TUALATIN RIVER WATERSHED
NON-POINT SOURCE TOTAL MAXIMUM DAILY LOAD
ANNUAL REPORT

Clackamas Water Environment Services, Clackamas County, and the City of Rivergrove

July 1, 2021 – June 30, 2022

November 1, 2022

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1. Introduction

The federal Clean Water Act, section 303, requires states to develop water quality standards to support uses beneficial of public water bodies. Where water quality standards are not being met, the water body or the appropriate reach is listed on the 303(d) list of water quality limited water bodies for that pollutant. The State of Oregon, through the Oregon Department of Environmental Quality (DEQ), is required to develop Total Maximum Daily Loads (TMDLs) to determine how to meet water quality standards for that pollutant.

The TMDL process begins when a stream, lake, or river does not meet water quality standards and is classified as water quality-limited on the state's 303(d) list. TMDLs identify the maximum amount of a specific pollutant that can be present in a water body without violating water quality standards. This is known as the loading capacity. After extensive water quality monitoring and modeling efforts, TMDLs establish the difference between the loading capacity and the current pollutant load. TMDLs are expressed as numeric standards or percent pollutant reductions that need to be met to bring water bodies into compliance with water quality standards. The difference between the current load and the loading capacity is known as excess load (DEQ, 2004). The excess load is split up between the different sources of pollution according to their contribution to the overall pollution load. Pollution reduction activities mitigate any difference between the waterway's loading capacity and the current pollutant load. DEQ develops waste load allocations (WLA) for point sources such as wastewater treatment plants, MS4-permitted outfalls, and industrial discharges, and load allocations (LA) for non-point source pollution from rural-residential, rural-commercial, rural-industrial, agricultural, and forestry lands, and from small urban areas which aren't regulated by a MS4 Permit.

Oregon Administrative Rule (OAR) 340-042-0080 requires local governments and other agencies to develop TMDL Implementation Plans for their non-point source pollution load allocation.

Responsible parties that are able to implement pollution reduction strategies are classified as Designated Management Agencies (DMAs). DMAs can include federal agencies such as the Bureau of Land Management, state agencies such as the Oregon Department of Forestry and the Oregon Department of Agriculture, counties, cities, and others. According to OAR 340-042-0080, TMDL Implementation Plans (IP) must include the following five elements:

1. Management strategies that will be used to achieve load allocations
2. A timeline and schedule to achieve measurable milestones
3. A plan for periodic review and revision of the implementation plan
4. Evidence of compliance with applicable statewide land use requirements
5. Any other analyses or information as specified in the Water Quality Management Plan

This TMDL Annual Report is for the non-point sources of surface water pollution from Clackamas Water Environment Services' (WES) surface water management service area in the Tualatin River's watershed (the Surface Water Management Agency of Clackamas County or SWMACC), Clackamas County's Business and Community Services Department (BCS), Clackamas County's Dept. of Transportation & Development (DTD), and the City of Rivergrove. The report summarizes the progress towards management strategies for protecting and improving water quality.

WES' surface water management service area in the Tualatin River's watershed was established in 1992 as a Clackamas County Service District with the purpose of addressing the total phosphorus Total Maximum Daily Load (TMDL). Its boundaries include the properties in the Tualatin River Watershed that are within unincorporated Clackamas County and the City of Rivergrove. WES collects fees from each residence and business within its boundaries – based on the amount of impervious surface on the property – for the specific purpose of addressing stormwater-related water quality issues, the stormwater-related TMDLs, and surface/groundwater pollution. The funding received by WES is dedicated to this purpose and cannot be allocated to other functions or programs.

SWMACC is a largely rural area with a small urban component in and near the City of Rivergrove and in the unincorporated Lake Grove area, which is near the City of Lake Oswego (it does not include lands in the cities of West Linn, Tualatin, and Lake Oswego).

This annual report addresses the Load Allocations (LA) that have been allocated to Clackamas County, the City of Rivergrove, and to WES/SWMACC. WLAs, which are issued by DEQ to point sources, are not addressed in this annual report.

2. Clackamas County Surface Water Overview

2.1 Watersheds

The major watersheds of Clackamas County are shown on Table 1. A large portion of Clackamas County is drained by the Willamette River and its tributaries including the Clackamas, Molalla, Pudding, and Tualatin Rivers (Table 1). The remaining lands are drained by the Sandy River, which enters the Columbia River in the City of Troutdale. Separate TMDL Implementation Plans have been developed for Clackamas County's, the City of Happy Valley's, and WES' efforts to comply with the Willamette, Sandy, and Molalla-Pudding River TMDLs.

Table 1. Clackamas County Watersheds

Clackamas County watersheds	Total acres in watershed	Watershed in Clackamas County, acres	Percent of watershed in Clackamas County
Clackamas	602,634	540,456	90
Molalla-Pudding	560,037	305,785	55
Tualatin	453,849	12,587	3
Lower Columbia-Sandy	560,566	235,361	42
Middle Willamette	455,502	73,906	16
Lower Willamette	411,905	33,797	8
Total	*3,044,494*	*1,201,890*	
Sub-watershed of Lower Willamette			
Johnson Creek	32,709	9,902	30

2.2 Organizational Summary

Water Environment Services (WES) plays a role in implementing portions of the Tualatin TMDL Implementation Plan. General responsibilities of each County Department, and the City of Rivergrove are outlined in Table 2.

Table 2. County, City and Service District Responsibilities

Responsible Party	Jurisdictional area	TMDL Implementation Plan Responsibility
Clackamas WES	All lands in WES' surface water management service area in the Tualatin River watershed excepting those lands which are regulated by the Stormwater WPCF Permit (i.e. drywells) and the MS4 Permit	Administers this service area, and provides many types of surface water quality protection services, including, but not limited to administering erosion control permits at construction sites, responding to spill incidents, storm system maintenance, water quality monitoring, and providing public education.
Clackamas County DTD	County-wide	Includes Planning, Roads & Engineering and the Office of Sustainability. Riparian area use and other land uses, roads, septic system permitting, illegal dumping and solid waste nuisances on private property.
Clackamas County BCS	County-wide	Economic development and management of surplus real estate, which includes many tracts of land which are under the bed and banks of the Tualatin River. No County Parks are in the watershed and, therefore, BCS does not administer its Dump Stoppers Program here (an illegal solid waste dumping prevention program).
City of Rivergrove	To City limits only	Limited to land use authority and management of City-owned Parks. Most other stormwater management functions are provided by WES on behalf of the City.[1]

[1] WES does not provide any services in the portion of the City of Rivergrove which lies within Washington County.

2.3 Surface Water Responsibilities

As stated above, Clackamas County, WES, and the City of Rivergrove have responsibility as Designated Management Agencies (DMAs) and have cooperated in the development and subsequent revision of the shared Tualatin TMDL Implementation Plan. Each organization has ongoing programs that provide for overall management of surface water quality that contribute to watershed health in the Tualatin watershed.

2.3.1 Wastewater

There are no discharges of treated wastewater effluent within the Tualatin Subbasin that Clackamas County, WES, or the City of Rivergrove is responsible for.

2.3.2 Stormwater

Stormwater enters the Tualatin River and tributaries from areas regulated by the NPDES Municipal Separate Stormwater System (MS4) Permit as well as from areas that are not regulated under the NPDES MS4 program. Figure 2 shows SWMACC, Clackamas County Boundaries and City Boundaries. DEQ regulates MS4-permitted storm sewer outfalls as point sources, and as a result, they are not addressed in the Implementation Plan or in this annual report. The MS4 permit was first issued to Clackamas County, SWMACC, the City of Rivergrove, and other co-permittees in December 1995. It was subsequently renewed in March 2004, and modified in July 2005, and in December 2007, renewed in 2012, and renewed again most recently in October 2021.

Note that much of the stormwater runoff in the portion of the WES service area which is in and near the City of Rivergrove and Lake Grove is discharged into stormwater injection devices, such as drywells. Stormwater injection devices discharge stormwater into soil, allowing the water to then be filtered and cleaned as it soaks down through soil to replenish groundwater supplies. Clackamas County and WES jointly own and operate approximately 50 stormwater injection devices in this area. The operation of these devices is regulated by a Stormwater WPCF Permit, which protects groundwater quality so that it can provide a beneficial use later, such as a source of drinking water. This WPCF-permitted storm sewer system is not included in this non-point source TMDL Implementation Plan, and thus is not relevant to or addressed in this annual report. Also note that an unknown number of privately owned stormwater injection systems, which receive runoff from privately property, are also present in this area.

Figure 1. Major Watersheds of Clackamas County

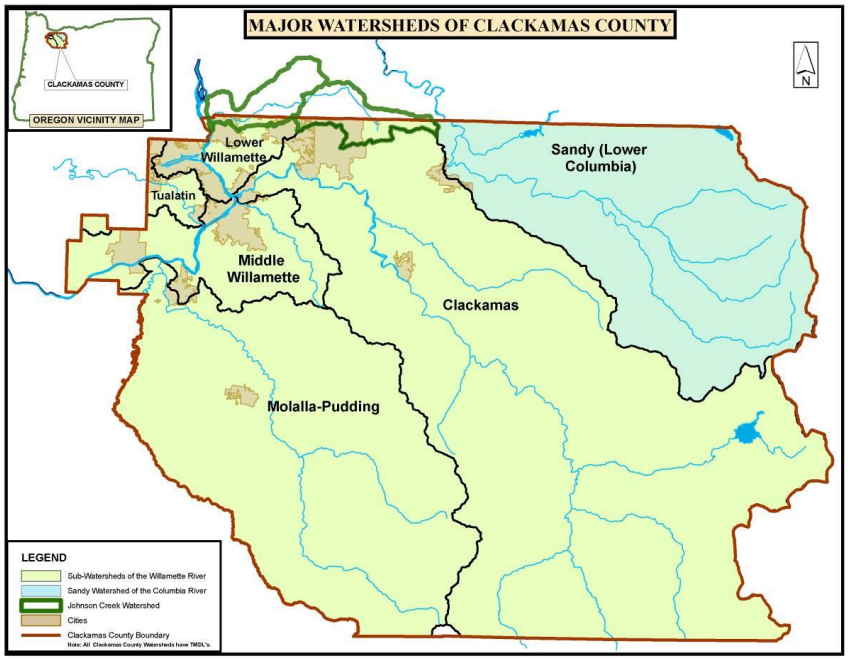


Figure 2. SWMACC, Clackamas County Boundaries and City Boundaries

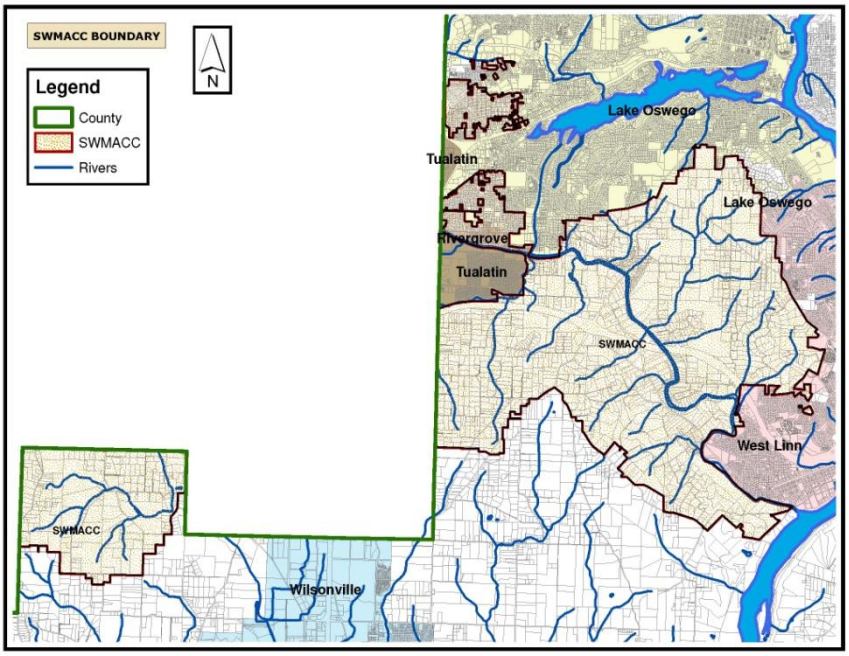
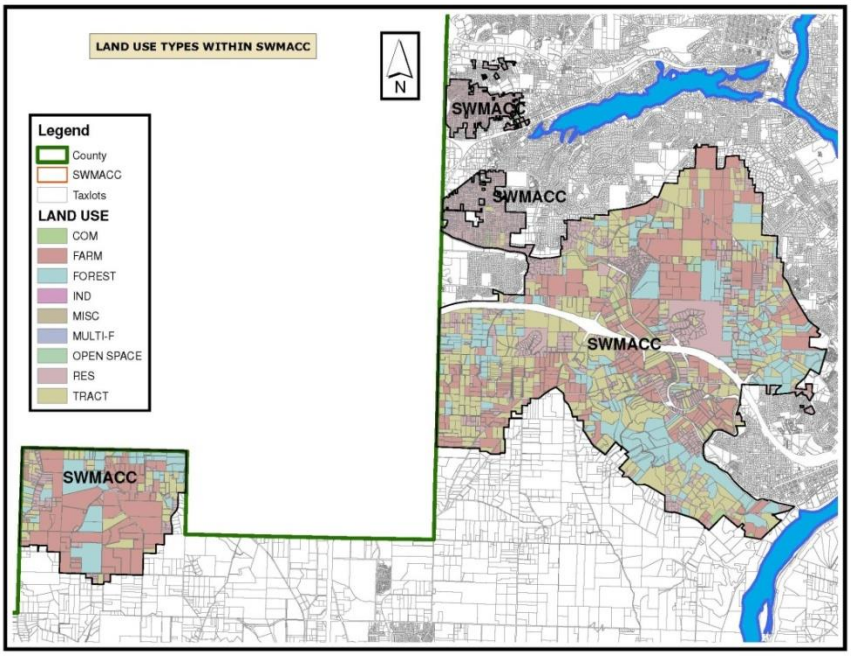


Figure 3 SWMACC Land Use Types



3. TMDL Parameters and Allocations

TMDLs have been developed in the Tualatin watershed for *E. coli*, pH and Chlorophyll A (Total Phosphorus), mercury, dissolved oxygen, and in-stream water temperature. Table 3 summarizes each TMDL parameter, load allocation, measurement, and DMA.

Table 3. TMDL Parameters and Load Allocations

Affected waters	Parameters	Measurement method	Allocation type	Load Allocation (LA)	DMA
All	In-stream temperature	Surrogate: shade	LA	Attaining "system potential vegetation" conditions	CC, WES and Rivergrove
All	*E. coli*	E. coli	LA	Summer (May 1st-Oct 31st): 12,000 colonies/100ml during storms AND 406 colonies/100ml during all other times. Winter (Nov. 1st-April 30th): 5,000 colonies/100ml during storms AND 406 colonies/100ml during all other times.	CC, WES and Rivergrove
All	pH and Chlorophyll A (Total Phosphorus)	Lab: Total Phosphorus	LA	0.14 mg/L in most instances. Only applies from May 1 to Oct. 31	CC, WES, and Rivergrove
All	Dissolved Oxygen	Lab: Winkler method, or field meter	LA	20% or 50% reduction in "settleable volatile solids (SVS) in Runoff".	CC, WES, and Rivergrove
All	Mercury[1]	Direct	LA	97 percent reduction from "General Non-Point Sources in Feb. 2021 final revised TMDL	CC, WES, and Rivergrove

3.1 *E. coli*

According to the January 2001 Tualatin TMDL, the following *E. coli* Load Allocations (LAs) apply to all River and tributary segments in SWMACC:

- Summer (May 1st-Oct 31st): 12,000 colonies/100ml during storms AND 406 colonies/100ml during all other times
- Winter (Nov. 1st-April 30th): 5,000 colonies/100ml during storms AND 406 colonies/100ml during all other times

3.2 Dissolved Oxygen

The DEQ established a new TMDL for dissolved oxygen (DO) – this one based largely on reducing the levels of settleable volatile solids (SVS) – in the Tualatin River watershed in 2001. Levels of SVS are believed to play in role in contributing to the amount of instream DO that bed sediments take as organic material is consumed or decomposes. The DO TMDL's Load Allocations that were issued are for SVS.

The DO TMDL's LAs are expressed in terms of a required percent reduction of settleable volatile solids (SVS) in stormwater runoff. For the roughly 27 acres of lands in SWMACC which can drain into Carter Creek, a Fanno Creek tributary, the required SVS reduction is 50% from May 1st to October 31st. For all other streams in SWMACC, including the mainstream Tualatin River, the required reduction is 20 percent from May 1st to October 31st.

3.3 Mercury

The 2021 revised final mercury TMDL established new required percentage reductions over time from all sources (point and non-point sources) of mercury compared to the TMDL's "baseline" loading levels. The required percentage reduction for "General Non-Point Sources" is 97%; this category is the one which applies to discharges which are addressed by this TMDL

Implementation Plan (IP). This new TMDL LA was incorporated into our revised non-point source TMDL IP which we submitted to DEQ on Sept. 2, 2022.

The Willamette TMDL for mercury applies to the Tualatin River because the Tualatin River is a Willamette River tributary. Although the water quality criteria for mercury in the Willamette River's water column is currently being met at all times or nearly all times, excessive levels of mercury have accumulated in certain species of the watershed's fish.

The stated objective of the mercury TMDL is to reduce average fish tissue mercury concentrations in the Willamette River so that all fish species are safe for human consumption. The multiple fish consumption advisories for mercury in the Willamette Basin indicate that this beneficial use is not currently being met. DEQ acknowledges that it may take many years, perhaps even decades, to achieve the desired reduction in fish tissue concentrations of mercury.

3.4 Temperature

All stream and Tualatin River reaches in WES' service area in the Tualatin River Watershed are regulated by the temperature TMDL. DEQ has established Percent Effective Shade (PES), a measurement of the shade-yielding capacity of a riparian area, as the TMDL's surrogate for instream heat load. "System potential vegetation" conditions represent areas with a high PES value. "System potential vegetation" conditions are considered by DEQ to be necessary to achieve "system potential effective shade," which is defined by DEQ as "the potential near-stream vegetation that can grow and reproduce on a site, given the climate, elevation, soil properties, plant biology, and hydrologic processes." Shade curves, developed by DEQ for the Willamette basin based on potential vegetation growth under different soil conditions, display the shade coverage that could potentially be present at given locations; these curves could be useful for efforts to increase riparian shade.

3.5 pH and Chlorophyll A (Total Phosphorus)

The EPA approved Total Maximum Daily Loads (TMDLs) for total phosphorus in the Tualatin River in 1988, in 1994 and in 2001. The DEQ issued the most recent TMDL for total phosphorus in the Tualatin River watershed in 2012. As delineated by the 2012 total phosphorus TMDL, the summer (May 1st to October 31st) instream median concentration for total phosphorus is 0.14 or 0.13 or 0.10 mg/L in WES' service area, depending on the specific location.

Naturally-occurring (i.e. "background") levels of phosphorus in the waters of the Tualatin River Watershed are known to be relatively high due to the large amount of phosphorus-rich groundwater which enters the river and tributaries from springs. Estimated background levels of phosphorus in the watershed are, in some instances, identical to the load allocations that were granted by DEQ to nonpoint sources (storm water running off of a field into the creek is a nonpoint source, for example), so there is no allowance in the TMDL for additional discharge of phosphorus beyond background levels in some instances.

4. TMDL Implementation Responsibilities

Responsibility for implementing the Tualatin River TMDLs has been assigned by DEQ, in part, to several designated management agencies (DMAs). WES (the DMA named in this instance is the SWMACC), Clackamas County, and the City of Rivergrove are all named as DMAs in the 2012 TMDL's Water Quality Management Plan (WQMP).

For the area of Clackamas County's and the City of Rivergrove's jurisdiction, these DMAS include:

- Clackamas WES', a Clackamas County Department, Surface Water Management (SWM) service area
- Clackamas County
    - Department of Transportation & Development
        - Planning
        - Roads & Engineering
        - Code Enforcement
        - Septic system/cesspool management
    - North Clackamas Parks & Recreation District
    - Facilities Division of the Finance Dept.
    - Public and Government Affairs Dept.
    - Business & Community Services

  - Clackamas County Parks
  - Economic Development
  - County Fair
- City of Rivergrove

TMDL-based programs are also being implemented by appropriate state and federal agencies for state and federally-owned and managed lands. TMDLs for private lands in timber management areas are being implemented through the Oregon Department of Forestry (ODF), and the TMDLs for private lands in agricultural areas are being implemented through the Oregon Department of Agriculture (ODA). Note that TMDLs are being implemented through the NPDES permitting process for point sources of pollutants such as wastewater treatment plant discharges and MS4-permitted stormwater discharges.

The Clackamas County-the Surface Water Management Agency of Clackamas County – the City of Rivergrove's Tualatin River Watershed Total Maximum Daily Load Implementation Plan includes management strategies that address non-point sources of pollution, including surface discharges of stormwater runoff from areas that are not regulated by the MS4 Permit program. This Implementation Plan does not address stormwater runoff directed to subsurface discharge through injection systems – such as drywells; the Stormwater Water Pollution Control Facilities Permit issued to WES and Clackamas County by DEQ regulates underground injection control systems. Lands subject to ODF and ODA jurisdiction are not included in this Implementation Plan either. In addition, the Implementation Plan does not address runoff from lands owned by the state or federal government. See Chapters 1 and 2 for previous discussion on jurisdictional authority and responsibility coverage.

The Clackamas County/WES/City of Rivergrove Tualatin River Total Maximum Daily Load Implementation Plan addresses stormwater runoff-related TMDL parameters that are discharged by these types of stormwater drainage systems:

- Clackamas County and WES-owned storm sewer outfalls and ditches that are not subject to MS4 permit requirements.
- Privately-owned storm sewer outfalls if they do not drain agricultural and timber management areas. These outfalls, unless they are permitted by an NPDES permit such as a 1200Z, are non-point sources of pollution.
- Overland sheet flow or channelized flows that do not flow through MS4-permitted or privately owned storm sewer outfalls. These drainage systems are non-point sources of pollution. They are found on lands with every type of land use. Those drainage systems that are not in agricultural and timber management areas are addressed in the Implementation Plan.

It is important to note that Clackamas County's, WES', and the City of Rivergrove's authority to control sources of pollution from privately owned storm sewer outfalls and ditches, overland sheet flow, and channelized flows is limited or non-existent. If Clackamas County, WES, and/or the City of Rivergrove are aware of a discharge that does not flow through a publicly owned storm sewer system which is a significant source of pollution, the matter will be referred to DEQ if public education and/or technical assistance fail to yield the necessary water quality improvement.

This TMDL IP also addresses the Tualatin temperature TMDL. The IP contains Management Strategies which:

- Protect existing riparian area shade in some instances. Local ordinances protect existing riparian area shade when the City of Rivergrove, Clackamas County and/or Clackamas WES administer ordinances which contain buffer setback requirements that are implemented during the land use and construction process for permitted developments.
- Increase riparian area shade on some properties through the planting of trees where the full system potential shade has not yet been attained.

5. Management Strategies: Water Quality Programs and Activities

A variety of Management Strategies (MS) are employed by Clackamas County, WES, and the City of Rivergrove to improve and protect surface and groundwater quality. The Management Strategies that have been implemented or planned for implementation to address non-point sources of TMDL pollutants include:

1. Stormwater policies, regulations, and administrative procedures
2. Water quality monitoring
3. Industrial/Commercial stormwater maintenance program
4. Other development related and watershed protection regulations
5. Erosion prevention and sediment control
6. Public involvement and education

7. Pet waste management
8. Septic system management
9. Illegal dumping management
10. Spill response and Illicit Discharge, Detection, and Elimination Program (IDDE)
11. Riparian assessment and management

Appendix A reports on these management strategies.

6. Review and Revision of Plan

According to OAR 340-042-0080(4)(a)(C), WES, Clackamas County, and the City of Rivergrove shall "Provide for… periodic review and revision of the implementation plan." The implementers of this plan review and revise the IP on an as-needed basis. The original Tualatin TMDL Implementation Plan was issued on August 7, 2003. On March 31, 2008, the Plan was amended to incorporate elements related to the Willamette River's mercury TMDL. The plan was updated in January 2011, to align its format with the Willamette River TMDL Implementation Plan. Most recently the plan was updated in March of 2014 and was conditionally approved by DEQ on July 18, 2014. The Implementation Plan may be reviewed and, if deemed necessary, revised at other times there are one or more cost-effective modifications that can be made which, if implemented, will result in attainment, or significant progress towards attainment, of one or more load allocations. Because the revised final mercury TMDL is now in effect, elements of this revised TMDL (the new TMDL Load Allocation, for example) were incorporated into the version of our non-point source Implementation Plan which we submitted to DEQ on Sept. 2, 2022.

APPENDIX A

2021-22 TUALATIN WATERSHED TMDL IMPLEMENTATION OF MANAGEMENT STRATEGIES

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Row No.	Watershed	Pollutant	Management Strategy #	Management Strategy	Jurisdiction	Geographic Area	Management Strategy Description	Measureable Milestone[1]	2021-22 Progress Update
1	Tualatin	Bacteria Mercury Total Phosphorous Dissolved Oxygen	1	Stormwater Regulations	DTD WES	Within SWMACC including City of Rivergrove	The planning procedures for developing, implementing, and enforcing controls to reduce the discharge of TMDL parameters from storm sewers which collect stormwater runoff from areas that have been significantly developed or redeveloped. These post-construction controls are applied to: (a) development on private property and Clackamas County and (b) Clackamas County and WES-funded capital improvement projects including road and building construction projects. Specifically, all new / redevelopment construction projects must infiltrate, treat, and detain runoff generated (SWMACC Rules and Regulations). This affects projects that apply stormwater treatment technologies (SWMACC Rules and Regulations.)	• # of permits applicable for new / redevelopment sites • Types of stormwater management control measures implemented at development sites	**DTD** Issued one (1) development permit in the Tualatin watershed that included SW flow control, water quality & infiltration BMPs. The site was Athey Creek Middle School - Bridge end panel modifications, bridge guardrail modifications, bridge re-striping, roundabout approach signage, and water quality facility modifications. **WES** 27 permits application processed within SWMACC including the City of Rivergrove. • 20 projects only required an erosion control permit • 7 projects required flow control, water quality, and infiltration BMPs, in SWMACC projects creating 5,000 sq. ft. of impervious surface area are required to submit a stormwater management and erosion control plan in accordance with SWMACC rules
2	Tualatin	Bacteria Total Phosphorous Dissolved Oxygen Temperature	2	Water Quality Monitoring	WES	Surface Water Management (SWM) service area in the Tualatin River watershed	Monitor selected creeks and stormwater	Conduct water quality monitoring	For **E. coli** (bacteria), **total phosphorus**, water **temperature**, and **dissolved oxygen**, creek water and stormwater quality **monitoring results** are in the WES-Happy Valley-Rivergrove MS4 Permit Annual Report for 2021-22. One creek in the Tualatin River watershed portion of WES' SWM service area – Pecan Creek – and a MS4-permitted storm sewer system outfall in the City of Rivergrove were monitored by WES in 2021-22. Most of Pecan creek's watershed drains a rural area, so most sources of pollution here are non-point sources. Also for **dissolved oxygen**, see the USGS' website for continuously collected dissolved oxygen data from the Tualatin River at River Mile 3.4, which is in the WES SWM service district. Funds from WES' SWM service district were contributed to the USGS in 2021-22 to support the operation of the continuous monitoring network in the Tualatin River watershed which includes this station. Additional note about **mercury** monitoring: Samples of non-point source stormwater runoff from WES' SWM service area have not been analyzed for mercury, to the best of our knowledge. However, one MS4-permitted storm sewer system outfall in the City of Rivergrove was monitored for mercury by WES during storms on April 9, 2014, July 23, 2014, and March 20, 2015. This water quality data has been submitted to DEQ.
3	Tualatin	Bacteria Mercury Total Phosphorous Dissolved Oxygen	3	Industrial/Commercial Stormwater Maintenance Program	WES	Surface Water Management (SWM) service area in the Tualatin River watershed	Stormdrain Cleaning Assistance Program (SCAP) and the DEQ's 1200-A/1200-Z Permit Programs	Number of annual letters WES sent to property owners Number of completed annual reports WES received	• 17 SCAP letters sent • 5 SCAP property owners provided annual reports • The current version of our TMDL IP (2014) says there are no 1200-Z-permitted facilities in this IP's geographic area, but the S & H Logging facility at 20200 SW Stafford Road, which is within a rural portion of WES' (SWM) service area in the Tualatin River watershed, now has a 1200-Z permit.

[1] Measureable milestones are included in all management strategies except for Public Involvement and Education. The 2014 Implementation Plan did not stipulate measureable milestones for Public Involvement and Education. Hence, benchmarks rather than measureable milestones are labeled as measureable milestones for Rows 6 through 9 that address public involvement and education for Temperature, Mercury, Bacteria, and Total Phosphorus / Dissolved Oxygen.

Row No.	Watershed	Pollutant	Management Strategy #	Management Strategy	Jurisdiction	Geographic Area	Management Strategy Description	Measureable Milestone[1]	2021-22 Progress Update
4	Tualatin	Temperature	4	Other Development-Related & Watershed Protection Regulations	DTD Rivergrove DTD (WES)	WES' Surface Water Management (SWM) service area in the Tualatin River watershed	This management strategy is a compilation of many watershed protection regulations, which protect rivers, creeks, wetlands, and their riparian areas. They include the following Habitat Conservation Dist., Metro Title 13 (Goal 5) / ZDO 706 Streamside Buffer Area, ZDO 1002.05 (River and Stream Corridors) Streamside Buffer Area, ZDO 1002.05 (Wetland) Streamside Buffer Area, ZDO 704 (River and Stream Conservation) Streamside Buffer Area, Metro Title 3 Streamside Buffer Area, ZDO 703 (Floodplain Management District) Streamside Buffer Area, ZDO 1002.8 (Significant Natural Areas) Streamside Buffer Area, ZDO 1003.03 (Standards for Flood Hazard Areas) Streamside Buffer Area, ZDO 709 (Wetland and Riparian areas) Streamside Buffer Area, Metro Title 3 Habitat Conservation Dist., Metro Title 13 (Goal 5) Streamside Buffer Area, Metro Title 3	Analyze aerial photos for changes in riparian area tree canopy: comprehensive review once every 5 years to assess changes	On behalf of DTD, WES, and the City of Rivergrove, Clackamas County reviewed and analyzed aerial photos of the Tualatin Watershed within Clackamas County in 2016-17 and were not able to detect any recent discernible change in riparian area tree canopy. At that time it appeared that there had been no major impacts to tree canopy whether positive or negative. This is a positive finding, since trees grow slowly, so any possible expansion would be modest at best, and there was not significant loss of riparian area canopy during the assessment time period.
5	Tualatin	Mercury Total Phosphorus Dissolved Oxygen	5	Erosion Prevention and Sediment Control	DTD WES	WES' Surface Water Management (SWM) service area in the Tualatin River watershed	Erosion control is addressed through the issuance of erosion control permits for sites undergoing significant development or redevelopment, reducing the amount of soil leaving the site and subsequent total suspended solids (TSS) and/or settleable volatile solids (SVS) in stormwater washing from the property. By reducing TSS and SVS in stormwater, it is presumed that the concentration in stormwater of TMDL parameters adhered to soil (such as mercury), or mixed with soil (such as organic matter with high SVS level), if present, is also reduced. The erosion control methods employed at these permitted sites include installation of sediment fence and catch basin silt sacks, planting grass to re-stabilize disturbed areas, and other similar techniques. Specifically, this addresses projects that fall under the ODOT Road Maintenance (1200-CA), NPDES 1200-C Permit for land disturbances greater or equal to 800 Sq. Ft., and NPDES 1200-C Permit for land disturbances greater than one acre.	• # of erosion/sediment control permits issued • # of erosion/sediment control inspections performed • # of erosion/sediment control enforcement actions taken • # of erosion/sediment control educ./outreach activities provided	**DTD** DTD issued three (3) erosion control permits, and conducted twelve (12) inspections in the Tualatin River Watershed without taking any enforcement action. To the development community, DTD offers flyers, brochures, and information on local training events and measures and site preservation in its permits lobby. In coordination with WES, Clackamas County published seven (7) stormwater quality related articles in MyClackCo. Additionally, there were four (4) Clackamas County Press Releases that were stormwater quality-related. In the past, DTD's reporting on ERCO was Grading Permit information (permits, inspections, etc…). In addition, every project, which requires a Construction Management Plan from the Planning Division, receives an Erosion Control review by Development Engineering. Development Engineering will then issue a Driveway Permit and the inspector will keep an eye out for any egregious ESC issues/violations. In the case of an egregious violation and/or a complaint from a citizen, if the permittee will not bring ESC into compliance, Development Engineering staff will shut the project down and require that an SC Erosion Control permit be acquired with subsequent plan review and inspections. DTD's comprehensive and county-wide ESC permitting, inspection and enforcement program will be implemented, as required, by 2025. **WES**

Row No.	Watershed	Pollutant	Management Strategy #	Management Strategy	Jurisdiction	Geographic Area	Management Strategy Description	Measureable Milestone[1]	2021-22 Progress Update
									In SWMACC, WES conducted the following: • Issued 27 Erosion Prevention and Sediment Control permits which included a minimum of three inspections for each permit • Performed 498 erosion control inspections whose total includes inspections conducted for carried-over permits issued in the prior year • Took 0 erosion-control enforcement actions without imposing a fine Staff handed out the flyers addressing proper installment of sediment fence and maintenance and summary of common erosion control BMPs: WES translated Erosion Sediment Control materials into Spanish and Russian; distributed approximately 30 Spanish / 2 Russian / 30 English. WES made the translated materials available to other County departments, including DTD, to use as needed. Staff also referred the public to WES' **Erosion Prevention and Sediment Control Planning and Design Manual**. For additional erosion prevention and sediment control activities see the Public Involvement and Education management strategy, Row 7 in this table.
6	Tualatin	Temperature	6	Public Involvement and Education	DTD WES Rivergrove	Within SWMACC including City of Rivergrove	Articles on maintaining riparian areas and enhancing damaged riparian areas on private property Provide educational opportunities to school-age children Website updates to reduce Non-Point Source Pollution, maintain healthy riparian areas, and implement practices that attribute to watershed health Partner with Clackamas Soil and Water Conservation District: Help landowners identify, plan for and implement conservation measures that reduce soil erosion Maintain riparian areas and enhance damaged riparian areas on property Partner with CCSWCD to help landowners identify, plan and undertake riparian area protection and enhance projects. Watershed signs addressing watershed concept located where County roads cross the Tualatin River or tributary	**Benchmark for Temperature** • # of brochures printed / distributed per year • # of requests for speakers or surveys taken, give-away requests or for more info • # of attendees at WES sponsored / project-related events • Erosion control educ. / outreach implemented each year • # of website hits per year	**Number of Attendees at WES-sponsored Project-related Events, Riparian Education and Outreach Implemented, and Educational Opportunities for School-age Children** WES developed educational tools that broaden access to information on temperature-reducing activities as well as on articles promoting the health of the watershed. **Provided educational opportunities to school-age children** 1. WES is a participating member of the **Tualatin Basin Public Awareness Committee** (TBPAC)**,** a group dedicated to protecting the Tualatin River Watershed through stormwater public awareness and education activities which included seven Will Hornyak "Living Streams" presentations to 1,400 elementary school students in the Tualatin River Watershed. The group also made in-kind contributions to the Watershed Navigator website, distributed a Nature-friendly Home & Yard Care brochure, promoted Tualatin SWCD's Naturescaping workshops and provided replacement river/stream crossing signs in Hillsboro. 2. WES also distributed River Health grant application information to the **Tualatin River Watershed Council** and encouraged other grant applicants to propose projects in this area; WES funded one project that included Salmon Watch education to a school in the SWMACC area in 2021-22. (We received an application for FY 2022-23 from TRWC that is currently funded.) 3. **The Coalition for Clean Rivers and Streams**, of which WES is a member, held a video contest for middle and high school students focused on water bacteria, pollution and ways to protect rivers and streams. Video submissions were viewed over 776 times and received 64 likes and 15 comments. The Coalition's annual report contains statistics related to website analytics and social media reach. Social media activity includes posts on the Coalition's accounts (Facebook, Instagram, Twitter, Snapchat, and a YouTube account) and ads on Facebook and Instagram. **Provided watershed health education through two partnerships that targeted children and adults** WES provided **watershed health education** for school-age children, as well as pre-school age and adults, through contracts with the Lower Columbia Estuary Partnership and with the Clackamas Community College Environmental Learning Center. 1. **The Lower Columbia Estuary Partnership and Clackamas River Basin Council** : • Provided elementary school watershed health education lessons and field trips to 231 students in 30 classes. Topics included trout dissection, detritovores, native

Row No.	Watershed	Pollutant	Management Strategy #	Management Strategy	Jurisdiction	Geographic Area	Management Strategy Description	Measureable Milestone[1]	2021-22 Progress Update
									plants, watersheds floor map, and a service learning field trip to remove invasive vegetation • Provided high school level watershed health education lessons and field trips to 138 students in six classes. Topics included macroinvertebrates and their collection, invasive species removal, using iNaturalist, and the Clackamas 360 Virtual Tour. • Included links to STEM career videos produced previously and updated set of learning questions to accompany the career videos • Funded canoe paddles for 231 4th and 5th grade NCSD students in 10 elementary school classrooms 2. **Lower Columbia Estuary Partnership** • The Estuary Partnership developed a new assessment protocol working with an Associate Professor of Psychology at Pacific University, surveyed 8 classrooms (112 students) and assessed student knowledge before and after the lessons. • The Estuary Partnership also employed a North Clackamas School District teacher who was on leave. This teacher's work created new, district level partnerships that will benefit our upcoming Watershed Health Education Support work, including embedding the Watershed Health lessons into the 4th grade curriculum. Any 4th grade teacher in the district can now access the lessons electronically. 3. **Clackamas Community College's Environmental Learning Center** • Implemented field trips to elementary age students • Provided livestream sessions to pre-school age children • Rolled out a water industry career exploration program for high school students, a community Wildlife & Water Friendly Gardens workshop series • Developed and implemented vegetated stormwater facility maintenance program to landscape & public works professionals While WES did not track the impact by geographic area, together, the three programs served 450 students on field trips, generated over 2,000 livestreams of career sessions that 99 students attended and garnered over 800 views of workshops of a vegetated stormwater facility maintenance class that 29 students attended. **WES managed, funded or sponsored volunteer events** • Planted trees to stabilize banks to prevent erosion, widen and protect property, and provide shade. Planting also prevents streams from heating, removes pollutants (including bacteria) from runoff that flows across the surface before it reaches the stream, protects wildlife habitat and provides food for insects, birds, and others. • WES funded 67 **SOLVE cleanup events** along waterways, 54 of which were in WES' service area, that included 1,481 volunteers, 214 of whom were children under 18. SOLVE volunteers removed 11,373 lbs. of trash, including 21 tires. • The **WES RiverHealth Stewardship Program** awarded a total of $300,000 to manage natural areas, including managing invasive vegetation and planting riparian trees; and to engage volunteers, expand outreach to increase participation in future site restoration of erosion, and engage youth through hands-on environmental education experiences. Accomplishments include one project in the Tualatin Watershed. No. of riparian projects: 1 # Volunteers or attendees: 678 # Lessons, field trips, or sessions: 59 # Students: 866 # Residents/ adults: 168

Row No.	Watershed	Pollutant	Management Strategy #	Management Strategy	Jurisdiction	Geographic Area	Management Strategy Description	Measureable Milestone[1]	2021-22 Progress Update
									# Public Events: 20 • The **Coalition for Clean Rivers and Streams,** of which WES is a member, supported a video contest for middle and high school students focused on water bacteria, pollution and ways to protect rivers and streams. Video submissions were viewed over 776 times and received 64 likes and 15 comments. The Coalition's annual report contains statistics related to website analytics and social media reach. Social media activity includes posts on the Coalition's accounts (Facebook, Instagram, Twitter, Snapchat, and a YouTube account) and ads on Facebook and Instagram. - - - - **Maintained Riparian Areas and Enhanced Damaged Riparian Areas including Private Property through the Tualatin River Watershed Council** Did not partner with Clackamas SWCD in the Tualatin watershed. The **Tualatin River Watershed Council** performed five SWMACC Riparian Enhancement Projects with private contractors without the use of volunteers with WES funding. They included invasive removal and vegetation planting at SW 65th and Childs Road, Borland Road, and Private Landowners at Rock Creek, Fields Creek, Wilson Creek and Pecan Creek. - - - - **Website Hits** While the County's Public & Government Affairs department, which administers the County websites, does not break down website statistics based on geographic area, it makes materials available on social media. During the reporting period, there were **1,737 website hits** for related activities such as pressure/car washing (210 views), storm drain cleanings (93 views), picking up after your pet (207 views), the Water pollution-property managers guide of an erosion-sediment control training (559 views), and storm water drains (668 views). **Three website updates to reduce Non-Point Source Pollution, maintain healthy riparian areas, and implement practices that attribute to watershed health** • **WES Newsletter article, January 2022** - How to Prevent Spills (includes reporting of spills as well as prevention of water pollution due to pesticides, herbicides, fertilizer) **1,086 views** • **WES Newsletter article, July 2021** Preventing and Cleaning up Spills and Leaks to protect our water (includes reporting of spills as well as prevention of water pollution due to pesticides, herbicides, fertilizer) **994 views** • **MyClackCo Magazine article, Spring 2022 -** You Can Prevent Water Pollution (includes reporting of spills as well as prevention of water pollution due to pesticides, herbicides, fertilizer) **Circulation 180,000** - - - - **Watershed signs addressing watershed concept located where County roads cross the Tualatin River or tributary** Many of the Tualatin River Watershed signs, which WES installed in late 1998 and/or 1999 at places where County-owned/maintained roads cross creeks in this watershed, are still standing in the Tualatin River watershed's portion of the WES SWM Service District (aka. SWMACC). WES paid DTD Transportation Maintenance staff to install them. Those signs continue to promote the County's investment in and encourage the preservation of the Tualatin River Watershed and WES hopes this includes motivating citizens to plant new trees, and protect existing trees, in riparian areas.

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7	Tualatin	Mercury	6	Public Involvement and Education	DTD WES Rivergrove	Within Tualatin River Watershed excluding SWMACC and Rivergrove Within SWMACC including City of Rivergrove Clackamas Soil and Water Conservation District	Partner with Clackamas Soil and Water Conservation District: Help landowners identify, plan for and implement conservation measures that reduce soil erosion Maintain riparian areas and enhance damaged riparian areas on property Partnership with CCSWCD to help landowners identify, plan and undertake riparian area protection and enhance projects. Watershed signs addressing watershed concept located where County roads cross the Tualatin River or tributary Encourage citizens to take unused amounts of hazardous wastes including pesticide products for disposal Website updates addressing watershed health including soil erosion Watershed articles and brochures addressing soil erosion control Report septic system failures / how to report failures	**Benchmark for Mercury** • # of attendees at WES sponsored / project-related events • # of brochures printed / distributed per year • # of requests for speakers or surveys taken, give-away requests or for more info. • Erosion control educ. / outreach implemented each year • # of website hits per year	**Partner with Clackamas County Soil and Water Conservation District to help landowners identify, plan for and implement conservation measures that reduce soil erosion** WES communicates frequently with the CCSWCD but has not undertaken a joint project with the District. WES, however, funded the **Tualatin Soil and Water Conservation District's** Naturescaping virtual workshops. - - - - **Other Mercury-related Partnership Activities in Addition to Those Listed for Bacteria in Row 6** The **Coalition for Clean Rivers and Streams** held a video contest for middle and high school students focused on water bacteria, pollution and ways to protect rivers and streams including erosion prevention and sediment control to protect against mercury. - - - - **Maintain Riparian Areas and Enhance Damaged Riparian Areas including Private Property** See Public Education and Outreach response for Temperature in Row 6. Healthy riparian areas can, in some instances, remove some mercury from stormwater runoff as the stormwater sheet-flows or flows over land through the riparian area. And in other instances, when all of the stormwater infiltrates prior to reaching the surface water body, 100% of the stormwater's mercury will be removed, preventing it from entering the surface water body. - - - - **Website Hits** While the County's Public & Government Affairs department, which administers the County websites, does not break down website statistics based on geographic area, it makes materials available on social media. During the reporting period, there were **1,737 website hits** for related activities such as pressure/car washing (210 views), storm drain cleanings (93 views), picking up after your pet (207 views), the Water pollution-property managers guide of an erosion-sediment control training (559 views), and storm water drains (668 views). **Website Updates and Facebook Watershed articles addressing Watershed Health including soil erosion** • **Facebook article, June 2022:** Pesticide Tips (proper use tips to prevent discharges of pesticides, herbicides and fertilizer when doing yard work). **863 views** • **Facebook article, February 2022 -** How to prevent spills and leaks (including pesticides and fertilizers). **2,089 views** • **WES Newsletter article, January 2022 -** How to Prevent Spills (including pesticides, herbicides, fertilizer). **1,086 views** • **WES Newsletter article, July 2021 -** Preventing and Cleaning up Spills and Leaks to protect our water ((including pesticides, herbicides, fertilizer). **994 views** • **MyClackCo Magazine article, spring 2022 -** You Can Prevent Water Pollution (addresses pesticides, herbicides, fertilizers). **Circulation 180,000** - - - - **Reporting of Illicit Discharges and Disposals Online** To report illicit discharges, disposals and spills, WES directs the community to a webpage offering options to reporting a discharge, spill or disposal with a link to https://www.clackamas.us/wes/reportaproblem.html. One can email or call in information during the day or

<table>
<tr><th>Row No.</th><th>Watershed</th><th>Pollutant</th><th>Management Strategy #</th><th>Management Strategy</th><th>Jurisdiction</th><th>Geographic Area</th><th>Management Strategy Description</th><th>Measureable Milestone[1]</th><th>2021-22 Progress Update</th></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>afterhours. Appropriate staff responds and investigates the alleged illicit discharge or improper disposal.

<u>WES Bill Insert</u>
Clean Water Exchange article, including landscaping tips to prevent water pollution from pesticides, herbicides, and fertilizers, were linked to WES Education page.

<u>Encouraging Citizens to Take Unused Amounts of Hazardous Wastes including Pesticide Products for Disposal</u>
While there were no requests for speakers or surveys taken specific to the SWMACC stormwater area, WES provided information on social media and printed medium that had greater readership including City of Rivergrove citizens. The information encouraged citizens to take unused amounts of hazardous wastes including pesticide products for disposal. In addition, WES distributed brochures on proper disposal of mercury to dental offices within our district.

Teamed with regional partners to put messaging on KPTV regarding avoidance of pesticide, fertilizer and other use of harmful chemicals under the campaign titled Clean Water: It’s Our Future. Results include 13,305,998 total impressions, which are the number of times content was displayed:

<table>
<tr><td>Total TV Messages</td><td>583</td></tr>
<tr><td>TV impressions</td><td>10,812,080</td></tr>
<tr><td>KPTV.com banner ad impressions</td><td>2,400,513</td></tr>
<tr><td>KPTV.com banner ad clicks</td><td>2,163</td></tr>
<tr><td>KPTV.com Water page views</td><td>3,191</td></tr>
<tr><td>Facebook impressions</td><td>93,405</td></tr>
<tr><td>Facebook clicks</td><td>1,464</td></tr>
<tr><td>Facebook video views</td><td>5,856</td></tr>
</table>
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<u>Watershed Signs</u>
See Public Education and Outreach response for Temperature in Row 6. Healthy riparian areas can, in some instances, remove some mercury from stormwater runoff as the stormwater sheet-flows or flows over land through the riparian area. And in other instances, when all of the stormwater infiltrates prior to reaching the surface water body, 100% of the stormwater’s mercury will be removed, preventing it from entering the surface water body.

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<u>Brochures Addressing Soil System Failures</u>
DTD's soil scientists distribute five brochures to the public at the County’s Permit lobby to prevent and report failed septic systems. See row 8 for detail.</td></tr>
<tr><td>8</td><td>Tualatin</td><td>Bacteria</td><td>6</td><td>Public Involvement and Education</td><td>WES
DTD</td><td>Within SWMACC including City of Rivergrove</td><td>Report septic system failures / how to report failures</td><td><u>Benchmark for Bacteria</u>
• # of attendees at WES sponsored / project-related events
• # of brochures printed / distributed per year
• # of requests for speakers or surveys taken, give-away</td><td><u>Brochures Addressing Soil System Failures</u>
DTD's soil scientists distribute these brochures at the County’s Permit lobby:
• 5 Things You Should Ask Before Buying a Home With a Septic System (2,000 printed in February 2015)
• Septic System Maintenance: A Clackamas County guide to the proper care and maintenance of your onsite wastewater treatment system (3,000 printed in May 2015)
• Do your Part – Be Septic Smart: A Clackamas County Homeowner’s Guide to Septic Systems (new print run in 2020)</td></tr>
</table>

Row No.	Watershed	Pollutant	Management Strategy #	Management Strategy	Jurisdiction	Geographic Area	Management Strategy Description	Measureable Milestone[1]	2021-22 Progress Update
								requests or for more info. • Erosion control educ. / outreach implemented each year • # of website hits per year	• Financial Assistance For Septic System Owners in the Clackamas Watershed: A properly functioning septic system can save you money and help protect our water quality (no new print run) • "Why Do Septic Systems Fail?": A 2-page informative article, published by the Oregon State University Extension Service (unspecified quantity printed in 2022) **Website Hits** While the County's Public & Government Affairs department, which administers the County websites, does not break down website statistics based on geographic area, it makes materials available on social media. During the reporting period, there were **1,737 website hits** for related activities such as picking up after your pet (207 views), pressure/car washing (210 views), storm drain cleanings (93 views), and the Water pollution-property managers guide of an erosion-sediment control training (559 views), and storm drains (668 views).
9	Tualatin	Total Phosphorus Dissolved Oxygen	6	Public Involvement and Education	DTD WES	Within SWMACC including City of Rivergrove	Develop English, Spanish and Russian language erosion/sediment control materials Encourage citizens to practice erosion control and sediment control BMPs (min fertilizer and yard debris management; and yard debris / street sweeping)	**Benchmark for Total Phosphorus and Dissolved Oxygen** • # of attendees at WES sponsored / project-related events • # of brochures printed / distributed per year • # of requests for speakers or surveys taken, give-away requests or for more info. • Erosion control educ. / outreach implemented each year • # of website hits per year	**Translated Educational Materials to Practice Sediment Control BMPs** WES translated Erosion Sediment Control materials into Spanish and Russian; distributed approximately 30 Spanish / 2 Russian / 30 English. WES made the translated materials available to other County departments, including DTD, to use as needed. WES staff worked with Clean Water Services staff to finalize and distribute the revised multi-jurisdictional **Erosion Planning and Sediment Control Planning and Design** manual. - - - - **Encouraged Citizens to Practice Erosion Control and Sediment Control BMPs** WES encouraged the community to minimize the use of pesticides, herbicides, and fertilizers. **Community Outreach** Teamed with regional partners to put messaging on KPTV regarding avoidance of pesticide, fertilizer and other use of harmful chemicals under the campaign titled ***Clean Water: It's Our Future***. Campaign results include 13,305,998 total impressions, which are the number of times content was displayed: Total TV Messages: 583 TV impressions: 10,812,080 KPTV.com banner ad impressions: 2,400,513 KPTV.com banner ad clicks: 2,163 KPTV.com Water page views: 3,191 Facebook impressions: 93,405 Facebook clicks: 1,464 Facebook video views: 5,856 **Tualatin Basin Public Awareness Committee (WES is a member) innovative stormwater public awareness and education activities about pesticides, fertilizers, spills, etc.** Will Hornyak created six video presentations (three for grades K-2 and three for grades 3-5, 10 min each) specific to the Tualatin River Watershed. TBPAC members shared video links with teacher/school contacts and community groups. - - - -

Row No.	Watershed	Pollutant	Management Strategy #	Management Strategy	Jurisdiction	Geographic Area	Management Strategy Description	Measureable Milestone[1]	2021-22 Progress Update
									Website Hits While the County's Public & Government Affairs department, which administers the County websites, does not break down website statistics based on geographic area, it makes materials available on social media. During the reporting period, there were **1,737 website hits** for related activities such as picking up after your pet (207 views), pressure/car washing (210 views), storm drain cleanings (93 views), and the Water pollution-property managers guide of an erosion-sediment control training (559 views), and storm drains (668 views). **Website Updates Addressing Watershed Health Including Soil Erosion** • Parting with Pesticides Pledge Program for the Clackamas Watershed, **987 views** • Lawn care tips to help protect our water, **161 views** • Landscape Maintenance tips to prevent pollutants, **51 views** • Backyard Habitat Certification Program, **101 views** • Pressure washing tips, **210 views** • Education page, **302 views** • Erosion Education, **555 views** • Watershed health, **1,039 views** **Website articles** • **Website article: Spills and Leaks** (Pesticides, Fertilizers - how to prevent contaminating waterways) **93 Views** • **Website article: Looking to Hire a Landscape Maintenance Service?** (Addresses tips to prevent misuse of fertilizer, pesticides, herbicides) **51 Views** • **Website article: Lawn Care Tips to Help Protect Our Water** (includes extensive information about pesticides. Also includes insecticides and fertilizer) **161 Views** **Facebook articles** • **Facebook article, June 2022:** Pesticide Tips (proper use tips to prevent discharges of pesticides, herbicides and fertilizer when doing yard work). **863 views** • **Facebook article, February 2022 -** How to prevent spills and leaks (including pesticides and fertilizers**) 2,089 views** • **WES Newsletter article, January 2022 -** How to Prevent Spills (including pesticides, herbicides, fertilizer) **1,086 views** • **WES Newsletter article, July 2021** Preventing and Cleaning up Spills and Leaks to protect our water (including pesticides, herbicides, fertilizer) **994 views** • **MyClackCo Magazine article, Spring 2022 - Y**ou Can Prevent Water Pollution (addresses pesticides, herbicides, fertilizers**) Circulation 180,000**
10	Tualatin	Bacteria Dissolved Oxygen Total Phosphorus	7	Pet Waste Management	DTD WES		Education and technical assistance about proper pet waste management shall be provided. In rare instances, if education and technical assistance fail to improve a specific and significant pet waste management problem, a referral to the County's Community Environment Division (aka. Code Enforcement) can be made	• # of Code Enforcement referrals for improper pet waste disposal • # of website "hits" per year • # of brochures printed and/or distributed per year • # of pet waste bags taken from dispensers each year	**Code Enforcement Referrals** DTD and WES made no Code Enforcement referrals for improper pet waste management. - - - - **Website Hits** **WES** received a total of 207 web hits addressing pet waste and disposal. WES' **educational web page** includes **"reasons to scoop"** with explanations about animal waste containing harmful organisms that can hard wildlife and humans and the environment. - - - -

Row No.	Watershed	Pollutant	Management Strategy #	Management Strategy	Jurisdiction	Geographic Area	Management Strategy Description	Measureable Milestone[1]	2021-22 Progress Update
									Pet-Waste Brochures / Book markers At WES-sponsored events held throughout the stormwater management service area, **WES** distributed hundreds of the 4000 book markers printed in 2021 to prevent pet waste from reaching rivers and streams, including hundreds of pet waste bags and *There Is No Poop Fairy* and *Please Clean Up After Your Pet* brochures. - - - - **Number of pet waste bags taken from dispensers** • **County Parks:** There are no County parks in the Tualatin River Watershed and, therefore, the County Parks does not operate or collect statistics on the number of pet waste taken from dispensers nor does it track enforcement actions taken in the Tualatin River Watershed. Parks distributed 6,000 pet waste bags county-wide from dispensers located in the Willamette River watershed. • **City of Rivergrove** does not track the number of pet waste bags given away.
11	Tualatin	Bacteria Dissolved Oxygen Total Phosphorus	8	Septic System Management	DTD		Clackamas County administers the Onsite Sewage Treatment and Disposal (Onsite) Program as an agent of DEQ throughout Clackamas County, including the Tualatin River watershed. The goals of the program are to have no septic system failures and for all septic systems to be in a properly functioning condition. To achieve these goals, the County implements processes to address suspected failed or failing systems, and to educate the public about how to prevent septic system failures, and how to report failures when they occur. When a report of a failed system is received, a site visit is performed, and if the septic system has indeed failed, steps for needed correction are identified and a process for correcting the failure is promptly established. Discharges into waterways are not allowed and are given the shortest time that is feasible for construction of repairs or for the implementation of alternatives.	• Date of follow-up confirming that repairs were made • # of reports of failed septic systems • Outcome of inspections (failing or not) • # of Safety Loans made	**DTD** • Issued 15 septic permits in the Tualatin watershed and performed 23 inspections without any enforcement actions • Included 10 septic system repairs. DTD's Soils/Septic team assures all repairs have been completed prior to deeming the permit as "final" or signing off on the repair permit • Will provide a list of "final" dates upon DEQ request • Did not issue any "Safety Net Program" loans
12	Tualatin	Bacteria Dissolved Oxygen Total Phosphorus Mercury	9	Illegal Dumping Management	DTD Rivergrove	Rural Areas within Tualatin River Watershed Urbanized, unincorporated areas and the City of Rivergrove	Cleaning up illegal solid waste dump sites and preventing new dumping from occurring prevent solid waste from being transported into waterways regulated under the Tualatin TMDL via stormwater runoff. Solid waste may contain: • E. coli includes, but is not limited to, soiled diapers and other waste containing fecal matter • Mercury includes, but is not limited to, fluorescent light bulbs, batteries, thermometers, and electronics. • Settleable volatile solids (SVS) – which can cause instream dissolved oxygen levels to be depleted – includes but is not limited to, old food, soiled diapers, and yard debris, • Total phosphorus includes, but is not limited to, old food, soiled diapers, and yard debris. Illegal dumping of solid waste is addressed by two separate programs, each of which serves their own geographic area within the area that is regulated by the Tualatin TMDL. County Ordinance through Code Enforcement Division administers a solid waste nuisance ordinance which pertains to illegal dumping on public and private property. This ordinance is administered on a priority-rated basis, and illegal dumping	• Tracking waste removed through the Dump Stoppers Program • # of enforcement actions taken for solid waste dumping • # of persons who complete the CED mediation process for solid waste dumping	**Waste Removed and Enforcement Actions Taken for Solid Waste Dumping** County Parks: There are no County parks in the Tualatin River Watershed and, therefore, the Dump Stopper Program does not operate or collect statistics on the number of enforcement actions taken for solid waste dumping in the Tualatin River Watershed. Dump Stoppers Program is provided to forested areas in the east county area - Molalla and Clackamas watersheds. **CED Mediation Process for Solid Waste Dumping** DTD: If an illegal dump is in the right of way, Transportation Maintenance staff will re-spond. On public land, within the Metro Urban Growth Boundary, Metro will respond. On most forest lands within Clackamas County, Dump Stoppers will respond. Since shifting to-wards an enforcement-based program, the number of illegal dumps in this watershed con-tinues to decrease and, therefore, no person completed the Code Enforcement mediation process for solid waste dumping in the Tualatin River Watershed. Zero public land solid waste-related enforcement actions by Clackamas County Code Enforcement in 2021-2022.

Row No.	Watershed	Pollutant	Management Strategy #	Management Strategy	Jurisdiction	Geographic Area	Management Strategy Description	Measureable Milestone[1]	2021-22 Progress Update
							that involves house-hold garbage is a high priority for enforcement and resolution. Mediation is an additional tool that CED uses to resolve certain types of solid waste issues that cause a condition of unsightliness on private property. County Dump Stoppers Program – This program is administered in the Willamette River Basin and Molalla-Pudding Basin. It is not available in the Tualatin River Basin.		
13	Tualatin	Bacteria Dissolved Oxygen Total Phosphorus Mercury	10	Spill Response & Illicit Discharge Elimination Programs	DTD WES	Non-MS4-regulated County Roads eligible for full County maintenance within Tualatin Watershed Privately owned sewer lines Right of Way in non-MS4-regulated County Roads eligible for full County maintenance Unincorporated Clack. County, State/Federal Lands, and County Roads without full County maintenance SWMACC within UGB including City of Rivergrove excluding MS4-regulated City and County roads	This is for responding to illicit discharges, ensuring it is cleaned up if deemed feasible, and is about preventing potential illicit discharges. Several strategies address spill response and illicit discharge detection and elimination (IDDE) programs, which include: • Illicit Discharges that Oregon Dept. of Agriculture oversees with DTD • Sewage discharges from pipe failure or improper connection • ODOT Road Maintenance / WQ / Habitat Guide • Unincorporated, non-Oregon Dept. of Agric./Dept. of Fisheries Spills and Discharges • Discharges Escalated to DEQ for Enforcement Action • Spills / Discharges From storm-sewer outfalls, overland flow, and ditches that are privately owned Clackamas County DTD Maintenances: If materials that potentially contain harmful substances (such as TMDL parameters including E. coli or mercury) are spilled or illicitly discharged onto a Clackamas County Transportation Maintenance road's right-of-way and the impacted road segment is eligible for —full County maintenance, personnel from Clackamas County's Road Department will respond if they discover the incident or if they are notified about the incident and it is determined that a response is appropriate. Clackamas County Transportation Maintenance Division crews will ensure that the release of the material is halted and that the material is subsequently cleaned up in a manner that prevents harmful substances from entering waters, if possible, or minimizes the amount of harmful substances that enters waterways if that is not possible. If a response by a government agency is required for a spill involving agricultural materials that contain TMDL parameters (i.e., E. coli from animal manure), ODA may be asked to assume the lead role in responding to the report and resolving the matter. As was noted previously, the Clackamas County Transportation Maintenance Division adheres to the ODOT Guide. Roadway spill response work is addressed in these two sections of this document: — Accident Cleanup (Activity 149) on page 32 and — Spill Prevention and Cleanup on page 15 of the ODOT Guide. Tualatin River Watershed TMDL Implementation Plan for Clackamas County, SWMACC and City of Rivergrove	# of illicit discharges and spills	DTD was not notified by OERS, DEQ, or by any other means of any spills or illicit discharges within the Tualatin Watershed. Additionally, no discharges were discovered by DTD staff during the year. WES did respond to one illicit discharge. An abandoned car was reported in an unnamed creek at its intersection with SW Ribera Lane. WES staff investigated to find car straddling the creek but not obviously leaking fluids into creek. Car was not reported stolen and was on private property so WES had no authority to have car removed. Tributary directly discharges to the Tualatin River. Contacted Sheriff's office, who found the car's owner. The car was removed from the creek. OERS Case No. 2022-0474

Row No.	Watershed	Pollutant	Management Strategy #	Management Strategy	Jurisdiction	Geographic Area	Management Strategy Description	Measureable Milestone[1]	2021-22 Progress Update
							WES: Spill response and illicit discharge elimination program services are provided by WES in SWMACC, which includes the City of Rivergrove. Instances involving spills and illicit discharges on County and City-owned roadways within the UGB in SWMACC are regulated by the MS4 permit and by Oregon's stormwater injection rules for drywells (OAR 340-044) and are not addressed in this Implementation Plan. The spill response and illicit discharge elimination work performed in SWMACC by WES that is described in this portion of the Implementation Plan is limited to spills and illicit discharges that: 1) pass through privately owned storm sewer outfalls, 2) move by overland sheet flow on private property, and 3) move through privately owned ditches. WES staff makes reasonable efforts during regular business hours to try to halt the release of spilled and illicitly discharged material and to get the responsible party to clean up their material. The goal is to prevent or to minimize the release of TMDL parameters and other potentially harmful substances into waterways. If efforts by WES staff fail to halt the release of the material and the material contains TMDL parameters that are likely to enter surface waters and/or storm sewers, WES staff will contact the DEQ and request their support. DEQ has the authority to compel most dischargers to halt or modify their spill or illicit discharge if the material contains a significant amount of pollution and is likely to flow to Waters of the State.		

Row No.	Watershed	Pollutant	Management Strategy #	Management Strategy	Jurisdiction	Geographic Area	Management Strategy Description	Measureable Milestone[1]	2021-22 Progress Update
14	Tualatin	Temperature	11	Riparian Area Assessment and Management	WES DTD	SWMACC (including City of Rivergrove)	Assess and Protect Riparian Area Shade	• Working with landowners directly and via partnerships to develop on-the-ground projects to enhance/protect riparian areas.	WES funded the **Tualatin River Watershed Council** (TRWC) to perform these SWMACC Riparian Enhancement Projects using contractors without the use of volunteers during the 2021-2022 NPS TMDL IP year: • **SW 65th and Childs Road in the City of Rivergrove**: Native plants are established and thriving at this small City-owned riparian frontage along the Tualatin River. Weeds were removed and mulch was re-applied. Due to overhead utility lines, native trees cannot be planted on this site, unfortunately. • **Private Landowners along Rock Creek-South near the City of Sherwood**: Habitat Restoration NW, the contractor who was hired by the TRWC, has been working to restore 2300 linear feet of riparian forest with two landowners and a new landowner was recently added between the upper and lower properties. 50 native trees and shrubs were planted efforts to control Himalayan blackberry at the site are underway. On the upper site along the floodplain, 160 bare root trees and shrubs were planted. The landowner will water during the summer of 2022 to improve plant survival. On the lower site ("Our Table" farm), water temperature monitoring was conducted, and 190 additional trees and shrubs were planted. Work on this site will continue with the recently awarded RiverHealth grant from WES in the 2022-2023 year. • **Private Landowners along Fields Creek**: Invasive plants (two types of ivy and Himalayan blackberry) continued to be removed. 75 conifers were planted in this streamside deciduous forest. Work on this site will continue with the recently awarded RiverHealth grant from WES in the 2022-2023 year. • **Private Landowners along Wilson Creek and Pecan Creek**: During this year, Habitat Restoration NW, the contractor working for the TRWC, familiarized themselves with these two watersheds and conducted outreach to landowners. Two future project sites have been identified. Work on these sites is expected to proceed with the recently awarded RiverHealth grant from WES in the 2022-2023 year.

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