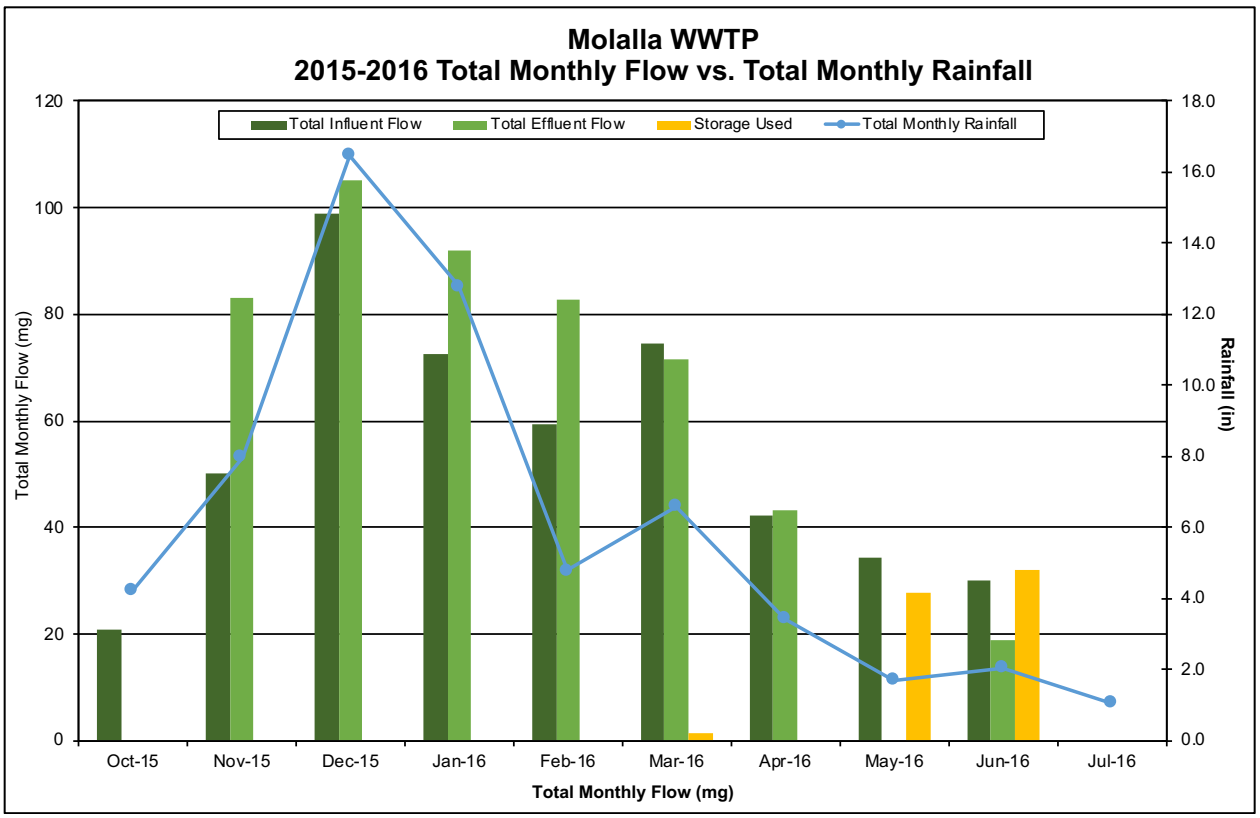

Figure 6-9: 2015-2016 Wet Weather Period Monthly Water Balance

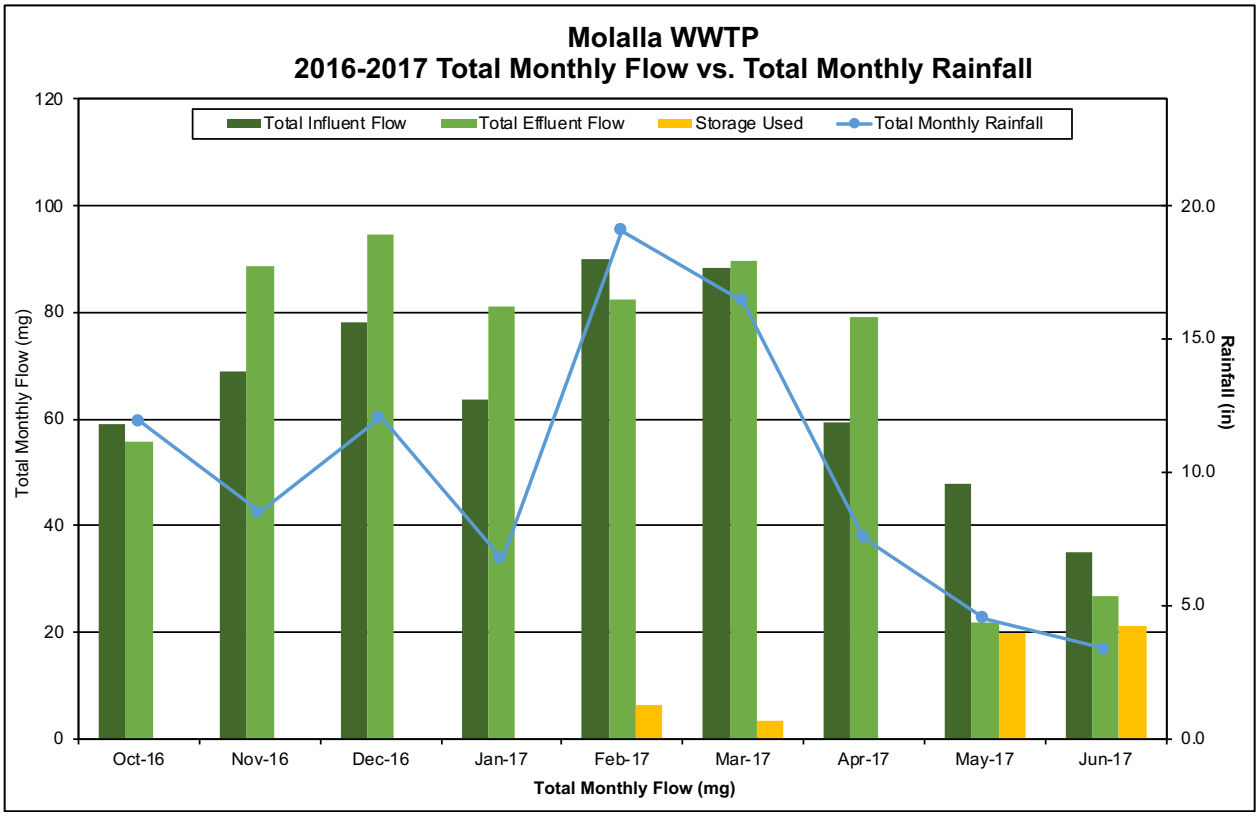

Figure 6-10: 2016-2017 Wet Weather Period Monthly Water Balance

6.4. Effluent Quality

The data for evaluation of the treated effluent quality was taken from the DMR reports for the period January 1, 2010 through July 31, 2018. The effluent data was evaluated to determine the level of historical permit compliance as well as determine the level of treatment that is being obtained under the current plant flow and loading conditions.

6.4.1. Effluent Biochemical Oxygen Demand (BOD_5)

The effluent BOD_5 data was evaluated to determine the level of historical permit compliance as well as determine the level of treatment that is being obtained under the current plant flow and loading conditions. Effluent BOD_5 sampling and testing is only done when the plant is discharging to the river. BOD_5 testing is not performed when discharging to a land application site. The permit limit for effluent BOD_5 is a monthly average of 10-mg/L with an average monthly mass limit of 160-lbs./day.

6.4.2. Effluent BOD_5 Concentration

The monthly average effluent BOD_5 concentration (calendar month) is shown in ***Figure 6-11***. This figure shows discharge during the permitted season in blue and discharges outside of the permitted season in red. This analysis shows that the permit limit for monthly average BOD_5 concentration was exceeded in January and December 2013 and in January 2014. The red bars are when discharge occurred outside of the permitted season.

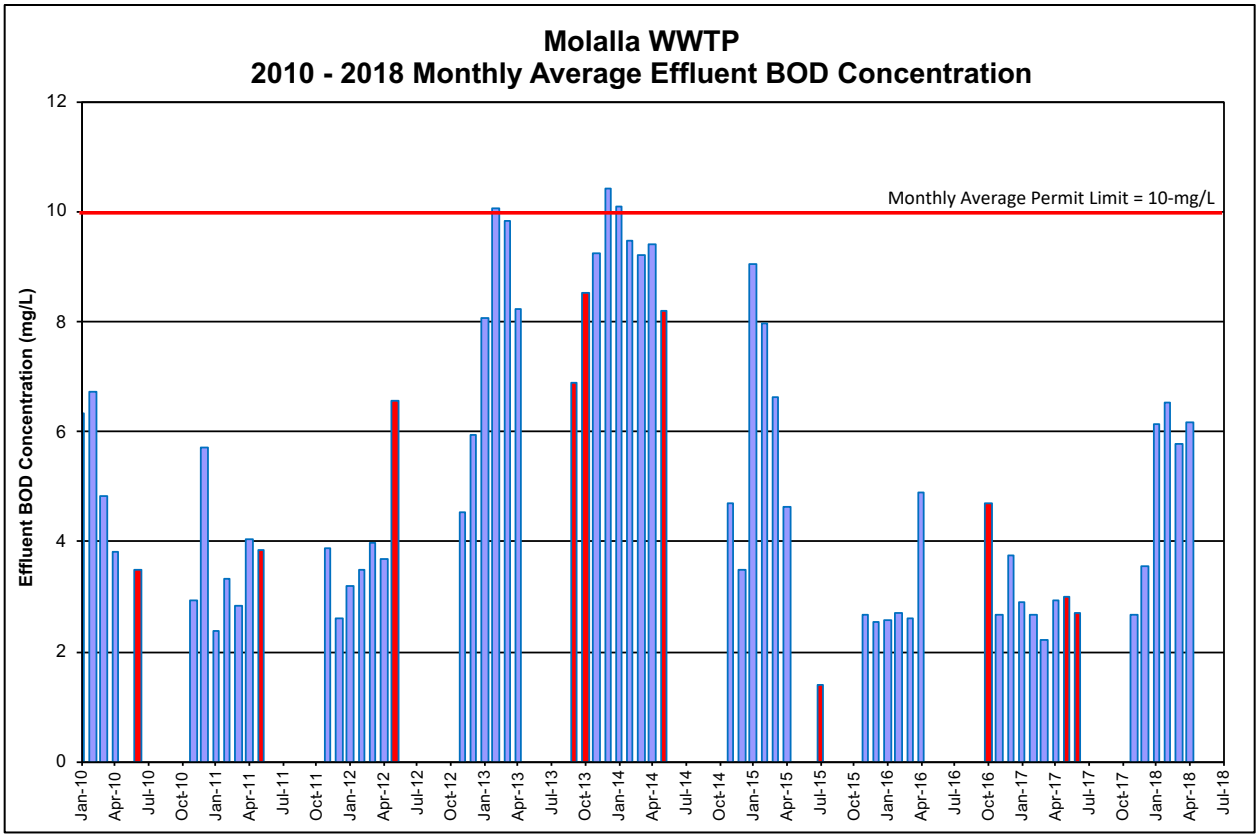

Figure 6-11 – January 2010 – July 2018 Monthly Average Effluent BOD_5 Concentration

The statistics for the effluent BOD_5 concentration are summarized in ***Table 6-5***. This shows that with the exception of the years 2013 and 2014, the plant has been able to meet the effluent BOD_5

concentration. The level of treatment has improved in 2016 and 2017 but was less in 2018 due to the higher flows that were treated.

Table 6-5
Molalla WWTP
2010 – 2018 Annual Effluent BOD_5 Concentration

Statistic	2010	2011	2012	2013	2014	2015	2016	2017	2018
Max	11.9	8.3	8.6	13.1	16.9	16.4	10.5	4.5	9.0
Min	0.5	0.3	2.1	4.0	2.0	1.4	2.0	1.9	1.0
Average	4.9	3.2	4.3	9.1	7.8	5.8	3.3	2.8	6.1
Median	5.0	3.1	3.9	9.4	8.6	4.4	2.7	2.8	6.2
90 Percentile	7.3	4.7	6.3	11.1	11.3	10.6	5.1	3.3	7.9
92 Percentile	7.4	4.7	7.3	11.5	11.4	12.3	5.4	3.4	8.2
98 Percentile	8.0	5.2	7.6	12.9	13.4	15.8	8.8	3.7	8.9
Std. Dev.	2.0	1.4	1.5	1.9	3.3	3.8	1.7	0.5	1.6
Count	54	47	51	53	56	47	56	53	32

6.4.3. Effluent BOD_5 Mass

The effluent BOD_5 mass for the period January 1, 2010 through July 2018 was evaluated to determine performance with the NPDES permit limits. The monthly average effluent BOD_5 mass (calendar month) is shown in ***Figure 6-12***. This figure shows discharge during the permitted season in blue and discharges outside of the permitted season in red. This analysis shows that the permit limit for monthly average BOD_5 concentration was exceeded in March and April 2014.

Table 6-6 provides an analysis of the effluent BOD_5 mass during the discharge season. The improved performance in BOD_5 mass discharged in the years 2016 and 2017 also occurred during high flow years as discussed earlier.

There is a direct relationship between the effluent BOD_5 mass and effluent flow. This is shown in ***Figure 6-13***. As the flow increases the effluent BOD_5 mass also increases. This shows that there are issues with meeting the 160-lbs/day mass limit as flows are greater than 1.5-mgd. The weekly permit limit has been exceeded at flows above 2.5-mgd.

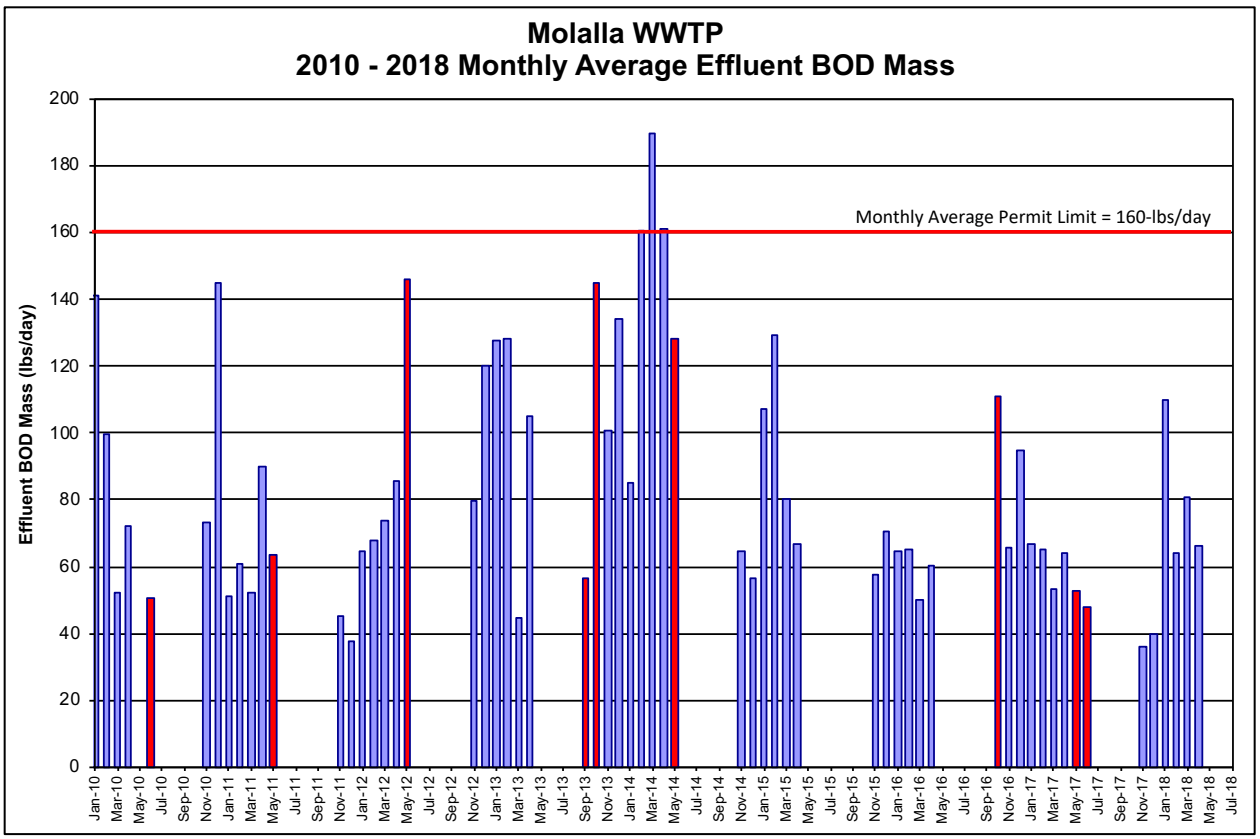

Figure 6-12 – January 2010 – July 2018 Monthly Average Effluent BOD_5 Mass

Table 6-6
Molalla WWTP
2010 – 2018 Annual Effluent BOD_5 Mass

Statistic	2010	2011	2012	2013	2014	2015	2016	2017	2018
Total	4997	2753	4441	6162	6685	4044	3971	2858	2584
Max	306	133	185	186	291	256	266	83	139
Min	12	6	28	31	14	11	40	27	14
Average	93	59	87	116	119	86	71	54	81
Median	72	54	79	114	122	70	60	55	81
90 Percentile	160	97	141	172	188	158	86	72	123
92 Percentile	162	99	144	173	195	173	89	73	124
98 Percentile	199	115	162	184	247	223	212	75	136
Std. Dev.	57	27	33	40	63	51	39	13	31
Count	54	47	51	53	56	47	56	53	32

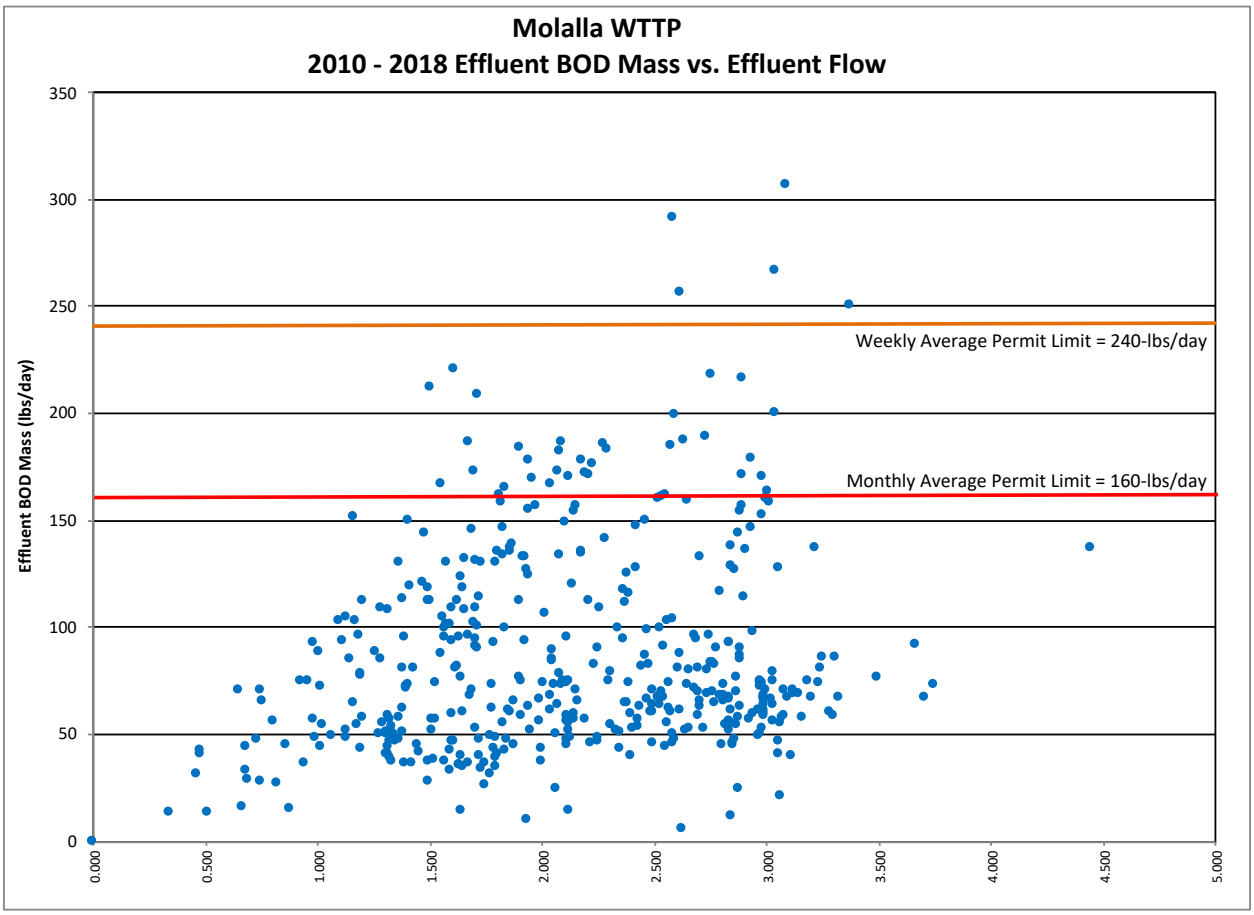

Figure 6-13 – January 2010 – July 2018 Effluent BOD_5 Mass vs. Effluent Flow

6.4.4. Total Suspended Solids

The effluent TSS data was evaluated to determine the level of historical permit compliance as well as determine the level of treatment that is being obtained under the current plant flow and loading conditions. Effluent TSS sampling and testing is only done when the plant is discharging to the river. TSS testing is not performed when discharging to a land application site. The permit limit for effluent TSS is a monthly average of 10-mg/L with an average monthly mass limit of 160-lbs./day.

6.4.5. Effluent TSS Concentration

The monthly average effluent TSS concentration (calendar month) is shown in ***Figure 6-14***. This figure shows discharge during the permitted season in blue and discharges outside of the permitted season in red. This analysis shows that the permit limit for monthly average TSS concentration was exceeded in March, November and December 2015 and January 2017.

The weekly permitted TSS concentration limit is 15-mg/L. The 7-day average of the effluent TSS concentration represents the weekly limit as the weekly limit is calculated on a Sunday through Saturday period. Two samples are taken each week. The weekly average TSS concentration that was discharged is shown in ***Figure 6-15***. This shows exceedances of the weekly concentration limit in 2017.

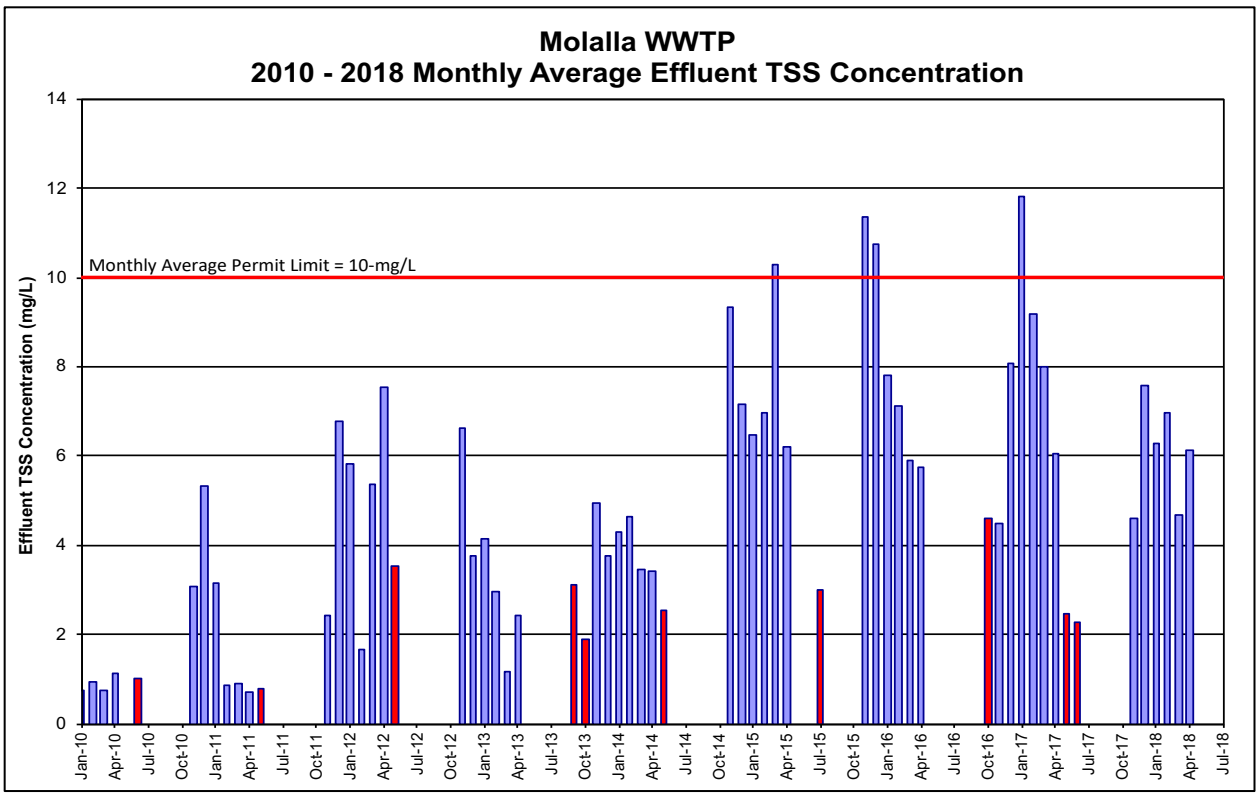

Figure 6-14 – January 2010 – July 2018 Monthly Average Effluent TSS Concentration

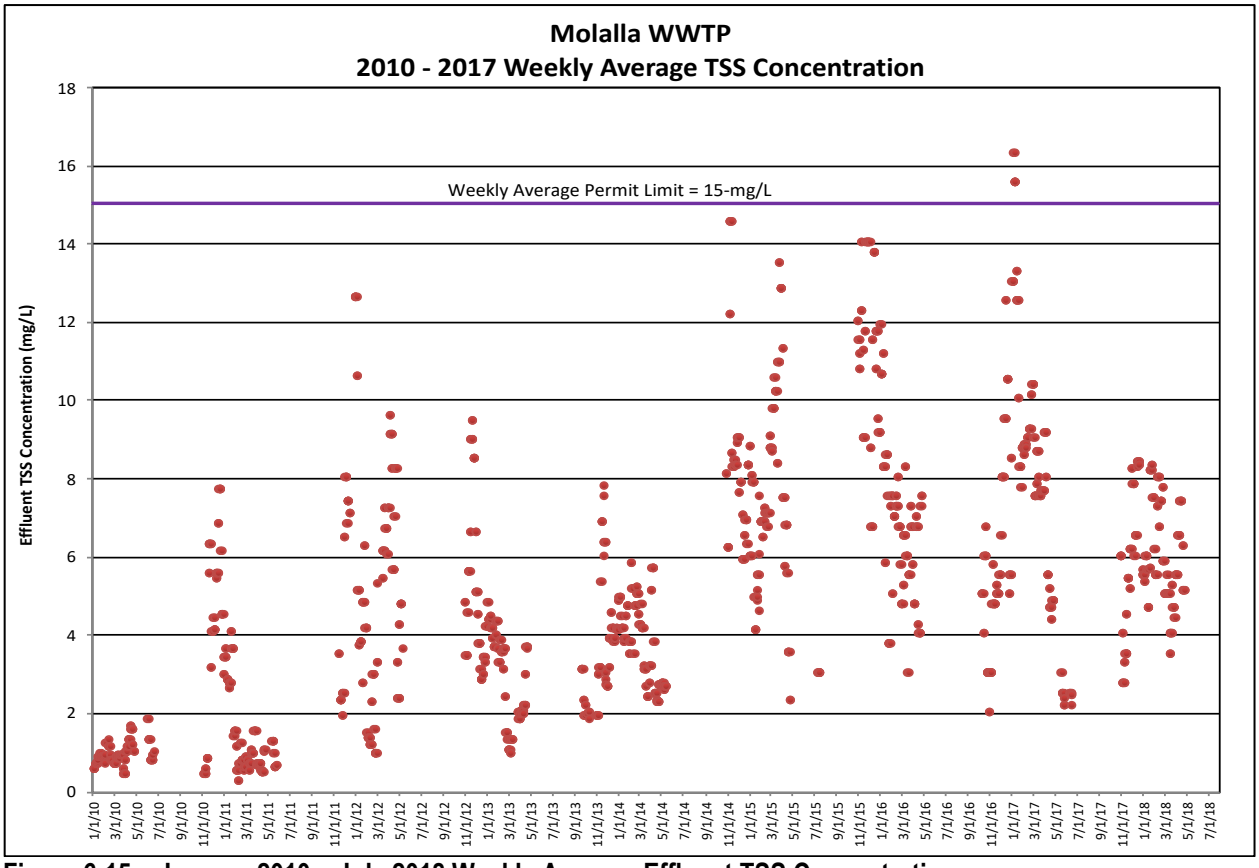

Figure 6-15 – January 2010 – July 2018 Weekly Average Effluent TSS Concentration

The statistics for the effluent TSS concentration are summarized in ***Table 6-7***. This shows that the effluent TSS concentration has been increasing over the past 4-years with the poorest TSS removal occurring in 2015 and 2016.

Table 6-7
Molalla WWTP
January 2010 – July 2017 Annual TSS Effluent Concentration

Statistic	2010	2011	2012	2013	2014	2015	2016	2017	
Max	10.2	10.6	12.6	9.7	20.0	16.5	13.5	19.6	9.0
Min	0.3	0.2	0.6	0.7	2.0	2.0	1.5	2.0	3.0
Average	1.9	2.1	5.0	3.2	5.1	8.5	6.3	7.2	6.0
Median	1.0	1.2	4.8	3.1	4.4	7.5	5.5	7.8	5.8
90 Percentile	4.5	5.6	9.0	5.0	8.4	14.0	9.7	10.0	8.0
92 Percentile	5.4	6.1	9.3	5.1	8.5	14.0	10.3	10.6	8.2
98 Percentile	9.5	8.4	12.0	8.3	9.6	15.8	13.3	14.9	8.8
Std. Dev.	2.2	2.3	3.0	1.7	3.0	3.7	2.9	3.4	1.5
Count	54	47	51	53	56	51	57	53	33

6.4.6. Effluent TSS Mass

The effluent TSS mass for the period January 1, 2010 through July 2018 was evaluated to determine performance with the NPDES permit limits. The monthly average effluent TSS mass (calendar month) is shown in ***Figure 6-16***. This figure shows discharge during the permitted season in blue and discharges outside of the permitted season in red. This analysis shows that the permit limit for monthly average TSS mass was exceeded in April 2012, November and December 2015, January, February and December 2016 and January, February and March 2017. This shows the effect of high flows on the ability of the treatment plant to meet permit conditions.

The weekly permitted TSS mass discharge limit is 240-lbs./day. The 7-day average of the effluent TSS mass represents the weekly limit as the weekly limit is calculated on a Sunday through Saturday period. Two samples are taken each week. The weekly average TSS mass that was discharged is shown in ***Figure 6-17***. This shows exceedances of the weekly limit in 2015, 2016 and 2017. The effluent TSS mass limit were exceeded even when meeting the weekly average concentration limits as shown in ***Figure 6-16*** due to high flows.

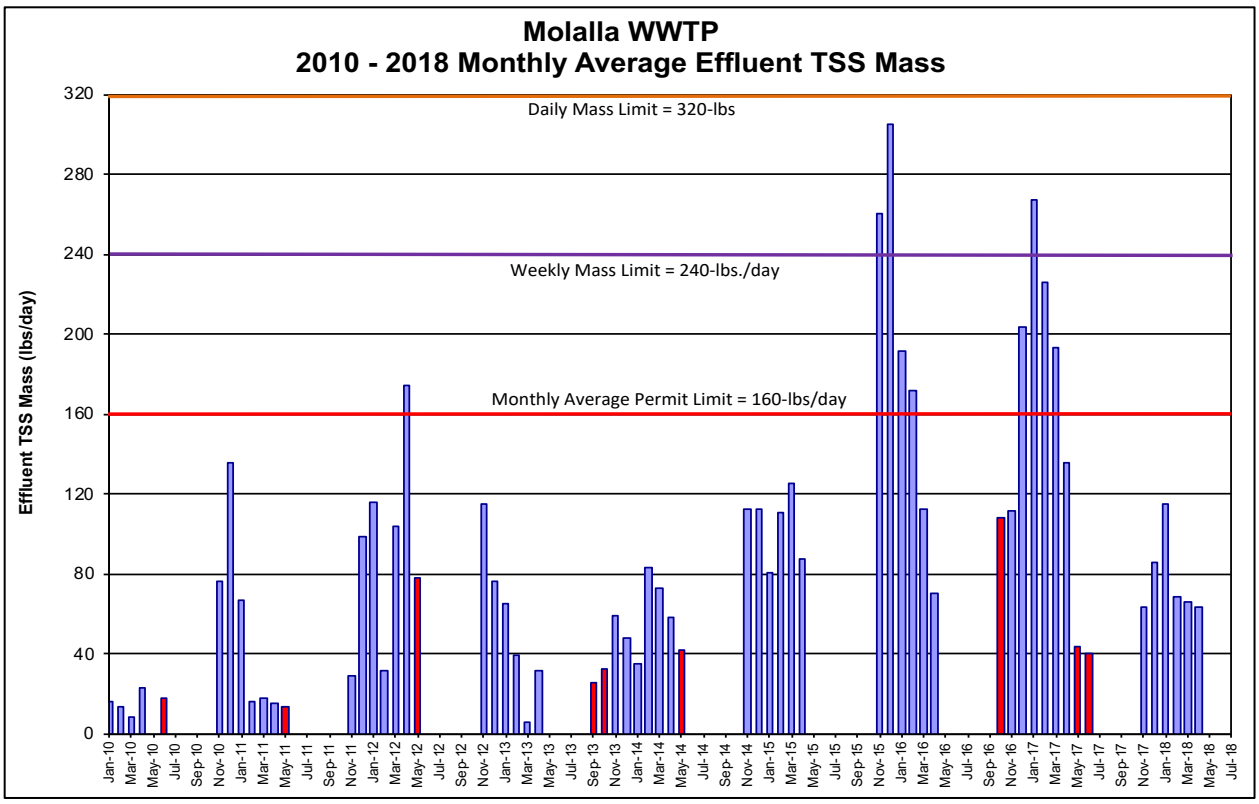

Figure 6-16 – January 2010 – July 2018 Monthly Average Effluent TSS Mass

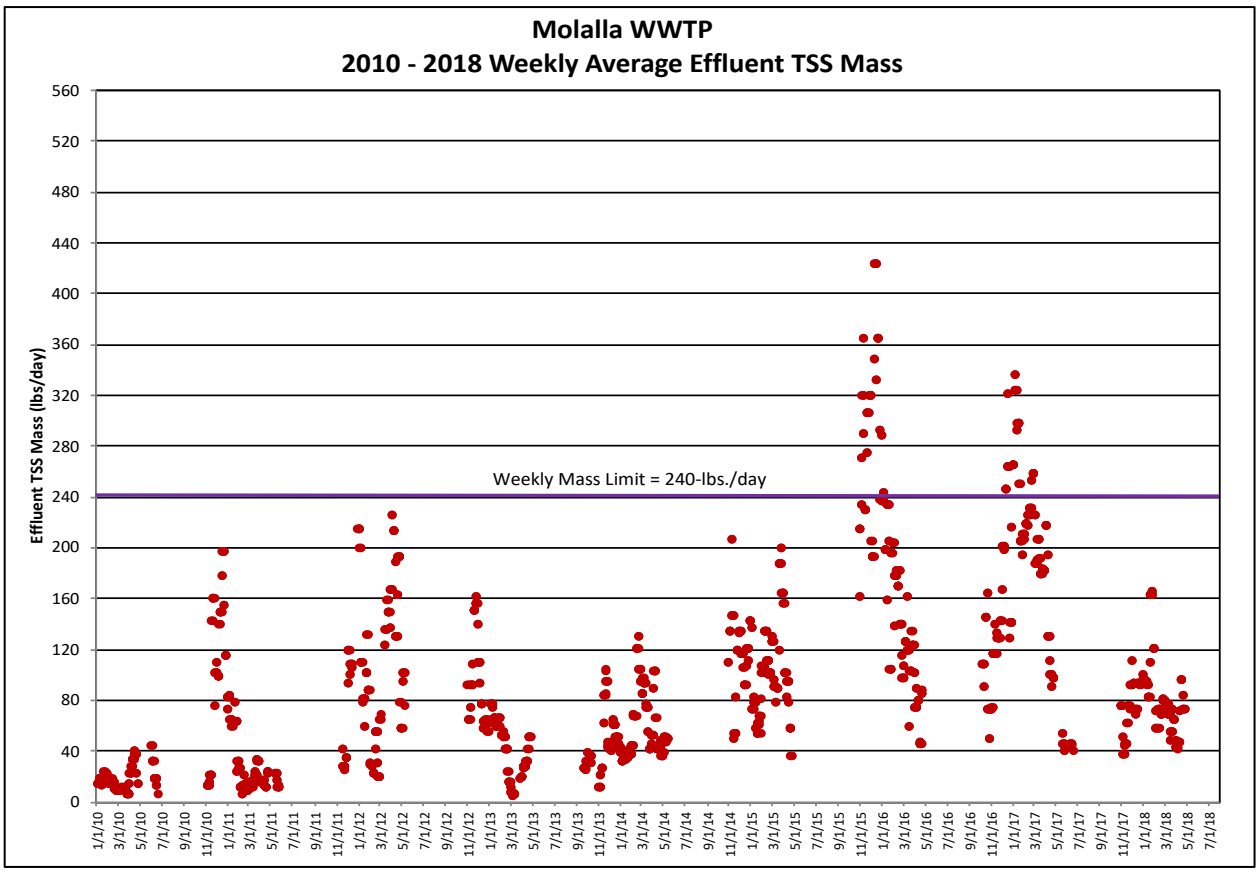

Figure 6-17 – January 2010 – July 2018 Weekly Average Effluent TSS Mass

The daily permitted TSS mass discharge limit is 320-lbs./day. Two samples are taken each week. The calculated daily TSS mass that was discharged is shown in ***Figure 6-18***. This shows exceedances of the daily limit in 2015, 2016 and 2017. The effluent TSS daily mass limit was exceeded due to high flows. There is no daily concentration limit.

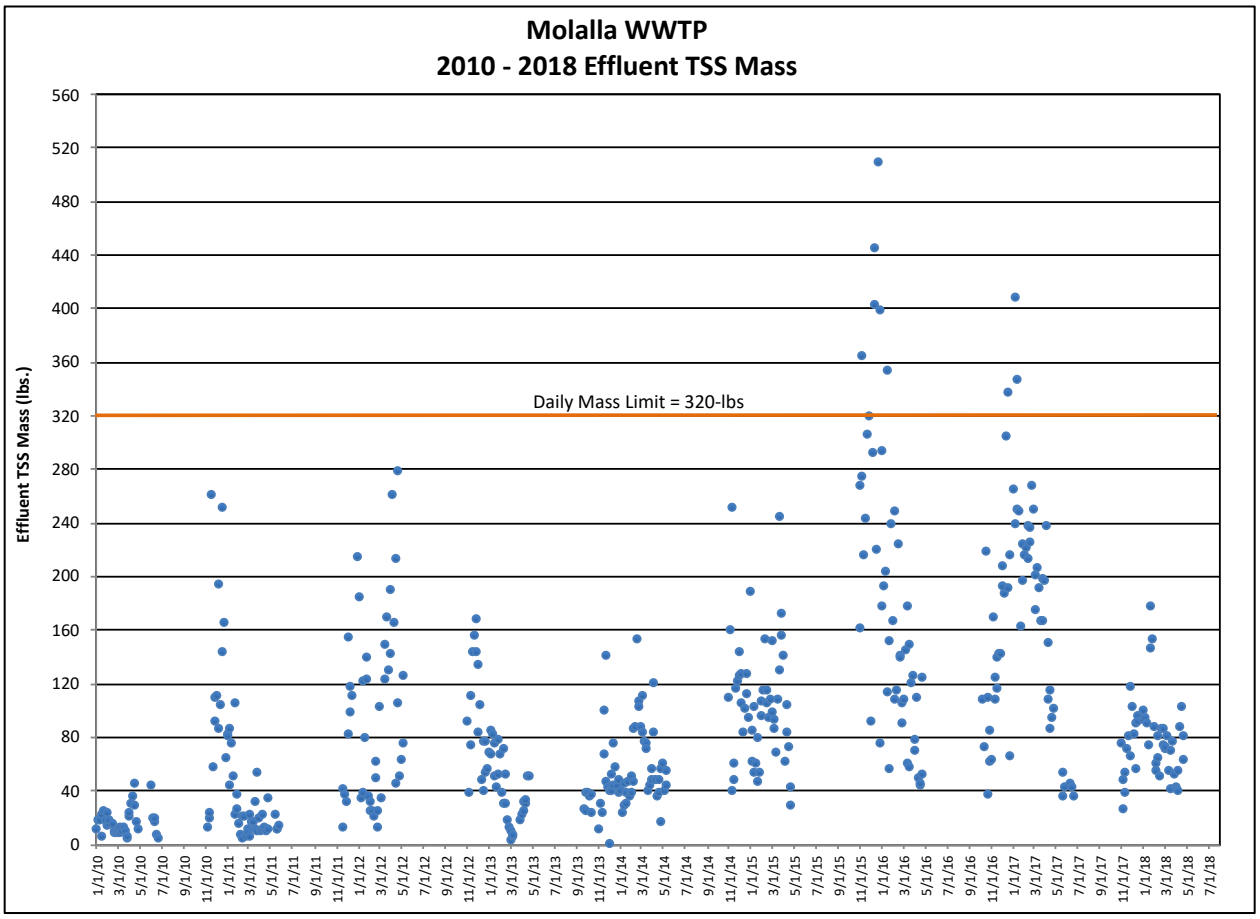

Figure 6-18 – January 2010 – July 2018 Daily Effluent TSS Mass

The statistics for the effluent TSS mass are summarized in ***Table 6-8***. This shows that the effluent TSS mass has been increasing over the past 4-years with the poorest TSS removal occurring in 2015 and 2016. This corresponds to the higher effluent TSS concentrations as well as the higher flows that have been treated.

Table 6-8
Molalla WWTP
January 2010 – July 2017 Annual TSS Effluent Mass

Statistic	2010	2011	2012	2013	2014	2015	2016	2017	2018
Total	2291	1701	5138	2299	4212	8029	7975	7903	2574
Max	260	154	278	140	251	508	353	408	177
Min	3	3	11	3	15	23	36	25	39
Average	42	36	101	43	75	157	140	149	78
Median	17	21	91	39	59	107	123	150	73
90 Percentile	109	90	183	75	125	318	229	248	101
92 Percentile	135	100	190	77	127	363	243	249	121
98 Percentile	246	120	260	98	159	443	332	342	161
Std. Dev.	60	36	65	26	44	116	74	89	31
Count	54	47	51	53	56	51	57	53	33

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7. ANTIDEGREDATION REVIEW

The Antidegradation Policy for the State of Oregon is defined in OAR 340-041-004. This policy is intended to guide decisions that affect water quality such that unnecessary further degradation from new or increased point and nonpoint sources of pollution is prevented. The policy is also to protect, maintain and enhance existing surface water quality to ensure the full protection of all existing beneficial uses. The policy is to require that growth and development be accommodated by increased efficiency and effectiveness of waste treatment and control such that measurable future discharged waste loads from existing sources do not exceed presently allowed discharged loads.

7.1. Water Quality Evaluation

An analysis of the Molalla River water quality was done to determine if an increase of the mass load for BOD_5 and TSS for the high stream flow discharge period (winter season) and allowing for discharge during the low stream flow discharge period (summer season) when river flows measured at the Canby station are greater than 350-cfs would show any degradation in water quality. An evaluation of the impact to river dissolved oxygen was performed. The report was completed by Geosyntec Consultants[9]. A copy of their report is provided in ***Attachment B***. This evaluation showed no significant impact to the river dissolved oxygen from the increased winter season discharge and the summer season discharge when river flows are greater than 350-cfs.

This water quality evaluation demonstrated that the increased loads do not have a significant impact on the Molalla River when river flows are greater than 350-cfs. This also shows that the assumptions made during previous permit renewals to limit discharges to concentrations below the Willamette Basin minimum water quality standards had no technical basis.

7.2. Nondegradation Discharges

The rule states in OAR 340-041-004(3) Nondegradation Discharges that an antidegradation review is not required for the specific conditions. These conditions are listed below with an explanation of how this applies to the increased mass load limit and summer season discharge as requested.

- Discharges Into Existing Mixing Zones – Pollutants discharged into the portion of a water body that has been included in a previous mixing zone for a permitted source, including the zones of initial dilution, are not considered a reduction in water quality

  The discharge will be into an existing mixing zone with no reduction in water quality.

- Water Conservation Activities – An increase in a pollutant concentration is not considered a reduction in water quality so long as the increase occurs as the result of a water conservation activity, the total mass load of the pollutant is not increased, and the concentration increase has no adverse effect on either beneficial uses or threatened or endangered species in the water body

  This does not apply to this request

[9] "Technical Analyses in Support of NPDES Permit Modification Request", Geosyntec Consultants, May 16, 2018

- Insignificant Temperature Increases – Insignificant temperature increases are not considered a reduction in water quality

  The mass load increase will not result in an insignificant temperature increase as defined in OAR 340-041-0028(11). The summer season discharge in early spring can be done under the existing temperature TMDL utilizing the unused temperature allocation to Sanders Wood Products.

- Dissolved Oxygen – Up to a 0.1-mg/L decrease in dissolved oxygen from the upstream end of a stream reach to the downstream end of the reach is not considered a reduction in water quality so long as It has no adverse effects on threatened and endangered species

- *The mass load increase will not result in a significant decrease in dissolved oxygen as demonstrated in the Geosyntec Consultants water quality evaluation for the Molalla River.*

The High-Quality Waters Policy stated in OAR 340-041-004(6) will not be a factor as no other reasonable alternatives exist except to lower water quality; water quality standards will be met and beneficial uses protected and federal threatened and endangered aquatic species will not be adversely affected.

Water quality standards will be met and beneficial uses protected and federal threatened and endangered aquatic species will not be adversely affected.

The Water Quality Limited Waters Policy in OAR 340-041-004(7) states that water quality limited wastes may not be further degraded for the pollutant parameters for the discharge are unrelated directly or indirectly to the parameter(s) causing the receiving stream to violate water quality standards and being designated water quality limited

The Molalla River is not listed as water quality limited for dissolved oxygen which is the parameter that will be affected by an increase in mass load for BOD_5 and TSS.

The request for a mass load increase does not require an antidegradation review under OAR 340-041-004(3) as it meets the conditions of the rule as shown in the discussion above. The allowance of a summer discharge during the shoulder months will require trading or a transfer of the unused temperature allocation provided to Sanders Wood Products to the City. It should be noted that the summer discharge should have been allowed when the permit for the Molalla River discharge was first written. This discharge would then have been part of the Molalla River TMDL and a temperature allocation would have been provided to the City of Molalla WWTP.

7.3. Antidegradation Exceptions

There are exceptions to the antidegradation policy that can be granted by the Commission or Department. These are listed in OAR 340-041-004(9) as stated below:

> (9) Exceptions. The Commission or Department may grant exceptions to this rule so long as the following procedures are met:
> (a) In allowing new or increased discharged loads, the Commission or Department must make the following findings:
> (A) The new or increased discharged load will not cause water quality standards to be violated;
> (B) The action is necessary and benefits of the lowered water quality outweigh the environmental costs of the reduced water quality. This evaluation will be conducted in accordance with DEQ's "Antidegradation Policy Implementation Internal Management Directive for NPDES Permits and section 401 water quality certifications," pages 27, and 33-39 (March 2001) incorporated herein by reference; and
> (C) The new or increased discharged load will not unacceptably threaten or impair any recognized beneficial uses or adversely affect threatened or endangered species. In making this determination, the Commission or Department may rely upon the presumption that if the numeric criteria established to protect specific uses are met the beneficial uses they were designed to protect are protected. In

making this determination the Commission or Department may also evaluate other State and federal agency data that would provide information on potential impacts to beneficial uses for which the numeric criteria have not been set;
(D) The new or increased discharged load may not be granted if the receiving stream is classified as being water quality limited under OAR 340-041-0002(62)(a), unless:
(i) The pollutant parameters associated with the proposed discharge are unrelated either directly or indirectly to the parameter(s) causing the receiving stream to violate water quality standards and being designated water quality limited; or
(ii) Total maximum daily loads (TMDLs), waste load allocations (WLAs) load allocations (LAs), and the reserve capacity have been established for the water quality limited receiving stream; and compliance plans under which enforcement action can be taken have been established; and there will be sufficient reserve capacity to assimilate the increased load under the established TMDL at the time of discharge; or
(iii) Effective July 1, 1996, in water bodies designated water-quality limited for dissolved oxygen, when establishing WLAs under a TMDL for water bodies meeting the conditions defined in this rule, the Department may at its discretion provide an allowance for WLAs calculated to result in no measurable reduction of dissolved oxygen (DO). For this purpose, "no measurable reduction" is defined as no more than 0.10 mg/L for a single source and no more than 0.20 mg/L for all anthropogenic activities that influence the water quality limited segment. The allowance applies for surface water DO criteria and for Intergravel dissolved oxygen (IGDO) if a determination is made that the conditions are natural. The allowance for WLAs applies only to surface water 30-day and seven-day means; or
(iv) Under extraordinary circumstances to solve an existing, immediate and critical environmental problem, the Commission or Department may, after the completion of a TMDL but before the water body has achieved compliance with standards, consider a waste load increase for an existing source on a receiving stream designated water quality limited under OAR 340-041-0002(62)(a). This action must be based on the following conditions:
(I) That TMDLs, WLAs and LAs have been set; and
(II) That a compliance plan under which enforcement actions can be taken has been established and is being implemented on schedule; and
(III) That an evaluation of the requested increased load shows that this increment of load will not have an unacceptable temporary or permanent adverse effect on beneficial uses or adversely affect threatened or endangered species; and
(IV) That any waste load increase granted under subparagraph (iv) of this paragraph is temporary and does not extend beyond the TMDL compliance deadline established for the water body. If this action will result in a permanent load increase, the action has to comply with sub-paragraphs (i) or (ii) of this paragraph.
(b) The activity, expansion, or growth necessitating a new or increased discharge load is consistent with the acknowledged local land use plans as evidenced by a statement of land use compatibility from the appropriate local planning agency.
(c) Oregon's water quality management policies and programs recognize that Oregon's water bodies have a finite capacity to assimilate waste. Unused assimilative capacity is an exceedingly valuable resource that enhances in-stream values and environmental quality in general. Allocation of any unused assimilative capacity should be based on explicit criteria. In addition to the conditions in subsection (a) of this section, the Commission or Department may consider the following:
(A) Environmental Effects Criteria:
(i) Adverse Out-of-Stream Effects. There may be instances where the non-discharge or limited discharge alternatives may cause greater adverse environmental effects than the increased discharge alternative. An example may be the potential degradation of groundwater from land application of wastes;
(ii) Instream Effects. Total stream loading may be reduced through elimination or reduction of other source discharges or through a reduction in seasonal discharge. A source that replaces other sources, accepts additional waste from less efficient treatment units or systems, or reduces discharge loadings during periods of low stream flow may be permitted an increased discharge load year-round or during seasons of high flow, so long as the loading has no adverse affect on threatened and endangered species;
(iii) Beneficial Effects. Land application, upland wetlands application, or other non-discharge alternatives for appropriately treated wastewater may replenish groundwater levels and increase streamflow and assimilative capacity during otherwise low streamflow periods.
(B) Economic Effects Criteria. When assimilative capacity exists in a stream, and when it is judged that increased loadings will not have significantly greater adverse environmental effects than other alternatives to increased discharge, the economic effect of increased loading will be considered. Economic effects will be of two general types:
(i) Value of Assimilative Capacity. The assimilative capacity of Oregon's streams is finite, but the potential uses of this capacity are virtually unlimited. Thus, it is important that priority be given to those beneficial uses that promise the greatest return (beneficial use) relative to the unused assimilative capacity that might be utilized. In-stream uses that will benefit from reserve assimilative capacity, as well as potential future beneficial use, will be weighed against the economic benefit associated with increased loading;
(ii) Cost of Treatment Technology. The cost of improved treatment technology, non-discharge and limited discharge alternatives may be evaluated.

The mass load increase that is being requested by the City of the Molalla WWTP discharged should not require an antidegradation review as it meets the criteria specified in OAR 340-041-004(3) Nondegradation Discharges. The mass load increase request also meets the requirements for an exception as stated in the rule. The basis for the exceptions is as follows:

- The increased discharged load for BOD_5 and TSS will not cause water quality standards to be violated.
- Per page 27 of the DWQ Antidegradation Policy Implementation IMD the following conditions are met:

  - 1) The discharge will result in less than 1.0°F increase at the edge of the mixing zone;
  - 2) No designated beneficial uses will be adversely impacted
  - 3) All reasonable management practices are being implemented with the planning, design and construction of a new treatment plant.
  - 4) The increased mass load will not affect beneficial uses
  - 5) The water quality standards for the Willamette Basin for BOD_5 and TSS will be met
  - 6) The cost of treating for BOD_5 and TSS without the mass load increase to the level necessary to assure full protection outweighs the risk to the resource.
- The new or increased discharged load will not unacceptably threaten or impair any recognized beneficial uses or adversely affect threatened or endangered species.
- The Molalla River has been classified as water quality limited, but not for dissolved oxygen which is the water quality parameter that can be affected by an increase in mass load for BOD_5 and TSS.
- The increased mass load for BOD_5 and TSS will result in no measurable reduction of dissolved oxygen (DO)
- The plant expansion is necessitated by growth and the increased discharge load is consistent with the acknowledged local land use plans as evidenced by a statement of land use compatibility from the appropriate local planning agency.
- The mass load increase and shoulder season discharge will not minimize the current dry weather season recycled water land application program.
- The cost of treated wet weather flows to meet the existing mass load limits is excessive and places and undue financial burden on the residents of the City of Molalla
- The cost of effluent storage during the dry weather season shoulder months when land application is not possible is excessive and places and undue financial burden on the residents of the City of Molalla

The antidegradation rules provide the basis for increasing mass load limits in NPDES permits. A water quality evaluation demonstrated that there would be no impact to water quality with the requested increase in mass limits.

8. FINANCIAL IMPACT OF NO PERMIT MODIFICATION

The greatest obstacle to the successful implementation of this project will be to make the project affordable to the community. The 2016[10] median household income of the 3,163 households in the City of Molalla was $55,082[11]. This is compared to the Oregon median household income of $57,270 and the Clackamas County median household income of $68,915. 11,8% of the families live below the federal poverty level.

8.1. Project Affordability

The document "Affordability Assessment Tool for Federal Water Mandates[12]" states the following:

> In 1995, EPA published its first set of affordability-related guidelines: The Interim Economic Guidance for Water Quality Standards. The 1995 Guidance contains a detailed discussion of the analyses a municipality should undertake to evaluate the economic impact of complying with water quality standards (WQS) under the CWA. In 1997, EPA published Guidance for Financial Capability Assessment and Schedule Development using a nearly identical approach to assess whether an extended compliance schedule might be granted to a community facing affordability problems. The analyses put forth in these guidance documents are divided into two parts:
>
> 1. The preliminary screen examines affordability using a factor called the Residential Indicator (RI). The RI weighs the average per household cost of wastewater bills relative to median household income in the service area. Ultimately, an RI of 2% or greater is deemed to signal a "large economic impact" on residents, meaning that the community is likely to experience economic hardship in complying with federal water quality standards.
> 2. A secondary screen examines metrics related to the financial capability of the impacted community. This screen applies a Financial Capability Indicator (FCI) reflecting the average of six economic indicators. Those indicators include the community's bond rating, its net debt, its MHI, the local unemployment rate, the service area's property tax burden, and its property tax collection rate. Each indicator is assigned a score of 1 to 3, based on EPA-established benchmarks. Lower FCI scores imply weaker economic conditions and thus an increased likelihood the mandate would cause substantial and widespread economic impact on the community or service area.
>
> The results of the RI and the FCI are ultimately combined into an overall rating based on EPA's Financial Capability Matrix. This rating is intended to demonstrate the overall level of financial burden imposed on a community by compliance with CWA mandates.

The guidelines for preliminary screening of affordability states that a Residential Indicator (RI) of 2% or greater is deemed to signal a large economic impact on residents. The RI is calculated as follows:

$$RI = \frac{Cost\ per\ Household}{Median\ Household\ Income}$$

Using an RI of 2% as the limit for the annual rate for sewer service the maximum annual cost per household can be calculated as follows:

[10] https://www.censusgov/quickfacts/mollacityoregon

[11] https://datausa.io/profile/geo/molla-or/

[12] ""Affordability Assessment Tool for Federal Water Mandates", Copyright 2013, U.S. Conference of Mayors, American Water Works Association and Water Environment Federation.

$$Max. Annual\ Cost\ per\ Household = RI\ x\ Median\ Household\ Income$$

$$Max. Annual\ Cost\ per\ Household = 0.02 * \$55{,}082$$

$$Max. Annual\ Cost\ per\ Household = \$1{,}101.64\ per\ year$$

$$Max. Monthly\ Cost\ per\ Household = \$91.80$$

This analysis shows that the maximum monthly cost per household affordability limit per EPA is $91.80.

8.2. Current Sewer Rates

The rate payers are currently paying a base rate of $38.15 per EDU per month with a volume charge of $3.78 per hundred cubic feet of winter average water consumption (Volume Charge). Assuming an average home will use 600-cubic feet of water a month, the average residential sewer bill is $57.31. With this assumption of water use, an average home currently has an RI of 1.25%. This is $34.49 per month less than the maximum household cost affordability index provided by EPA.

8.3. Projected Sewer Rates

Estimates for user rates are provided with the caveat that the City is currently revisiting their EDU calculations, with the belief that the currently calculated EDU count is too low. With that in mind, based on current information, the City has 3,418 EDUs (based on OBDD-IFA guidelines).

Based on 3,418 EDUs, and the total projected cost estimates, the estimated user rate structure for each of the alternative permit scenarios was determined by Dyer as part of the 2018 Master Plan. The estimated monthly sewer rate for each permitting scenario and the RI is provide in ***Table 8-1***.

Table 8-1
Estimated Monthly Sewer Rate and RI
For Each Permit Scenario

Item	Scenario 1 No Permit Modification	Scenario 2 Summer Season Discharge without Mass Load Increase	Scenario 3 Mass Load Increase with No Summer Season Discharge	Scenario 4 Summer Season Discharge with Mass Load Increase
Monthly Sewer Rate	$135	$120	$116	$100 - $107
RI	2.94%	2.61%	2.53%	2.18% - 2.33%

NOTE: These City is currently in the process of analyzing and reviewing their connected EDUs. These rates are subject to the current EDU count.

This analysis shows that for each scenario, the monthly sewer rate will be above the EPA affordability index of 2% of median income. The only one that is close to the 2% median income is Scenario 4 where both a summer season discharge and the mass load increase is granted. Even with this, the monthly sewer rates are projected to be between $100 and $107 per month depending on the financing and grants that are available.

This clearly shows that to not change the permit conditions will present a financial burden on the ratepayers. Even Scenario 4, which is the most economically viable scenario will place a financial burden on the ratepayers.

Attachment A
August 28, 2018 DEQ Letter to City
NPDES Modification Mass Load Increase

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Oregon
Kate Brown, Governor

Department of Environmental Quality
Northwest Region Portland Office/Water Quality
700 NE Multnomah Street, Suite 600
Portland, OR 97232
(503) 229-5263
FAX (503) 229-6957
TTY 711

August 28, 2018

GERALD FISHER, P.E.
PUBLIC WORKS DIRECTOR
PO BOX 248
MOLALLA, OR 97038

RE: City of Molalla STP
File No: 57613/Permit No. 101514
Clackamas County

RE: NPDES Modification Mass Load Increase

Dear Mr. Fisher:

The City of Molalla (City) has requested the Department of Environmental Quality (DEQ) grant them an NPDES permit modification including concentration and mass load limit increases. This memorandum spells out the steps needed to facilitate this request.

The City's justification for the concentration increase rests largely on the Basin Standards, which for the Willamette River Basin is 30 mg/L BOD and TSS as monthly averages. The City's current permit has had 10 mg/L BOD and TSS as monthly averages because the City had been discharging to Bear Creek until 2006. The permit has been renewed twice with these limits since the discharge location has relocated to the Molalla River.

Mass load increase requests begin with a petition by the City with background material to back the claim. Antidegradation policy is stated thus (OAR 340-041-004):

"2) Growth Policy. In order to maintain the quality of waters in the State of Oregon, it is the commission's general policy to require that more efficient and effective waste treatment and control accommodate growth and development such that measurable future discharged waste loads from existing sources do not exceed presently allowed discharged loads except as provided in section (3) through (9) of this rule."

The steps are as follows:

1. The City must do an antidegradation review as described in OAR 340-041(2) (See OAR Findings Summary Enclosure), in which the City demonstrates that the increased loads do not significantly impact to the Molalla River. The City has submitted part of this examination.

2. The next part has multiple parts:
    a. If the City would like the concentration limits raised, the City has to show that these

limits are not possible to meet. The City has been meeting these limits for years. An improved wastewater treatment plant would make this even easier to meet.

b. For a load limit increase, the City has to demonstrate that it is not possible way to meet the current load limit with the expected increased flows with current technology. The state of the art is Membrane Bioreactors, or MBR, which can readily produce water with less than 3 mg/L BOD and TSS. Based on the estimated 4.1 MGD MMWWF of the current wastewater treatment plant for the year 2025, the current average monthly load limit of 160 lbs/day is attainable with currently available technology.
c. Lastly, the City would have to prove that the installation of technology that can meet raise the current load limit would be too costly for the City ratepayers. DEQ has recent examples of where an MBR is cost competitive with Sequencing Batch Reactor treatment systems.

To be enacted, the proposal must be approved by DEQ. If approved by DEQ, it must further be approved by the Environmental Quality Commission (EQC).

The Department would like to thank the City of Molalla and its consulting Engineers for their cooperativeness during the planning stages to improve the City's wastewater treatment facilities and the future overall improvements to the water quality of the waters of the State of Oregon.

Sincerely,

Michael Pinney PE
Senior Environmental Engineer
DEQ-NWR-WQ

Attachment: OAR Antidegradation Findings Requirements

CC: File

Enclosure
OAR Antidegradation Findings Requirements

In order to approve the mass load increase and discharge to the receiving stream, the Department is obligated to review the request in relation to the Department's rules for allowing a mass load discharge to a receiving water body (OAR 340-041-0004(9)).

a. In allowing new or increased discharged loads, the commission or Department must make the following findings:

A. The new or increased discharged load will not cause water quality standards to be violated.

B. The action is necessary and benefits of the lowered water quality outweigh the environmental costs of the reduce water quality.

C. The new or increased discharge load would not threaten or impair any recognized beneficial uses or adversely affect threatened or endangered species.

D. The new or increase discharge load shall not be granted if the receiving stream is classified as being water quality limited under OAR 340-041-0002(62)(a), unless certain circumstances apply.

b. The activity, expansion, or growth necessitating a new or increased discharge load is consistent with the acknowledged local land use plans as evidenced by a statement of land use compatibility from the appropriate local planning agency.

c. Oregon's water quality management policies and programs recognize that Oregon's water bodies have a finite capacity to assimilate waste. Unused assimilative capacity is an exceedingly valuable resource that enhances in-stream values and environmental quality in general. Allocation of any unused assimilative capacity should be based on explicit criteria. In addition to the conditions in subsection (a) of this section, the Commission or Department may consider the following:

(A) Environmental Effects Criteria:

(i) Adverse Out-of-Stream Effects. There may be instances where the non-discharge or limited discharge alternatives may cause greater adverse environmental effects that the increased discharge alternative. An example may be the potential degradation of groundwater from land application of wastes;

(ii) In stream Effects. Total stream loading may be reduced through elimination or reduction of other source discharges or through a reduction in seasonal discharge. A source that replaces other sources, accepts additional waste from less efficient treatment units or systems, or reduces discharge loadings during periods of low stream flow may be permitted an increased discharge load year-round or during seasons of high flow, so long as the loading has no adverse affect on threatened and endangered species.

(iii) Beneficial Effects. Land application, upland wetland's application, or other non-discharge alternatives for appropriately treated wastewater may replenish groundwater levels and increase stream flow and assimilative capacity during otherwise low stream flow periods.

(B) Economic Effects Criteria:

When assimilative capacity exists in a stream, and when it is judged that increased loadings will not have significantly greater adverse environmental affects than other alternatives to increased discharge, the economic effect of increased loading will be considered. Economic effects will be of two general types:

(i) Value of Assimilative Capacity. The assimilative capacity of Oregon's streams is finite, but the potential uses of this capacity are virtually unlimited. Thus it is important that priority be given to those beneficial uses that promise the greatest return (beneficial use) relative to the unused assimilative capacity that might be utilized. In-stream uses that will benefit from reserve assimilative capacity, as well as potential future beneficial use, will be weighed against the economic benefit associated with increased loading.

(ii) Cost of Treatment Technology. The cost of improved treatment technology, non-discharge and limited discharge alternatives may be evaluated.

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Attachment B
City of Molalla WWTP
Current NPDES Permit

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NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM WASTE DISCHARGE PERMIT

Oregon Department of Environmental Quality
Northwest Region – Portland Office
2020 SW 4th Avenue, Suite 400
Telephone: 503-229-5263

Issued pursuant to ORS 468B.050 and The Federal Water Pollution Control Act (The Clean Water Act)

ISSUED TO:

City of Molalla
PO Box 248
Molalla, OR 97038

SOURCES COVERED BY THIS PERMIT:

Type of Waste	Outfall Number	Location
Treated Wastewater	001	45.15°N -122.54085°W
Recycled Water	002	Specified in RWU Plan
Biosolids	N/A	Specified in BLA Plan

FACILITY TYPE AND LOCATION:

Pre-aerated lagoons with effluent filtration
Molalla STP, 12424 Toliver Road
Molalla, OR 97038

RECEIVING STREAM INFORMATION:

WRD Basin: Willamette
USGS Subbasin: Molalla-Pudding
Receiving Stream: Molalla River
LLID: 1227171452976-20.0-D
County: Clackamas

Treatment System Class Level: III
Collection System Class Level: II

EPA REFERENCE #: OR-002238-1
Issued in response to application #962753 received August 24, 2012, and based on the land use compatibility statement in the permit record.

Tiffany Yelton-Bram, Manager
WQ Source Control
Northwest Region

5/12/2014
Signature Date

June 1, 2014
Effective Date

PERMITTED ACTIVITIES

Until this permit expires or is modified or revoked, the permittee is authorized to: 1) operate a wastewater collection, treatment, control and disposal system; and 2) discharge treated wastewater to waters of the state only from the authorized discharge point or points in Schedule A in conformance with the requirements, limits, and conditions set forth in this permit.

Unless specifically authorized by this permit, by another NPDES or WPCF permit, or by Oregon statute or administrative rule, any other direct or indirect discharge of pollutants to waters of the state is prohibited.

Table of Contents

List of Tables

SCHEDULE A
Waste Discharge Limits

1. Treated Effluent Outfall 001

a. May 1 – October 31: During this time period the permittee may not discharge to waters of the state.

b. November 1 – April 30: During this time period the permittee must comply with the limits in Tables A1 and A2 while discharging to waters of the state:

i. Biochemical Oxygen Demand (BOD_5) and Total Suspended Solids (TSS).

Table A1: BOD_5 and TSS Limits

Parameter	Average Effluent Concentrations, mg/L		Monthly Average lbs/day	Weekly Average lbs/day	Daily Maximum Lbs
	Monthly	Weekly			
BOD_5	10 mg/L	15 mg/L	160	240	320
TSS	10 mg/L	15 mg/L	160	240	320

Mass load limits are based on the average wet weather design flow to the facility which equals 1.92 MGD.

ii. Additional Parameters

Table A2: Limits for Additional Parameters

November - April	Limits
BOD_5 and TSS Removal Efficiency	May not be less than 85% monthly average for BOD_5 and TSS
E. coli Bacteria (see Note 1.)	Monthly geometric mean may not exceed 126 organisms per 100 ml. No single sample may exceed 406 organisms per 100 ml.
pH	May not be outside the range of 6.0 to 9.0 S.U.
Total Residual Chlorine	Monthly average concentration may not exceed 0.07 mg/L. Daily maximum concentration may not exceed 0.18 mg/L
Ammonia (NH_3-N)	Monthly average concentration may not exceed 16.7 mg/L. Daily maximum concentration may not exceed 25.9 mg/L.
Dilution	Discharge may not commence until gauged stream flow exceeds 350 cfs and will cease when the average stream flow for the previous seven-day-period is less than 350 cfs.
Temperature	Effluent discharge will cease when the 7-day moving average effluent temperature exceeds 18.0 degrees C.
Notes 1. No single *E. coli* sample may exceed 406 organisms per 100 mL; however, no violation has occurred if the permittee takes at least 5 consecutive re-samples at 4 hour intervals beginning within 28 hours after the original sample was taken and the log mean of the 5 re-samples is less than or equal to 126 *E. coli* organisms/100 mL.	

2. Regulatory Mixing Zone

No wastes may be discharged or activities conducted that cause or contribute to a violation of water quality standards in OAR Chapter 340, Division 41 applicable to the Willamette Basin except within the following regulatory mixing zone:

The allowable mixing zone includes that portion of the Molalla River with boundary dimensions equal to the length of the effluent diffuser plus 10-feet on each end with the mixing zone extending 5-feet upstream and 50-feet downstream of the diffuser. The Zone of Immediate Dilution (ZID) is defined as that portion of the allowable mixing zone within 5-feet of the diffuser.

3. Groundwater Protection

The permittee may not conduct any activities that could cause an adverse impact on existing or potential beneficial uses of groundwater. All wastewater and process related residuals must be managed and disposed of in a manner that will prevent a violation of the Groundwater Quality Protection Rules (OAR Chapter 340, Division 40).

4. Use of Recycled Water (Outfall 002)

The permittee is authorized to distribute recycled water if it is:

a. Treated and used according to the criteria listed in Table A3.
b. Managed as described in its DEQ-approved Recycled Water Use Plan unless exempt as provided in Schedule D, condition 3.
c. Used in a manner and applied at a rate that does not adversely impact groundwater quality.
d. Applied at a rate and in accordance with site management practices that ensure continued agricultural, horticultural, or silvicultural production and does not reduce the productivity of the site.
e. Irrigated using sound irrigation practices to prevent:
    i. Offsite surface runoff or subsurface drainage through drainage tile;
    ii. Creation of odors, fly and mosquito breeding, or other nuisance conditions; and
    iii. Overloading of land with nutrients, organics, or other pollutants.

Table A3: Recycled Water Limits

Class	Level of Treatment (after disinfection unless otherwise specified)	Beneficial Uses
A	Oxidized, filtered and disinfected. Before disinfection, turbidity may not exceed: • 2 NTUs within a 24-hour period. • 5 NTUs more than five percent of the time within a 24-hour period • 10 NTUs at any time. After disinfection, total coliform may not exceed: • A median of 2.2 organisms per 100 mL based on daily sampling over the last 7 days that analyses have been completed. • 23 organisms per 100 mL in any single sample.	• Class B, Class C, Class D, and nondisinfected uses. • Irrigation for any agricultural or horticultural use. • Landscape irrigation of parks, playgrounds, school yards, residential landscapes, or other landscapes accessible to the public. • Commercial car washing or fountains when the water is not intended for human consumption. • Water supply source for non restricted recreational impoundments.
B	Oxidized and disinfected. Total coliform may not exceed: • A median of 2.2 organisms per 100 mL, based on the last 7 days that analyses have been completed. • 23 total coliform organisms per 100 mL in any single sample.	• Class C, Class D, and nondisinfected uses. • Stand-alone fire suppression systems in commercial and residential building, non-residential toilet or urinal flushing, or floor drain trap priming. • Water supply source for restricted recreational impoundments.
C	Oxidized and disinfected. Total coliform may not exceed: • A median of 23 total coliform organisms per 100 mL, based on results of the last 7 days that analyses have been completed. • 240 total coliform organisms per 100 mL in any two consecutive samples.	• Class D and nondisinfected uses. • Irrigation of processed food crops; irrigation of orchards or vineyards if an irrigation method is used to apply recycled water directly to the soil. • Landscape irrigation of golf courses, cemeteries, highway medians, or industrial or business campuses. • Industrial, commercial, or construction uses limited to: industrial cooling, rock crushing, aggregate washing, mixing concrete, dust control, nonstructural fire fighting using aircraft, street sweeping, or sanitary sewer flushing.

5. Biosolids

The permittee may land apply biosolids or provide biosolids for sale or distribution, subject to the following conditions:

a. The permittee must manage biosolids in accordance with its DEQ-approved Biosolids Management Plan and Land Application Plan.

b. Except when used for land reclamation and approved by DEQ, biosolids must be applied at or below the agronomic rate required for maximum crop yield.

c. The permittee must obtain written site authorization from DEQ for each beneficial use site before land application (see Schedule D, Condition 6.b.), and follow the minimum site-specific management conditions in the site authorization letter.
d. Biosolids must 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.
e. Pollutants in biosolids may not exceed the ceiling concentrations shown in Table A4 below. Biosolids exceeding the pollutant concentrations in Table A4 must be applied at a rate that does not exceed the corresponding cumulative pollutant loading rates.

Table A4: Biosolids Limits

Pollutant	Ceiling concentrations[1] (mg/kg)	Pollutant concentrations[1] (mg/kg)	Cumulative pollutant loading rates[1] (kg/ha)
Arsenic	75	41	41
Cadmium	85	39	39
Copper	4300	1500	1500
Lead	840	300	300
Mercury	57	17	17
Molybdenum	75	N/A	N/A
Nickel	420	420	420
Selenium	100	100	100
Zinc	7500	2800	2800

Note:
1. Biosolids pollutant limits are described in 40 CFR§503.13, which uses the terms *ceiling concentrations*, *pollutant concentrations*, and *cumulative pollutant loading rates*. Biosolids containing pollutants in excess of the ceiling concentrations may not be beneficially reused by application to the land. Biosolids containing pollutants in excess of the pollutant concentrations, but less than the ceiling concentrations, may be beneficially reused by application to the land; however, the total quantity of biosolids applied to the land may not exceed the cumulative pollutant loading rates.

6. Septage Requirements
Septage may not be accepted at this facility for treatment or processing without written approval from DEQ.

7. Re-opener
Upon EPA approval of a Total Maximum Daily Load (TMDL) addressing any pollutants during the discharge period, this permit may be re-opened to include any waste load allocations (WLA), best management practice or any other condition the TMDL requires.

SCHEDULE B
Minimum Monitoring and Reporting Requirements

1. Monitoring and Reporting Protocols

a. Test Methods, Quantitation Limits, and Laboratory Quality Assurance and Quality Control

i. Test Methods – monitoring must be conducted according to test procedures in 40 CFR Part 136.

ii. Quantitation Limits (QLs)[1] – all compliance analyses must meet the QLs specified in the permit. Effluent characterization monitoring must use the QLs unless one of the conditions below is met.

a) The monitoring result indicates nondetect at an MDL which is less than or equal to the QL, or

b) Monitoring is being conducted solely for the purpose of effluent characterization, and matrix effects prevent the attainment of QLs[2]. In such cases, DEQ may authorize re-sampling. If requested by the permit holder, Tier 1 re-sampling may be combined with Tier 2 monitoring.

Laboratories may need to modify methods as allowed in 40 CFR Part 136.6 or in EPA's Solutions for Analytical Chemistry Problems with Clean Water Methods, EPA 821-R-07-002, March 2007 in order to achieve some QLs.

iii. Laboratory Quality Assurance and Quality Control (QA/QC) – the permittee must develop and implement a written QA/QC program that conforms to the requirements of 40 CFR Part 136.7.

b. Re-analysis and Re-sampling if QA/QC Requirements Not Met

If QA/QC requirements are not met any analysis, the results must be included in reports, but not used in calculations required by this permit. The permittee must re-analyze the sample if QA/QC requirements are not met. If the sample cannot be re-analyzed, the permittee must re-sample and analyze at the earliest seasonally appropriate opportunity.

c. Significant Figures and Rounding Conventions

Mass load limits all have two significant figures unless otherwise noted. The permittee must report the same number of significant digits as the permit limit for a given parameter. Regardless of the rounding conventions used by the permittee (such as, rounding 5 up for the calculated results or, in the case of laboratory results, rounding 5 to the nearest even number), the permittee must use the convention consistently, and must ensure that laboratories employed by the permittee use the same convention[3].

d. Reporting of Detection Levels and Quantitation Limits

When reporting sampling results, the permittee must record the laboratory detection level and quantitation limit as defined below for each analyte except biochemical oxygen demand (BOD), suspended solids (TSS), fats, oil and grease (FOG), bacteria and pH).

i. Detection Level (DL): The Method Detection Limit (MDL) or Limit of Detection (LOD) and derived using 40 CFR Part 136 Appendix B; and

ii. Quantitation Limit (QL): The Method Reporting Limit (MRL) or Limit of Quantitation (LOQ). It is the lowest level at which the entire analytical system gives a recognizable signal and acceptable calibration for the analyte. It is equivalent to the concentration of the lowest calibration standard assuming that all method-specified sample weights, volumes, and cleanup procedures have been employed.

e. Reporting Sample Results

The permittee must follow the procedures listed below when reporting sampling results.

i. If a sample result is below the DL, the permittee must report the result as less than the specified DL. For example, if the DL is 1.0 µg/L and the result is non-detect, report "<1.0 µg/L" on the discharge monitoring report (DMR).
ii. If a sample result is above the DL but below the QL, the permittee must report the result as the DL preceded by DEQ's data code "e". For example, if the DL is 1.0 µg/l, the QL is 3.0 µg/L, and the result is estimated to be between the DL and QL, the permittee must report "e1.0 µg/L" on the DMR.
iii. If a sample result does not meet QA/QC requirements, the result must be included in the DMR along with a notation but must not be used in any calculation required by this permit.
iv. Requirements i. and ii. above do not apply to the following parameters: biochemical oxygen demand (BOD), suspended solids (TSS), fats, oil and grease (FOG), bacteria and pH.

f. Calculating and Reporting Mass Loads
The permittee must follow the procedures listed below when calculating and reporting mass loads.

Flow (MGD) X Concentration (mg/L) X 8.34 = Pounds per day

i. When concentration data are below the DL: To calculate the mass load from this result, use the DL. Report the mass load as less than the calculated mass load. For example, if flow is 2 MGD and the reported sample result is <1.0 µg/L, report "<0.02 lb/day" for mass load on the DMR (1.0 µg/L x 2 MGD x conversion factor = 0.017 lb/day, round off to 0.02 lb/day).
ii. When concentration data are above the DL, but below the QL: To calculate the mass load from this result, use the detection level. Report the mass load as the calculated mass load preceded by "e". For example, if flow is 2 MGD and the reported sample result is e1.0 µg/L, report "e0.02 lb/day" for mass load on the DMR (1.0 µg/L x 2 MGD x conversion factor = 0.017 lb/day, round off to 0.02 lb/day).

2. Influent Monitoring Requirements
The permittee must monitor influent just downstream of the Parshall flume and ahead of the pre-aeration basin in accordance with the table below.

Table B1: Influent Monitoring

Item or Parameter	Time Period	Minimum Frequency	Sample Type/Action	Report
flow (MGD)	year-round	daily	measurement by totalizing meter	1. daily values 2. monthly total 3. monthly average
flow meter calibration		annually	verification	report date that calibration was completed
BOD_5 and TSS (mg/L)	year-round	2/Week	24-hour composite	1. daily values 2. monthly average
pH (S.U.)	year-round	3/week	continuous	1. daily values 2. maximum daily value 3. minimum daily value

3. Compliance Effluent Monitoring

When discharging to the Molalla River, the permittee must monitor effluent for Outfall 001 at the discharge monitoring structure (DMS) located near the Molalla River and in accordance with the table below:

Table B2: Effluent Monitoring (November - April)

Item or Parameter	Minimum Frequency	Sample Type/Action	Report
flow (MGD)	daily	measurement by totalizing meter	1. daily values 2. monthly total 3. monthly average
BOD_5 and TSS (mg/L)	2/week	24-hour composite	1. daily values 2. monthly average 3. weekly averages 4. maximum weekly average 5. maximum daily value
BOD_5 and TSS mass load (lb/day)	2/week	calculation	1. daily values 2. monthly average 3. weekly averages 4. maximum weekly average 5. maximum daily value
BOD_5 and TSS percent removal (%)	monthly	calculation	monthly average percentage
pH (S.U.)	3/week	continuous	1. daily values 2. maximum daily value 3. minimum daily value
temperature (° C)	daily	continuous	1. daily maximum 2. weekly average of daily maximum
E. coli (colonies/100 mL or MPN/100mL depending on method)	1/week	grab	1. daily values 2. maximum daily value 3. monthly geometric mean
quantity chlorine used (lbs)	daily	measurement	1. daily values 2. monthly average
total residual chlorine (mg/L)	daily	continuous	1. daily values 2. maximum daily value 3. monthly average
Lagoon Depth	weekly	staff gauge reading	monthly values

4. Ambient Stream Monitoring (Molalla River)

The permit holder must report stream data using online USGS recordings from gauge station 14200000 located at river mile 6.01 according to the table below:

Table B3: Molalla River

Item or Parameter	Time period	Frequency	Sample type/action	Report
flow (cfs)	November-May	daily	on-line reading from USGS gauge station 14200000	1. daily values 2. monthly average
temperature	November-May	5/week	continuous	1. monthly average 2. 7-day average of daily maximum
alkalinity	November-May	annually	grab	daily values

5. Effluent Toxics Characterization Monitoring

The permittee must analyze effluent samples for the parameters listed in tables B4-B7 below. Samples must be collected at the DMS during two sample events each year in 2015 and 2016. Samples must be 24-hour composites except as noted in Table B4, B5 and B6 for Total Cyanide, Free Cyanide, Total Phenolic Compounds and Volatile Organic Compounds.

Table B4: Metals, Cyanide, Total Phenols, Nutrients and Hardness
(µg/L unless otherwise specified)

Pollutant[a]	CAS[b]	QL	Pollutant	CAS	QL
Antimony	7440360	0.10	Mercury	7439976	0.005
Arsenic (total)[c]	7440382	0.50	Nickel	7440020	10
Arsenic (Inorganic)[c]	7440382	1.0	Selenium	7782492	2.0
Arsenic III[c]	22541544	50	Silver	7440224	1.0
Beryllium	7440417	0.10	Thallium	7440280	0.10
Cadmium	7440439	0.10	Zinc	7440666	5.0
Chromium (total)	7440473	0.40	Cyanide (Free)[e]	57125	10
Chromium III[d]	16065831	10	Cyanide (Total)[e]	57125	5.0
Chromium VI[d]	18540299	10	Total Phenolic Compounds[f]		5.0
Copper	7440508	10	Nitrates-Nitrite (NO_3+NO_2-N)	14797558	100
Iron	7439896	100	Ammonia (NH_3-N)	7664417	1000
Lead	7439921	5	Hardness (Total as $CaCO^3$)		
Alkalinity					

a. All metals must be analyzed for total recoverable concentration unless otherwise specified.
b. Chemical Abstract Service
c. If the result for Total Arsenic does not exceed 1.0 µg/L, it is not necessary to monitor for Inorganic Arsenic and Arsenic III. Otherwise, Method 1632A must be used to monitor for Inorganic Arsenic and Arsenic III.
d. If the result for Total Chromium does not exceed 10 µg/L, then it is not necessary to monitor for Chromium III and Chromium VI.
e. When sampling for Cyanide, at least six discrete grab samples must be collected over the operating day with samples collected no less than one hour apart. The aliquot must be at least 100 mL and collected and composited into a larger container that has been preserved with sodium hydroxide to insure sample integrity. If the result for Total Cyanide does not exceed 5.0 µg/L, it is not necessary to test for free cyanide.
f. When sampling for Total Phenolic Compounds, at least six discrete grab samples must be collected over the operating day with samples collected no less than one hour apart. "Total Phenolic Compounds" is identified as Phenols in 40 CFR Part 136.3, Table 1B.

Table B5: Volatile Organic Compounds
(µg/L unless otherwise specified)

Pollutant[a]	CAS	QL	Pollutant[a]	CAS	QL
Acrolein	107028	5.0	1,1-dichloroethylene[e]	75354	0.50
acrylonitrile	107131	5.0	1,2-dichloropropane	78875	0.50
Benzene	71432	0.50	1,3-dichloropropylene[f]	542756	0.50
bromoform	75252	0.50	Ethylbenzene	100414	0.50
carbon tetrachloride	56235	0.50	methyl bromide[g]	74839	0.50
chlorobenzene	108907	0.50	methyl chloride[h]	74873	0.50
Chlorodibromomethane[b]	124481	0.50	methylene chloride	75092	0.50
chloroethane	75003	0.50	1,1,2,2-tetrachloroethane	79345	0.50
2-chloroethylvinyl ether	110758	5.0	tetrachloroethylene[i]	127184	0.50
chloroform	67663	0.50	Toluene	108883	0.50
dichlorobromomethane[c]	75274	0.50	1,1,1-trichloroethane	71556	0.50
1,1-dichloroethane	75343	0.50	1,1,2-trichloroethane	79005	0.50
1,2-dichloroethane	107062	0.50	Trichloroethylene[j]	79016	0.50
1,2-trans-dichloroethylene[d]	156605	0.50	vinyl chloride	75014	0.50

a. Permit holders with lagoon facilities that have retention times in excess of 24 hours may collect a single sample over the operating day. Permit holders with other types of facilities must collect six discrete samples (not less than 40 mL) over the operating day at intervals of at least one hour. The samples may be analyzed separately or composited. If analyzed separately, the analytical results for all samples must be averaged for reporting purposes. If composited, they must be proportionally composited in the laboratory at the time of analysis and this must be done in a manner that maintains the integrity of the samples and prevents the loss of volatile analytes. The quantitation limits listed above remain in effect for composite samples.

b. Chlorodibromomethane is identified as dibromochloromethane in 40 CFR Part 136.3, Table 1C.

c. Dichlorobromomethane is identified as Bromodichloromethane in 40 CFR Part 136.3, Table 1C.

d. 1,2-trans-dichloroethylene is identified as trans-1,2-dichloroethene in 40 CFR Part 136.3, Table 1C.

e. 1,1-dichloroethylene is identified as 1,1-dichloroethene in 40 CFR Part 136.3, Table 1C.

f. 1,3-dichloropropylene consists of both cis-1,3-dichloropropene and trans-1,3-dichloropropene. Both should be reported individually.

g. Methyl bromide is identified as Bromomethane in 40 CFR Part 136.3, Table 1C.

h. Methyl chloride is identified as chloromethane in 40 CFR Part 136.3, Table 1C.

i. Tetrachloroethylene is identified as tetrachloroethene in 40 CFR Part 136.3, Table 1C.

j. Trichloroethylene is identified as trichloroethene in 40 CFR Part 136.3, Table 1C.

Table B6: Acid-Extractable Compounds

(µg/L unless otherwise specified)

Pollutant	CAS	QL[a]	Pollutant	CAS	QL[a]
p-chloro-m-cresol	59507	1.0	2-nitrophenol	88755	2.0
2-chlorophenol	95578	1.0	4-nitrophenol	100027	5.0
2,4-dichlorophenol	120832	1.0	pentachlorophenol	87865	2.0
2,4-dimethylphenol	105679	5.0	Phenol	108952	1.0
4,6-dinitro-o-cresol[c]	534521	2.0	2,4,5-trichlorophenol[d]	95954	2.0
2,4-dinitrophenol	51285	5.0	2,4,6-trichlorophenol	88062	1.0

a. Some QLs may need methods with modification allowed in 40 CFR Part 136.6 or EPA's *Solutions for Analytical Chemistry Problems w/Clean Water Methods, March 2007.* **(url: http://water.epa.gov/scitech/methods/cwa/atp/upload/2008_02_06_methods_pumpkin.pdf)**

b. p-chloro-m-cresol is identified as 4-Chloro-3-methylphenol in 40 CFR Part 136.3, Table 1C.

c. 4,6-dinitro-o-cresol is identified as 2-Methyl-4,6-dinitrophenol in 40 CFR Part 136.3, Table 1C.

d. To monitor for 2,4,5-trichlorophenol, use EPA Method 625.

Table B7: Base-Extractable Compounds

(µg/L unless otherwise specified)

Pollutant	CAS	QL[a]	Pollutant	CAS	QL
acenaphthene	83329	1.0	3,3-Dichlorobenzidine	91941	1.0
acenaphthylene	208968	1.0	diethyl phthalate	84662	1.0
anthracene	120127	1.0	dimethyl phthalate	131113	1.0
benzidine	92875	10	2,4-dinitrotoluene	121142	1.0
benzo(a)anthracene	56553	1.0	2,6-dinitrotoluene	606202	1.0
benzo(a)pyrene	50328	1.0	1,2-diphenylhydrazine[d]	122667	5.0
3,4-benzofluoranthene[b]	205992	1.0	fluoranthene	206440	2.0
benzo(ghi)perylene	191242	1.0	fluorene	86737	1.0
benzo(k)fluoranthene	207089	1.0	hexachlorobenzene	118741	1.0
bis(2-chloroethoxy)methane	111911	2.0	hexachlorobutadiene	87683	2.0
bis(2-chloroethyl)ether	111444	1.0	hexachlorocyclopentadiene	77474	2.0
bis(2-chloroisopropyl)ether[c]	108601	2.0	hexachloroethane	67721	2.0
bis (2-ethylhexyl)phthalate	117817	1.0	indeno(1,2,3-cd)pyrene	193395	1.0
4-bromophenyl phenyl ether	101553	1.0	isophorone	78591	10
butylbenzyl phthalate	85687	1.0	napthalene	91203	1.0
2-chloronaphthalene	91587	1.0	nitrobenzene	98953	1.0
4-chlorophenyl phenyl ether	7005723	1.0	N-nitrosodimethylamine	62759	1.0
chrysene	218019	1.0	N-nitrosodi-n-propylamine	621647	2.0
di-n-butyl phthalate	84742	1.0	N-nitrosodiphenylamine	86306	1.0
di-n-octyl phthalate	117817	1.0	Pentachlorobenzene[e]	608935	10
dibenzo(a,h)anthracene	53703	1.0	phenanthrene	85018	1.0
1,2-Dichlorobenzene (o)	95501	0.50	pyrene	129000	1.0
1,3-Dichlorobenzene (m)	541731	0.50	1,2,4-trichlorobenzene	128821	5.0
1,4-Dichlorobenzene (p)	106467	0.50	Tetrachlorobenzene,1,2,4,5[e]	95943	1.0

a. Some QLs may need methods with modification allowed in 40 CFR Part 136.6 or EPA's *Solutions for Analytical chemistry Problems w/Clean Water Methods, March 2007.*
b. 3,4-benzofluoranthene is listed as Benzo(b)fluoranthene in 40 CFR Part 136.
c. Bis(2-chloroisopropyl)ether is listed as 2,2'-oxybis(2-chloro-propane in 40 CFR Part 136.
d. 1,2-diphenylhydrazine is difficult to analyze given its rapid decomposition rate in water. Azobenzene (a decomposition product of 1,2-diphenylhydrazine), should be analyzed as an estimate of this chemical.
e. To analyze for Pentachlorobenzene and Tetrachlorobenzene 1,2,4,5, use EPA Method 625.

6. Ambient and Additional Effluent Characterization Monitoring

DEQ will evaluate the results of monitoring required under Schedule B, condition 5: Effluent Toxics Characterization Monitoring, to determine whether the permittee will be required to conduct additional ambient water quality and/or effluent monitoring. DEQ will notify the permittee of its determination through a written "Monitoring Action Letter."

a. Sampling Plan

If additional monitoring is needed, the permittee must submit a sample and analysis plan to DEQ for approval within 3 months of receipt of the DEQ Monitoring Action Letter. The sampling plan must include the following:

i. Characterization of ambient water quality for any pollutants identified as having the reasonable potential to exceed the water quality criterion at the point of discharge .
ii. Completion of Schedule B sampling requirements that could not be completed due to analytical interferences.
iii. Characterization of effluent and ambient water quality for new pollutant parameter(s) adopted by the EQC after permit issuance.

iv. Characterization of effluent and ambient water quality, if necessary, when the receiving stream is listed as impaired on the DEQ 303(d) list for new parameter(s).
v. Sampling locations for receiving water must be located as far upstream from outfall location as necessary to insure that samples contain no effluent.
vi. Timing of sampling must coincide with the critical period.

b. Implementation
The permittee must begin implementing the approved plan within 3 months of DEQ approval.

7. Whole Effluent Toxicity Testing Requirements

The permittee must monitor final effluent for whole effluent toxicity as described below using the testing protocols specified in Schedule D, Condition 9, Whole Effluent Toxicity Testing for Freshwater. Samples for Outfall 001 must be collected at the DMS.

Table B8: WET Test Monitoring

Parameter	Minimum Frequency	Sample Type/Location
Acute toxicity	The permit holder must monitor 4 times over the permit cycle with each sample collected during a different month of the discharge period. All four samples may be collected in the first year of the permit or they may be collected during a different month each year over 4 years (i.e., Year 1, November, Year 2, December). When possible, conduct WET testing concurrent with Effluent Toxics Characterization Monitoring as described in Schedule B, Condition 5. If the four consecutive tests show no toxicity at the acute (ZID) and the chronic (RMZ) dilutions, no further testing is required. Otherwise, the permittee must re-test and if necessary, evaluate the cause of toxicity as described in Schedule D, Condition 9.	For acute toxicity: 24-hr composite taken at the DMS after dechlorination and before the effluent flume.
Chronic toxicity		For chronic toxicity: 24-hr composite, taken at the DMS after dechlorination and before the effluent flume.

8. Recycled Water Monitoring Requirements: Outfall no. 002

The permittee must monitor recycled water as listed below. The samples must be representative of the recycled water delivered for beneficial reuse at a location identified in the Recycled Water Use Plan.

Table B9: Recycled Water Monitoring

Item or Parameter	Minimum Frequency	Sample Type
flow (MGD) or quantity irrigated (inches/acre)	daily	measurement
flow meter calibration	annually	verification
quantity chlorine used (lbs)	daily	measurement
chlorine, total residual (mg/L)	daily	grab
pH	2/week	grab

Item or Parameter	Minimum Frequency	Sample Type
total coliform	daily (Class A) 3/week (Class B) 1/week (Class C)	grab
turbidity	hourly (Class A only)	measurement
nutrients (TKN, NO_2+NO_3-N, NH_3-N, Total Phosphorus)	quarterly	grab

9. Biosolids Monitoring Requirements

The permittee must monitor biosolids land applied or produced for sale or distribution as listed below. The samples must be representative of the quality and quantity of biosolids generated and the treatment process used to prepare the biosolids.

Table B10: Biosolids Monitoring

Item or Parameter	Minimum Frequency	Sample Type
nutrient and conventional parameters (% dry weight unless otherwise specified): 1) Total Kjeldahl Nitrogen (TKN) 2) Nitrate-Nitrogen (NO_3-N) 3) Ammonium Nitrogen (NH_4-N) 4) Total Phosphorus (P) 5) Potassium (K) 6) pH (S.U.) 7) Total Solids 8) Volatile Solids	as described in the DEQ-approved Biosolids Management Plan, but not less than the frequency in Table B11.	
pollutants: As, Cd, Cu, Hg, Pb, Mo, Ni, Se, Zn, mg/kg dry weight	as described in the DEQ-approved Biosolids Management Plan, but not less than the frequency in Table B11	
pathogen reduction	as described in the DEQ-approved Biosolids Management Plan, but not less than the frequency in Table B11.	as described in the DEQ-approved Biosolids Management Plan
vector attraction reduction	as described in the DEQ-approved Biosolids Management Plan, but not less than the frequency in Table B11.	as described in the DEQ-approved Biosolids Management Plan
record of biosolids land application: date, quantity, location.	each event	record the date, quantity, and location of biosolids land applied on site location map or equivalent electronic system, such as GIS.

Table B11: Biosolids Minimum Monitoring Frequency

Quantity of biosolids land applied or produced for sale or distribution per calendar year		Minimum Sampling Frequency
(dry metric tons)	(dry U.S. tons)	
Less than 290	Less than 320	Once per year
290 to 1,500	320 to 1,653	Once per quarter
1,500 to 15,000	1,653 to 16,535	Once per 60 days
15,000 or more	16,535 or more	Once per month

10. Permit Application Monitoring Requirements

The following information is provided for the convenience of the permit holder and does not represent a requirement under the current permit. The renewal application for this permit requires 3 scans for the parameters listed in the table below. This data may be collected up to 4.5 years in advance of submittal of the renewal application. DEQ recognizes that some facilities may find it difficult to collect 3 scans that are representative of the seasonal variation in the discharge from each outfall within the permit renewal timeframe, and is therefore calling attention to it within this permit.

Table B12: Effluent Monitoring Required for NPDES Permit Application
(a minimum of 3 scans required)

Parameter
Ammonia (as N)
Chlorine (Total Residual, TRC)
Dissolved Oxygen
Total Kjeldahl Nitrogen (TKN)
Nitrate Plus Nitrite Nitrogen
Oil and Grease

11. Minimum Reporting Requirements

The permittee must report monitoring results as listed below.

Table B13: Reporting Requirements and Due Dates

Reporting Requirement	Frequency	Due Date	Report Form (unless otherwise specified in writing)	Submit To:
1. Table B1: Influent Monitoring 2. Table B2: Effluent Monitoring	monthly	15th day of the following month	DEQ-approved discharge monitoring report (DMR).	DEQ Regional Office (See notes a & b)

Reporting Requirement	Frequency	Due Date	Report Form (unless otherwise specified in writing)	Submit To:
Table B3: Ambient monitoring	Monthly (November-May)	15th day of the following month	DEQ-approved discharge monitoring report (DMR).	DEQ Regional Office
Tables B4 – B7: Effluent Toxics Characterization	once (See Note c.)	end of the 25th month of this permit term	• DEQ - approved electronic summary template • 1 hard copy	DEQ Regional Office
Table B8: WET Test Monitoring	See Table B8	within the month after performing the test.	1 hard copy	DEQ Regional Office
1. Recycled water annual report (see Schedule D for more detail) 2. Table B9: Recycled Water Monitoring	annually	January 31	2 hard copies	One each to: • DEQ Regional Office • DEQ Water Reuse Program Coordinator
1. Biosolids land application annual report describing solids handling activities for the previous year and includes the information described in OAR 340-050-0035(6)(a)-(e). 2. Table B10: Biosolids Monitoring	annually	February 19	3 hard copies	One each to: • DEQ Regional Office • DEQ Biosolids Program Coordinator • EPA Region 10
Inflow and infiltration report	annually	March 1	1 hard copy	DEQ Regional Office

Notes:

a. Name, certificate classification, and grade level of each responsible principal operator as well as identification of each system classification must be included on DMRs.
b. Equipment breakdowns and bypass events must be noted on DMRs.
c. Though the overall characterization only needs to be performed once during the permit cycle, a particular characterization may include multiple sampling events.

SCHEDULE D
Special Conditions

1. **Inflow Removal**
   a. Within 180 days of the effective date of the permit, the permittee must submit to DEQ for approval an updated Inflow Removal Program. The program must consist of the following:
      i. Identification of all overflow points.
      ii. Verification that sewer system overflows are not occurring up to a 24-hour, 5-year storm event or equivalent.
      iii. Monitoring of all pump station overflow points.
      iv. A process for identifying and removing all inflow sources into the permittee's sewer system over which the permittee has legal control, including a time .schedule for identifying and reducing inflow.
      v. If the permittee does not have the necessary legal authority for all portions of the sewer system or treatment facility, a strategy and schedule for gaining legal authority to require inflow reduction and a process and schedule for identifying and removing inflow sources once legal authority has been obtained.
   b. Within 60 days of receiving written DEQ comments, the permittee must submit a final approvable program and time schedule.
   c. A copy of the program must be kept at the wastewater treatment facility for review upon request by DEQ.
   d. An annual inflow and infiltration report must be submitted to the DEQ as directed in Schedule B. The report must include the following:
      i. Details of activities performed in the previous year to identify and reduce inflow and infiltration.
      ii. Details of activities planned for the following year to identify and reduce inflow and infiltration.
      iii. A summary of sanitary sewer overflows that occurred during the previous year.
      iv. Information that demonstrates compliance with the DEQ-approved Inflow Removal Plan required by condition 1.a above.

2. **Emergency Response and Public Notification Plan**
   The permittee must develop and maintain an Emergency Response and Public Notification Plan per Schedule F, Section B, Conditions 7 & 8. The permit holder must develop the plan within six months of permit issuance and update the plan annually to ensure that telephone and email contact information for applicable public agencies are current and accurate. An updated copy of the plan must be kept on file at the wastewater treatment facility for Department review. The latest plan revision date must be listed on the plan cover along with the reviewer's initials or signature.

3. **Recycled Water Use Plan**
   In order to distribute recycled water for reuse, the permittee must have and maintain a DEQ-approved Recycled Water Use Plan meeting the requirements in OAR 340-055-0025. The permittee must submit substantial modifications to an existing plan to DEQ for approval at least 60 days before making the proposed changes. Conditions in the plan are enforceable requirements under this permit.

4. **Exempt Wastewater Reuse at the Treatment System**
   The permittee is exempt from the recycled water use requirements in OAR 340-055 when recycled water is used at the wastewater treatment system for landscape irrigation or for in-plant processes at a wastewater treatment system, and all of the following conditions are met:
      i. The recycled water is an oxidized and disinfected wastewater.
      ii. The recycled water is used at the wastewater treatment system site where it is generated or at an auxiliary wastewater or sludge treatment facility that is subject to the same NPDES or WPCF permit as the wastewater treatment system. Contiguous property to the parcel of land upon which the treatment system is located is considered the wastewater treatment system site if under the same ownership.
      iii. Spray or drift or both from the use does not occur off the site.
      iv. Public access to the site is restricted.

5. Biosolids Management Plan

The permittee must maintain a Biosolids Management Plan meeting the requirements in OAR 340-050-0031(5). The permittee must keep the plan updated and submit substantial modifications to an existing plan to DEQ for approval at least 60 days before making the proposed changes. Conditions in the plan are enforceable requirements under this permit.

6. Land Application Plan

a. Plan Contents

The permittee must maintain a land application plan that contains the information listed below. The land application plan may be incorporated into the Biosolids Management Plan.

i. All known DEQ-approved sites that will receive biosolids while the permit is effective.
ii. The geographic location, identified by county or smaller unit, of new sites which are not specifically listed at the time of permit application.
iii. Criteria that will be used in the selection of new sites.
iv. Management practices that will be implemented at new sites authorized by the DEQ.
v. Procedures for notifying property owners adjacent to proposed sites of the proposed activity before starting the application.

b. Site Authorization

The permittee must obtain written authorization from DEQ for each land application site before its use. Conditions in site authorizations are enforceable requirements under this permit. The permittee may land apply biosolids to a DEQ-approved site only as described in the site authorization, while this permit is effective, and with the written approval of the property owner. DEQ may modify or revoke a site authorization, following the procedures for a permit modification described in OAR 340-045-0055.

c. Public Participation

iii. No DEQ-initiated public notice is required for continued use of sites identified in the DEQ-approved land application plan.
iv. For new sites that fail to meet the site selection criteria in the land application plan, or that DEQ deems to be sensitive with respect to residential housing, runoff potential, or threat to groundwater, DEQ will provide an opportunity for public comment as directed by OAR 340-050-0015(10).
v. For all other new sites, the permittee must provide for public participation, following procedures in its DEQ-approved land application plan.

7. Wastewater Solids Transfers

a. *Within state.* The permittee may transfer wastewater solids including Class A and Class B biosolids, to another facility permitted to process or dispose of wastewater solids, including but not limited to: another wastewater treatment facility, landfill, or incinerator. The permittee must monitor, report, and dispose of solids as required under the receiving facility's permit.
b. *Out of state.* If wastewater solids, including Class A and Class B biosolids, are transferred out of state for use or disposal, the permittee must obtain written authorization from DEQ, meet Oregon requirements for the use or disposal of wastewater solids, notify in writing the receiving state of the proposed use or disposal of wastewater solids, and satisfy the requirements of the receiving state.

8. Hauled Waste Control

The permittee may accept hauled wastes at discharge points designated by the POTW after receiving written DEQ approval of a hauled waste control plan. Hauled wastes may include wastewater solids from another wastewater treatment facility, septage, grease trap wastes, portable and chemical toilet wastes, landfill leachate, groundwater remediation wastewaters and commercial/industrial wastewaters. Wastewater solids from out-of-state facilities must not exceed the ceiling concentration limits in Schedule A, Table A5: Biosolids Limits.

9. Lagoon Solids

At least 60 days, and preferably six months before removing accumulated solids from the lagoon, the permittee must submit to DEQ a biosolids management plan and land application plan as required in conditions 4 and 5 respectively.

DEQ will provide an opportunity for comment on the biosolids management plan and land application plan, as directed by OAR 340-050-0015(8). The permittee must follow the conditions in the approved plan.

10. Whole Effluent Toxicity Testing for Freshwater

a. The permit holder must conduct whole effluent toxicity (WET) tests as specified here and in Schedule B of this permit.

b. Acute Toxicity Testing - Organisms and Protocols

i. The permittee must conduct 48-hour static renewal tests with *Ceriodaphnia dubia* (water flea) and 96-hour static renewal tests with *Pimephales promelas* (fathead minnow).

ii. All test methods and procedures must be in accordance with Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, Fifth Edition, EPA-821-R-02-012, October 2002. Any deviation of the bioassay procedures outlined in this method must be submitted in writing to DEQ for review and approval before use.

iii. Treatments to the final effluent samples (for example, dechlorination), except those included as part of the methodology, may not be performed by the laboratory unless approved by DEQ before analysis.

iv. Unless otherwise approved by DEQ in writing, acute tests must be conducted on a control (0%) and the following dilution series: 6.25%, 10%, 25%, 50%, and 100%. An acute WET test will be considered to show toxicity if there is a statistically significant difference in survival between the control and 10% effluent reported as the NOEC $\leq$ 10 percent effluent.

c. Chronic Toxicity Testing - Organisms and Protocols

i. The permittee must conduct tests with *Ceriodaphnia dubia* (water flea) for reproduction and survival test endpoint, *Pimephales promelas* (fathead minnow) for growth and survival test endpoint, and *Raphidocelis subcapitata* (green alga formerly known as *Selanastrum capricornutum*) for growth test endpoint.

ii. All test methods and procedures must be in accordance with Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, Fourth Edition, EPA-821-R-02-013, October 2002. Any deviation of the bioassay procedures outlined in this method must be submitted in writing to DEQ for review and approval before use.

iii. Treatments to the final effluent samples (for example, dechlorination), except those included as part of the methodology, may not be performed by the laboratory unless approved by DEQ before analysis.

iv. Unless otherwise approved by DEQ in writing, chronic tests must be conducted on a control (0%) and the following dilution series: 2%, 4%, 10%, 40%, and 100% A chronic WET test will be considered to show toxicity if the IC_{25} (25% inhibition concentration) occurs at dilutions equal to or less than the dilution that is known to occur at the edge of the mixing zone, that is, $IC_{25} \leq 4\%$

d. Dual End-Point Tests

i. WET tests may be dual end-point tests in which both acute and chronic end-points can be determined from the results of a single chronic test. The acute end-point will be based on 48-hours for the *Ceriodaphnia dubia* (water flea) and 96-hours for the *Pimephales promelas* (fathead minnow).

ii. All test methods and procedures must be in accordance with Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, Fourth Edition, EPA-821-R-02-013, October 2002. Any deviation of the bioassay procedures outlined in this method must be submitted in writing to DEQ for review and approval before use.

iii. Unless otherwise approved by DEQ in writing, tests run as dual end-point tests must be conducted on a control (0%) and the following dilution series: 2%, 4%, 10%, 40%, and 100%. Toxicity determinations for dual end-point tests must correspond to the acute and chronic tests described in conditions 9.b.iv. and 9.c.iv. above.

e. Evaluation of Causes and Exceedances
   i. If any test exhibits toxicity as described in conditions 9.b.iv. and 9.c.iv. above, the permittee must conduct another toxicity test using the same species and DEQ-approved methodology within two weeks unless DEQ approves otherwise.
   ii. If two consecutive WET test results indicate acute or chronic toxicity as described in conditions 9.b.iv. and 9.c.iv. above, the permittee must immediately notify DEQ of the results. DEQ will work with the permittee to determine the appropriate course of action to evaluate and address the toxicity.

f. Quality Assurance and Reporting
   i. Quality assurance criteria, statistical analyses, and data reporting for the WET tests must be in accordance with the EPA documents stated in this condition.
   ii. A bioassay laboratory report for each test must be prepared according to the EPA method documents referenced in this Schedule. The report must include all QA/QC documentation, statistical analysis for each test performed, standard reference toxicant test (SRT) conducted on each species required for the toxicity tests, and completed Chain-of-Custody forms for the samples including time of sample collection and receipt. Reports must be submitted to DEQ within 45 days of test completion.
   iii. The report must include all endpoints measured in the test: NOEC, LOEC, and IC_{25}.
   iv. The permittee must make available to DEQ upon request the written standard operating procedures they, or the laboratory performing the WET tests, use for all toxicity tests DEQ requires.

g. Reopener
   DEQ may reopen and modify this permit to include new limits, monitoring requirements, and/or conditions as determined by DEQ to be appropriate, and in accordance with procedures outlined in OAR Chapter 340, Division 45 if:
   i. WET testing data indicate acute and/or chronic toxicity.
   ii. The facility undergoes any process changes.
   iii. Discharge monitoring data indicate a change in the reasonable potential to exhibit toxicity.

11. Operator Certification

a. Definitions
   i. "Supervise" means to have full and active responsibility for the daily on-site technical operation of a wastewater treatment system or wastewater collection system.
   ii. "Supervisor" or "designated operator" means the operator delegated authority by the permittee for establishing and executing the specific practice and procedures for operating the wastewater treatment system or wastewater collection system in accordance with the policies of the owner of the system and any permit requirements.
   iii. "Shift Supervisor" means the operator delegated authority by the permittee for executing the specific practice and procedures for operating the wastewater treatment system or wastewater collection system when the system is operated on more than one daily shift.
   iv. "System" includes both the collection system and the treatment systems.

b. The permittee must comply with OAR Chapter 340, Division 49, "Regulations Pertaining to Certification of Wastewater System Operator Personnel" and designate a supervisor whose certification corresponds with the classification of the collection and/or treatment system, as specified on page 1 of this permit.

c. The permittee must have its system supervised full-time by one or more operators who hold a valid certificate for the type of wastewater treatment or wastewater collection system, and at a grade equal to or greater than the wastewater system's classification, as specified on page 1 of this permit.

d. The permittee's wastewater system may not be without the designated supervisor for more than 30 days. During this period, there must be another person available to supervise who is certified at no more than one grade lower than the classification of the wastewater system. The permittee must delegate authority to this operator to supervise the operation of the system.

e. If the wastewater system has more than one daily shift, the permittee must have another properly certified operator available to supervise system operation. Each shift supervisor, if any, must be certified at no more than one grade lower than the system classification.

f. The permittee is not required to have a supervisor on-site at all times; however, the supervisor must be available to the permittee and operator at all times.

g. The permittee must notify DEQ in writing of the name of the system supervisor. The permittee may replace or re-designate the system supervisor with another properly certified operator at any time and must notify DEQ in writing within 30 days of replacement or re-designation of operator in charge. The notice of replacement or re-designation must be sent to DEQ-Water Quality Division, Operator Certification Program, 2020 SW 4th Avenue, Suite 150, Portland, OR 97201

h. Upon written request, DEQ may grant the permittee reasonable time, not to exceed 120 days, to obtain the services of a qualified person to supervise the wastewater system. The written request must include a justification for the time needed, schedule for recruiting and hiring, date the system supervisor availability ceased, and name of the alternate system supervisor as required above.

12. Industrial Waste Survey/Pretreatment Program

The permittee must conduct an industrial user survey to determine the presence of any industrial users discharging wastewaters subject to pretreatment and submit a report on the findings to DEQ within 24 months of permit issuance. 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 to state waters. If the POTW has already completed a baseline IU Survey the results of this survey are to be provided to DEQ within two months of permit re-issuance.

Guidance on conducting IU Surveys can be found at
http://www.deq.state.or.us/wq/pretreatment/docs/guidance/IUSurveyGuidance.pdf

Once an initial baseline IU Survey is conducted it is to be maintained by the POTW and made available for inspection by DEQ. Every 5 years from permit renewal, the permittee must submit an updated IU survey.

13. Cooperative Operating Agreement with City of Canby

The permittee must maintain a copy of the Cooperative Operating Agreement with the city of Canby, and meet all Agreement conditions, particularly regarding contacting Canby when the permittee plans to begin discharging to the Molalla River.

14. Leak Test.

Within one year following permit issuance, the permittee must perform a lagoon leak test. Within 30 days after completing the test, the permittee must report the test results to DEQ. Depending on the test results, the permittee may need to take a further action, such as perform groundwater monitoring to determine if the leakage has adversely impacted groundwater quality.

SCHEDULE F
NPDES GENERAL CONDITIONS – DOMESTIC FACILITIES

SECTION A. STANDARD CONDITIONS

A1. Duty to Comply with Permit

The permittee must comply with all conditions of this permit. Failure to comply with any permit condition is a violation of Oregon Revised Statutes (ORS) 468B.025 and the federal Clean Water Act and is grounds for an enforcement action. Failure to comply is also grounds for DEQ to terminate, modify and reissue, revoke, or deny renewal of a permit.

A2. Penalties for Water Pollution and Permit Condition Violations

The permit is enforceable by DEQ or EPA, and in some circumstances also by third-parties under the citizen suit provisions 33 USC § 1365. DEQ enforcement is generally based on provisions of state statutes and Environmental Quality Commission (EQC) rules, and EPA enforcement is generally based on provisions of federal statutes and EPA regulations.

ORS 468.140 allows DEQ to impose civil penalties up to $10,000 per day for violation of a term, condition, or requirement of a permit. The federal Clean Water Act provides for civil penalties not to exceed $32,500 and administrative penalties not to exceed $11,000 per day for each violation of any condition or limitation of this permit.

Under ORS 468.943, unlawful water pollution, if committed by a person with criminal negligence, is punishable by a fine of up to $25,000, imprisonment for not more than one year, or both. Each day on which a violation occurs or continues is a separately punishable offense. The federal Clean Water Act provides for criminal penalties of not more than $50,000 per day of violation, or imprisonment of not more than 2 years, or both for second or subsequent negligent violations of this permit.

Under ORS 468.946, a person who knowingly discharges, places, or causes to be placed any waste into the waters of the state or in a location where the waste is likely to escape into the waters of the state is subject to a Class B felony punishable by a fine not to exceed $250,000 and up to 10 years in prison per ORS chapter 161. The federal Clean Water Act provides for criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment of not more than 3 years, or both for knowing violations of the permit. In the case of a second or subsequent conviction for knowing violation, a person is subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both.

A3. Duty to Mitigate

The permittee must take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment. In addition, upon request of DEQ, the permittee must correct any adverse impact on the environment or human health resulting from noncompliance with this permit, including such accelerated or additional monitoring as necessary to determine the nature and impact of the noncomplying discharge.

A4. Duty to Reapply

If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and have the permit renewed. The application must be submitted at least 180 days before the expiration date of this permit.

DEQ may grant permission to submit an application less than 180 days in advance but no later than the permit expiration date.

A5. Permit Actions

This permit may be modified, revoked and reissued, or terminated for cause including, but not limited to, the following:

a. Violation of any term, condition, or requirement of this permit, a rule, or a statute.
b. Obtaining this permit by misrepresentation or failure to disclose fully all material facts.
c. A change in any condition that requires either a temporary or permanent reduction or elimination of the authorized discharge.
d. The permittee is identified as a Designated Management Agency or allocated a wasteload under a total maximum daily load (TMDL).
e. New information or regulations.
f. Modification of compliance schedules.
g. Requirements of permit reopener conditions
h. Correction of technical mistakes made in determining permit conditions.
i. Determination that the permitted activity endangers human health or the environment.
j. Other causes as specified in 40 CFR §§ 122.62, 122.64, and 124.5.
k. For communities with combined sewer overflows (CSOs):
   (1) To comply with any state or federal law regulation for CSOs that is adopted or promulgated subsequent to the effective date of this permit.
   (2) If new information that was not available at the time of permit issuance indicates that CSO controls imposed under this permit have failed to ensure attainment of water quality standards, including protection of designated uses.
   (3) Resulting from implementation of the permittee's long-term control plan and/or permit conditions related to CSOs.

The filing of a request by the permittee for a permit modification, revocation or reissuance, termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

A6. Toxic Pollutants
The permittee must comply with any applicable effluent standards or prohibitions established under Oregon Administrative Rule (OAR) 340-041-0033 and section 307(a) of the federal Clean Water Act for toxic pollutants, and with standards for sewage sludge use or disposal established under section 405(d) of the federal Clean Water Act, within the time provided in the regulations that establish those standards or prohibitions, even if the permit has not yet been modified to incorporate the requirement.

A7. Property Rights and Other Legal Requirements
The issuance of this permit does not convey any property rights of any sort, or any exclusive privilege, or authorize any injury to persons or property or invasion of any other private rights, or any infringement of federal, tribal, state, or local laws or regulations.

A8. Permit References
Except for effluent standards or prohibitions established under section 307(a) of the federal Clean Water Act and OAR 340-041-0033 for toxic pollutants, and standards for sewage sludge use or disposal established under section 405(d) of the federal Clean Water Act, all rules and statutes referred to in this permit are those in effect on the date this permit is issued.

A9. Permit Fees
The permittee must pay the fees required by OAR.

SECTION B. OPERATION AND MAINTENANCE OF POLLUTION CONTROLS

B1. Proper Operation and Maintenance
The permittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of the permit.

B2. Need to Halt or Reduce Activity Not a Defense

For industrial or commercial facilities, upon reduction, loss, or failure of the treatment facility, the permittee must, to the extent necessary to maintain compliance with its permit, control production or all discharges or both until the facility is restored or an alternative method of treatment is provided. This requirement applies, for example, when the primary source of power of the treatment facility fails or is reduced or lost. It is not a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

B3. Bypass of Treatment Facilities

a. Definitions
   (1) "Bypass" means intentional diversion of waste streams from any portion of the treatment facility. The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, provided the diversion is to allow essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of paragraphs b and c of this section.
   (2) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources that can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

b. Prohibition of bypass.
   (1) Bypass is prohibited and DEQ may take enforcement action against a permittee for bypass unless:
      i. Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
      ii. There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate backup equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass that occurred during normal periods of equipment downtime or preventative maintenance; and
      iii. The permittee submitted notices and requests as required under General Condition B3.c.
   (2) DEQ may approve an anticipated bypass, after considering its adverse effects and any alternatives to bypassing, if DEQ determines that it will meet the three conditions listed above in General Condition B3.b.(1).

c. Notice and request for bypass.
   (1) Anticipated bypass. If the permittee knows in advance of the need for a bypass, a written notice must be submitted to DEQ at least ten days before the date of the bypass.
   (2) Unanticipated bypass. The permittee must submit notice of an unanticipated bypass as required in General Condition D5.

B4. Upset

a. Definition. "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operation error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventative maintenance, or careless or improper operation.

b. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology-based permit effluent limitations if the requirements of General Condition B4.c are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

c. Conditions necessary for a demonstration of upset. A permittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:
   (1) An upset occurred and that the permittee can identify the causes(s) of the upset;
   (2) The permitted facility was at the time being properly operated;

(3) The permittee submitted notice of the upset as required in General Condition D5, hereof (24-hour notice); and
(4) The permittee complied with any remedial measures required under General Condition A3 hereof.

d. Burden of proof. In any enforcement proceeding the permittee seeking to establish the occurrence of an upset has the burden of proof.

B5. Treatment of Single Operational Upset

For purposes of this permit, a single operational upset that leads to simultaneous violations of more than one pollutant parameter will be treated as a single violation. A single operational upset is an exceptional incident that causes simultaneous, unintentional, unknowing (not the result of a knowing act or omission), temporary noncompliance with more than one federal Clean Water Act effluent discharge pollutant parameter. A single operational upset does not include federal Clean Water Act violations involving discharge without a NPDES permit or noncompliance to the extent caused by improperly designed or inadequate treatment facilities. Each day of a single operational upset is a violation.

B6. Overflows from Wastewater Conveyance Systems and Associated Pump Stations

a. Definition. "Overflow" means any spill, release or diversion of sewage including:
(1) An overflow that results in a discharge to waters of the United States; and
(2) An overflow of wastewater, including a wastewater backup into a building (other than a backup caused solely by a blockage or other malfunction in a privately owned sewer or building lateral), even if that overflow does not reach waters of the United States.

b. Reporting required. All overflows must be reported orally to DEQ within 24 hours from the time the permittee becomes aware of the overflow. Reporting procedures are described in more detail in General Condition D5.

B7. Public Notification of Effluent Violation or Overflow

If effluent limitations specified in this permit are exceeded or an overflow occurs that threatens public health, the permittee must take such steps as are necessary to alert the public, health agencies and other affected entities (for example, public water systems) about the extent and nature of the discharge in accordance with the notification procedures developed under General Condition B8. Such steps may include, but are not limited to, posting of the river at access points and other places, news releases, and paid announcements on radio and television.

B8. Emergency Response and Public Notification Plan

The permittee must develop and implement an emergency response and public notification plan that identifies measures to protect public health from overflows, bypasses, or upsets that may endanger public health. At a minimum the plan must include mechanisms to:

a. Ensure that the permittee is aware (to the greatest extent possible) of such events;
b. Ensure notification of appropriate personnel and ensure that they are immediately dispatched for investigation and response;
c. Ensure immediate notification to the public, health agencies, and other affected public entities (including public water systems). The overflow response plan must identify the public health and other officials who will receive immediate notification;
d. Ensure that appropriate personnel are aware of and follow the plan and are appropriately trained;
e. Provide emergency operations; and
f. Ensure that DEQ is notified of the public notification steps taken.

B9. Removed Substances

Solids, sludges, filter backwash, or other pollutants removed in the course of treatment or control of wastewaters must be disposed of in such a manner as to prevent any pollutant from such materials from entering waters of the state, causing nuisance conditions, or creating a public health hazard.

SECTION C. MONITORING AND RECORDS

C1. Representative Sampling

Sampling and measurements taken as required herein must be representative of the volume and nature of the monitored discharge. All samples must be taken at the monitoring points specified in this permit, and must be taken, unless otherwise specified, before the effluent joins or is diluted by any other waste stream, body of water, or substance. Monitoring points must not be changed without notification to and the approval of DEQ.

C2. Flow Measurements

Appropriate flow measurement devices and methods consistent with accepted scientific practices must be selected and used to ensure the accuracy and reliability of measurements of the volume of monitored discharges. The devices must be installed, calibrated and maintained to insure that the accuracy of the measurements is consistent with the accepted capability of that type of device. Devices selected must be capable of measuring flows with a maximum deviation of less than ± 10 percent from true discharge rates throughout the range of expected discharge volumes.

C3. Monitoring Procedures

Monitoring must be conducted according to test procedures approved under 40 CFR part 136 or, in the case of sludge use and disposal, approved under 40 CFR part 503 unless other test procedures have been specified in this permit.

C4. Penalties of Tampering

The federal Clean Water Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit may, upon conviction, be punished by a fine of not more than $10,000 per violation, imprisonment for not more than two years, or both. If a conviction of a person is for a violation committed after a first conviction of such person, punishment is a fine not more than $20,000 per day of violation, or by imprisonment of not more than four years, or both.

C5. Reporting of Monitoring Results

Monitoring results must be summarized each month on a discharge monitoring report form approved by DEQ. The reports must be submitted monthly and are to be mailed, delivered or otherwise transmitted by the 15th day of the following month unless specifically approved otherwise in Schedule B of this permit.

C6. Additional Monitoring by the Permittee

If the permittee monitors any pollutant more frequently than required by this permit, using test procedures approved under 40 CFR part 136 or, in the case of sludge use and disposal, approved under 40 CFR part 503, or as specified in this permit, the results of this monitoring must be included in the calculation and reporting of the data submitted in the discharge monitoring report. Such increased frequency must also be indicated. For a pollutant parameter that may be sampled more than once per day (for example, total residual chlorine), only the average daily value must be recorded unless otherwise specified in this permit.

C7. Averaging of Measurements

Calculations for all limitations that require averaging of measurements must utilize an arithmetic mean, except for bacteria which must be averaged as specified in this permit.

C8. Retention of Records

Records of monitoring information required by this permit related to the permittee's sewage sludge use and disposal activities must be retained for a period of at least 5 years (or longer as required by 40 CFR part 503). Records of all monitoring information including all calibration and maintenance records, all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit and records of all data used to complete the application for this permit must be retained for a period of at least 3 years from the date of the sample, measurement, report, or application. This period may be extended by request of DEQ at any time.

C9. Records Contents

Records of monitoring information must include:

a. The date, exact place, time, and methods of sampling or measurements;
b. The individual(s) who performed the sampling or measurements;
c. The date(s) analyses were performed;
d. The individual(s) who performed the analyses;
e. The analytical techniques or methods used; and
f. The results of such analyses.

C10. Inspection and Entry

The permittee must allow DEQ or EPA upon the presentation of credentials to:

a. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;
b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and
d. Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by state law, any substances or parameters at any location.

C11. Confidentiality of Information

Any information relating to this permit that is submitted to or obtained by DEQ is available to the public unless classified as confidential by the Director of DEQ under ORS 468.095. The permittee may request that information be classified as confidential if it is a trade secret as defined by that statute. The name and address of the permittee, permit applications, permits, effluent data, and information required by NPDES application forms under 40 CFR § 122.21 are not classified as confidential [40 CFR § 122.7(b)].

SECTION D. REPORTING REQUIREMENTS

D1. Planned Changes

The permittee must comply with OAR 340-052, "Review of Plans and Specifications" and 40 CFR § 122.41(l)(1). Except where exempted under OAR 340-052, no construction, installation, or modification involving disposal systems, treatment works, sewerage systems, or common sewers may be commenced until the plans and specifications are submitted to and approved by DEQ. The permittee must give notice to DEQ as soon as possible of any planned physical alternations or additions to the permitted facility.

D2. Anticipated Noncompliance

The permittee must give advance notice to DEQ of any planned changes in the permitted facility or activity that may result in noncompliance with permit requirements.

D3. Transfers

This permit may be transferred to a new permittee provided the transferee acquires a property interest in the permitted activity and agrees in writing to fully comply with all the terms and conditions of the permit and EQC rules. No permit may be transferred to a third party without prior written approval from DEQ. DEQ may require modification, revocation, and reissuance of the permit to change the name of the permittee and incorporate such other requirements as may be necessary under 40 CFR § 122.61. The permittee must notify DEQ when a transfer of property interest takes place.

D4. Compliance Schedule

Reports of compliance or noncompliance with, or any progress reports on interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date. Any reports of noncompliance must include the cause of noncompliance, any remedial actions taken, and the probability of meeting the next scheduled requirements.

D5. Twenty-Four Hour Reporting

The permittee must report any noncompliance that may endanger health or the environment. Any information must be provided orally (by telephone) to the DEQ regional office or Oregon Emergency Response System (1-800-452-0311) as specified below within 24 hours from the time the permittee becomes aware of the circumstances.

a. Overflows.
   (1) Oral Reporting within 24 hours.
      i. For overflows other than basement backups, the following information must be reported to the Oregon Emergency Response System (OERS) at 1-800-452-0311. For basement backups, this information should be reported directly to the DEQ regional office.
         (a) The location of the overflow;
         (b) The receiving water (if there is one);
         (c) An estimate of the volume of the overflow;
         (d) A description of the sewer system component from which the release occurred (for example, manhole, constructed overflow pipe, crack in pipe); and
         (e) The estimated date and time when the overflow began and stopped or will be stopped.
      ii. The following information must be reported to the DEQ regional office within 24 hours, or during normal business hours, whichever is earlier:
         (a) The OERS incident number (if applicable); and
         (b) A brief description of the event.
   (2) Written reporting within 5 days.
      i. The following information must be provided in writing to the DEQ regional office within 5 days of the time the permittee becomes aware of the overflow:
         (a) The OERS incident number (if applicable);
         (b) The cause or suspected cause of the overflow;
         (c) Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the overflow and a schedule of major milestones for those steps;
         (d) Steps taken or planned to mitigate the impact(s) of the overflow and a schedule of major milestones for those steps; and
         (e) For storm-related overflows, the rainfall intensity (inches/hour) and duration of the storm associated with the overflow.

      DEQ may waive the written report on a case-by-case basis if the oral report has been received within 24 hours.

b. Other instances of noncompliance.
   (1) The following instances of noncompliance must be reported:
      i. Any unanticipated bypass that exceeds any effluent limitation in this permit;
      ii. Any upset that exceeds any effluent limitation in this permit;
      iii. Violation of maximum daily discharge limitation for any of the pollutants listed by DEQ in this permit; and
      iv. Any noncompliance that may endanger human health or the environment.
   (2) During normal business hours, the DEQ regional office must be called. Outside of normal business hours, DEQ must be contacted at 1-800-452-0311 (Oregon Emergency Response System).
   (3) A written submission must be provided within 5 days of the time the permittee becomes aware of the circumstances. The written submission must contain:
      i. A description of the noncompliance and its cause;
      ii. The period of noncompliance, including exact dates and times;
      iii. The estimated time noncompliance is expected to continue if it has not been corrected;
      iv. Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance; and
      v. Public notification steps taken, pursuant to General Condition B7.
   (4) DEQ may waive the written report on a case-by-case basis if the oral report has been received within 24 hours.

D6. Other Noncompliance

The permittee must report all instances of noncompliance not reported under General Condition D4 or D5 at the time monitoring reports are submitted. The reports must contain:

a. A description of the noncompliance and its cause;
b. The period of noncompliance, including exact dates and times;
c. The estimated time noncompliance is expected to continue if it has not been corrected; and
d. Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

D7. Duty to Provide Information

The permittee must furnish to DEQ within a reasonable time any information that DEQ may request to determine compliance with the permit or to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit. The permittee must also furnish to DEQ, upon request, copies of records required to be kept by this permit.

Other Information: When the permittee becomes aware that it has failed to submit any relevant facts or has submitted incorrect information in a permit application or any report to DEQ, it must promptly submit such facts or information.

D8. Signatory Requirements

All applications, reports or information submitted to DEQ must be signed and certified in accordance with 40 CFR § 122.22.

D9. Falsification of Information

Under ORS 468.953, any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance, is subject to a Class C felony punishable by a fine not to exceed $125,000 per violation and up to 5 years in prison per ORS chapter 161. Additionally, according to 40 CFR § 122.41(k)(2), any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit including monitoring reports or reports of compliance or non-compliance will, upon conviction, be punished by a federal civil penalty not to exceed $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.

D10. Changes to Indirect Dischargers

The permittee must provide adequate notice to DEQ of the following:

a. Any new introduction of pollutants into the POTW from an indirect discharger which would be subject to section 301 or 306 of the federal Clean Water Act if it were directly discharging those pollutants and;
b. Any substantial change in the volume or character of pollutants being introduced into the POTW by a source introducing pollutants into the POTW at the time of issuance of the permit.
c. For the purposes of this paragraph, adequate notice must include information on (i) the quality and quantity of effluent introduced into the POTW, and (ii) any anticipated impact of the change on the quantity or quality of effluent to be discharged from the POTW.

SECTION E. DEFINITIONS

E1. *BOD* or BOD_5 means five-day biochemical oxygen demand.
E2. *CBOD* or $CBOD_5$ means five-day carbonaceous biochemical oxygen demand.
E3. *TSS* means total suspended solids.
E4. *Bacteria* means but is not limited to fecal coliform bacteria, total coliform bacteria, *Escherichia coli* (*E. coli*) bacteria, and *Enterococcus* bacteria.
E5. *FC* means fecal coliform bacteria.
E6. *Total residual chlorine* means combined chlorine forms plus free residual chlorine
E7. *Technology based permit effluent limitations* means technology-based treatment requirements as defined in 40 CFR § 125.3, and concentration and mass load effluent limitations that are based on minimum design criteria specified in OAR 340-041.

E8. *mg/l* means milligrams per liter.
E9. *µg/l* means microgram per liter.
E10. *kg* means kilograms.
E11. m^3/d means cubic meters per day.
E12. *MGD* means million gallons per day.
E13. *Average monthly effluent limitation* as defined at 40 CFR § 122.2 means the highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month.
E14. *Average weekly effluent limitation* as defined at 40 CFR § 122.2 means the highest allowable average of daily discharges over a calendar week, calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week.
E15. *Daily discharge* as defined at 40 CFR § 122.2 means the discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the daily discharge must be calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurement, the daily discharge must be calculated as the average measurement of the pollutant over the day.
E16. *24-hour composite sample* means a sample formed by collecting and mixing discrete samples taken periodically and based on time or flow. The sample must be collected and stored in accordance with 40 CFR part 136.
E17. *Grab sample* means an individual discrete sample collected over a period of time not to exceed 15 minutes.
E18. *Quarter* means January through March, April through June, July through September, or October through December.
E19. *Month* means calendar month.
E20. *Week* means a calendar week of Sunday through Saturday.
E21. *POTW* means a publicly-owned treatment works.

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[1] DEQ recognizes that high TSS levels in influent can make achievement of QLs difficult, and at this time DEQ is not requiring that influent monitoring be performed using the QLs listed in the permit.

[2] Elevated TSS levels can result in matrix effects.
[3] For more information, refer to the Significant Figures IMD at http://www.deq.state.or.us/wq/pubs/imds/SigFigsIMD.pdf

Attachment C
City of Molalla WWTP
Permit Evaluation and Fact Sheet

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State of Oregon
Department of
Environmental
Quality

National Pollutant Discharge Elimination System
PERMIT EVALUATION AND FACT SHEET

Oregon Department of Environmental Quality

Northwest Region
2020 SW 4th Avenue, Suite 150
Portland, OR 97201-4987
(503) 229-5263

Permittee:	City of Molalla P.O. Box 248 Molalla, OR 97038
Existing Permit Information:	File Number: 57613 Permit Number: 101514 Expiration Date: December 31, 2008 EPA Reference Number: OR-002238-1
Source Contact:	Otis Phillips, 503-829-5407 STP Operations Supervisor
Source Location:	12424 Toliver Road Molalla, Oregon
LLID	1227171452976-20.0-D
Receiving Stream	Molalla River
Proposed Action:	Renew Permit Application Number: 972786 Date Received: July 7, 2008
Source Category	NPDES Minor Domestic
Permit Writer:	David Cole Permit Compliance Specialist

Table of Contents

1.0 INTRODUCTION

The existing National Pollutant Discharge Elimination System (NPDES) Permit expired on December 31, 2008. The Department received renewal application number 972786 from the city of Molalla on July 7, 2008. As this renewal application was submitted to the Department in a timely manner before the permit's expiration date, the permit shall not be deemed to expire until final action has been taken on the renewal application to issue the new permit as per OAR 340-045-0040.

This permit evaluation report describes the basis and methodology used in developing the permit. The permit is divided into the following sections:

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

The Federal Water Pollution Control Act of 1972 and subsequent amendments require a NPDES permit for the discharge of wastewater to surface waters. Furthermore, Oregon Revised Statutes (ORS 468B.050) also require DEQ to grant a permit to a discharger for the discharge of wastewater to surface waters. This proposed DEQ permit action complies with both federal and state requirements.

2.0 FACILITY DESCRIPTION

2.1 General

The city of Molalla operates a publicly owned treatment works (POTW) that serves much of the developed area within the Molalla urban growth boundary. The POTW is located just west of the city, along Highway 213, between Highway 211 on the south, and Toliver Road on the north. (see map):

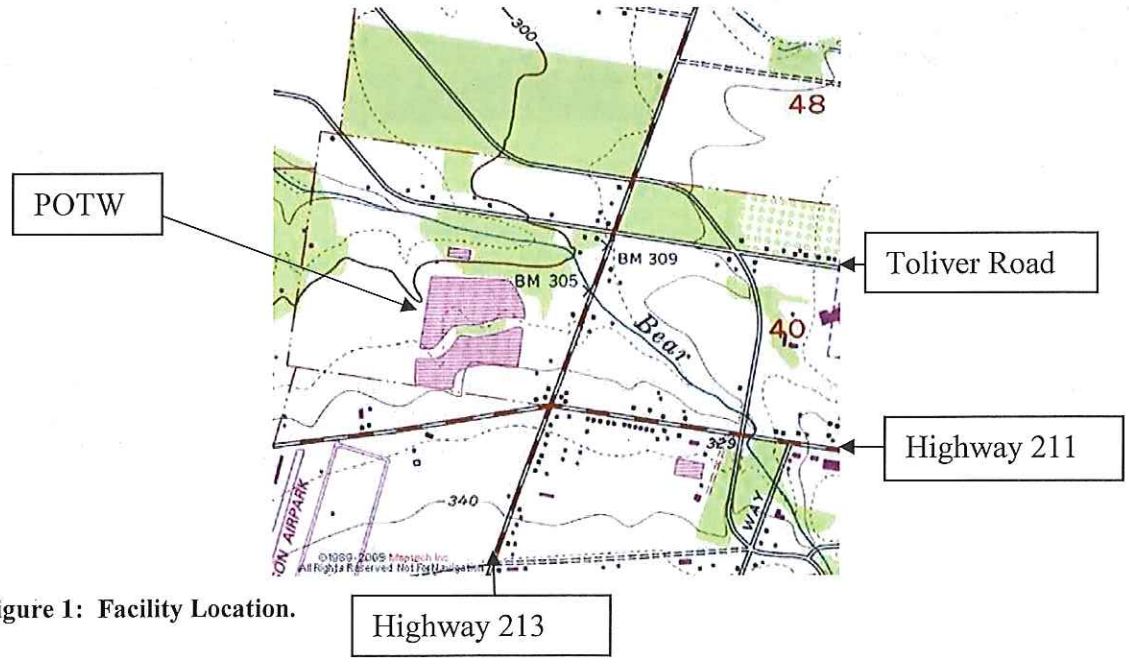

Figure 1: Facility Location.

2.2 Wastewater Treatment

The POTW includes a headworks with screening and compaction. Following this is an asphalt lined aeration basin. The screened and aerated influent is pumped up to a two-cell facultative lagoon treatment system, with a total surface area of about 25. Lagoon effluent is further treated through a dissolved air flotation (DAF) unit and then filtered. The final effluent is disinfected using chlorine and is either irrigated (during the drier months), or discharged to the Molalla River, in accordance with restrictions established in this permit. A schematic of the treatment process/wastewater flow is attached (**Exhibit #1**).

The application indicates the population served in Molalla to be 7,195 persons, while the most recent discharge monitoring report (DMR) for February 2014 listed a population served as 8,110 persons.

Figure 2. Air photo of facility.

2.3 Changes in Operation

Up until January 2007, when facility upgrades were completed, the final effluent was discharged during the wetter winter months to Bear Creek at the plant site. In 2006 a pipeline was completed and an outfall structure was built that allowed the effluent to be discharged at a new location on the Molalla River nearly five miles from the plant site. The discharge point on Bear Creek was abandoned in January 2007.

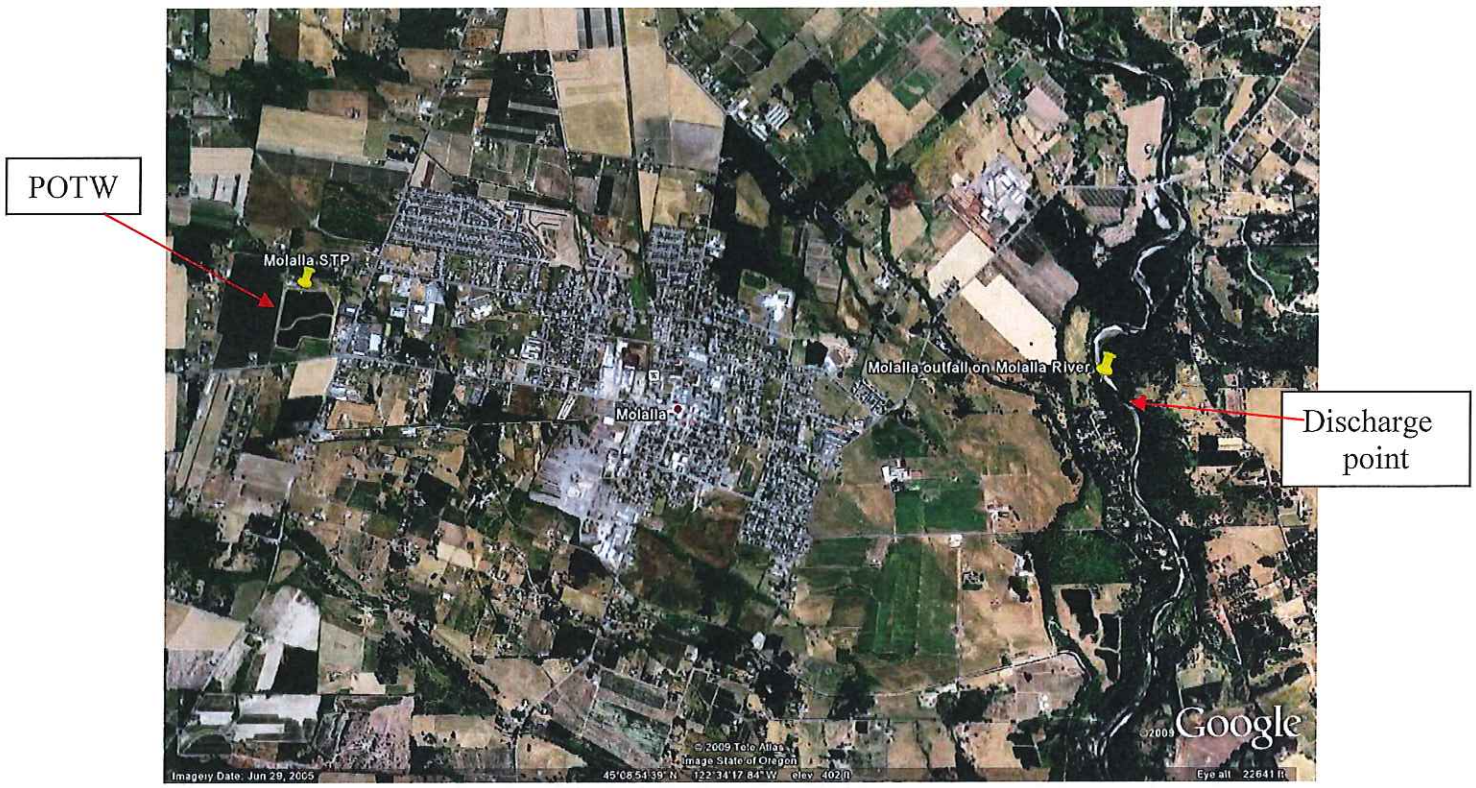

Figure 3. Air photo showing location of Outfall 001 (discharge point). relative to facility.

2.4 Groundwater Issues

Facilities that recycle wastewater are required to manage their facility and apply recycled water such that groundwater will not be impacted. Limiting irrigation to agronomic loading rates protects the groundwater resource in the application areas. The last permit renewal included a requirement for the facility to perform a lagoon leak test on this facility. The facility provided a report on that testing to DEQ on November 19, 2004. The facility performed the test in September 2004. The test results indicated a leakage rate of approximately 0.21 inches/day.

Historically, it has been DEQ policy that lagoon systems with leakage rates of less than 0.25 inches/day were not required to do a formal groundwater review at renewal. The vicinity map that DEQ received with the application identifies 23 water wells within ¼ mile of the facility (see Figure 4). Previously, DEQ indicated that the city should review well log information related to the identified wells, and also develop a sampling plan to confirm that facility operations are not adversely affecting groundwater quality.

Because the lagoon leakage rate was below the action threshold, no further groundwater analysis was required. However, considering it has been ten years since the facility reported leak test results, and that the leakage rate has likely increased during that time, Schedule D of this permit includes a requirement for the facility to perform and report the results of another leak test, within one year of permit issuance. Depending on the test results, DEQ may require the facility to perform additional work, such as conduct groundwater monitoring to determine if facility operations have adversely affected groundwater.

Figure 4. Map of facility, showing locations of water wells within ¼ mile of the facility.

2.5 Storm Water

The facility manages stormwater on-site, and therefore poses no threat to human health or the environment.

2.6 Outfalls

Outfall 001 is located on the Molalla River at about river mile 20. Effluent is only discharged from this point during the wet weather months (November - April), when stream flow is at least 350 cfs, as gauged at the USGS gauging station. Outfall 002 is the recycled water outfall, and represents monitoring for a number of different locations where land application of treated effluent occurs during the dry summer months (May - October).

2.7 Industrial Pretreatment – Majors Only

This facility is a minor domestic source and as such is not requried to have a pretreatment program.

2.8 Biosolids

Biosolids accumulate in the treatment lagoons and periodically must be removed for land application. This was last done in 2000. The permit includes a condition that requires the City of Molalla to comply with state biosolids regulations (Division 50) when solids are removed.

2.9 Inflow and Infiltration (I/I)

Inflow and infiltration (I/I) is a measure of the extraneous water that enters a collection system. Permit holders are expected to have programs in place to reduce and control I/I for a number of different reasons including the following:

- I/I can overload and/or damage treatment facilities.
- I/I can increase energy usage due to additional pumping costs.
- I/I can contribute to basement backups and sewage overflows resulting in unexpected property damage and unneceessary public health issues.
- I/I adds to sewage treatment costs.

For these and other reasons it is preemptive for permit holders to assure that construction standards for new sewers are adhered to, and that the City budget for ongoing maintenance and repair programs for the collection system. The permit includes a condition requiring the City of Molalla to have a program in place to identify and reduce I/I within their collection system (Schedule D., condition 1). DEQ requires an annual report, summarizing their activity in this area.

3.0 PERMIT HISTORY

3.1 Compliance History

DEQ reviewed discharge monitoring reports (DMRs) and inspection reports since the last permit renewal. Before building the new outfall and completing plant upgrades, the facility frequently violated effluent limits, due to lack of dilution during the discharge period. The plant upgrades addressed those concerns. During the 2006 irrigation season, DEQ issued a warning letter (WL-NWR-WQ-0132) for a bacteria violation noted during September. This violation was not repeated. In March 2009, DEQ issued a warning letter (WL-NWR-WQ-09-0028) for ammonia limit violations noted during November and December 2008 and January 2009 for discharges to

the Molalla River. The limits in the permit are water quality based, and because stream flows were much higher than the worst case low flow used to establish effluent limits, DEQ determined that the elevated effluent ammonia observed did not cause or contribute to in-stream water quality standards violations. A summary of effluent monitoring data is attached to this fact sheet.

DEQ completed facility inspections on July 20, 2005, February 14, 2007, and April 30, 2008. DEQ noted no violations in these reports. During the 2008 site visit, DEQ laboratory personnel gathered field data and observations for analysis of the Molalla River mixing zone established for this discharge.

4.0 RECEIVING WATER

The City of Molalla discharges to the Molalla River, which is a tributary stream in the Willamette Basin. DEQ established the water quality standards for all waterbodies (Oregon Administrative Rules 340-41), and specifically the Willamette Basin (Oregon Administrative Rules 340-41-0345), to protect the basin's beneficial uses. The Molalla River's designated beneficial uses are as follows:

- public and private domestic water supply,
- industrial water supply,
- irrigation,
- livestock watering,
- anadromous fish passage,
- salmonid spawning and rearing,
- resident fish and aquatic life,
- wildlife and hunting,
- fishing,
- boating,
- water contact recreation,
- aesthetic quality, and
- hydro power.

4.1 Receiving Stream Water Quality

The treatment plant discharges to a reach of the Molalla River near river mile 20 (see picture below). The Molalla River drains from the Cascade Mountains to the Willamette River. As such, winter rains and spring snowmelt markedly influence the observed stream flow. This facility's discharge is limited to periods of higher stream flow (November 1 - April 30).

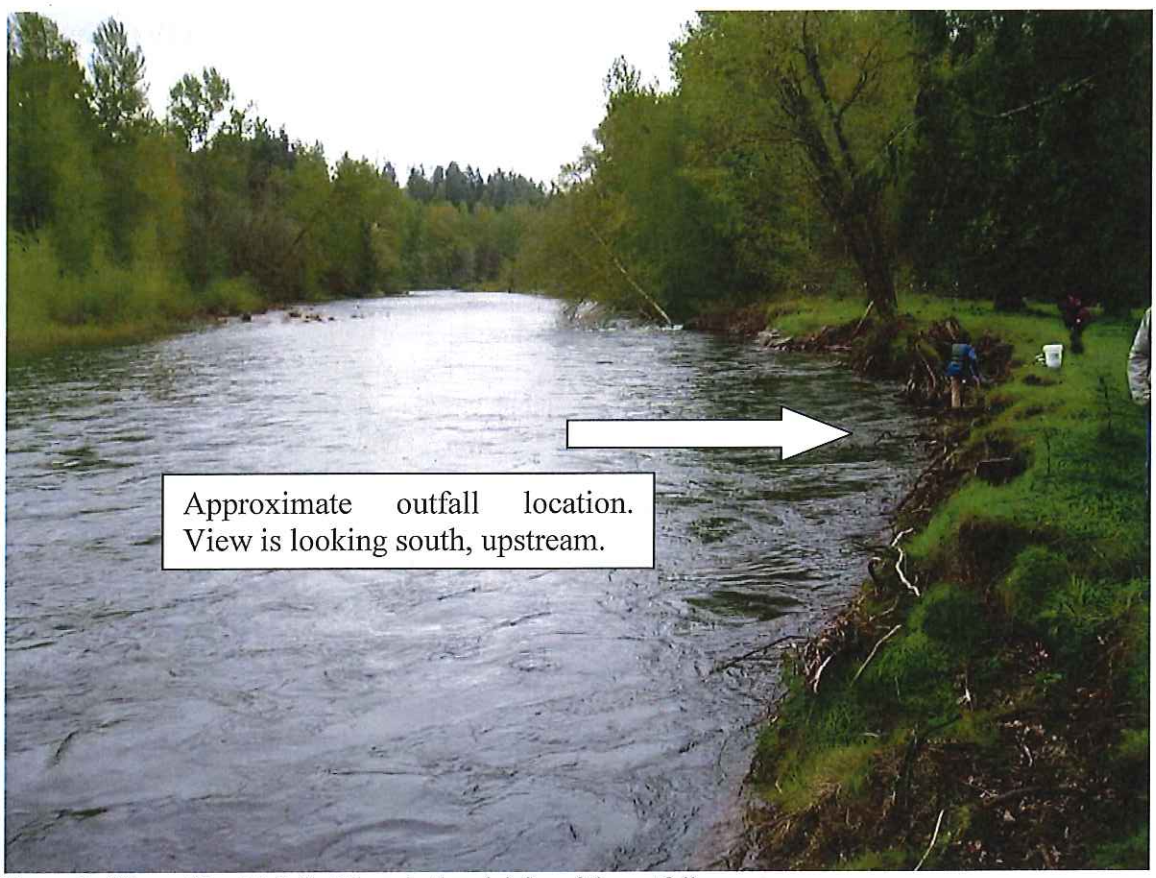

Figure 5. View of the Molalla River, in the vicinity of the outfall.

Certain reaches of this river are listed, including where this discharge occurs, as water quality impaired under DEQ's 303(d) inventory of impaired water bodies. Table 1 shows a list of parameters the Molalla River is water quality limited for, downstream of the City of Molalla STP discharge location. In 2008 DEQ issued Total Maximum Daily Loads (TMDL) for temperature and bacteria. The TMDL analysis concluded that there would be no reasonable potential for this facility to contribute to the bacteria or temperature listings.

Table 1: Listed Water Quality Limited Parameters

River Mile	Parameter	Season	Criteria
0 to 25	Bacteria	Fall/Winter/Spring	
19.7 to 44.7	Temperature	August 15-June 15	Spawning 13.0°C
18.2 to 48.3	Temperature	Year Around	Core cold water habitat16.0°C
0 to 25	Temperature	Summer	

4.2 Mixing Zone Analysis

Federal regulations (40 CFR 131.13) allow for the use of mixing zones. These are small areas around a discharge where water quality standards may be suspended. Application of mixing zones must assure acute toxicity to drifting organisms is prevented, and the integrity of the waterbody as a whole is not impaired. EPA does not have specific regulations pertaining to mixing zones. Each state may adopt its own mixing zone regulations that are subject to EPA review and approval. In States that lack approved mixing zone regulations, ambient water quality

standards must be met at the end of the pipe. OAR 340-041-0053(1) provides that DEQ may suspend all or part of the water quality standards in a designated portion of the receiving water to serve as a zone of dilution for wastes and receiving waters to mix thoroughly.

DEQ has developed mixing zone regulations and policy based in part on the acute and chronic aquatic life criteria. Based on EPA guidance and DEQ's mixing zone regulations, two mixing zones may be developed for each discharge that reflect acute and chronic effects: (1) The acute mixing zone, also known as the "zone of initial dilution" (ZID), and (2) the chronic mixing zone, usually referred to as "the mixing zone". Acute criteria are suspended within the ZID. The ZID is designed to prevent lethality to organisms passing through it. Chronic criteria are suspended within the mixing zone, which is designed to protect the integrity of the entire water body as a whole. The allowable size of the mixing zone should be based on the relative size of the discharge to the receiving stream, the beneficial uses of the receiving stream, location of other discharges nearby, location of drinking water intakes, and other considerations. More specific guidance is available from EPA regarding criteria used in appropriately sizing a ZID.

During the planning and design of the new outfall to the Molalla River, DEQ required the City of Molalla to provide preliminary computer modeling of the discharge's impacts. DEQ used that modeling effort to evaluate the potential discharge, and aid in establishing the permit-defined mixing zone boundaries. The outfall is a multiport diffuser, located away from the west bank of the river (see Figure 5). The mixing zone is listed as the length of the diffuser plus ten feet on either end, extending five feet upstream and fifty feet downstream. The ZID is specified as the area within five feet of the diffuser.

On April 30, 2008, DEQ laboratory personnel conducted a field evaluation of the mixing zone to confirm assumptions used during the design, construction and permitting process. In December 2007, DEQ adopted its "Regulatory Mixing Zone Internal Management Directive". This guidance document provides the basic process for reviewing mixing zones during the permitting process. Based on that guidance, DEQ determined a Level 1 (Simple) evaluation was most appropriate for this discharge. Because of relatively high river flows (gauged at 2,200 cfs downstream near City of Canby) observed at the time of the study, it was difficult to make a safe validation of dilution and mixing. DEQ concluded that under the observed conditions, the stream was very turbulent, had rapid mixing, and high effluent dilution. DEQ identified no problematic issues at the site.

DEQ issued the approved TMDL in December 2008. The TMDL evaluated the potential ambient river temperature increases from the facility's discharge. This evaluation addressed protecting the cold water criterion applicable to the stretch of the river where the discharge occurs, and the spawning criterion. The evaluation included an equation to calculate the potential change in temperature the facility's discharge would have on the river, and used the conservative assumption that the river temperature would be at the temperature criterion of 13° C. The evaluation concluded that there is no reasonable potential for the facility's discharge to increase river temperature more than 1° C during the spawning season.

The DEQ's mixing zone rule (OAR 340-0410053) includes temperature thermal plume limitations. DEQ field evaluation included gathering information to help evaluate if the four following adverse effects on salmonids inside the mixing zone are minimized:

1. *Impairment of spawning is prevented by limiting exposure to temperatures above 13 degrees Celsius.* Discharge monitoring data from the past three winters indicates that the Molalla STP discharge is often less than 13°C. The permit will require continued monitoring of effluent temperature and proposes that if the seven-day moving average for effluent

temperature reaches 18°C that discharge be stopped. Even when effluent temperatures are above 13°C the rapid mixing provided by the diffuser will prevent thermal issues in the mixing zone. Temperature monitoring over the past few years indicates that the rise in effluent temperature corresponds with rising ambient stream temperatures. The proposed permit effluent temperature limit protects against adverse stream temperature impacts.

2. *Acute impairment or instantaneous lethality is prevented or minimized by limiting potential fish exposure to temperatures of less than 32 degrees Celsius for more than 2 seconds.* The proposed permit's effluent temperature limit prohibits discharge if the 7-day moving average exceeds 18.0° C.
3. *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 or more to less than 5% of the cross section of 100% of the 7Q10 low flow of the water body.* There is no evidence to indicate that this facility will ever discharge effluent near this temperature.
4. *Unless the ambient temperature is 21.0 degrees or greater, migration blockage is prevented or minimized by limiting potential fish exposure to temperatures of 21 degrees Celsius or more to less than 25% of the cross section of 100% of the 7Q10 low flow of the water body.* Again with the temperature limits in this permit, this will never happen.

4.3 Environmental Mapping

The City of Molalla discharges to the Molalla River at River Mile 20.0 through Outfall 001. Figure 6 below shows the outfall's location on a USGS Quad Map of this area. Based on the Oregon Department of Fish and Wildlife fish habitat maps and Oregon Administrative Rules, Division 41, Water Quality Standards, Figure 340A (Fish Use Designations, Willamette Basin), salmonids use this section of the Molalla River for spawning (Sept 1- June15), rearing and migration. The 2008 DEQ TMDL lists this section of the river as water quality limited for temperature.

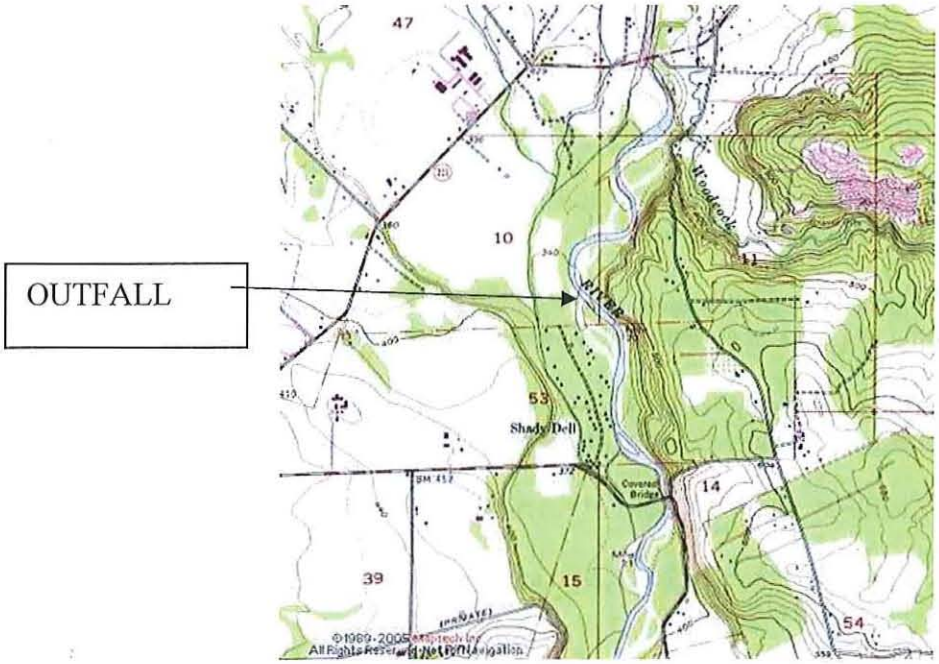

Figure 6: Outfall Location

The discharge is located approximately 1 mile downstream of Feyrer Park and nearly 15 miles upstream from the City of Canby. There are some public access sites to this portion of the river. Local citizens use the river for recreation and fishing. The discharge is located in a watershed

used as source water for drinking water; however, no drinking water intakes are located within ½ mile of the Outfall. No other NPDES permitted discharges are located within ½ mile of this outfall.

5.0 PERMIT LIMITATIONS

Two categories of effluent limitations exist for NPDES permits: (1) Technology based effluent limits (TBELS), and (2) Water quality based effluent limits (WQBELS). TBELS apply the EPA-established secondary treatment requirements for municipal dischargers (Publically Owned Treatment Works - POTWs). The EPA established TBLS to require a minimum level of treatment for municipal sources to meet the federal secondary standards (40CFR Part 133). The EPA designed WQBELS to protect the beneficial uses of the receiving water, and are independent of the available treatment technology. In addition, when performing a permit renewal, there are existing permit limits. These may be TBELS, WQBELS, or limits based on best professional judgment. When renewing a permit, the most stringent limits apply.

5.1 Existing Permit Limits

The current permit for this facility includes effluent limitations on Biochemical Oxygen Demand (BOD_5), Total Suspended Solids (TSS), bacteria, pH, chlorine, ammonia (NH_3-N) and dilution. A summary of current discharge monitoring report data is attached (**Exhibit #2**).

5.2 Technology-Based Effluent Limits

Federal rules for secondary treatment requires at a minimum the following standards be met for BOD_5, TSS and pH:

- BOD_5 shall not exceed a 30-day average of 30 mg/l and a 7-day average of 45 mg/l and the 30-day average percent removal shall not be less than 85 percent.
- TSS shall not exceed a 30-day average of 30 mg/l and a 7-day average of 45 mg/l and the 30-day average percent removal shall not be less than 85 percent.
- pH shall be maintained within the limits of 6.0 to 9.0.

The City of Molalla STP limitations for BOD_5, TSS and pH are at least as stringent as the federal requirements in that the following must be met:

- BOD_5 shall not exceed a monthly average of 10 mg/l and a weekly average of 15 mg/l and the monthly average percent removal shall not be less than 85 percent.
- TSS shall not exceed a monthly average of 10 mg/l and a weekly average of 15 mg/l and the monthly average percent removal shall not be less than 85 percent.
- pH shall be maintained within the limits of 6.0 to 9.0.

The concentration limits for BOD_5 and TSS are based on the Willamette Basin water quality standards, set in OAR 340-041-0345(3)(a)(A).

In addition, DEQ requires that mass load limitations for BOD_5 and TSS must be met when discharging to surface waters. These loads are required to be reported in pounds per day and include a monthly average, weekly average and daily mass limitation. DEQ established the limits for this facility, based on a wet weather design flow of 1.92 mgd. Weekly limits are 1.5 times the monthly mass, and the daily limit is twice the monthly mass. Limits are calculated as follows:

BOD_5 and TSS Average Monthly Limit = (1.92 mgd)(10mg/l)(8.34 lbs/gal)=160 lbs/day
Average Weekly Limit = (1.5)160 lbs(Average Monthly Limit)= 240 lbs/day
Daily Limit= (2.0)160 lbs= 320 lbs

5.3 Water Quality-Based Effluent Limits

Reasonable Potential Analysis

DEQ performs an analysis to determine if there is a reasonable potential to cause or contribute to violations of instream water quality criteria. DEQ has adopted EPA's recommended methodology for performing a reasonable potential analysis (RPA). EPA developed this methodology primarily for acute and chronic criteria, but can be adapted to other criteria, based on different frequencies and durations. This RPA takes into account effluent variability, available dilution (if applicable), and receiving stream water quality. The RPA for specific parameters are discussed below.

In accordance with DEQ's "Internal Management Directive for Reasonable Potential Analysis for Toxic Pollutants" (September 2005), domestic sources like City of Molalla with a dry weather design flow greater than 0.1 mgd but less than 1 mgd must be characterized for chlorine and ammonia. The RPA spreadsheet using current data from over the past three years for this renewal indicates that no reasonable potential exists for ammonia toxicity.

Permit Limit Derivation

During the last permit renewal, effluent limits were included in the permit for both ammonia and chlorine. DEQ established these limits assuming very conservative assumptions but without any real monitoring results available. The facility uses a dechlorination system to control effluent chlorine levels. The limits for chlorine will remain the same. Ammonia is not specifically controlled through this treatment system. DEQ used recent monitoring data and the mixing zone review to determine the water quality based ammonia limit. DEQ revised the ammonia limit slightly, based on that analysis.

The RPA spreadsheet and permit effluent limit derivation worksheets are attached (**Exhibit #3**).

The pH is a measure of how acidic or basic a solution is. A pH of 7.0 Standard Units (S.U.) is considered neutral. The purpose of an in-stream water quality pH standard is generally to protect aquatic life since most aquatic organisms can only tolerate a fairly narrow range around 7.0 S.U.

The Willamette Basin Water Quality Standard for pH is found in OAR 340-041-0345(1)(a). The allowed range is 6.5 to 8.5 S.U. The proposed permit limits pH to the range 6.0 to 9.0 S.U. This limit is based on Federal secondary treatment standards for wastewater treatment facilities (40 CFR Part 133.102), and is applied to the majority of domestic NPDES permittees in the state. Within the permittee's mixing zone, the water quality standard for pH does not have to be met. The Department evaluated pH using a spreadsheet that derives the pH at the mixing zone boundary **(See attached Exhibit #4).** Mixing with ambient water within the mixing zone assures that the pH at the edge of the mixing zone meets the ambient criteria. Therefore, DEQ considers the proposed permit limits protects the water quality standard.

The WQBELS for total residual chlorine proposed in this permit are lower than the EPA-established Minimum Level (ML) for chlorine of 0.1 mg/L. In accordance with EPA Region X Guidance for WQBELs below Analytical Detection Limits issued in 1996, the permit should include the ML as a "compliance evaluation level". DEQ proposes to include a note in Schedule A establishing 0.10 mg/L as a compliance evaluation level for total residual chlorine.

5.4 Whole Effluent Toxicity

Though this facility remains classified as a minor domestic NPDES facility, design data from the recent upgrade and flow information in the application indicates that this facility is routinely treating over 1 mgd, which is the threshold for requiring whole effluent toxicity (WET) or bioassay tests at publicly owned treatment works. The permit includes the requirements for bioassay tests that will meet the application requirements for the next renewal. Because of the apparent steady growth in population within the Molalla community, and flow at the POTW, DEQ will recommend to EPA that this facility should be reclassified as a major facility for the next permit cycle.

5.5 Antidegradation

DEQ performed an Antidegradation Review for this facility's discharge. DEQ is renewing the permit without any increase in discharge loadings. Permit renewals with the same discharge loadings as the previous permit are not considered to lower water quality from the existing condition. Based on the antidegradation review, DEQ determined the proposed discharge complies with the Antidegradation Policy for Surface Waters found in OAR 340-041-0026. See the attached antidegradation review (**Exhibit #5**).

6.0 PERMIT DRAFT DISCUSSION

6.1 Face Page

The face page provides information about the permittee, description of the wastewater, outfall locations, receiving stream information, permit approval authority, and a description of permitted activities. The permittee is authorized to construct, install, modify, or operate a wastewater collection, treatment, control and disposal system. The permit allows discharge to the Molalla River and the use of recycled water within limits set by the permit. All other discharges are prohibited.

6.2 Schedule A - Waste Discharge Limitations

The periods of when discharge is allowed and the limitations that must be met for this facility are provided in this Schedule. These limits remain the same as the previous permit with some minor exceptions:

- The BOD_5 and TSS percent removal had been adjusted to a lower level than 85% for the last permit. This was done because of concern that the new headworks was lowering influent loading. A review of the monitoring reports over the past three years indicates that the facility has no difficulty meeting 85% removal for both BOD_5 and TSS.
- Ammonia limits remain the same.
- The previous permit relied on a staged flow to allow the operator the ability to determine the quantity to be discharged, based on a dilution ratio. The intent was to maximize protection while allowing flexibility on the discharge side. Actual practice has seen that given adequate stream flow, discharge volume does not need to be as closely monitored. What the draft permit proposes is that if the gauged flow is above 350 cfs, discharge can occur. Under all other stream flow circumstances, the plant will hold effluent in the lagoons. This change should ease the operator's decision on discharging, based on the gauged stream flow.
- Another limit that will need to be tracked is the moving average effluent temperature. If the temperature is above 18 degrees Celsius, discharge will be prohibited. This limit was necessary to achieve the thermal plume limitations defined in DEQ's mixing zone rule (OAR-340-041-0053).

Bacteria:

The proposed permit limits are based on the *E. coli* standard contained in OAR 340-041-0009(5). The proposed limits are 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 log 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 proposed limits are taken directly from the Oregon bacteria rule which is found in OAR 340-041-0009. This rule establishes numeric in-stream water quality standards (OAR 340-041-0009(1)), and establishes effluent limitations and the methodology for establishing a violation (OAR 340-041-0009(5)).

The current version of Schedule F, General Conditions, Section B, condition 6, no longer prohibits overflows. The Environmental Quality Commission (EQC) recognizes that it is impossible to design and construct a conveyance system that will prevent overflows under all storm conditions. The applicant is not seeking permit coverage for overflows and the permit does not authorize such discharges. The State of Oregon has determined that all wastewater conveyance systems should be designed to transport storm events up to a specific size to the treatment facility. Therefore, in exercising its enforcement discretion regarding Sanitary Sewer Overflows, the Department will consider the following:

(1) Whether the permittee has conveyance and treatment facilities adequate to prevent overflows except during a storm event greater than the one-in-five-year, 24-hour duration storm from November 1 through May 21 and except during a storm event greater than the one-in-ten-year, 24-hour duration storm from May 22 through October 31. In addition, DEQ will also consider using enforcement discretion for overflows that occur during a storm event less than the one-in-five-year, 24-hour duration storm from November 1 through May 21 if the permittee had separate sanitary and storm sewers on January 10, 1996, had experienced sanitary sewer overflows due to inflow and infiltration problems, and has submitted an acceptable plan to the Department to address these sanitary sewer overflows by January 1, 2010;
(2) Whether the permittee has provided the highest and best practicable treatment and/or control of wastes, activities, and flows and has properly operated the conveyance and treatment facilities;
(3) Whether the permittee has minimized the potential environmental and public health impacts from the overflow; and
(4) Whether the permittee has properly maintained the capacity of the conveyance system.

DEQ will review the permittee's determination of the one-in-five-year, 24-hour duration winter storm and the one-in-ten year, 24-hour duration summer storm as described above in the permittee's facilities plan. In the event that the permittee reports an overflow event associated with a storm event, and DEQ does not have information from the permittee sufficient to determine whether or not the storm event exceeds storm events, as specified in OAR 340-041-0009(6) & (7), DEQ will perform the determination using the information contained in Figure 26 of the 1973 NOAA Atlas 2 entitled "Precipitation-Frequency Atlas of the Western United States, Volume X – Oregon". This figure is entitled "Isopluvials of 5-yr 24-hr precipitation in tenths of an inch". The Atlas can be obtained on line at http://hdsc.nws.noaa.gov/hdsc/pfds/other/or_pfds.html, however the file is very large. A scanned version of Figure 26 is available at: http://www.wrcc.dri.edu/pcpnfreq/or5y24.gif. DEQ will

compare the information in this figure with rainfall data available from the National Weather Service, or other source as necessary.

6.3 Schedule B – Minimum Monitoring and Reporting Requirements

This schedule includes the monitoring and reporting requirements established in this permit. In addition to the monthly monitoring and reporting requirements being listed, the reporting procedures are also established. Annual report requirements for I/I, recycled water and biosolids are found within this schedule.

6.4 Schedule C - Compliance Schedules and Conditions

This permit does not incorporate any compliance schedule conditions.

6.5 Schedule D - Special Conditions

The following special conditions are included:

- This facility requires a certified operator. Specific requirements related to that certified operator are provided in this condition.
- If biosolids are to be removed from the treatment lagoons, the permittee is required to update their management plan at least six months prior to removal.
- Specific requirements in relation to the reuse of recycled wastewater are provided.
- Instructions regarding WET tests are included in this condition.
- Hydrogeologic characterization is not required provided the facility operates in accord with the permit and evidence develops that groundwater is no longer being protected.
- Treatment plant site use of recycled water is considered an exempt reuse.
- The permittee is required to submit to the DEQ a completed industrial use survey.
- The permittee is required to perform a lagoon leak test within one year of permit issuance.
- The permittee must adhere to all conditions of the Cooperative Operating Agreement with the City of Canby.

6.6 Schedule F - NPDES General Conditions

All NPDES permits issued in the State of Oregon contain certain conditions that remain the same regardless of the type of discharge and the activity causing the discharge. These conditions are called General Conditions. These conditions can be changed or modified only on a statewide basis. The latest edition of the NPDES General Conditions is from 2009 and this edition is included as Schedule F of the draft permit.

Section A contains standard conditions which include compliance with the permit, assessment of penalties, mitigation of noncompliance, permit renewal application, enforcement actions, toxic discharges, property rights and referenced rules and statutes. Section B contains requirements for operation and maintenance of the pollution control facilities. This section includes conditions for proper operation and maintenance, duty to halt or reduce activity in order to maintain compliance, bypass of treatment facilities, upset conditions, treatment of single operational events, overflows from wastewater conveyance systems and associated pump stations, public notification of effluent violation or overflow, and disposal of removed substances. Section C contains requirements for monitoring and reporting. This section includes conditions for representative sampling, flow measurement, monitoring procedures, penalties of tampering, reporting of monitoring results, additional monitoring by the permittee, averaging of measurements, retention of records, contents of records, and inspection and entry. Section D contains reporting requirements and includes

conditions for reporting planned changes, anticipated noncompliance, permit transfers, progress on compliance schedules, noncompliance which may endanger public health or the environment, other noncompliances, and other information. Section D also contains signatory requirements and the consequences of falsifying reports. Section E contains the definitions used throughout the permit.

6.7 Permit Processing/Public Comment/Appeal Process

The beginning and end date of the public comment period to receive written comments regarding this permit, and the contact name and telephone number are included in the public notice. The permittee is the only party having standing to file a permit appeal. If the Permittee is dissatisfied with the conditions of the permit when issued, they may request a hearing before the EQC or its designated hearing officer, within 20 days of the final permit being mailed. The request for hearing must be sent to the DEQ Director. Any hearing held shall be conducted pursuant to DEQ regulations.

Exhibit #1

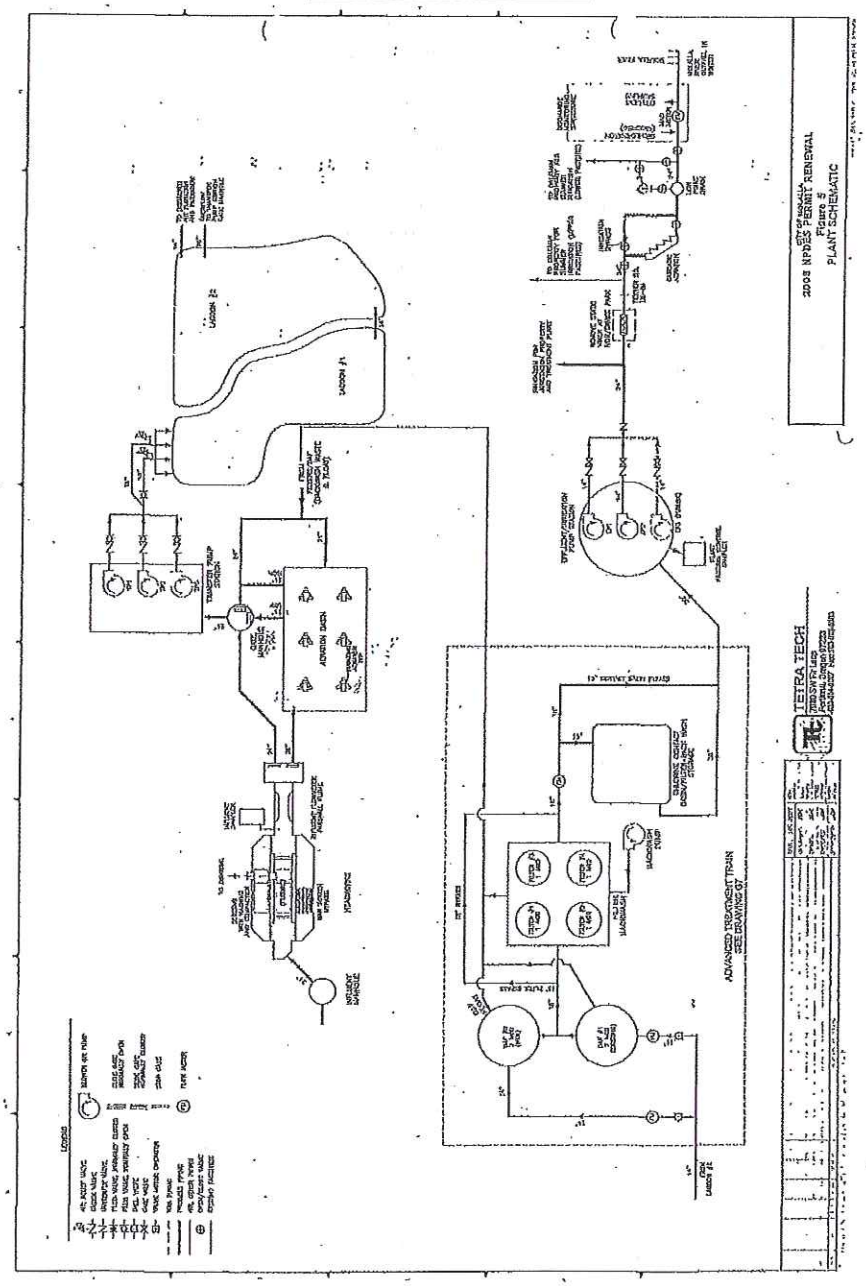
2003 NPDES PERMIT RENEWAL
Figure 3
PLANT SCHEMATIC
TETRA TECH

Exhibit #2

Molalla DMR Data

date	Influent				Effluent											Molalla River			
	flow (MGD)		BOD5	TSS	flow(MGD)	BOD5		TSS		NH3-N (mg/l)		E.coli	DO	Temp		Flow (cfs)		DO (mg/l)	Temp
	max	mth av	mth av (mg/l)		max	mth av	mg/l	%rem	mg/l	%rem	mth av	max	mth av	mth av	max wk	min	av	av	wk max
Sep-09	0.9	0.7	241	243	No river discharge													10.1	20.7
Aug-09	0.7	0.7	237	235	No river discharge													9.5	23.5
Jul-09	0.8	0.7	235	238	No river discharge													8.8	27.5
Jun-09	0.9	0.8	203	201	No river discharge													9.8	20.5
May-09	2.4	1.3	135	112	No river discharge													11.9	16
Apr-09	1.8	1.3	134	125	3.1	2.3	6.5	95	1.6	99	8.3	9.5	<1	9.6	16.9	742	1581	12.1	9.8
Mar-09	2.3	1.6	104	104	1.7	1	5.9	95	3.3	97	9.8	12	<1	10.6	10.4	806	1682	11.9	7.3
Feb-09	2.1	1.2	130	126	1.7	1.3	5.7	95	1.5	99	10.3	11.3	<1	11.1	8.2	501	984	13.4	6.9
Jan-09	6.8	2	92	97	3.6	3.2	4.3	95	1.1	98	11.7	13.9	<1	11.6	7.9	821	3102	13.2	7.1
Dec-08	3	1.5	148	141	1.6	1.4	4.6	97	0.7	99	15.5	16.4	<1	11.2	10	405	819	13.4	8
Nov-08	2.3	1.2	146	134	1.4	1.3	1.8	99	0.8	99	11.7	14.8	<1	10.8	11.4	459	669	11.9	10.5
Oct-08	1.1	0.8	253	270	No river discharge													11.4	15.4
Sep-08	0.9	0.7	274	339	No river discharge													9.8	20.4
Aug-08	1	0.8	290	402	No river discharge													9.2	23.8
Jul-08	1.3	0.8	265	380	No river discharge													9.1	22
Jun-08	1.7	0.7	169	157	No river discharge													11.7	15.1
May-08	2.1	1.2	142	120	No river discharge													12.3	9.8
Apr-08	2	1.4	119	130	3	2	8.1	93	1.3	99	9	10.5	<1	11	13.1	997	1409	12.6	8.5
Mar-08	3	1.8	119	131	3	2.3	5.5	95	2.7	98	8.4	9.2	<1	12.8	10.9	1110	1768	12.8	8
Feb-08	3.4	1.7	133	174	3.8	2.2	6.1	95	3.7	98	7.1	9.2	<1	12.3	9.4	1170	1603	12.9	7.6
Jan-08	3.7	2.3	81	83	3.3	2.3	4.8	94	2.5	97	7.3	8.1	<1	11.7	7.3	881	2184	13.6	7
Dec-07	4.3	2.4	82	88	3.4	3	6	92	2.2	97	6.9	8.4	<1	10.7	8.9	799	2653	13.1	8.8
Nov-07	3.1	1.3	135	165	1.6	1.1	5.4	95	2.7	95	3.6	5.5	<1	12.1	13.6	157	902	12.8	8.7
Oct-07	2.1	1.1	165	175	No river discharge													11.8	12.8
Sep-07	1.4	0.7	225	215	No river discharge													10	20.8
Aug-07	0.8	0.7	207	218	No river discharge													9.2	22.5
Jul-07	1	0.8	194	225	No river discharge													8.9	25.2
Jun-07	1	0.8	171	177	No river discharge													9.8	20.1
May-07	1.3	0.9	155	161	No river discharge													10.9	18.9
Apr-07	1.7	1.3	118	120	1.7	1.5	9.1	92	5.6	95	9.1	10.3	<1	12.8	16.3	648	1023	12.2	11.2
Mar-07	3.1	1.8	85	97	1.9	1.6	6	92	4.9	94	8.2	9.4	<1	10.4	14.3	1140	1959	13	8.1
Feb-07	3.3	1.7	95	110	1.7	1.4	6.3	92	5.3	95	7.1	9.2	<1	12	10.8	360	1496	13.4	7.8
Jan-07	5.3	1.8	100	118	3.9	1.7	6.4	93	3.8	96	6.7	9.2	<1	11.8	9.3	446	1968	13	7.5

Exhibit #3

Exhibit #3

Reasonable Potential Analysis - Chlorine and Ammonia

Facility Name: Molalla STP

Date: 3/9/2009

[illegible]	n	[illegible]
Low Flow Dilution @ ZID (1Q10)	*	*
Low Flow Dilution @ MZ (1Q10)	*	*
Low Flow Dilution @ MZ (30Q5)	*	*
High Flow Dilution @ ZID (1Q10)	*	5.0
High Flow Dilution @ MZ (7Q10)	*	13.1
High Flow Dilution @ MZ (30Q5)	*	15.1
Data to calculate dilution	Summer	Winter
Effluent Flow (mgd)	*	2
1Q10 (cfs)	*	125
7Q10 (cfs)	*	150
30Q5 (cfs)	*	175
Dilution @ ZID	*	25
Dilution @ MZ	*	10

Confidence Level	99%
Probability Basis	95%

Summer data	Effluent	Stream	Mixed ZID	Mixed MZ	
pH	*	*	*	*	(6.5-9)
Temp	*	*	*	*	°C
Alkalinity	*	*			
Salmonids Present (y/n)	n/a	*			
Salmonid Spawning (y/n)	n/a	*			
Fresh Water? (y/n)	n/a	*			
Salinity (ppt)	*	*	*	*	
Winter data					
pH	7.7	7.9	7.8	7.9	(6.5-9)
Temp	13.2	7.3	8.5	7.7	°C
Alkalinity	70	15			
Salmonids Present (y/n)	n/a	y			
Salmonid Spawning (y/n)	n/a	y			
Fresh Water? (y/n)	n/a	y			
Salinity (ppt)	0	0	*	*	

PARAMETER	# of Samples	Highest Conc. mg/l	Coeff. of Variance	Calculated Maximum Conc. mg/l	Background Conc. mg/l	Maximum Conc. at ZID mg/l	Maximum Conc. at MZ mg/l	WQ CRITERIA Acute (CMC) mg/l	WQ CRITERIA Chronic (CCC) mg/l	REASONABLE POTENTIAL? ACUTE	REASONABLE POTENTIAL? CHRONIC
Low Flow Season											
CHLORINE	*	*	*	*	*	*	*	0.019	0.011	*	*
AMMONIA - Freshwater	*	*	*	*	*	*	*	*	*	*	*
AMMONIA - Saltwater	*	*	*	*	*	*	*	n/a	n/a	*	*
AMMONIA - Proposed 1hr/Acute	*	*	*	*	*	*	*	*	*	*	*
AMMONIA - Proposed 30day	*	*	*	*	*	n/a	*	n/a	n/a	n/a	*
High Flow Season											
CHLORINE	*	*	*	*	*	*	*	0.019	0.011	*	*
AMMONIA - Freshwater	106	16.400	0.33	16.40	0.02	3.27	1.27	8.3	1.5	NO	NO
AMMONIA - Saltwater	*	*	*	*	*	*	*	n/a	n/a	*	*
AMMONIA - Proposed 1hr/Acute	105	16.400	0.33	16.40	0.02	3.27	1.27	8.0	7.47	NO	NO
AMMONIA - Proposed 30day	106	16.400	0.33	16.40	0.02	n/a	1.10	n/a	3.0	n/a	NO

* -NOTES :

Temperature must be between 0 and 30 °C
pH must be between 6.5 and 9
Ammonia is total ammonia as N

Page 1

Exhibit # 3, continued

Permit Limits - Chlorine and Ammonia

Facility Name: Molalla STP

Date: 3/10/2009

	Y	Summer
Acute Dilution @ ZID (CCC)	*	*
Chronic Dilution @ MZ (CMC)	*	*
Chronic Dilution @ MZ (CCC)	*	*
High Flow Dilution @ ZID (1Q10)	10	*
High Flow Dilution @ MZ (1Q10)	13	*
High Flow Dilution @ MZ (CCC)	*	*
	Summer	Winter
Effluent Flow (MGD)	*	*
1Q10 (CFS)	*	*
7Q10 (CFS)	*	*
30Q5 (CFS)	*	*
% Effluent @ MZ	*	*
% Effluent @ ZID	*	*
Probability Basis (WQ Guidance)	99%	

Summer data	Effluent	Stream	Mixed ZID 1Q10	Mixed MZ 7Q10	Mixed MZ 30Q5	
pH *	*	*	*	*	*	(6.5-9)
Temp *	*	*	*	*	*	°C
Hardness	*	*				
Salmonids Present (Y/N)	n/a	*				
Salmonid Spawning (Y/N)	n/a	*				
Fresh Water 2 (Y/N)	n/a	*				
Salinity	*	*	*	*		
Winter data						
pH *	7.7	7.9	7.8	7.8	*	(6.5-9)
Temp *	13.2	7.3	7.9	7.8	*	°C
Hardness	70	35				
Salmonids Present (Y/N)	n/a	y				
Salmonid Spawning (Y/N)	n/a	y				
Fresh Water 2 (Y/N)	n/a	y				
Salinity	0	0	0.0	0.0		

PARAMETER	WATER QUALITY CRITERIA 1 Hour (CMC) mg/l	4 Day (CCC) mg/l	30 Day (CCC) mg/l	Background Ground mg/l	Acute mg/l	4 Day mg/l	30 Day mg/l	CV	Samples No.	Acute LTA mg/l	4-day LTA mg/l	30 Day LTA mg/l	n	Calculated Limits Monthly mg/l	Daily mg/l
Low Flow Season															
CHLORINE	0.019	0.011	n/a	*	*	*	n/a	*	*	*	*	n/a	*	*	*
AMMONIA - Freshwater	n/a	n/a	n/a	*	*	*	n/a	*	*	*	*	n/a	*	*	*
AMMONIA - Saltwater	n/a	n/a	n/a	*	*	*	n/a	*	*	*	*	n/a	*	*	*
AMMONIA - Effluent	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
High Flow Season															
CHLORINE	0.019	0.011	n/a	0.00	0.18	0.14	n/a	0.5	30	0.07	0.08	n/a	0.07	0.1	0.2
AMMONIA - Freshwater	7.9	1.5	n/a	0.02	75.97	18.65	n/a	0.33	4	37.87	12.91	n/a	12.91	16.7	25.9
AMMONIA - Saltwater	n/a	n/a	n/a	*	*	*	n/a	*	*	*	*	n/a	*	*	*
AMMONIA - Effluent	7.6	*	*	*	*	*	*	*	*	*	*	*	*	*	*

NOTES :

Temperature must be between 0 and 30 ° C
pH must be between 6.5 and 9
Ammonia is mg/l ammonia as N.

Exhibit #4

Calculation of pH of a mixture of two flows.
Based on the procedure in EPA's DESCON program (EPA, 1988, Technical Guidance on Supplementary Stream Design Conditions for Steady State Modeling. USEPA Office of Water, Washington D.C.)

	RPA for pH	
INPUT	Lower pH	Upper pH
Mollalla STP pH evaluation	Criteria	Criteria
1. DILUTION FACTOR AT MZ BOUNDARY - (Qe+Qr)/Qe	13	13
2. UPSTREAM/BACKGROUND CHARACTERISTICS		
Temperature (deg C):	7.3	7.3
pH:	6.9	7.7
Alkalinity (mg CaCO3/L):	15.0	15.0
3. EFFLUENT CHARACTERISTICS		
Temperature (deg C):	15.0	15.0
pH:	6.0	9.0
Alkalinity (mg CaCO3/L):	70.0	70.0
4. APPLICABLE PH CRITERIA	6.5	8.5
OUTPUT		
1. IONIZATION CONSTANTS		
Upstream/Background pKa:	6.49	6.49
Effluent pKa:	6.42	6.42
2. IONIZATION FRACTIONS		
Upstream/Background Ionization Fraction:	0.72	0.94
Effluent Ionization Fraction:	0.28	1.00
3. TOTAL INORGANIC CARBON		
Upstream/Background Total Inorganic Carbon (mg CaCO3/	20.84	15.93
Effluent Total Inorganic Carbon (mg CaCO3/L):	254.12	70.18
4. CONDITIONS AT MIXING ZONE BOUNDARY		
Temperature (deg C):	7.89	7.89
Alkalinity (mg CaCO3/L):	19.23	19.23
Total Inorganic Carbon (mg CaCO3/L):	38.78	20.10
pKa:	6.48	6.48
pH at Mixing Zone Boundary:	**6.5**	**7.8**
Is there Reasonable Potential?	**No**	**No**

Exhibit #5

Anti-degradation Review Worksheet for a Proposed Individual NPDES Discharge

Applicant: City of Molalla

1. What is the name of the surface water that receives the discharge? Molalla River.

   Briefly describe the proposed activity: Renew NPDES permit.

   This review is for a: ☐ Renewal ☐ New

   Go to Step 2.

2. Are there any existing uses associated with the water body that are not included in the list of designated uses? Example: DEQ's Fish Use Designation Maps identify the waterbody as supporting salmonid migration; however ODFW has determined that it also supports salmonid spawning.

   ☐ Yes. Identify additional use(s), the basis for conclusion, and the applicable criteria: Click here to enter text. Go to Step 3.

   ☐ No. Go to Step 3.

3. Was the analysis of the impact of the proposed activity performed relative to criteria applicable to the most sensitive beneficial use?

   ☐ Yes. Go to Step 4.

   ☐ No. Re-do analysis to develop permit limits using correct criteria, and modify permit as necessary. Go to Step 4.

4. Is this surface water an **Outstanding Resource Water** or **upstream** from an **Outstanding Resource Water**? Note: No waters in Oregon have been designated as Outstanding Resource Waters. OAR 340-041-0004(8)(a) contains criteria for designating such waters. Example: they are found in State or National parks.

   ☐ Yes. Go to Step 7. ☐ No. Go to Step 5.

5. Is this surface water a **High Quality Water**? A High Quality Water is one not on the 303(d) list. To determine, go to the 303(d) list at http://www.deq.state.or.us/wq//assessment.htm.

   ☐ Yes. Go to Step 10. ☐ No. Go to Step 6.

   ☐ No. Provide basis for conclusion: Go to Step 20.

6. If the proposed activity results in a non-permanent new or expanded source of pollutants directly to or affecting an **Outstanding Resource Water**, will the lowering of water quality in the **Outstanding Resource Water** be on a short-term basis in response to an emergency or to protect human health and welfare?

   ☐ Yes. Proceed with Application Process to Interagency Coordination and Public Comment. Go to Step 23.

☐ No. Recommend Preliminary Decision to deny proposed activity (subject to Interagency Coordination and Public Comment). Go to Step 20.

7. Will the proposed activity result in a Lowering of Water Quality in the **High Quality Water**[see OAR 340-041-0004(3)-(5) for a description in rule of discharges that do not result in lowering of water quality or do not constitute a new and/or increased discharge or are otherwise exempt from antidegradation review; otherwise see "Is an Activity Likely to Lower Water Quality?" in *Antidegradation Policy Implementation Internal Management Directive for NPDES Permits and Section 401 Water Quality Certifications*.]

   ☐ Yes. Go to Step 11.

   ☐ No. Proceed with Permit Application. Applicant should provide basis for conclusion: Click here to enter text. Go to Step 23.

8. OAR 340-041-0004(6)(c) of the *High Quality Waters Policy* requires that the Department evaluate the application to determine that all water quality standards will be met and beneficial uses protected after allowing discharge to **High Quality Waters**. Will all water quality standards be met and beneficial uses protected?

   ☐ Yes. Provide basis for conclusion: Click here to enter text. Proceed with Application Process to Interagency Coordination and Public Comment. Go to Step 12.

   ☐ No. Provide basis for conclusion. Recommend Preliminary Decision to deny proposed activity (subject to Interagency Coordination and Public Comment). Go to Step 23.

9. OAR 340-041-0004(6)(a) of the High Quality Waters Policy requires that the Department evaluate the application to determine if no other reasonable alternatives exist except to discharge to High Quality Waters. At a minimum, the following list must be considered:

   - Improved operation and maintenance of existing treatment system
   - Recycling or reuse with no discharge
   - Discharge to on-site system
   - Seasonal or controlled discharges to avoid critical water quality periods
   - Discharge to sanitary sewer
   - Land application

   Were any of the alternatives feasible?

   ☐ Yes. Provide basis for conclusion (see below for information requirements): Click here to enter text. Recommend Preliminary Decision that applicant use alternative. Go to Step10.

   ☐ No. Provide basis for conclusion (see below for information requirements): Click here to enter text. Go to Step 13.

   In a separate statement to this application, please explain the *technical feasibility* of the alternative, explain the *economic feasibility* of the alternative, and provide an *estimated cost* of NPDES permit alternative for a five-year period from start-up.

10. OAR 340-041-0004(6)(b) of the *High Quality Waters Policy* requires that the Department evaluate the application to determine if there are social and economic benefits that outweigh the environmental costs of allowing discharge to High Quality Waters. Do the social and economic benefits outweigh the environmental costs of lowering the water quality?

☐ Yes. Provide basis for conclusion (see below for information requirements): Click here to enter text. Go to Step 14.

☐ No. Provide basis for conclusion (see below for information requirements): Click here to enter text. Go to Step 23.

The basis for conclusion should include a discussion of whether the lowering of water quality is necessary and important. "Necessary" means that the same social and economic benefits cannot be achieved with some other approach. "Important" means that the value of the social and economic benefits due to lowering water quality is greater than the environmental costs of lowering water quality.

Benefits can be created from measures such as:

- Creating or expanding employment (provide current/expected number of employees, type & relative amount of each type
- Increasing median family income
- Increasing community tax base (provide current/expected annual sales, tax info)
- Providing necessary social services
- Enhancing environmental attributes

Environmental Costs can include:

- Losing assimilative capacity otherwise used for other industries/development
- Impacting fishing, recreation, and tourism industries negatively
- Impacting health protection negatively
- Impacting societal value for environmental quality negatively

11. OAR 340-041-0004(6)(d) of the *High Quality Waters Policy* requires that DEQ prevent federal threatened and endangered aquatic species from being adversely affected. Will lowering the water quality likely result in adverse effects on federal threatened and endangered aquatic species?

☐ Yes, please provide basis for conclusion (see below for information requirements):Click here to enter text. Go to Step 23.

☐ No, please provide basis for conclusion (see below for information requirements):Click here to enter text. Go to Step 15.

12. Will lowering water quality in the **High Quality Water** be on a short-term basis in response to an emergency or to protect human health and welfare?

☐ Yes, go to Step 20.

☐ No, recommend Preliminary Decision to deny proposed activity (subject to Interagency Coordination and Public Comment). Go to Step 23

13. Will the proposed activity result in a lowering water quality in the **Water Quality Limited Water**? [see OAR 340-041-0004(3)-(5) for a description in rule of discharges that do not result in lowering of water quality or do not constitute a new and/or increased discharge or are otherwise exempt from anti-degradation review; otherwise see "Is an Activity Likely to Lower Water Quality?" in *Anti-degradation Policy Implementation Internal Management Directive for NPDES Permits and Section 401 Water Quality Certifications*.]

☐ Yes, go to Step 17.

☐ No, proceed with Permit Application. Permit writer should provide basis for determination in permit evaluation report: Click here to enter text. Go to Step 23.

14. OAR 340-041-0004(9)(a)(A) of the *Water Quality Limited Waters Policy* requires that the Department evaluate the application to determine that all water quality standards will be met. Will all water quality standards be met?

☐ Yes, please provide basis for conclusion: Click here to enter text. Go to Step 18.

☐ No, please provide basis for conclusion. Recommend Preliminary Decision to deny proposed activity (subject to Interagency Coordination and Public Comment). Go to Step 23.

15. OAR 340-041-0004(9)(a)(C) of the *Water Quality Limited Waters Policy* requires that the Department evaluate the application to determine that all recognized beneficial uses will be met and that threatened or endangered species will not be adversely affected. Will all beneficial uses be met and will threatened or endangered species be protected from adverse effects?

☐ Yes, please provide basis for conclusion: Click here to enter text. Go to Step 19.

☐ No, please provide basis for conclusion: Click here to enter text. Recommend Preliminary Decision to deny proposed activity (subject to Interagency Coordination and Public Comment). Go to Step 23.

16. OAR 340-041-0004(9)(a)(D)(i-iv) of the *Water Quality Limited Waters Policy* requires that the Department evaluate the application for one of the following: Will the discharge be associated (directly or indirectly) with the pollution parameter(s) causing the waterbody to be designated a Water Quality Limited Water?

☐ Yes, please provide basis for conclusion: Click here to enter text. Recommend Preliminary Decision to deny proposed activity (subject to Interagency Coordination and Public Comment). Go to Step 23.

☐ No, please provide basis for conclusion: Click here to enter text. Go to Step 20.

Have TMDLs, WLAs, LAs, and reserve capacity been established, compliance plans been established, and is there sufficient reserve capacity to assimilate the increased load under the established TMDL?

☐ Yes, please provide basis for conclusion: Click here to enter text. Go to Step 20.

☐ No, please provide basis for conclusion: Click here to enter text. Recommend Preliminary Decision to deny proposed activity (subject to Interagency Coordination and Public Comment). Go to Step 23.

Will the proposed activity meet the requirements, as specified under OAR 340-041-0004(9)(a)(D)(iii) of the *Water Quality Limited Waters Policy*, for dissolved oxygen?

☐ Yes, please provide basis for conclusion: Click here to enter text. Go to Step 20.

☐ No, please provide basis for conclusion: Click here to enter text. Recommend Preliminary Decision to deny proposed activity (subject to Interagency Coordination and Public Comment). Go to Step 23.

Will the activity solve an existing, immediate, and critical environmental problem?

☐ Yes, please provide basis for conclusion: Click here to enter text. Go to Step 20.

☐ No, please provide basis for conclusion: Click here to enter text. Recommend Preliminary Decision to deny proposed activity (subject to Interagency Coordination and Public Comment). Go to Step 23.

17. Is the proposed activity consistent with local land use plans?

☐ Yes, go to Step 21.

☐ No, please provide basis for conclusion: Click here to enter text. Recommend Preliminary Decision to deny proposed activity (subject to Interagency Coordination and Public Comment). Go to Step 23.

18. OAR 340-041-0004(9)(c)(A) requires the Department to consider alternatives to lowering water quality. At a minimum, the following list must be considered:

- Improved operation and maintenance of existing treatment system
- Recycling or reuse with no discharge
- Discharge to on-site system
- Seasonal or controlled discharges to avoid critical water quality periods
- Discharge to sanitary sewer
- Land application

Were any of the alternatives feasible?

☐ Yes, please provide basis for conclusion (see below for information requirements): Click here to enter text. Recommend Preliminary Decision that applicant use alternative. Go to Step 16.

☐ No, please provide basis for conclusion (see below for information requirements: Click here to enter text. Go to Step 22.

In a separate statement to this application, please explain the *technical feasibility* of the alternative, explain the *economic feasibility* of the alternative, and provide an *estimated cost* of NPDES permit alternative for a five-year period from start-up.

19. OAR 340-041-0004(9)(c)(B) of the *Water Quality Limited Waters Policy* requires the Department to consider the economic effects of the proposed activity, which in this context consists of determining if the social and

economic benefits of the activity outweigh the environmental costs of allowing a lowering of water quality. Do the social and economic benefits outweigh the environmental costs of lowering the water quality?

☐ Yes. Provide basis for conclusion: Click here to enter text. Proceed with Application Process to Interagency Coordination and Public Comment. Go to Step 23.

☐ No. Provide basis for conclusion: Click here to enter text. Recommend Preliminary Decision to deny proposed activity (subject to Interagency Coordination and Public Comment). Go to Step 23.

The basis for conclusion should include a discussion of whether the lowering of water quality is necessary and important. "Necessary" means that the same social and economic benefits cannot be achieved with some other approach. "Important" means that the value of the social and economic benefits due to lowering water quality is greater than the environmental costs of lowering water quality.

Benefits can be created from measures such as:

- Creating or expanding employment (provide current/expected number of employees, type & relative amount of each type
- Increasing median family income
- Increasing community tax base (provide current/expected annual sales, tax info)
- Providing necessary social services
- Enhancing environmental attributes

Environmental Costs can include:

- Losing assimilative capacity otherwise used for other industries/development
- Impacting fishing, recreation, and tourism industries negatively
- Impacting health protection negatively
- Impacting societal value for environmental quality negatively

20. On the basis of the Anti-degradation Review, the following is recommended:

☐ Proceed with Application to Interagency Coordination and Public Comment Phase.

☐ Deny Application; return to applicant and provide public notice

21. OAR 340-041-0004(9)(c)(A) requires the Department to consider alternatives to lowering water quality. At a minimum, the following list must be considered:

- Improved operation and maintenance of existing treatment system
- Recycling or reuse with no discharge
- Discharge to on-site system
- Seasonal or controlled discharges to avoid critical water quality periods

- Discharge to sanitary sewer
- Land application

Were any of the alternatives feasible?

☐ Yes, please provide basis for conclusion (see below for information requirements): Click here to enter text. Recommend Preliminary Decision that applicant use alternative. Go to Step 16.

☐ No, please provide basis for conclusion (see below for information requirements: Click here to enter text. Go to Step 22.

In a separate statement to this application, please explain the *technical feasibility* of the alternative, explain the *economic feasibility* of the alternative, and provide an *estimated cost* of NPDES permit alternative for a five-year period from start-up.

22. OAR 340-041-0004(9)(c)(B) of the *Water Quality Limited Waters Policy* requires the Department to consider the economic effects of the proposed activity, which in this context consists of determining if the social and economic benefits of the activity outweigh the environmental costs of allowing a lowering of water quality. Do the social and economic benefits outweigh the environmental costs of lowering the water quality?

☐ Yes. Provide basis for conclusion: Click here to enter text. Proceed with Application Process to Interagency Coordination and Public Comment. Go to Step 23.

☐ No. Provide basis for conclusion: Click here to enter text. Recommend Preliminary Decision to deny proposed activity (subject to Interagency Coordination and Public Comment). Go to Step 23.

The basis for conclusion should include a discussion of whether the lowering of water quality is necessary and important. "Necessary" means that the same social and economic benefits cannot be achieved with some other approach. "Important" means that the value of the social and economic benefits due to lowering water quality is greater than the environmental costs of lowering water quality.

Benefits can be created from measures such as:

- Creating or expanding employment (provide current/expected number of employees, type & relative amount of each type
- Increasing median family income
- Increasing community tax base (provide current/expected annual sales, tax info)
- Providing necessary social services
- Enhancing environmental attributes

Environmental Costs can include:

- Losing assimilative capacity otherwise used for other industries/development
- Impacting fishing, recreation, and tourism industries negatively
- Impacting health protection negatively

- Impacting societal value for environmental quality negatively

23. On the basis of the Anti-degradation Review, the following is recommended:

☐ Proceed with Application to Interagency Coordination and Public Comment Phase.

☐ Deny Application; return to applicant and provide public notice.

Action Approved

Review prepared by ☐ DEQ, go to DEQ info ☐ Other, go to Other info

DEQ info

Section: Source Control

Name: David Cole

Phone: 503-229-5011

Date Prepared: 4/29/2014

Other info

Please provide the following information and submit with the completed application form to:

Department of Environmental Quality

Water Quality Division—Surface Water Management

811 SW Sixth Avenue

Portland, Oregon 97204-1390

Attachment D
Permit Scenarios Water Balances

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City of Molalla
Monthly Water Balance
Future (2043) - Scenario #1
Project Number 100.26

Influent Flow Information:	AWWF	4.24	mgd	
	ADWF	1.9	mgd	
Lagoon Information (7):	Average Lagoon Area	25	acres	
	Future Additional Lagoon Area	35	acres	
	Assumed Level at beginning of summer	3	ft	
	Maximum water level	12	ft	
	Maximum total storage capacity	720	ac-ft	235 MG
	Maximum surge volume	540	ac-ft	176 MG
	Irrigation area	440	acres	
	Additional Irrigation Area	400	acres	
	Irrigation efficiency	100%		
	Irrigation May and Oct	Yes		
	Discharge May	No		
	Discharge June	No		
	Discharge October	No		

Month	Influent (1)		Precipitation (2)		Evap. (3)			Irrigation (4)			Lagoon Leakage (5)			Molalla River Discharge (6)		Net Storage	Storage Accum.	Surge Volume
	(MG)	(ac-ft)	(in)	(ac-ft)	(in)	(ac-ft)	(MG)	(in)	(ac-ft)	(MG)	(in)	(ac-ft)	(MG)	(MG)	(ac-ft)	(ac-ft)	(ac-ft)	(ac-ft)
																	180	
May	105	322	2.59	13.0	4.1	-20.50	-6.68	1.31	-91.7	-29.9	0	0	0	0	0	222	402	222
June	60	183	2.07	10.4	5.1	-25.50	-8.31	3.01	-210.7	-68.7	0	0	0	0	0	-43	360	180
July	48	148	0.52	2.6	6.9	-34.50	-11.24	5.88	-411.6	-134.1	0	0	0	0	0	-295	180	0
August	45	139	1.07	5.4	6.2	-31.00	-10.10	4.68	-327.6	-106.7	0	0	0	0	0	-214	180	0
September	45	139	2.02	10.1	4.2	-21.00	-6.84	1.53	-107.1	-34.9	0	0	0	0	0	21	201	21
October	46	142	4.29	21.5	1.9	-9.50	-3.10	0.19	-13.3	-4.3	0	0	0	0	0	141	342	162
November	97	296	6.38	31.9	0.0	0.00	0.00	0	0.0	0.0	0	0	0	-97	-296	32	374	194
December	191	585	7.13	35.7	0.0	0.00	0.00	0	0.0	0.0	0	0	0	-191	-585	36	409	229
January	140	431	7.31	36.6	0.0	0.00	0.00	0	0.0	0.0	0	0	0	-140	-431	37	446	266
February	115	352	4.99	25.0	0.0	0.00	0.00	0	0.0	0.0	0	0	0	-115	-352	25	471	291
March	144	441	5.13	25.7	0.0	0.00	0.00	0	0.0	0.0	0	0	0	-144	-441	26	496	316
April	81	250	3.2	16.0	3.1	-15.50	-5.05	0	0.0	0.0	0	0	0	-81	-250	1	497	317
May	105	322	2.59	13.0	4.1	-20.50	-6.68	1.31	-91.7	-29.9	0	0	0	0	0	222	719	539
June	60	183	2.07	10.4	5.1	-25.50	-8.31	3.01	-210.7	-68.7	0	0	0	0	0	-43	676	496
July	48	148	0.52	2.6	6.9	-34.50	-11.24	5.88	-411.6	-134.1	0	0	0	0	0	-295	381	201
August	45	139	1.07	5.4	6.2	-31.00	-10.10	4.68	-327.6	-106.7	0	0	0	0	0	-214	180	0
September	45	139	2.02	10.1	4.2	-21.00	-6.84	1.53	-107.1	-34.9	0	0	0	0	0	21	201	21
October	46	142	4.29	21.5	1.9	-9.50	-3.10	0.19	-13.3	-4.3	0	0	0	0	0	141	342	162
November	97	296	6.38	31.9	0.0	0.00	0.00	0	0.0	0.0	0	0	0	-97	-296	32	374	194
December	191	585	7.13	35.7	0.0	0.00	0.00	0	0.0	0.0	0	0	0	-191	-585	36	409	229
January	140	431	7.31	36.6	0.0	0.00	0.00	0	0.0	0.0	0	0	0	-140	-431	37	446	266
February	115	352	4.99	25.0	0.0	0.00	0.00	0	0.0	0.0	0	0	0	-115	-352	25	471	291
March	144	441	5.13	25.7	0.0	0.00	0.00	0	0.0	0.0	0	0	0	-144	-441	26	496	316
April	81	250	3.2	16.0	3.1	-15.50	-5.05	0	0.0	0.0	0	0	0	-81	-250	1	497	317
Total	1117	3428	47	234	31.5	-157.5	-51.3	16.6	-1162.0	-378.6	0	0	0	-767	-2355	Required	719	539

Average Flow	-4.2	
AWWF	-4.2	

(1) Influent based on AWWF and ADWF and historical distribution of flows.
(2) Precipitation data derived from NOAA Molalla station.
(3) Evaporation based on historical means for Corvallis in the Climatology Handbook, September 1969.
(4) Irrigation based on 2015 RWUP.
(5) Lined lagoon.
(6) Molalla River discharge is equal to influent flow.
(7) Assumes sludge is removed from lagoons to allow flow equalization.

City of Molalla
Monthly Water Balance
Future (2043) - Scenario #2
Project Number 100.26

Influent Flow Information:	AWWF	4.24	mgd	
	ADWF	1.9	mgd	
Lagoon Information (7):	Average Lagoon Area	25	acres	
	Future Additional Lagoon Area	10	acres	
	Assumed Level at beginning of summer	3	ft	
	Maximum water level	12	ft	
	Maximum total storage capacity	420	ac-ft	137 MG
	Maximum surge volume	315	ac-ft	103 MG
	Irrigation area	440	acres	
	Additional Irrigation Area	150	acres	
	Irrigation efficiency	100%		
	Irrigation May and Oct	Yes		
	Discharge May	Yes		
	Discharge June	No		
	Discharge October	No		

Month	Influent (1)		Precipitation (2)		Evap. (3)			Irrigation (4)			Lagoon Leakage (5)			Molalla River Discharge (6)		Net Storage	Storage Accum.	Surge Volume
	(MG)	(ac-ft)	(in)	(ac-ft)	(in)	(ac-ft)	(MG)	(in)	(ac-ft)	(MG)	(in)	(ac-ft)	(MG)	(MG)	(ac-ft)	(ac-ft)	(ac-ft)	(ac-ft)
																	105	
May	105	322	2.59	7.6	4.1	-11.96	-3.90	1.31	-64.4	-21.0	0	0	0	-105	-322	-69	105	0
June	60	183	2.07	6.0	5.1	-14.88	-4.85	3.01	-148.0	-48.2	0	0	0	0	0	26	131	26
July	48	148	0.52	1.5	6.9	-20.13	-6.56	5.88	-289.1	-94.2	0	0	0	0	0	-159	105	0
August	45	139	1.07	3.1	6.2	-18.08	-5.89	4.68	-230.1	-75.0	0	0	0	0	0	-106	105	0
September	45	139	2.02	5.9	4.2	-12.25	-3.99	1.53	-75.2	-24.5	0	0	0	0	0	57	162	57
October	46	142	4.29	12.5	1.9	-5.54	-1.81	0.19	-9.3	-3.0	0	0	0	0	0	140	302	197
November	97	296	6.38	18.6	0.0	0.00	0.00	0	0.0	0.0	0	0	0	-97	-296	19	321	216
December	191	585	7.13	20.8	0.0	0.00	0.00	0	0.0	0.0	0	0	0	-191	-585	21	341	236
January	140	431	7.31	21.3	0.0	0.00	0.00	0	0.0	0.0	0	0	0	-140	-431	21	363	258
February	115	352	4.99	14.6	0.0	0.00	0.00	0	0.0	0.0	0	0	0	-115	-352	15	377	272
March	144	441	5.13	15.0	0.0	0.00	0.00	0	0.0	0.0	0	0	0	-144	-441	15	392	287
April	81	250	3.2	9.3	3.1	-9.04	-2.95	0	0.0	0.0	0	0	0	-81	-250	0	393	288
May	105	322	2.59	7.6	4.1	-11.96	-3.90	1.31	-64.4	-21.0	0	0	0	-105	-322	-69	324	219
June	60	183	2.07	6.0	5.1	-14.88	-4.85	3.01	-148.0	-48.2	0	0	0	0	0	26	350	245
July	48	148	0.52	1.5	6.9	-20.13	-6.56	5.88	-289.1	-94.2	0	0	0	0	0	-159	191	86
August	45	139	1.07	3.1	6.2	-18.08	-5.89	4.68	-230.1	-75.0	0	0	0	0	0	-106	105	0
September	45	139	2.02	5.9	4.2	-12.25	-3.99	1.53	-75.2	-24.5	0	0	0	0	0	57	162	57
October	46	142	4.29	12.5	1.9	-5.54	-1.81	0.19	-9.3	-3.0	0	0	0	0	0	140	302	197
November	97	296	6.38	18.6	0.0	0.00	0.00	0	0.0	0.0	0	0	0	-97	-296	19	321	216
December	191	585	7.13	20.8	0.0	0.00	0.00	0	0.0	0.0	0	0	0	-191	-585	21	341	236
January	140	431	7.31	21.3	0.0	0.00	0.00	0	0.0	0.0	0	0	0	-140	-431	21	363	258
February	115	352	4.99	14.6	0.0	0.00	0.00	0	0.0	0.0	0	0	0	-115	-352	15	377	272
March	144	441	5.13	15.0	0.0	0.00	0.00	0	0.0	0.0	0	0	0	-144	-441	15	392	287
April	81	250	3.2	9.3	3.1	-9.04	-2.95	0	0.0	0.0	0	0	0	-81	-250	0	393	288
Total	1117	3428	47	136	31.5	-91.9	-29.9	16.6	-816.2	-265.9	0	0	0	-872	-2677	Required	393	288

Average Flow	-4.8	
AWWF	-4.2	

(1) Influent based on AWWF and ADWF and historical distribution of flows.
(2) Precipitation data derived from NOAA Molalla station.
(3) Evaporation based on historical means for Corvallis in the Climatology Handbook, September 1969.
(4) Irrigation based on 2015 RWUP.
(5) Lined lagoon.
(6) Molalla River discharge is equal to influent flow.
(7) Assumes sludge is removed from lagoons to allow flow equalization.

City of Molalla
Monthly Water Balance
Future (2043) - Scenario #3
Project Number 100.26

Influent Flow Information:	AWWF	4.24	mgd	
	ADWF	1.9	mgd	
Lagoon Information (7):	Average Lagoon Area	25	acres	
	Future Additional Lagoon Area	10	acres	
	Assumed Level at beginning of summer	3	ft	
	Maximum water level	12	ft	
	Maximum total storage capacity	420	ac-ft	137 MG
	Maximum surge volume	315	ac-ft	103 MG
	Irrigation area	440	acres	
	Additional Irrigation Area	100	acres	
	Irrigation efficiency	100%		
	Irrigation May and Oct	Yes		
	October Discharge	No		
	May Discharge	No		
	June Discharge	No		

Month	Influent (1)		Precipitation (2)		Evap. (3)			Irrigation (4)			Lagoon Leakage (5)			Molalla River Discharge (6)		Net Storage	Storage Accum.	Surge Volume
	(MG)	(ac-ft)	(in)	(ac-ft)	(in)	(ac-ft)	(MG)	(in)	(ac-ft)	(MG)	(in)	(ac-ft)	(MG)	(MG)	(ac-ft)	(ac-ft)	(ac-ft)	(ac-ft)
																	105	
May	105	322	2.59	7.6	4.1	-11.96	-3.90	1.31	-59.0	-19.2	0	0	0	0	0	258	363	258
June	60	183	2.07	6.0	5.1	-14.88	-4.85	3.01	-135.5	-44.1	0	0	0	0	0	39	402	297
July	48	148	0.52	1.5	6.9	-20.13	-6.56	5.88	-264.6	-86.2	0	0	0	0	0	-135	267	162
August	45	139	1.07	3.1	6.2	-18.08	-5.89	4.68	-210.6	-68.6	0	0	0	0	0	-87	181	76
September	45	139	2.02	5.9	4.2	-12.25	-3.99	1.53	-68.9	-22.4	0	0	0	0	0	64	244	139
October	46	142	4.29	12.5	1.9	-5.54	-1.81	0.19	-8.6	-2.8	0	0	0	0	0	140	385	280
November	97	296	6.38	18.6	0.0	0.00	0.00	0	0.0	0.0	0	0	0	-117	-359	-45	340	235
December	191	585	7.13	20.8	0.0	0.00	0.00	0	0.0	0.0	0	0	0	-210	-645	-39	301	196
January	140	431	7.31	21.3	0.0	0.00	0.00	0	0.0	0.0	0	0	0	-166	-510	-58	243	138
February	115	352	4.99	14.6	0.0	0.00	0.00	0	0.0	0.0	0	0	0	-140	-428	-61	182	77
March	144	441	5.13	15.0	0.0	0.00	0.00	0	0.0	0.0	0	0	0	-168	-514	-58	123	18
April	81	250	3.2	9.3	3.1	-9.04	-2.95	0	0.0	0.0	0	0	0	-105	-321	-71	105	0
Total	1117	3428	47	136	31.5	-91.9	-29.9	16.6	-747.0	-243.4	0	0	0	-905	-2778	Required	402	297

Average Flow	-5.0
AWWF	-5.0

(1) Influent based on AWWF and ADWF and historical distribution of flows.
(2) Precipitation data derived from NOAA Molalla station.
(3) Evaporation based on historical means for Corvallis in the Climatology Handbook, September 1969.
(4) Irrigation based on 2015 RWUP.
(5) Lined lagoon.
(6) Molalla River discharge is equal to influent flow plus surge volume at end of October plus precipitation in winter.
(7) Assumes sludge is removed from lagoons to allow flow equalization.

City of Molalla
Monthly Water Balance
Future (2043) - PS #4
Project Number 100.26

Influent Flow Information:	AWWF	4.24	mgd	
	ADWF	1.9	mgd	
Lagoon Information (7):	Average Lagoon Area	25	acres	
	Future Additional Lagoon Area	0	acres	
	Assumed Level at beginning of summer	3	ft	
	Maximum water level	12	ft	
	Maximum total storage capacity	300	ac-ft	98 MG
	Maximum surge volume	225	ac-ft	73 MG
	Irrigation area	440	acres	
	Additional Irrigation Area	100	acres	
	Irrigation efficiency	100%		
	Irrigation May and Oct	Yes		
	October Discharge	No		
	May Discharge	Yes		
	June Discharge	No		

Month	Influent (1)		Precipitation (2)		Evap. (3)			Irrigation (4)			Lagoon Leakage (5)			Molalla River Discharge (6)		Net Storage	Storage Accum.	Surge Volume
	(MG)	(ac-ft)	(in)	(ac-ft)	(in)	(ac-ft)	(MG)	(in)	(ac-ft)	(MG)	(in)	(ac-ft)	(MG)	(MG)	(ac-ft)	(ac-ft)	(ac-ft)	(ac-ft)
																	75	
May	105	322	2.59	5.4	4.1	-8.54	-2.78	1.31	-59.0	-19.2	0	0	0	-105	-322	-62	75	0
June	60	183	2.07	4.3	5.1	-10.63	-3.46	3.01	-135.5	-44.1	0	0	0	0	0	41	116	41
July	48	148	0.52	1.1	6.9	-14.38	-4.68	5.88	-264.6	-86.2	0	0	0	0	0	-130	75	0
August	45	139	1.07	2.2	6.2	-12.92	-4.21	4.68	-210.6	-68.6	0	0	0	0	0	-82	75	0
September	45	139	2.02	4.2	4.2	-8.75	-2.85	1.53	-68.9	-22.4	0	0	0	0	0	66	141	66
October	46	142	4.29	8.9	1.9	-3.96	-1.29	0.19	-8.6	-2.8	0	0	0	0	0	138	279	204
November	97	296	6.38	13.3	0.0	0.00	0.00	0	0.0	0.0	0	0	0	-111	-342	-33	246	171
December	191	585	7.13	14.9	0.0	0.00	0.00	0	0.0	0.0	0	0	0	-205	-629	-29	218	143
January	140	431	7.31	15.2	0.0	0.00	0.00	0	0.0	0.0	0	0	0	-159	-488	-42	176	101
February	115	352	4.99	10.4	0.0	0.00	0.00	0	0.0	0.0	0	0	0	-133	-407	-44	131	56
March	144	441	5.13	10.7	0.0	0.00	0.00	0	0.0	0.0	0	0	0	-161	-494	-42	89	14
April	81	250	3.2	6.7	3.1	-6.46	-2.10	0	0.0	0.0	0	0	0	-98	-301	-51	75	0
Total	1117	3428	47	97	31.5	-65.6	-21.4	16.6	-747.0	-243.4	0	0	0	-972	-2983	Required	279	204

Average Flow	-5.4
AWWF	-4.8

(1) Influent based on AWWF and ADWF and historical distribution of flows.
(2) Precipitation data derived from NOAA Molalla station.
(3) Evaporation based on historical means for Corvallis in the Climatology Handbook, September 1969.
(4) Irrigation based on 2015 RWUP.
(5) Lined lagoon.
(6) Molalla River discharge is equal to influent flow plus surge volume at end of October plus precipitation in winter.
(7) Assumes sludge is removed from lagoons to allow flow equalization.

Attachment E
Geosyntec Consultants
Technical Analysis in Support of Draft NPDES Permit

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Geosyntec consultants

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Date:	16 May 2018
To:	Tiffany Yelton Bram, Oregon Department of Environmental Quality
Cc:	Dan Huff, City of Molalla
	J.W. Ring, Mark Strandberg, and Christine Hein, Ring Bender LLP
	Dale Richwine, Richwine Environmental.
From:	Rob Annear and Jacob Krall, Geosyntec Consultants
Subject:	Technical Analyses in Support of NPDES Permit Modification Request

INTRODUCTION

This memorandum details analyses conducted to support the City of Molalla (City) in its draft National Pollutant Discharge Elimination System (NPDES) permit for its wastewater treatment plant (WWTP). The impacts of the proposed revised permit conditions on dissolved oxygen (DO) and total suspended solids (TSS) are evaluated.

The WWTP currently discharges to the Molalla River between November and April. The maximum WWTP effluent concentration is 10 mg/L for both Biochemical Oxygen Demand (BOD) and TSS. The WWTP is currently required to stop discharging when the 7-day average flow as measured at the USGS Gauge at Canby (Gauge #14200000) drops below 350 cfs.

This memorandum also evaluates the impacts of potentially increasing the maximum BOD and TSS concentration to 30 mg/L for November-April and allowing river discharge for the full year, provided the other conditions are met.

DISSOLVED OXYGEN

The Streeter-Phelps equation was used to evaluate the predicted maximum dissolved oxygen deficit due to the Biochemical Oxygen Demand (BOD) from the current WWTP with the proposed new permit conditions. The Oregon DEQ Streeter-Phelps equation spreadsheet, developed for reasonable potential analysis, was used[1]. Table 1 outlines the assumptions made in these calculations. The dissolved oxygen analysis was conducted for the current WWTP, based on 2025

[1] ODEQ, 2005. RPA Calculation Workbook Dissolved Oxygen, Revision 1.0. Retrieved from http://www.oregon.gov/deq/wq/wqpermits/Pages/NPDES-Individual-Permit-Templates.aspx

Dry Weather Design Flow conditions from the 2007 design documents. The assumptions made in this analysis are outlined in Table 1.

Table 1. Assumptions made in Dissolved Oxygen Analysis for Current WWTP Using the Streeter-Phelps Equation Spreadsheet (from DEQ).

Assumption/Parameter	Assumed Value	Notes/Reference
Ambient River Flow	350 cfs at Canby	Table 1
Ambient DO concentration	10.48 mg/L	Saturation value based on temperature at the point where the WWTP enters the river after mixing
WWTP Design Flow	2.3 MGD	2025 Dry Weather Design Flows For Current WWTP
WWTP DO Concentration	6 mg/L	Typical value for Cascade Aeration System
WWTP $CBOD_5$ concentration	10 mg/L	Draft NPDES Permit, May-October conditions
WWTP NH3-N concentration	16.7 mg/L	Current Permit Conditions
Total Kjeldahl Nitrogen	20.9 mg/L	Based on NH3-N being 80% of total Nitrogen
Deoxygenation rate constant at 20°C	Worst Case: 0.14/day	Maximum of range for Willamette River (McCutchen, 1983, DEQ spreadsheet)
River velocity	2.5 feet/second	Estimated based on USGS (2010)
River depth	1.7 feet	Estimated based on USGS (2010)
River width	67 feet	Estimated based on USGS (2010)
Sediment Oxygen Demand	0.45 $g/m^2/day$	Set so that the river without the WWTP maintains a constant DO.

The calculation conducted here is conservative for three reasons.

1) The calculation assumes that the WWTP is discharging at the Dry Weather Design Flow despite low river flow conditions, which is very unlikely.
2) The calculation assumes an effluent BOD of 30 mg/L—the November-April permit limit. It is much more likely that a river flow of 350 cfs at Canby would occur during the summer months, when the maximum BOD would be 10 mg/L.
3) The calculation assumes a WWTP effluent DO of 6 mg/L. Discharge monitoring report data shows that effluent DO is typically 10-12 mg/L.

Figure 1 shows the DO concentration sag curve for the assumptions indicated in Table 1, with an ambient river flow at Canby of 350 cfs. The figure demonstrates the current WWTP would have a small impact on the DO concentration in the Molalla River for 2025 Dry Weather Design Flow.

The figure shows the DO concentration sag curve for the river both with and without the current WWTP discharge. The DO in the river is reduced by 0.07 mg/L within the mixing zone due to the mixing with the current WWTP effluent.

Downstream of the WWTP, in the absence of other point sources and tributaries, the river DO concentration trends towards a value 0.09 mg/L below the river absent the WWTP. The analysis based on the current plant flows for 2025 show the DO concentration remains above 95% of saturation, meeting the standard in OAR 340-041-006 and the antidegradation condition in OAR 340-041-0028 (3) (c).

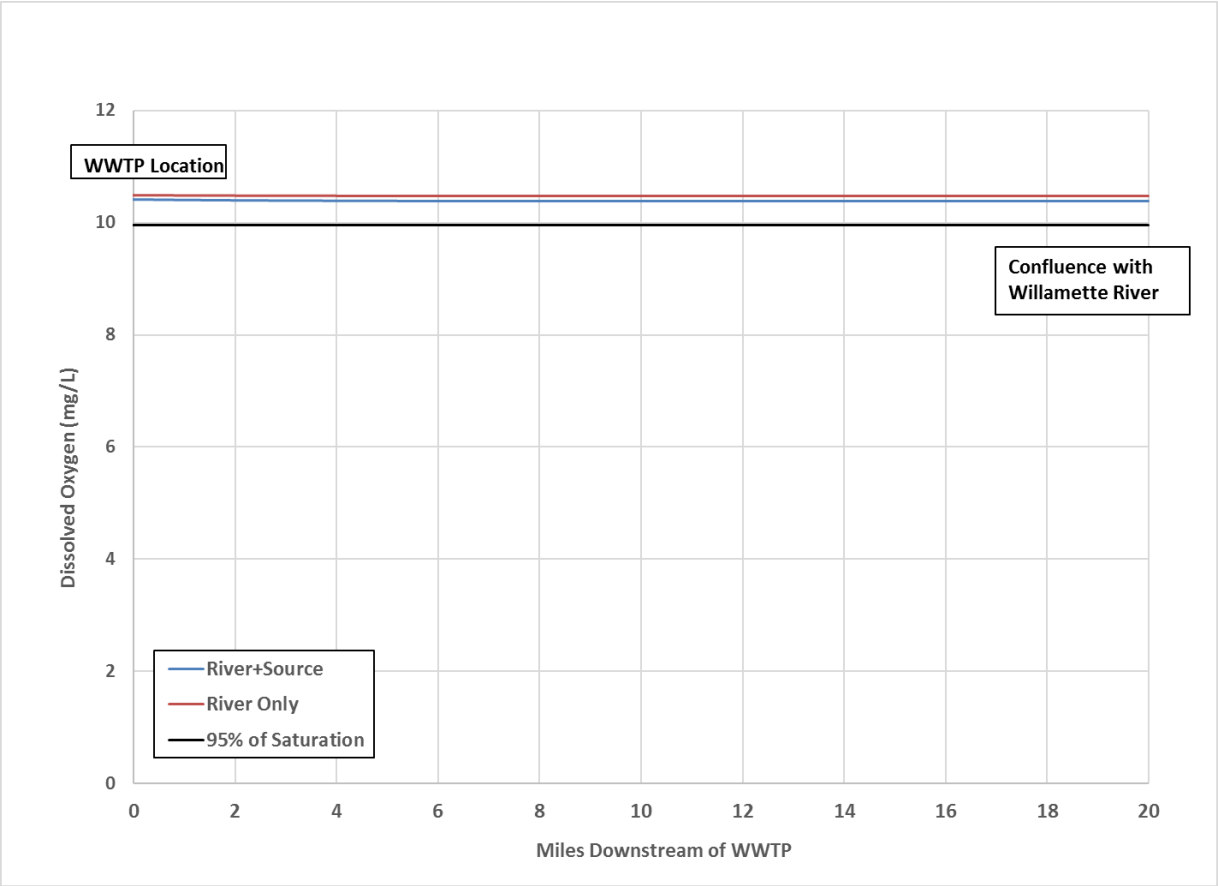

Figure 1. Dissolved Oxygen Sag Curve for the current WWTP 2025 Dry Weather Design Flow Conditions for Ambient River Flow of 350 cfs at Canby.

TOTAL SUSPENDED SOLIDS

Molalla River TSS concentration data were analyzed to understand the natural variability of TSS in the river and as the basis for determining the impacts to river TSS due to the WWTP.

Figure 2 is a box-and-whisker plot showing the natural variability of TSS in the Molalla River based on 25 samples collected by the ODEQ at Canby from February 2013 through April 2017. The average TSS concentration for these samples is 7.5 mg/L and the median is 3.0 mg/L. The 25^{th}-75^{th} percentile range is 1-6 mg/L.

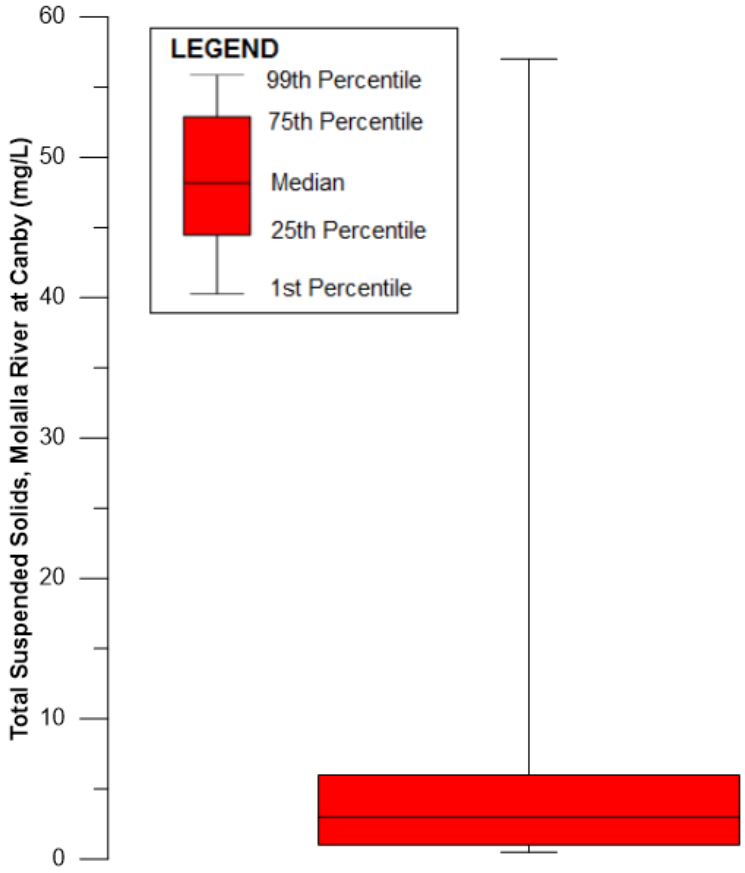

Figure 2. Box-and-whisker plot displaying variability of TSS in the Molalla River.

Table 2 shows how much the TSS concentration in the Molalla River would be expected to increase, as a function of ambient river flow. The table is based on a mass balance calculation assuming a plant discharge of 2.3 MGD, the median river TSS concentration of 3.0 mg/L and an effluent TSS of 30 mg/L. Table 2 demonstrates the increase in river TSS concentration due to the WWTP would be small—even at a low river flow of 150 cfs at Canby (well below the flow at which Molalla will be required to cease discharge) and median ambient TSS in the river (3.0 mg/L), the WWTP would only increase the TSS concentration in the river by 1.0 mg/L, well within the natural variability of river TSS concentration.

Table 2. Expected Increase in Molalla River TSS due to WWTP, as a Function of Ambient Molalla River Flow.

Molalla River Flow at USGS Gauge at Canby (#14200000), cfs	Expected TSS Concentration Downstream of WWTP (mg/L)	Increase in TSS Due to WWTP (mg/L), Relative to Median River TSS
350	3.2	0.4
300	3.2	0.5
250	3.3	0.6
200	3.3	0.7
150	3.3	1.0

SUMMARY

Overall, the analyses presented here support the requested permit criteria and demonstrate that the proposed new permit conditions will not degrade the river.

REFERENCES

ODEQ, 2008. Molalla-Pudding Subbasin TMDL & WQMP. December.

ODEQ, 2014. National Pollutant Discharge Elimination System Waste Discharge Permit #101514.

United States Geological Survey (2010). Geomorphic Setting, Aquatic Habitat and Water-Quality Conditions of the Molalla River, Oregon, 2009-2010.

Attachment F
2010 – 2018
Wet Season System Water Balances

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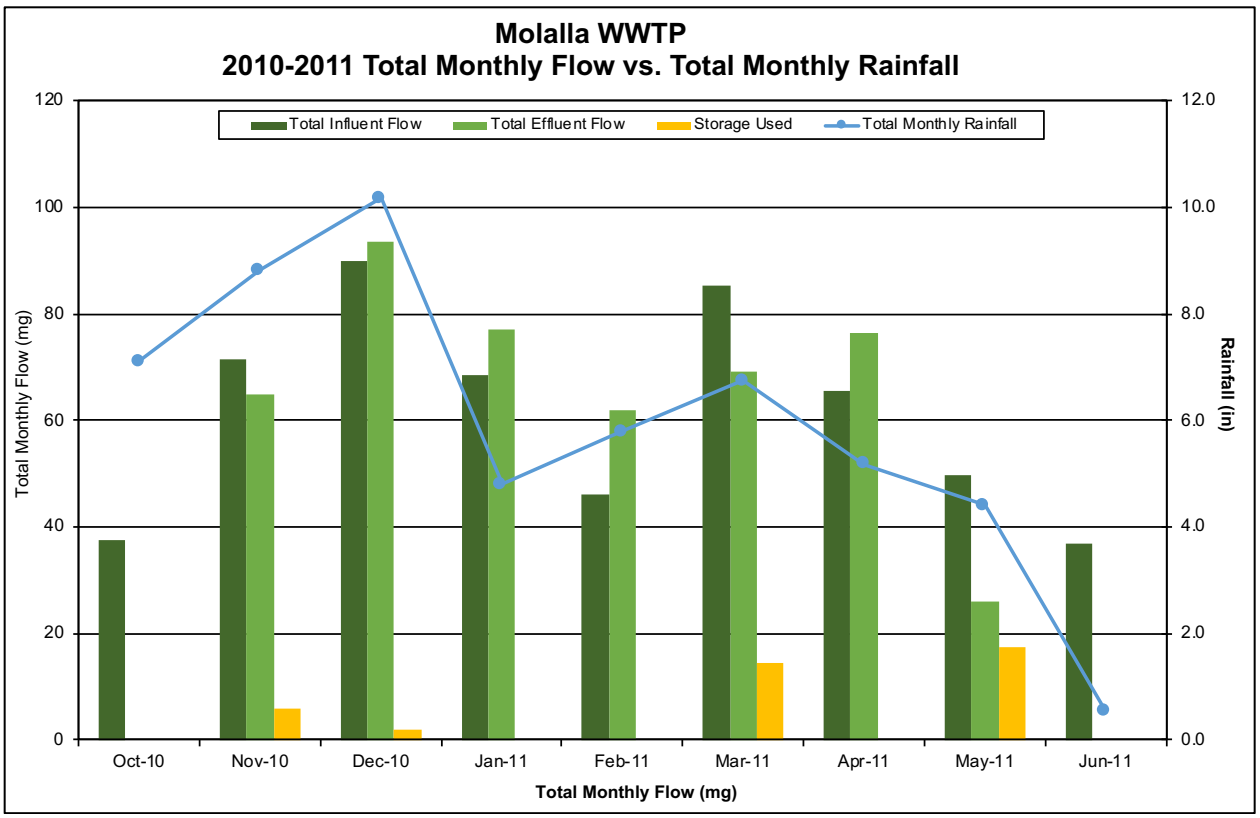

Figure F-1: 2010 – 2011 System Water Balance

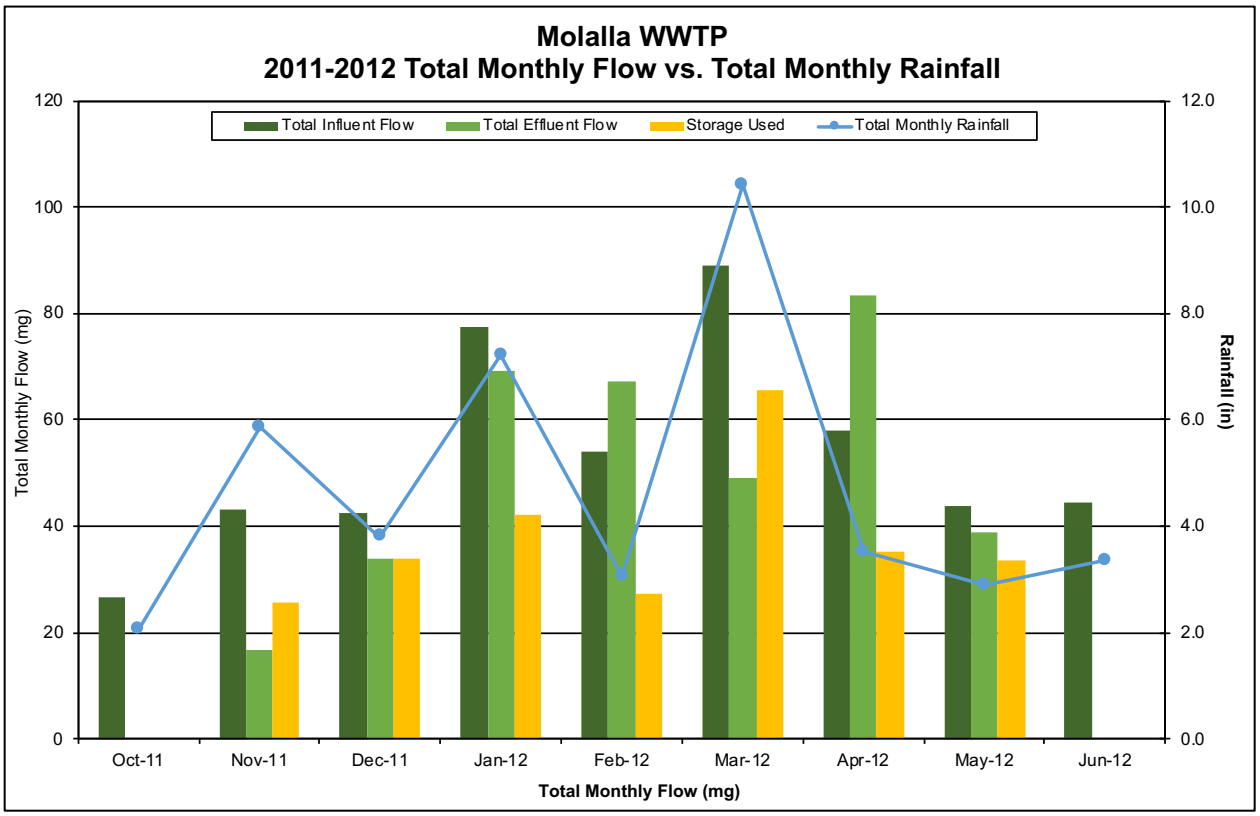

Figure F-2: 2011 – 2012 System Water Balance

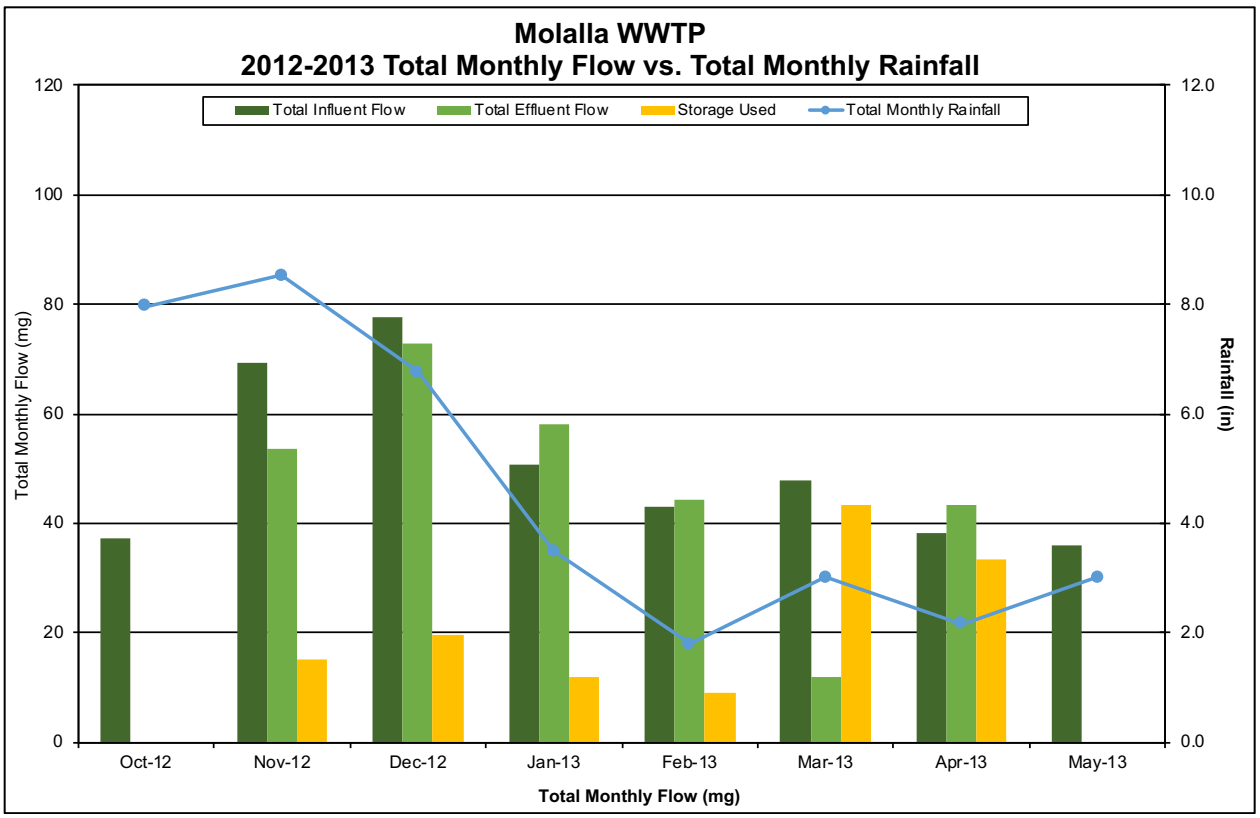

Figure F-3: 2012 – 2013 System Water Balance

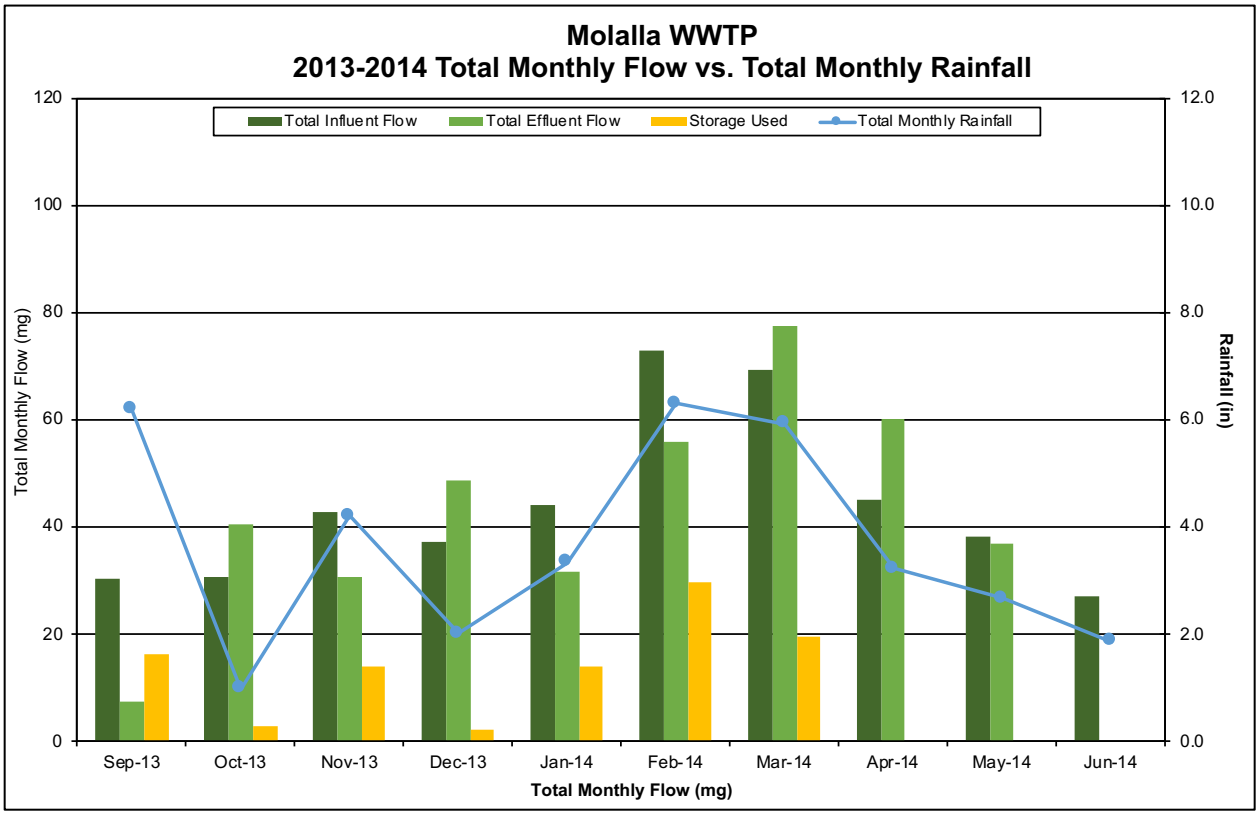

Figure F-4: 2013 – 2014 System Water Balance

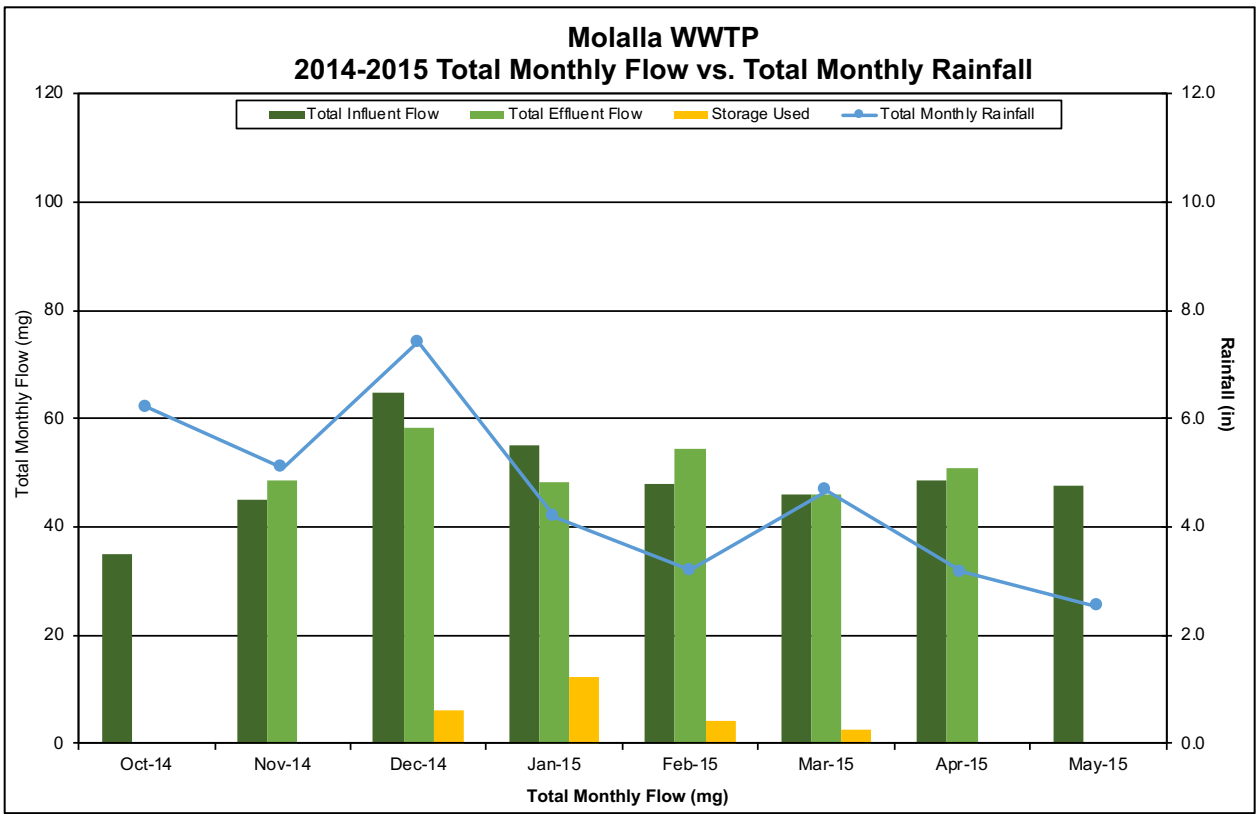

Figure F-5: 2014 – 2015 System Water Balance

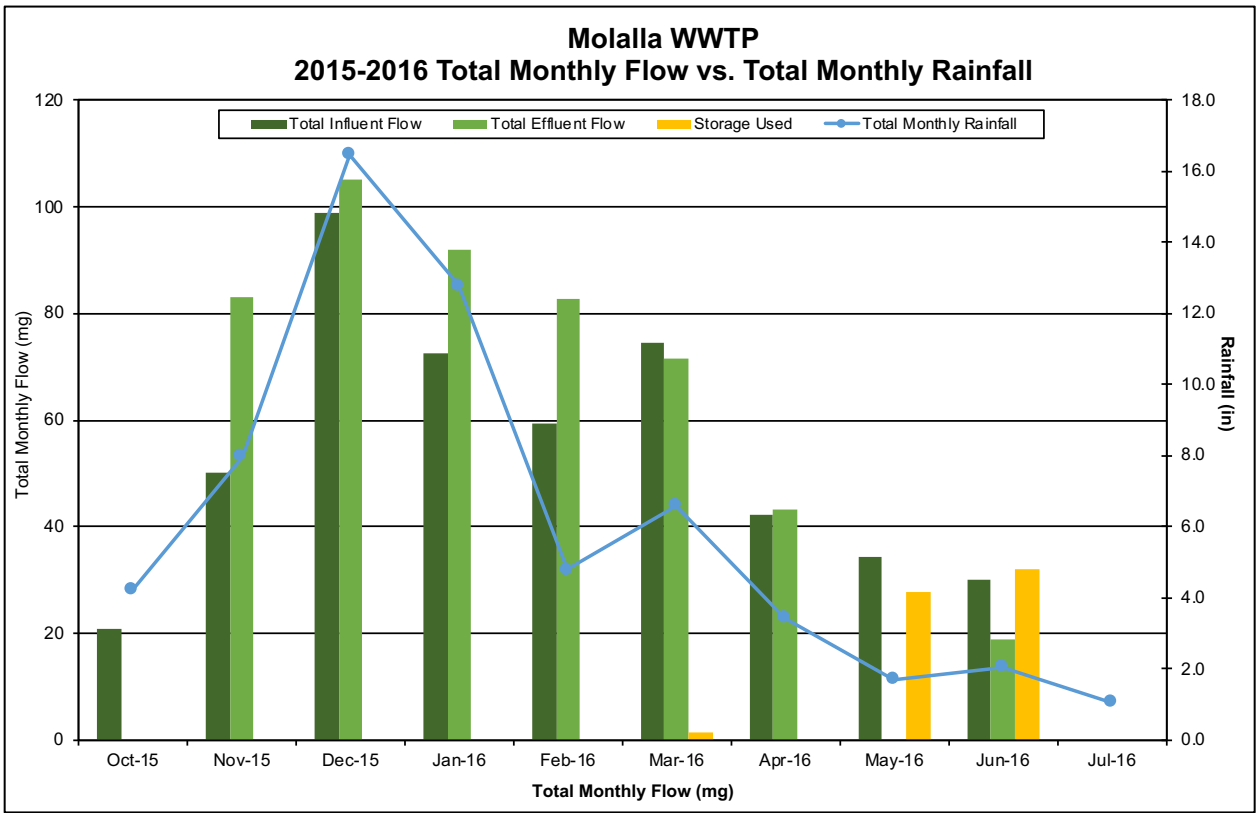

Figure F-6: 2015 – 2016 System Water Balance

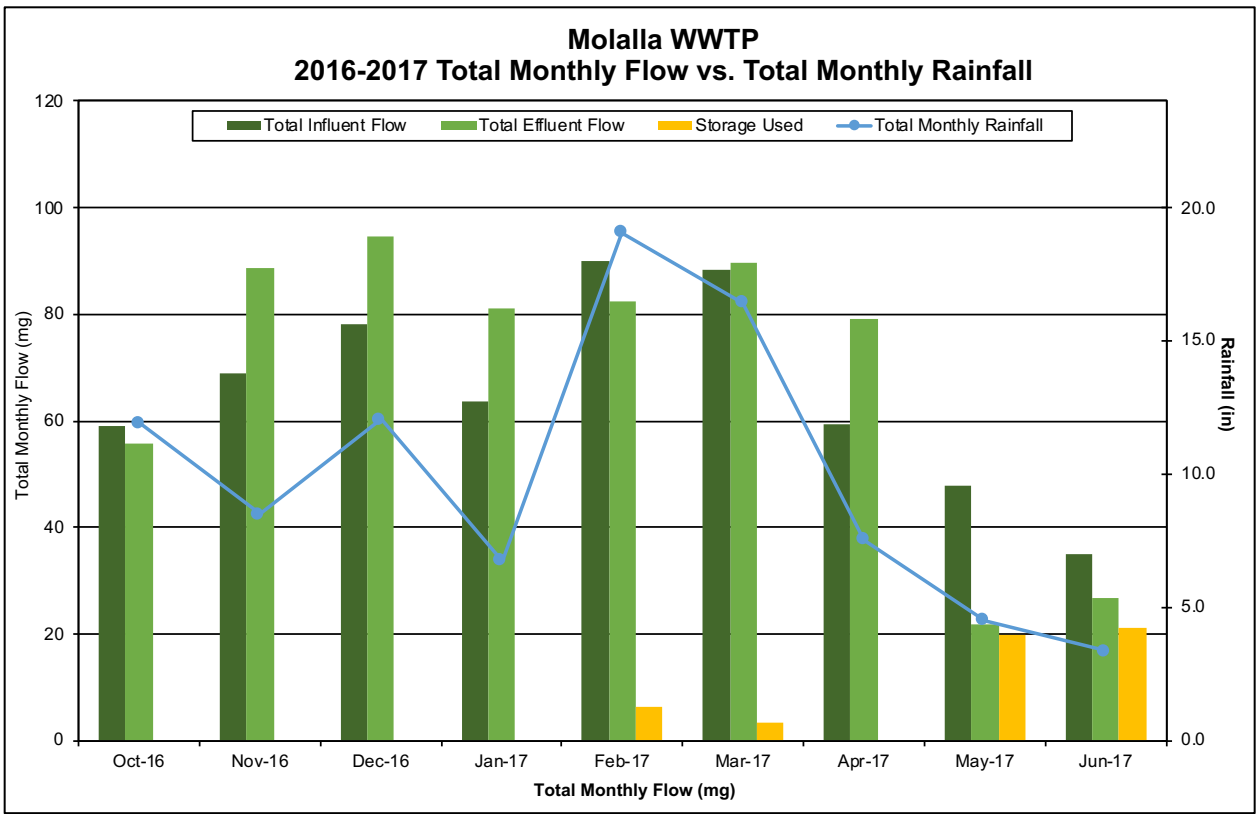

Figure F-7: 2016 – 2017 System Water Balance

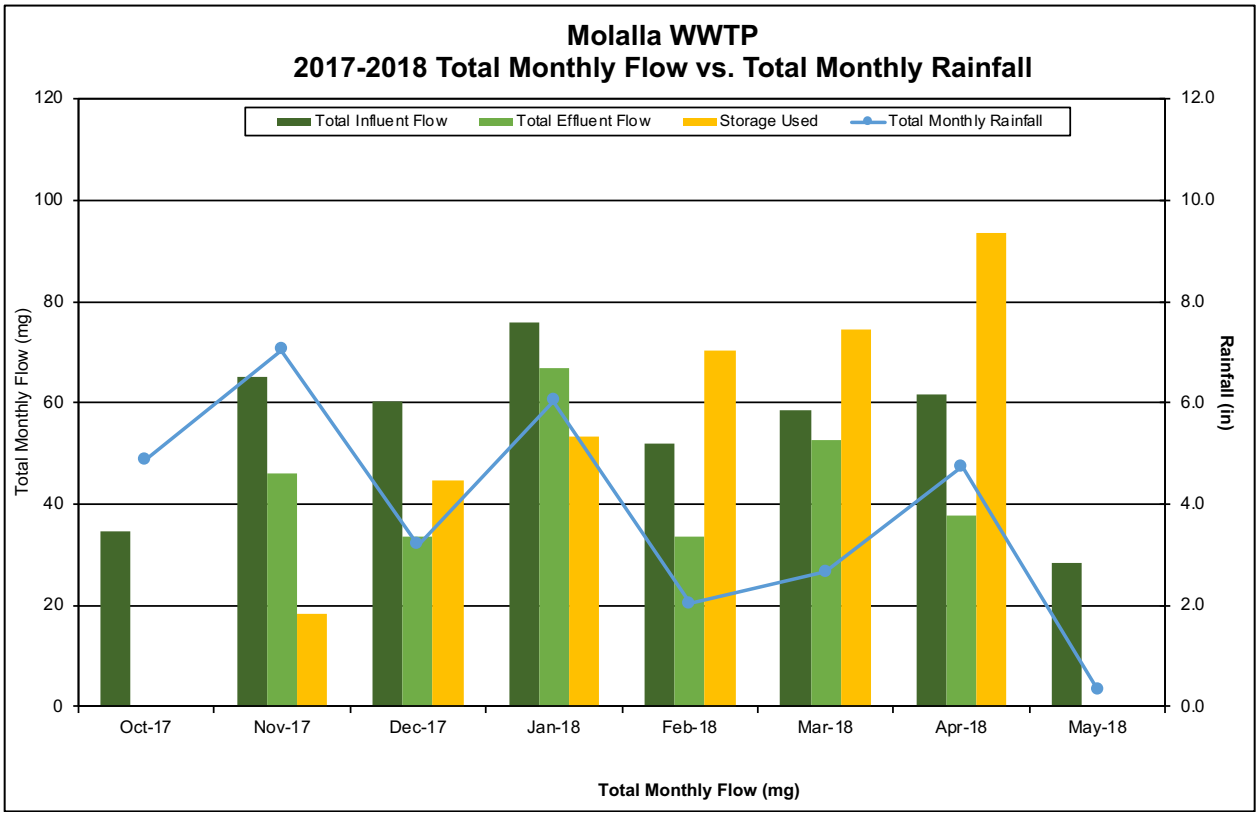

Figure F-8: 2017 – 2018 System Water Balance

Attachment G
2002 Permit Fact Sheet
and NPDES Wastewater Discharge Permit Evaluation

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FACT SHEET
And
NPDES WASTEWATER DISCHARGE PERMIT EVALUATION

FOR CITY OF MOLALLA

Department of Environmental Quality
Northwest Region – Portland Office
2020 SW 4th Ave., Suite 400, Portland, OR 97201
Telephone: (503) 229-5263

PERMITTEE: **City of Molalla**
PO Box 248
Molalla, OR 97038
File Number: 57613

SOURCE LOCATION: 12424 Toliver Road

SOURCE CONTACT:

Dean Madison, Director of Public Works Telephone Number: 503-829-6855

PERMIT WRITER:

Garry L. Sage Telephone Number: 503-229-5690

PROPOSED ACTION: Renewal of a National Pollutant Discharge Elimination System (NPDES) wastewater discharge permit

SOURCE CATEGORY: Minor Domestic

TREATMENT SYSTEM CLASS: Level III

COLLECTION SYSTEM CLASS: Level II

PERMIT APPLICATION DATE: October 17, 2002

PERMIT APPLICATION NUMBER: 988627

BACKGROUND

Introduction

The City of Molalla (the City), operates a Wastewater Treatment Facility (the Facility) that is located near the edge of town. Currently, wastewater is treated and discharged to Bear Creek (Outfall 001A), a Pudding River tributary, in accordance with National Pollutant Discharge Elimination System (NPDES) permit Number 101514. The previous permit for the Facility was issued on December 19, 1997 and administratively expired on November 30, 2002. The permit is currently under an administrative continuation awaiting implementation of the renewal permit. The Department of Environmental Quality (DEQ or the Department) received a renewal application on October 17, 2002. A renewal permit is necessary to discharge to state waters pursuant to provisions of Oregon Revised Statutes (ORS) 468B.050 and the Federal Clean Water Act. The Department proposes to renew the permit with significant changes.

The renewal permit facilitates the relocation of the City's discharge from Bear Creek to the Molalla River at approximately River Mile (RM) 20. The proposed Molalla River discharge is listed as Outfall 001, and the existing Bear Creek discharge is "Outfall 001A (temporary)." A Mutual Agreement and Order (the Order) was drafted by the Department to assist in Outfall 001 planning and construction, and to ensure that Outfall 001A is abandoned once Outfall 001 is operational.

Facility Description

The Facility was placed into operation in 1980 to replace an earlier 1955 treatment facility. The last major expansion (Year 2000 through Year 2002) included the construction/installation of headworks improvements, a transfer pumping station, an irrigation pumping station, auxiliary/emergency facility power, and the extension of irrigation supply lines. Facility unit processes are described and design criteria are listed in Attachments 1 and 2.

The major Facility treatment processes include stabilization lagoons (total of 25-acres) with pre-aeration and final effluent polishing by Dissolved Air Floatation (DAF) and filtration. The engineer who designed the Facility determined the design Average Dry Weather Flow (ADWF). The ADWF is the estimated maximum flow during May 1 to October 31 (expressed as a daily average flow), at which the design engineer expects the Facility to consistently meet all effluent limits. Dry weather flows do not include the high levels of Infiltration and Inflow (I&I) that are associated with Oregon winters. Therefore, the design ADWF is used mostly to estimate how much treatment capacity is available for organic loads. For this Facility, the design ADWF is **0.79** million gallons/day (MGD). The current actual average dry weather flow for May 1 to October 31 for the past two years is 0.67 MGD. Based on current flows, the Facility is at 85% of its organic treatment capacity, and is approaching its design ADWF.

The primary cause of past permit violations by the Facility is the lack of adequate dilution in the receiving stream (Bear Creek) during the winter season. Winter storms rapidly fill the lagoons with influent and rainfall, since the lagoons cover more than 25-acres. To protect the lagoon dikes from wash-out, the facility must increase its discharge to Bear Creek (the former Outfall

001). Even during winter, Bear Creek often has insufficient flow to provide adequate dilution. The lack of receiving stream dilution contributes to violations of permit limits and of water quality standards and criteria, including: 1) the temperature criterion [no more than a 0.25 °F effluent-driven temperature increase allowed in the Regulatory Mixing Zone (RMZ)], the Dissolved Oxygen (DO) depletion criterion (no more than a 0.1 mg/L effluent-driven DO drop allowed in the receiving stream), ammonia toxicity in the Zone of Immediate Dilution (ZID) and RMZ, and incomplete disinfection. When chlorine is used for effluent disinfection, it causes ZID and RMZ toxicity violations. When filtration alone is used to meet *E. coli* limits, the virus kill level is uncertain.

See the Compliance History section below and Attachment 3 for further discussion of past permit limit violations.

The current actual average wet weather flow (November 1 through April 30) for the past two years is 1.31 MGD. The peak day flow over the past two years is 3.85 MGD. Given winter discharge and the lack of adequate flow in Bear Creek, the Department recommends that the Facility outfall be moved to the Molalla River at RM 20. DEQ has calculated a design Average Wet Weather Flow (AWWF) = 1.92 MGD that applies at the new discharge location (see Attachment 4). New mass load limits are allowed based on the AWWF, per Oregon Administrative Rule (OAR) 340-041-0120 (9) (B) and (D). By shifting the Facility outfall to the Molalla River and by using the AWWF as the basis for mass load calculations, the Facility can comply in all respects with renewal permit limits based on more stringent Water Quality (WQ) criteria. It is anticipated that once the above changes are made, dilution related violations of permit limits and of water quality standards and criteria should not occur.

A further consideration is that the previous permit allowed year-round discharge to Bear Creek based on the dilution limit specified in the permit. The renewal permit only allows winter discharge, both to the Molalla River and to the temporary outfall on Bear Creek (Outfall 001A). Winter mass loads go up under the renewal permit for Outfall 001, but year-round discharge is eliminated. Additionally, summer irrigation on the Coleman Ranch (the majority of irrigated lands) will offset in-part current irrigation withdrawals from the Molalla River. This should increase flow in the Molalla River near RM 20 during a critical low-flow season that has documented WQ problems.

See the section on I&I for further discussion of winter flows and hydraulic capacity issues.

A "Water Quality Permit Drafting Checklist" (Attachment 5) contains DEQ's Antidegradation Review worksheet and documentation relating to groundwater, enforcement, and facility information.

Attachment 6, "Inspection of Wastewater Treatment Facility," summarizes DEQ's last inspection for the Facility. During this visit, Department staff was shown the proposed location for Outfall 001 to the Molalla River.

Attachment 7, "Permit Milestones," lists major event and documentation milestones since 1955. The milestone summary was prepared using DEQ's current source files.

Biosolids Management and Utilization

In 1999, the City removed biosolids from its treatment lagoons, and no further removal is planned for approximately 10-years (Attachment 8).

No beneficial land application will be allowed under this permit until a Biosolids Management Plan is submitted by the permittee and approved by the Department. The Biosolids Management Plan will ensure compliance with the federal biosolids regulations (40 CFR Part 503).

Inflow and Infiltration (I&I)

An AWWF is added to the permit (Attachment 4). Mass loads are calculated from the AWWF, per Oregon Administrative Rule (OAR) 340-041-0120 (9) (B) and (D), because the facility is impacted by inflow and infiltration. Pursuant to OAR 340-041-0120 (9) (G) the permittee is required to eliminate cost-effective inflow in the collection system. Schedule C, Condition 1, requires the permittee to submit to the Department for review and approval a program and time schedule for identifying and reducing inflow.

Pretreatment

The permittee does not have a formal pretreatment program, nor is one required for this source.

Pollutants Discharged

The renewal permit allows the City to discharge treated effluent from the wastewater treatment plant during winter season. The permit sets limits on the following pollutants: Five-day Biochemical Oxygen Demand (BOD_5), Total Suspended Solids (TSS), *E. coli* bacteria, chlorine residual, ammonia, and specifies minimum required dilution. The discharge is also regulated for pH and pollutant removal efficiency.

Outfalls

Once the outfall relocation is complete, treated and disinfected wastewater must be discharged during winter season at Outfall 001 located at RM 20 on the Molalla River. Outfall 001 must be completed according to the terms and conditions of the MAO that accompanies this permit. Outfall 001 will use an existing irrigation forcemain that currently runs to within several thousand feet of the Molalla River. To complete the outfall, the forcemain must be extended to the river where a diffuser will be installed. Molalla River Outfall 001 replaces the Bear Creek Outfall 001A which must be abandoned because creek flow is inadequate for proper effluent dilution at given discharge levels.

Effluent is irrigated during the summer season. Irrigation is assigned to Outfall 002 which is actually a number of different irrigation properties located within about 4-miles of the treatment

facility. A "Reclaimed Water Use Plan" (the Plan) is required to control all aspects of effluent reuse. A draft Plan was submitted in 1997 (Attachment 9), but many changes have occurred since then to make the Plan obsolete. An updated Plan is required by permit Schedule C, Condition 5.

Receiving Streams/Impact

The designated beneficial uses of the receiving stream per Tables 1-19 in OAR 340-041 are: public and private domestic water supply, irrigation, livestock watering, anadromous fish passage, spawning and rearing, salmonid passage, spawning and rearing, resident fish and aquatic life, wildlife and hunting, fishing, boating, water contact recreation, and aesthetic quality. Attachment 10 contains spawning trend data for the Molalla River.

Water quality standards for the Willamette Basin (OAR 340-041-0445) were developed to protect the beneficial uses for the basin. The permit allows discharge of treated wastewater to the Molalla River at Outfall 001 during winter season. No summer discharge is allowed at this outfall. During winter season, this river segment is water quality limited for Fecal Coliform (Attachment 11) according to the Department's 303(d) list. Effluent discharged at Outfall 001 will not contribute to the Fecal Coliform problem because effluent must be disinfected prior to discharge.

The Department does not anticipate any effluent-drive water quality problems at Outfall 001. Should future data indicate a water quality concern; the Department will develop a Total Maximum Daily Load (TMDL) that will determine the corrective actions necessary to bring this water body back into compliance. The TMDL may assign a pollutant Waste Load Allocation (WLA) to this point source discharge. If a WLA is assigned, the permit will be reopened to incorporate the WLA.

Attachment 12 contains a complete summary of WQ modeling for discharges at Molalla River Outfall 001. Temperature, DO, and chlorine and ammonia toxicity are investigated. Modeling shows that when the dilution equation based on DO is used (see permit Schedule A), all WQ standards and criteria are met.

Attachment 13 contains a summary of WQ modeling for the temporary Bear Creek outfall 001A. Modeling results indicate that the existing Facility can not typically meet WQ standards and criteria at this discharge point.

Temperature

The discharge does not cause a measurable increase in temperature (see Attachment 12) when measured at the edge of the RMZ (a "measurable increase" is defined as greater than 0.25° F). DEQ's temperature calculations use worst-case, winter effluent temperature (59 °F), 25% of available river flow at discharge point, and the applicable stream temperature standard (55 °F).

Discharge at Molalla River Outfall 001 occurs during the winter, when the receiving stream meets all applicable water quality criteria for temperature. The Department's analysis demonstrates that there is no reasonable potential for the discharge to cause or contribute to an exceedance of the temperature standard. Therefore, the permittee is not required to submit or

implement a Temperature Management Plan. Additionally, the permit includes a dilution equation (Schedule A) that ensures compliance with the temperature criterion at the RMZ boundary. Schedule B of the permit requires daily effluent and river temperature monitoring during winter season.

The Department's analysis for temperature criterion compliance at the temporary Bear Creek discharge (Attachment 13) indicates that there are frequent violations.

Groundwater

Available information contained in the Groundwater Prioritization Worksheet (Attachment 14) indicates that there are at least 23 wells in close proximity to the treatment facility and its storage lagoons. Information indicates that some of the wells are probably used as potable water sources. The permit requires further investigation (Schedule-C, Condition 4). Condition 4 requires testing of all wells within 0.25-miles of the treatment facility lagoons for bacteria and nitrates. The well testing results must be submitted to the Department along with a Preliminary Groundwater Assessment within 6-months of permit issuance. Based on report results, further characterizations and/or monitoring of the groundwater may be required. Attachment 14 contains appropriate sections of the Groundwater Prioritization Worksheet, an aerial photograph of the 23 known wells, and recommendations from Henning Larsen of DEQ-NWR for additional data that the Department should request of the permittee.

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.

Permit History

A permit history for this facility must include a discussion of why the Bear Creek outfall is being relocated to the Molalla River at RM 20. The change is necessary because past effluent discharges to Bear Creek have frequently violated the dilution equation specified as follows in the last permit:

> "Effluent BOD_5 concentration in mg/L, divided by the dilution factor (ratio of receiving steam to effluent flow) shall not exceed one."

Furthermore, the above dilution equation does not consider Department guidance requiring the use of only 25% to 33% of the creek flow at the discharge point for RMZ calculations. The above dilution equation uses the full creek flow to specify dilution. When 33% of available creek flow is considered for mixing, it is readily apparent that there is insufficient dilution available to comply with the temperature and DO criteria, and with ammonia and chlorine toxicity (Attachment 13).

In the past the City avoided chlorine toxicity by not disinfecting with chlorine, since filtration typically reduced *E. coli* to levels compliant with the permit limit. This approach, however, created another problem; the level of viral kill without chlorine disinfection is unknown, and as a consequence unacceptable.

The relocation of Outfall 001 to the Molalla River will solve the water quality problems listed above because flow in the Molalla River is significantly greater than that of Bear Creek. The shift in outfall will provide the City with a safe and practical way to meet all water quality standards and criteria.

The renewal permit is written to prevent effluent-driven water quality impacts on the Molalla River. It also corrects negative impacts on Bear Creek by making Outfall 001A a temporary discharge point. The permit deals with winter season I&I and with winter rainfall collected by 25-acres of treatment lagoons by establishing an AWWF = **1.92 MGD**. Mass loads in the renewal permit are based on the AWWF. AWWF data and calculations are contained in Attachment 4. Mass loads under the previous permit were based on the ADWF.

An Antidegradation Review was completed with a recommendation to proceed with this permit action. Attachment 5 contains a copy of the review sheet.

Compliance History

This facility was last inspected April 21, 2003 and on that day was found to be operating in compliance. An inspection report was prepared (Attachment 6).

The monitoring reports for this facility were reviewed for the period since the current permit was issued, including any actions taken relating to effluent violations. The permit compliance conditions were reviewed and all inspection reports for the same period were reviewed (see Attachment 3). Based on this review, the following violations have been documented at this facility during the term of the current permit.

Date of Violation	Type of Enforcement Action	Description of Violation
28April99	Notice of Noncompliance	20 Class II permit limit violations (Dec97 – Apr99).
10Dec03	Notice of Noncompliance	93 Class II permit limit violations (May99 – Sep03)

The Facility's surface water discharge will shift from Bear Creek (Pudding River) to the Molalla River at RM 20. The new outfall location provides ample dilution for stage-based discharge, and the DO based dilution equation listed in Schedule A of the permit protects water quality for all parameters. A MAO was drafted to protect water quality during the outfall relocation process.

PERMIT DISCUSSION

Face Page

The permittee is authorized to construct, install, modify, or operate a wastewater collection, treatment, control, and disposal system. Permits discharge of treated effluent to the Molalla River at Outfall 001 during winter and discharge to irrigation (Outfall 002, reuse) during summer within

limits set by Schedule A and the following schedules. All other discharges are prohibited, except for a temporary winter discharge to Bear Creek at Outfall 001A.

Schedule-A, Waste Discharge limitations

BOD and TSS concentration and mass limits

Based on the Willamette Basin minimum design criteria, wastewater treatment resulting in a monthly average effluent concentration of 10 mg/L for BOD_5 and TSS must be provided from May 1 - October 31. From November 1 - April 30, a minimum of secondary treatment or equivalent control is required. Secondary treatment for this facility is defined as monthly average concentration limit of 30 mg/L for BOD_5 (or 25 mg/L for $CBOD_5$) and 50 mg/L for TSS.

The Department proposes winter season concentration limits more stringent than the basin minimum design criteria. The limits are unchanged from the previous permit. The proposed monthly average BOD_5 concentration limit is 10 mg/L with a weekly average limit of 15 mg/L. The proposed monthly average TSS concentration limit is 10 mg/L with a weekly average limit of 15 mg/L.

Winter mass load limits for the facility at Outfall 001 are based on the design AWWF = 1.92 MGD and the monthly average BOD_5 or TSS concentration limits of 10 mg/L and 10 mg/L, respectively. Winter mass load limits at Outfall 001A are based on the design ADWF = 0.79 MGD and the monthly average BOD_5 or TSS concentration limits of 10 mg/L and 10 mg/L, respectively. These limits are in accordance with OAR 340-041-0120 (9) (a) (B) and (D), and all mass load limitations are rounded to two significant figures.

Since winter mass limits at Outfall 001 are based on AWWF, the permittee is required to remove significant sources of inflow from the collection system. The proposed permit includes a Schedule-C, Condition-1, requiring submittal of a program and time schedule for identifying and removing inflow.

Treated Effluent, Outfall 001A (temporary discharge to Bear Creek)

BOD_5 and TSS

The limits are:

(1) May 1 - October 31:

No discharge to state waters is permitted.

(2) November 1 - April 30:

Parameter	Average Effluent Concentrations		Monthly Average lb/day	Weekly Average lb/day	Daily Maximum Lbs
	Monthly	Weekly			
BOD_5	10 mg/L	15 mg/L	66	99	132
TSS	10 mg/L	15 mg/L	66	99	132

Calculations:

(1) BOD_5

(a) 0.79 MGD x 8.34 #/gal x 10 mg/L monthly avg. = 66 lbs/day
(b) 66 lbs/day monthly avg. x 1.5 = 99 lbs/day weekly avg.
(c) 66 lbs/day monthly avg. x 2.0 = 132 lbs/day daily max.

(2) TSS

(a) 0.79 MGD x 8.34 #/gal x 10 mg/L monthly avg. = 66 lbs/day
(b) 66 lbs/day monthly avg. x 1.5 = 99 lbs/day weekly avg.
(c) 66 lbs/day monthly avg. x 2.0 = 132 lbs/day daily max.

A review of recent DMRs indicates that the City should be able to comply with these permit limits.

BOD and TSS Percent Removal Efficiency

A minimum level of percent removal for BOD_5 and TSS for municipal dischargers is required by the Code of Federal Regulations (CFR) secondary treatment standards (40 CFR, Part 133). An 85 percent removal efficiency limit is included in the proposed permit to comply with federal requirements. An examination of the DMR data indicates the permittee will have little difficulty meeting the limit with the current facilities.

pH

The Willamette Basin Water Quality Standard for pH is found in OAR 340-041-0445 (2) (d). The allowed range is 6.5 to 8.5. The proposed permit limits pH to the range 6.0 to 9.0. This limit is based on Federal wastewater treatment guidelines for sewage treatment facilities, and is applied to the majority of NPDES permittees in the state. Within the permittee's mixing zone, the water quality standard for pH does not have to be met. It is the Department's belief that mixing with ambient water within the mixing zone will ensure that the pH at the edge of the mixing zone meets the standard, and the Department considers the proposed permit limits to be protective of the water quality standard.

Bacteria

The proposed permit limits are based on an *E. coli* standard approved in January 1996. The proposed limits are a monthly geometric mean of 126 E. coli per 100 mL, with no single sample exceeding 406 E. coli per 100 mL. The bacteria standard allows that if a single sample exceeds 406 E coli per 100 mL, then the permittee may take five consecutive re-samples. If the log mean of the five re-samples is less than or equal to 126, a violation is not triggered. The rule states that the re-samples should be taken at four hour intervals beginning as soon as practicable (preferably

within 28 hours) after the original sample was taken. The rule also allows for changing the resampling timeframe, if it poses an undue hardship on the treatment facility.

Dilution

Dilution at Outfall 001A is controlled by following:

> Effluent BOD5 concentration in mg/L, divided by the dilution factor (ratio of receiving stream flow to effluent flow) shall not exceed one.

Mixing Zone on Bear Creek

The mixing zone established on Bear Creek at Outfall 001A is defined as follows:

> The mixing zone must not extend beyond fifty (50) feet downstream from the point of discharge.

Chlorine Residual

The permittee does not chlorinate the effluent discharged at Outfall 001A. Instead, the Facility uses DAF followed by filtration to meet permit limits for bacteria (*E. coli*). Since no chlorine is used, there is no potential for chlorine toxicity in the mixing zone. Filtration, however, without chlorine disinfection potentially causes a second problem, i.e. the level of virus kill is unknown.

Temperature

Attachment 13 provides a summary of the Department's temperature analysis for Bear Creek at Outfall 001A. DEQ has determined that discharge to Bear Creek frequently violates the temperature criterion.

The Department has determined that the Facility can meet the above permit limits, with the exception of dilution; however, the dilution formula above is not protective of water quality in Bear Creek. Mixing zone modeling by DEQ shows that available dilution typically is far below that required to protect water quality. The above formula does not protect water quality for allowable temperature increase and DO reduction, or from ammonia toxicity. The Order that accompanies this permit will correct these problems by ensuring a timely relocation of winter effluent discharge to the Molalla River with subsequent abandonment of Outfall 001A.

Treated Effluent, Outfall 001 (discharge to the Molalla River)

BOD_5 and TSS

The limits are:

(1) May 1 - October 31:

No discharge to waters of the State is permitted, unless approved in writing by the Department.

(2) November 1 - April 30:

Parameter	Average Effluent Concentrations Monthly	Weekly	Monthly Average lb/day	Weekly Average lb/day	Daily Maximum Lbs
BOD_5	10 mg/L	15 mg/L	160	240	320
TSS	10 mg/L	15 mg/L	160	240	320

Calculations:

(1) BOD_5

(a) 1.92 MGD x 8.34 #/gal x 10 mg/L monthly avg. = 160 lbs/day
(b) 160 lbs/day monthly avg. x 1.5 = 240 lbs/day weekly avg.
(c) 160 lbs/day monthly avg. x 2.0 = 320 lbs/day daily max.

(2) TSS

(a) 1.92 MGD x 8.34 #/gal x 10 mg/L monthly avg. = 160 lbs/day
(b) 160 lbs/day monthly avg. x 1.5 = 240 lbs/day weekly avg.
(c) 160 lbs/day monthly avg. x 2.0 = 320 lbs/day daily max.

A review of recent water quality modeling indicates that the City should be able to comply with the permit limits at Outfall 001 to the Molalla River.

BOD and TSS Percent Removal Efficiency

A minimum level of percent removal for BOD_5 and TSS for municipal dischargers is required by the Code of Federal Regulations (CFR) secondary treatment standards (40 CFR, Part 133). An 85 percent removal efficiency limit is included in the proposed permit to comply with federal requirements. An examination of the DMR data indicates the permittee will have little difficulty meeting the limit with the current facilities.

pH

The Willamette Basin Water Quality Standard for pH is found in OAR 340-041-0445 (2) (d). The allowed range is 6.5 to 8.5. The proposed permit limits pH to the range 6.0 to 9.0. This limit is based on Federal wastewater treatment guidelines for sewage treatment facilities, and is applied to the majority of NPDES permittees in the state. Within the permittee's mixing zone, the water quality standard for pH does not have to be met. It is the Department's belief that mixing with ambient water within the mixing zone will ensure that the pH at the edge of the mixing zone meets

the standard, and the Department considers the proposed permit limits to be protective of the water quality standard.

Bacteria

The proposed permit limits are based on an *E. coli* standard approved in January 1996. The proposed limits are a monthly geometric mean of 126 E. coli per 100 mL, with no single sample exceeding 406 E. coli per 100 mL. The bacteria standard allows that if a single sample exceeds 406 E coli per 100 mL, then the permittee may take five consecutive re-samples. If the log mean of the five re-samples is less than or equal to 126, a violation is not triggered. The rule states that the re-samples should be taken at four hour intervals beginning as soon as practicable (preferably within 28 hours) after the original sample was taken. The rule also allows for changing the resampling timeframe, if it poses an undue hardship on the treatment facility.

Chlorine Residual

Disinfection of the effluent with chlorine is the process the permittee will use at Outfall 001 to comply with the waste discharge limitations for bacteria. Chlorine is a known toxic substance and as such is subject to limitation under Oregon Administrative Rules. The rule (OAR 340-041-0445 (2) (p)) states in part that toxic substances shall not be discharged to waters of the state at levels that adversely affect public health, aquatic life or other designated beneficial uses. In addition, levels of toxic substances shall not exceed the criteria listed in Table 20 which were based on criteria established by the EPA and published in Quality Criteria for Water (1986), unless otherwise noted.

OAR 340-041-0445 (4), however, states that the Department may allow a designated portion of a receiving water to serve as a zone of dilution for wastewaters and receiving waters to mix thoroughly and this zone will be defined as a mixing zone. The Department may suspend all or part of the water quality standards or set less restrictive standards in the RMZ provided: (1) The water within the mixing zone that lies outside of the ZID is free of materials in concentrations that will cause acute toxicity to aquatic life, as measured by the acute bioassay method, and (2) Water outside the boundary of the RMZ is free of materials in concentrations that will cause chronic toxicity.

Furthermore, 40 CFR §122.44 (d) states that permit limitations must control all pollutants or pollutant parameters which are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any state water quality standard, including state narrative criteria for water quality. Fresh water criteria for chlorine were used to calculate permit limits. According to OAR 340-041, Table 20, a chlorine concentration of **11 µg/L** can result in chronic toxicity in fresh waters, while **19 µg/L** can result in acute chlorine toxicity in fresh waters.

Compliance with acute toxicity criteria is required at the edge of the ZID and compliance with chronic toxicity criteria is required at the edge of the RMZ. For the facility, outfall, and mixing zone as presently configured, the dilution factor at the edge of the ZID must be at least **9.6:1** during

critical low stream flow conditions. The dilution factor at the edge of the RMZ must be at least **12.6:1** during critical low flow conditions.

The above minimum dilutions were used to perform a reasonable potential analysis for chlorine. The analysis indicated there was a reasonable potential for chlorine to cause toxicity within the receiving stream. Therefore, permit limits based on the acute and chronic criteria were calculated. Since the acute and chronic criteria are based on different durations, the durations have to be equalized using an EPA spreadsheet program to determine the more restrictive criteria (Attachment 12). In this case, the acute criterion is the more stringent of the two. Thus, end-of-pipe limits based on that criterion are proposed in the permit.

Final (end-of-pipe) chlorine limits are listed in the permit as **0.07 mg/L** monthly average and **0.18 mg/L** daily maximum. These final permit limits apply to all discharges to the Molalla River.

Temperature

Attachment 12 contains the temperature analysis for Outfall 001 to the Molalla River. Discharges to the Molalla River will not violate the temperature criterion because a dilution equation must be followed, per Schedule A of the permit. The dilution equation
($\mathbf{DR_{DO} = 481.42x^{-0.2765}}$)
is more protective than the dilution required for temperature criterion compliance, per Attachment 12. In conclusion, DEQ is confident that winter discharge to the Molalla River can easily meet the temperature criterion (temperature increase no greater than 0.25 °F). Since the discharge occurs during winter season, no thermal load limit is required.

Mixing Zone and Zone of Immediate Dilution

The allowable mixing zone is that portion of the Molalla River contained within a band extending out 12-feet from the discharge side of the river, wherein the mixing zone extends 5-feet upstream of the outfall and 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 5-feet of the point of discharge.

The Department believes that the beneficial uses of the receiving stream will not be affected by the discharge and that the defined mixing zone meets the criteria in the rule.

Dissolved Oxygen (DO)

Schedule-A of the permit states that discharge at Molalla River Outfall 001 must comply with the dilution equation
($\mathbf{DR_{DO} = 481.42x^{-0.2765}}$)
Where x = Molalla River flow in cfs, and DR_{DO} = **DO** Dilution Ratio = (river flow)/(effluent flow). DR_{DO} complies with the DO reduction criterion both near- and far-field, i.e. ensures that effluent will not cause a DO deficit anywhere in the river greater than 0.1 mg/L.

Other Parameters

Schedule-A contains limits to prevent ammonia toxicity in the Molalla River RMZ. The limits require that effluent ammonia not exceed **11.5 mg/L** monthly average and **25.9 mg/L** daily maximum at end-of-pipe. When MAO mandated construction is complete, it is anticipated that the permitted facility can meet these limits.

Reclaimed Wastewater (reuse), Outfall 002

The Total Coliform (bacteria) limits for irrigation of level II reclaimed water are a 7-day median of 23 organisms/100 mL, with no two consecutive samples to exceed 240 total coliform per 100 mL.

The proposed effluent limits are achievable through proper operation and maintenance.

Reclaimed Water

The utilization of treated effluent for agricultural purposes is regulated under OAR 340-055. The facility produces Level II reclaimed water, and irrigates during the summer up to 343 acres at various locations.

Prior to irrigation with reclaimed water, the discharge must comply with total coliform limits based on protection of human health due to human pathogens. For Level II reclaimed water, the limits include a weekly median of 23 total coliform per 100 mls with no two consecutive samples to exceed 240 total coliform per 100 mls.

The application of reclaimed water must be managed in accordance with an approved Reclaimed Water Use Plan. All reclaimed water shall be distributed on land, for dissipation by evapotranspiration and controlled seepage by following sound irrigation practices so as to prevent:

a. Prolonged ponding of treated reclaimed water on the ground surface.
b. Surface runoff or subsurface drainage through drainage tile.
c. The creation of odors, fly and mosquito breeding or other nuisance conditions.
d. The overloading of land with nutrients, organics, or other pollutant parameters.
e. Impairment of existing or potential beneficial uses of groundwater.

Specific crops, application rates and buffers are approved by the Department under the Reclaimed Water Use Plan. The bacterial effluent limitations are achievable through proper operation and maintenance. Schedule C, Condition 5, requires the submittal of an updated and approvable Reclaimed Water Use Plan within 180 days of permit issuance.

Raw Sewage Discharges

Schedule-A includes a narrative requirement prohibiting raw sewage discharges to waters of the State from November 1 through May 21, except during a storm event greater than the one-in-

five-year, 24-hour duration storm; and from May 22 through October 31, except during a storm event greater than the one-in-ten-year, 24-hour duration storm.

Groundwater Protection

Schedule-A includes a narrative requirement for managing all wastewater and process related residuals in a manner that will prevent a violation of the Department's Groundwater Quality Protection Rules.

Schedule-B - Minimum Monitoring and Reporting Requirements

In 1988, the Department developed a monitoring matrix for commonly monitored parameters. Proposed monitoring frequencies for all parameters are based on this matrix and, in some cases, may have changed from the current permit. The proposed monitoring frequencies for all parameters correspond to those of facilities of similar size and complexity in the state.

The permittee is required to have a laboratory Quality Assurance/Quality Control program. The Department recognizes that some tests do not accurately reflect the performance of a treatment facility due to quality assurance/quality control problems. These tests should not be considered when evaluating the compliance of the facility with the permit limitations. Thus, the Department proposes to include in the opening paragraph of Schedule B a statement recognizing that some test results may be inaccurate, invalid, or do not adequately represent the facility's performance and should not be used in calculations required by the permit.

Influent Monitoring and Reporting Requirements

Total influent flow must be monitored daily, and the flow meter calibrated annually. BOD_5 and TSS must be sampled by 24-hour composite sampler twice per week. pH must be grab-sampled three times per week.

Effluent Monitoring and Reporting Requirements

Total effluent flow must be monitored daily, and the flow meter calibrated annually. BOD_5 and TSS must be sampled by 24-hour composite sampler twice per week. pH must be grab-sampled three times per week. Monitoring for *E. coli*, once per week, must be performed in accordance with one of the methods approved by the Department. Daily measurement of chlorine residual requires a daily grab-sample to check/calibrate the continuous chlorine monitor from which the daily maximum chlorine residual is taken. The weight of chlorine used must be measured daily. The chlorine residual average is calculated monthly. Pounds of BOD_5 and TSS discharged daily must be calculated twice per week, and a weekly average must be calculated for each. BOD_5 and TSS average percent removal must be calculated monthly. Ammonia as total N must be grab-sampled twice per week. A monthly average must be calculated for ammonia based on all daily grab sample results. Daily maximum effluent and Molalla River temperatures must be measured and recorded. Daily effluent and river temperatures must be averaged monthly. Temperature monitors must be audited in November and March, and must receive a visual check each month

during the season of use. A daily minimum effluent DO determination and a calculation of monthly average minimum effluent DO are required.

Reuse Monitoring and Reporting Requirements

Reclaimed wastewater is discharged at Outfall 002, as summer season irrigation. Reuse of effluent requires daily monitoring for irrigation flow, and quantity of chlorine used and chlorine residual. The flow meter must be calibrated annually. pH must be grab-sampled twice per week, and total coliform grab-sampled once per week.

In order to characterize the Facility's contribution of nutrients to irrigated lands during the summer season, the proposed permit includes a requirement to monitor the treated effluent for certain nutrients. One grab-sample quarterly (May 1 through October 31) must be collected to monitor Total Kjeldahl Nitrogen, nitrate plus nitrite, ammonia and total phosphorus. The monitoring frequencies are in accordance with Department rules and guidance. An annual report describing the effectiveness of the reclaimed water system is required.

Discharge monitoring reports must be submitted to the Department monthly by the 15th day of the following month. The monitoring reports need to identify the principal operators designated by the Permittee to supervise the treatment and collection systems. The reports must also include records concerning movement of sewage solids within the facility, and all applicable equipment breakdowns and bypassing.

Permit Schedule-B includes the requirement for submittal of annual reports. The conditions are standard language requirements concerning: (1) Annual report on inflow and infiltration removal, and (2) Annual report on the use of reclaimed water.

Schedule C - Compliance Conditions

The proposed permit includes 5 compliance conditions with compliance deadlines. The requirements include:

(1) Inflow Reduction – Within 180-days of permit issuance, the permittee must submit a draft program and schedule for identifying and reducing inflow. Within 60-days of receiving Department comment, the permittee must submit a final approvable program and time schedule.

(2) Bio-Solids Management Plan - The permittee must submit a Biosolids Management Plan to the Department for approval at least six months prior to the removal of biosolids from the lagoon.

(3) Sewage Overflow Locations – Permittee must submit within 90 days of permit issuance a report identifying known raw sewage overflow points and providing a schedule to eliminate the overflows, if applicable.

(4) Preliminary Groundwater Assessment – Permittee must submit within 6 months of permit issuance a Preliminary Groundwater Assessment Report. Based on the Department's review of the Preliminary Groundwater Assessment Report, a hydrogeologic characterization and/or groundwater monitoring plan may be required.

(5) Reclaimed Water Use Plan – Permittee must submit an updated and approvable Reclaimed Water Use Plan within 180-days of permit issuance. The Plan must comply with OAR 340-055.

The final condition requires the permittee to meet the compliance dates established in this schedule or notify the Department within 14 days following any lapsed compliance date.

Schedule D - Special Conditions

The proposed permit includes 4 special conditions under Schedule D. The requirements include:

(1) Reclaimed Water Use - The permittee must comply with the rules concerning the use of reclaimed water and the Reclaimed Water Use Plan approved by the Department.

(2) Cropping and Reuse – The permittee must keep a cover crop on the irrigation site at all times, unless otherwise approved by the Department in the Reclaimed Water Use Plan.

(3) Operator Certification – The permittee must have the facilities supervised by personnel certified by the Department in the operation of treatment and/or collection systems.

(4) Notification – Permittee must notify the Department in accordance with the response times noted in the General Conditions of the permit of any malfunction so that corrective action can be coordinated between the permittee and the Department.

Schedule E, Pretreatment Program - ***NOT APPLICABLE***

Schedule-F, NPDES General Conditions – NPDES Standard Conditions are attached to the permit.