



Draft Water Quality Management Plan – Willamette Subbasins TMDL Temperature

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1. Introduction

DEQ developed this draft Water Quality Management Plan to guide implementation of the temperature Total Maximum Daily Load developed for the subbasins of the Willamette River Basin. DEQ will complete another temperature TMDL rulemaking for the mainstem Willamette and major tributaries following this TMDL. A WQMP is an element of a TMDL, as described by Oregon Administrative Rule 340-042-0040(4)(l), which provides the framework for management strategies to attain and maintain water quality standards and is designed to work in conjunction with detailed implementation plans prepared by responsible persons, including designated management agencies responsible for TMDL implementation.

This Willamette Subbasins temperature WQMP will be proposed for adoption by Oregon's Environmental Quality Commission, by reference, into rule as OAR 340-042-0090(xx). This WQMP is intended to provide comprehensive information for implementation of the temperature TMDL, and will be amended, as needed, upon issuance of any future developed or revised TMDLs within the Willamette Basin. Any subsequently amended or renumbered rules cited in this document are intended to apply.

The Willamette River Basin encompasses twelve subbasins. Except for the Yamhill Subbasin, EPA previously approved temperature TMDLs developed by DEQ for the following eleven subbasins by TMDL:

1. Molalla-Pudding Subbasin TMDL (2008)
2. Willamette Basin TMDL (2006)
 - Clackamas Subbasin
 - Coast Fork Willamette Subbasin
 - Lower Willamette Subbasin
 - McKenzie Subbasin
 - Middle Fork Willamette Subbasin
 - Middle Willamette Subbasin
 - North Santiam Subbasin
 - South Santiam Subbasin
 - Upper Willamette Subbasin
3. Tualatin Subbasin TMDL (2001)

This TMDL replaces the temperature TMDLs above with the exception of the Tualatin Subbasin TMDL, which remains effective for temperature and other approved TMDLs. The Tualatin TMDL did not use the natural conditions criteria to develop TMDL allocations; therefore, it is not required to be replaced under the litigation. The Yamhill subbasin will not be covered by this temperature TMDL.

The pending mainstem temperature TMDL rulemaking will cover the mainstem Willamette River and major tributaries following this Willamette Subbasins rulemaking. Therefore, this TMDL applies to all waters of the state in the following subbasins listed in Table 1:

Table 1: Waterbodies included in Willamette Subbasins TMDL

Subbasin	Waterbodies Included
1. Clackamas	All waters of the state in the Clackamas Subbasin except the Clackamas River downstream of River Mill Dam (approximately river miles 0 - 26).
2. Coast Fork	All waters of the state in the Coast Fork Willamette Subbasin except the Coast Fork Willamette River downstream of Cottage Grove Dam (approximately river miles 0- 30) and the Row River downstream of Dorena Dam (approximately river miles 0 -7.5).
3. Lower Willamette	All waters of the state in the Lower Willamette Subbasin except the Willamette River and Multnomah Channel.
4. McKenzie	All waters of the state in the McKenzie Subbasin except the McKenzie River downstream of the confluence with the South Fork McKenzie River (approximately river miles 0 - 56), the South Fork McKenzie River downstream of Cougar Dam (approximately river miles 0 – 4), the Blue River downstream of Blue River Dam (approximately river miles 0 - 1.9), and Walterville Reservoir.
5. Middle Fork	All waters of the state in the Middle Fork Willamette Subbasin except the Middle Fork Willamette River downstream of Dexter Dam (approximately river miles 0 - 17) and Fall Creek downstream of Fall Creek Dam (approximately river miles 0 - 7).
6. Middle Willamette	All waters of the state in the Middle Willamette Subbasin expect for the Willamette River, Willamette Slough, Mission Lake, and Lambert Slough.
7. Molalla-Pudding	All waters of the state.
8. North Santiam	All waters of the state in the North Santiam Subbasin except the North Santiam River downstream of Detroit Dam (approximately river miles 0 - 49), and the Santiam River.
9. South Santiam	All waters of the state in the South Santiam Subbasin expect for the South Santiam River downstream of Foster Dam (approximately river miles 0 - 38).
10. Upper Willamette	All waters of the state in the Upper Willamette Subbasin except for the Long Tom River downstream stream of Fern Ridge Dam (approximately river miles 0 - 26), and the Willamette River including the Bonneville Channel, Albany Channel, Curtis Slough, Third Slough, Marshall Slough, Curtis Creek, and Mill Race

The list of waters (1 – 10) above is referred to throughout this document as the “Willamette Subbasins”. Section 3 of the Willamette Subbasins Temperature TMDL Rule contains a listing of all the Category 5 temperature impairments from the 2022 Integrated Report. **Section XX** of the TMDL Technical Support Document contains a complete listing of all the Assessment Units included in this rulemaking.

1.1 Condition assessment and problem description

The first element of the WQMP according to OAR 340-042-0040(I)(A) is an assessment of water quality conditions in the Willamette Subbasins with a problem description. There are assessment units in the Willamette Subbasins listed as impaired (category 5 or 4A) for temperature in Oregon’s 2022 Integrated Report, which was approved by the U.S. Environmental Protection Agency on September 1, 2022.

DEQ must develop TMDLs for pollutants causing temperature impairments of waters within the Willamette Subbasins, as required by Section 303(d) of the federal Clean Water Act. These pollutants are solar radiation and heat from various sources and conditions, which contribute to impairments of the temperature criteria established to support aquatic life beneficial uses.

1.2 Goals and objectives

OAR 340-042-0040(4)(I)(B) requires identification of the goals and objectives of the WQMP.

The goal of this WQMP is to provide the framework for implementation of the temperature TMDL to achieve and maintain the temperature water quality criteria, including narrative criteria, and meet antidegradation requirements in streams within the Willamette Subbasins.

The primary objectives of this WQMP are to describe responsibilities for implementing TMDL management strategies and actions necessary to reduce excess pollutant loads to meet all TMDL allocations and provide a strategy to evaluate progress towards attaining water quality standards throughout the Willamette Subbasins.

2. Proposed Management Strategies

The following section presents proposed management strategies, by pollutant source and activity, that are designed to meet the load and wasteload allocations required by the Willamette Subbasins temperature TMDL, as required by OAR 340-042-0040(I)(C).

OAR 340-042-0030(6) defines management strategies as “measures to control the addition of pollutants to waters of the state and includes application of pollutant control practices, technologies, processes, siting criteria, operating methods, best management practices or other alternatives.”

2.1 Streamside vegetation management strategies

DEQ's water quality analysis and modeling concluded that riparian vegetation planting and management are the strategies necessary to improve temperature and meet water quality criteria in the impaired sections of the streams in the Willamette Subbasins. This is because protecting and restoring streamside overstory vegetation reduces solar radiation loads to streams by providing the effective shade necessary to achieve the TMDL surrogate measure allocations. More information about the physical and ecological factors affecting effective shade can be found in [Section XX](#) of the draft TMDL Technical Support Document.

The primary riparian vegetation planting and management strategies are summarized as follows:

1. Vegetation planting and establishment

This strategy addresses locations that have little or no shade producing overstory vegetation and are therefore important locations for riparian tree and shrub planting projects. These sites may currently be dominated by invasive species.

2. Vegetation protection (enhancement, maintenance, and growth)

This strategy addresses streamside areas that have existing vegetation that needs to be protected from removal to maintain current shade levels. In some cases, protection is needed because full site potential shade can only be achieved with additional growth. Protecting and maintaining existing vegetation ensures that it can grow and mature, enhance vegetation success and survival, and provide for optimal ecological conditions.

3. Vegetation thinning and management

This strategy addresses streamside areas that might need vegetation density reduction to achieve optimal benefits of shade. Current site conditions are overly dense with trees and need thinning to promote development of a healthy mature riparian forest or are dominated by invasive species that inhibit a healthy riparian community. This strategy recognizes that riparian plant communities may require that these activities be routinely conducted to ensure survival, health and optimal growth of the desired vegetation.

2.2 Water withdrawal management strategies

Water quality data, modeling and research has shown that water withdrawals decrease the capacity of streams to assimilate pollutant loads. Because temperature is a flow-related parameter, water withdrawals can result in increased pollutant concentrations and warmer stream temperatures. In waterbodies where temperatures are already known to exceed standards, further withdrawals from the stream will reduce the stream's heat capacity and cause greater fluctuation in daytime and nighttime stream temperatures.

Under state law, the first person to file for and obtain a water right on a stream is the last person to be denied water in times of low streamflows. Therefore, restoration of streamflows may require establishing instream water rights. This can be accomplished by donating or purchasing out-of-stream rights and converting these rights to instream uses.

Water conservation is a best management practice that directly links the relationship between water quantity and water quality. Leaving water instream where possible, functions as a method to protect water quality from flow-related parameters of concern, such as temperature.

2.3 Channel morphology and hydromodification management strategies

The size and shape of a stream, or channel morphology, can impact stream temperature (Galli and Dubose, 1990). For example, streams with high width to depth ratios (i.e. wide, shallow streams) can allow solar radiation to increase heating of waterbodies compared to channels that are narrow and deep (Larson and Larson, 1996). Wide, shallow streams can occur due to uncontrolled livestock access to streams, and stream banks lacking established vegetation may experience increased bank erosion during high water events. Streams that have been disconnected from floodplains due to activities such as urban development or road construction are not able to slow and store floodwaters during the rainy season or recharge groundwater to support summer flows (EPA, 2017). Note that permits are often needed to conduct stream restoration work involving removal and fill activities, and to ensure activities occur during the in-water work period to avoid harming fish. In addition, DMAs need to conduct site-specific evaluations of streams to determine what specific channel modifications are appropriate to meet the desired future condition.

Hydromodification alters the hydrologic characteristics of a waterbody, such as construction and operation of dams and impoundments for flood control, power generation, irrigation, navigation, and to create ponds, lakes, and reservoirs for uses such as livestock watering, municipal water supply, fish farming, and recreation. Changes to water temperature from dams are influenced by the size of the dam installed, how much water is released, how often water is released, and at what depth of the dam water is released (EPA, 2007). For more information about hydromodification impacts, see EPA's, National Management Measures to Control Nonpoint Source Pollution from Hydromodification (epa.gov). See also DEQ's study, *Water Temperature Impacts from In-Channel Ponds in Portland Metro and Northwest Region*.

2.4 Priority management strategies

Table 2 includes proven strategies (and practices within the strategies) summarized by pollutant source. These strategies and practices are adapted from published sources. DEQ used the categories and terminology from Oregon Watershed Enhancement Board's Oregon Aquatic Habitat Restoration and Enhancement Guide and Oregon Watershed Restoration Inventory Online List of Treatments. Additional strategies included in Table 2 are supported by Oregon Department of Agriculture, the U.S. Department of Agriculture Natural Resources Conservation Service, Oregon State University Extension Service, Oregon Plan for Salmon and Watersheds, and other publicly available published sources. DEQ identified the strategies in Table 2 as appropriate for the conditions and sources within the subbasins. Therefore, these are considered priority strategies and practices that should receive special focus during TMDL implementation plan development.

DEQ expects that entities identified in Section 5.1 will develop implementation plans that incorporate strategies and practices listed in Table 2 that are applicable to their jurisdiction. Implementation plans must include specifics on where and when priority and other strategies and practices will be applied, along with measurable objectives and milestones for documenting their implementation and gaging their effectiveness. See Section 5.3.2 for location-specific methods for determining whether effective shade allocations are met along waterbodies impaired for temperature.

Although not specifically detailed in this WQMP, climate change is another important factor affecting stream temperature. Potential climate change impacts to waterbodies in Oregon may include increased air temperatures; decreased snowpack leading to less water in reservoirs, streams and groundwater; and large-scale wildfires, which can reduce effective shade in riparian areas.

Table 2: Priority temperature management strategies by source

Pollutant	Source or Activity	Management Strategies
Solar Radiation	Insufficient height and density of riparian vegetation	<p>Riparian tree planting (conifer and hardwood); riparian vegetation planting (shrub or herbaceous cover); riparian vegetation management (invasive thinning, removal or other treatment); voluntary riparian tree retention; riparian invasive plant control; riparian fencing or other livestock riparian exclusion methods; identify and protect cold water refuges</p> <p>Maintain plants until free to grow; monitor survival rates.</p> <p>Develop, update and/or enforce riparian code/ordinance to ensure streamside native vegetation and intact bank conditions are protected or restored following site development; purchase, acquire, designate conservation easements along riparian areas</p> <p>Goal is to increase site effective shade (combination of vegetation height, buffer width and canopy density) through streamside vegetation management strategies using regulatory programs and voluntary activities, including incentive-based projects</p>
	Water withdrawals	Pursue instream water right transfers and leases; water right application reviews; irrigation conservation and management; repair or replace leaking pipes and infrastructure; provide incentives for water conservation; implement water consumption restrictions during the summer months, such as lawn watering
	Channel morphology and hydromodification	Conduct whole channel restorations (e.g. enhance channel, wetlands, and floodplain interactions, reduce width to depth channel ratios, bank stabilization, large wood placement, create/connect side channels, etc.); riparian road re-construction/obliteration activities; riparian fencing or other livestock exclusion methods; protect and enhance cold water refuges; develop dam management strategies for temperature; remove in-channel ponds or modify pond structures to reduce temperature increases downstream; and protect areas that don't require restoration actions

3. Timelines for implementing strategies

OAR 340-042-0040(I)(D) requires schedules for implementing management strategies including permit revisions, achieving appropriate incremental and measurable water quality targets, implementing control actions and completing measurable milestones. DEQ's water quality permitting program has responsibility for revising permits to comply with TMDLs. Timelines for implementation of management strategies by responsible persons, including DMAs is discussed separately.

3.1 DEQ permit revisions

NPDES permits have five-year terms. Appendix B includes a list of permit holders located within the project area that have NPDES permits, as well as the next expected permit renewal date. DEQ incorporates any required TMDL wasteload allocations into NPDES permits when the permit is renewed.

3.2 Management strategies implemented by responsible persons, including DMAs

The Oregon Watershed Enhancement Board's Oregon Watershed Restoration Inventory is a repository for storing watershed restoration activities. OWRI contains project level information from watershed councils, landowners and other groups who have implemented restoration projects to improve aquatic habitat and water quality conditions. DEQ retrieved data from OWRI and summarized total linear miles of riparian trees planted in the Willamette Basin following the establishment of the 2006 Willamette Basin TMDL for temperature (Figure 1). Additional stream temperature projects in OWRI that have been implemented in the Willamette Basin include riparian fencing, channel modification, voluntary riparian tree retention, dam management and others.

Every five years in the Willamette Basin, DEQ's goal is to develop a Year Five Report that summarizes data and information submitted by DMAs. Figure 2 summarizes total linear miles of riparian trees planted in the Willamette Basin, and in the Molalla-Pudding Subbasin where a separate Year Five Report was completed. DEQ did not collect total linear miles of riparian trees planted by DMAs in the 2013 Year Five Report. Additionally, DEQ did not collect information from DMAs on linear feet or acres of riparian land acquisitions, which is an important strategy in protecting water quality.

Note that in Figures 1 and 2, DEQ did not specifically exclude riparian trees planted in the Tualatin Basin, which is not included in the Subbasins TMDL.

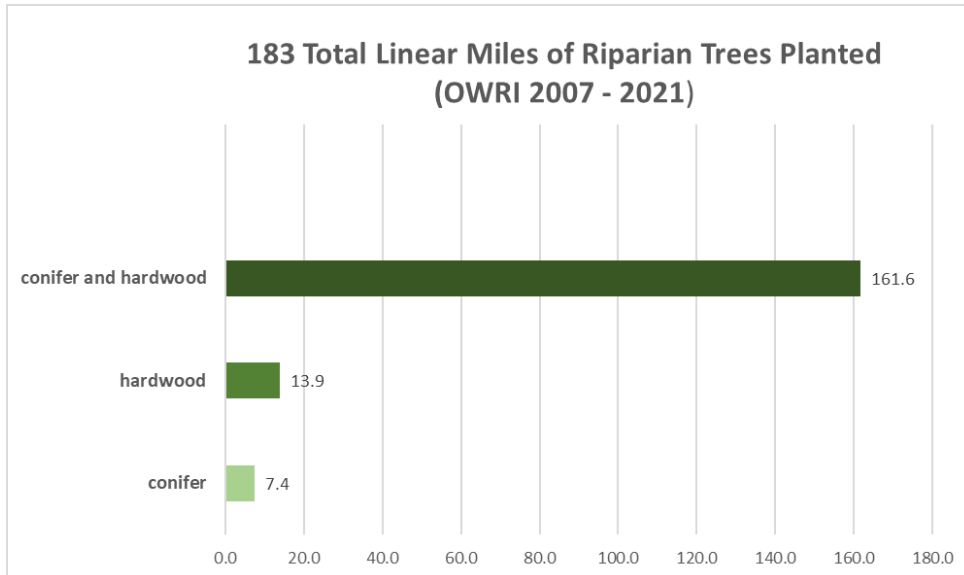


Figure 1: Oregon Watershed Restoration Inventory of miles of riparian trees planted

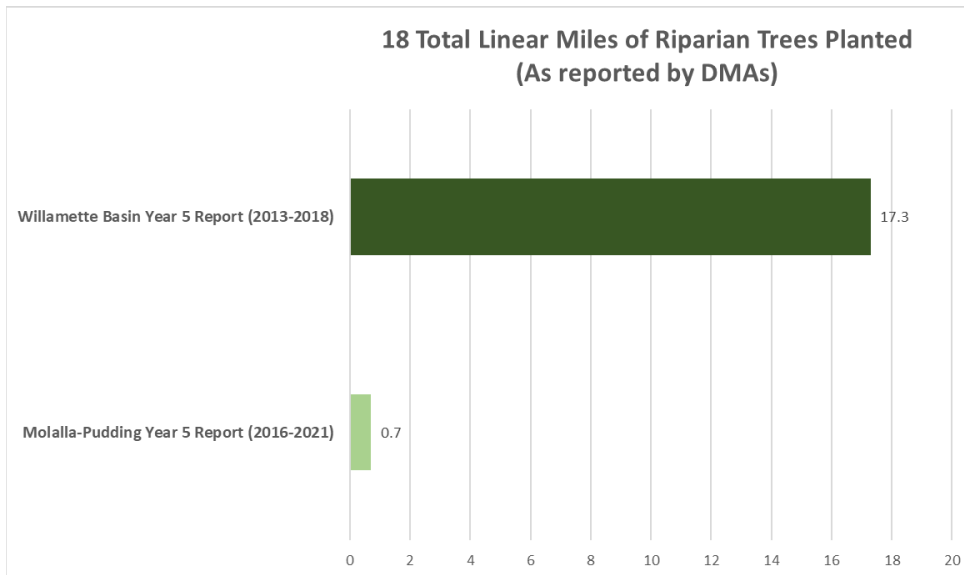


Figure 2: DEQ Year Five Reports: DMA reported miles of riparian trees planted

4. Attaining water quality standards

Based on the TMDLs analyses, achieving the excess load reductions identified will result in attainment. Each management strategy identified in this WQMP and in responsible persons' implementation plans represents part of a system of measures and practices that collectively reduce pollutant loads and improve water quality.

4.1 How management strategies support attainment of water quality standards

OAR 340-042-0040(I)(E) requires an explanation of how implementing the proposed management strategies will result in attainment of water quality standards.

Based on the excess solar radiation and shade deficit calculated along streams within the Willamette Subbasins (see Section 8 of the TMDL Rule), DEQ identified the priority management strategies and specific practices in Table 2 and Section 2.1 to increase site effective shade. DEQ focused on the three vegetation strategies described in Section 2.1 to estimate reasonable timelines for achieving surrogate effective shade targets, and by extension solar radiation load reductions to meet temperature water quality criteria.

DEQ developed site-specific effective shade targets and effective shade curves to meet temperature load allocations in the TMDL Rule (Section 9 in the TMDL Rule). Shade curves identify the relationship between stream width, orientation, and site potential effective shade for specific riparian vegetation types. Effective shade curves are applicable to any stream that does not have site specific shade targets. Effective shade curves represent the maximum possible effective shade for a given vegetation type.

Landowners, foresters, restoration professionals and horticulturists have expertise and experience needed to develop site-specific planting prescriptions that will ensure that the best combination of riparian species are planted. These site-specific planting prescriptions will typically contain a higher diversity of shrub and overstory species than the vegetation types used in developing the shade curves. The overall goal is to establish and protect riparian vegetation to meet shade targets established for that site. Maintenance activities, such as removal of invasive species and watering newly established trees and shrubs will be important for trees to become fully established (free to grow).

4.2 Timelines for attaining temperature water quality standards

OAR 340-042-0040(I)(F) requires an estimated timeline for attaining water quality standards through implementation of the TMDL, WQMP and associate TMDL implementation plans.

Based on DEQ’s source assessment and TMDL analyses (DEQ, 2023a), nonpoint sources contribute nearly all of the excess pollutant loading associated with temperature water quality impairments in the Willamette Subbasins. Therefore, it is critical for nonpoint sources to make timely progress toward meeting the TMDL load allocations.

DEQ estimated reasonable timelines for achieving the needed reductions in solar radiation. DEQ expects persons responsible for developing implementation plans to consider the timeline projections and interim targets presented below in establishing commitments for vegetation management and other actions, in order to identify measurable objectives, milestones and implementation timelines.

Timelines for attainment of water quality standards (i.e., numeric criteria) are based on estimated timelines for excess pollutant load reduction and meeting surrogate targets.

Table 3: Projected timelines for solar radiation load reductions to the modeled reaches of the Willamette Subbasins in X-yr increments

To be developed

5. Implementation responsibilities and schedule

5.1 Identification of implementation responsibility

OARs 340-042-0040(4)(I)(G) and 340-042-0080(1) require identification of persons, including Designated Management Agencies, responsible for implementing management strategies and preparing and revising implementation plans.

OAR 340-042-0030(2) defines Designated Management Agency as a federal, state or local governmental agency that has legal authority over a sector or source contributing pollutants and is identified as such by DEQ in a TMDL.

The TMDL rule provides numerous mentions of the term ‘responsible person’ with associated requirements. OAR 340-042-0025(2) indicates that responsible sources must meet TMDL load allocations through strategies developed in implementation plans. OAR 340-042-0030(9) defines ‘reasonable assurance’ as a demonstration of TMDL implementation by governments or individuals. OARs 340-042-0040(4)(I)(G) requires identification of persons, including DMAs, responsible for developing and revising implementation plans. OAR 340-042-0040(4)(I)(I) requires a schedule for submittal and revision of implementation plans by responsible persons, including DMAs. OAR 340-042-0080(4) reiterates the requirement for persons, including DMAs, responsible for development, submittal and revision of implementation plans, along with the required elements of those plans. For purposes of this Willamette Subbasins WQMP, for implementation of the temperature TMDLs, ‘responsible person’ is defined as any entity responsible for any source of pollution addressed by the TMDL.

Responsible persons including DMAs are organized by DMA type in the following subsections. These persons are responsible for developing or revising implementation plans and

implementing management strategies to achieve the TMDL allocations. A complete list of responsible persons including DMAs for the Willamette Subbasins Temperature TMDL is in Appendix A. There are 135 responsible persons that include cities, counties, federal and state agencies, and other entities.

Appendix A is not an exhaustive list of every individual that bears responsibility for improving water quality in the Willamette Subbasins. It may be necessary for all people that live, work and recreate in the basin to take steps to reduce pollution and protect or restore water quality to attain standards and designated beneficial uses. Active participation may be needed to achieve long-term water quality improvements throughout the basin.

Unless otherwise specified (See section 5.1.2), all responsible persons, including DMAs, are required to develop, submit, implement and revise, as needed, an implementation plan specific to the Willamette Subbasins TMDL that includes: management strategies; timelines for implementation; a schedule for achieving milestones; and a performance monitoring component with a plan for periodic review and plan revision.

Figures 3 and 4 below show which DMAs have the highest percentage of acres in the Subbasins Temperature TMDL, and the percent of DMA acres that are within 150 feet of a stream. Appendix A contains jurisdictional acres associated with many DMAs, however, that information was not available for all responsible persons or DMAs.

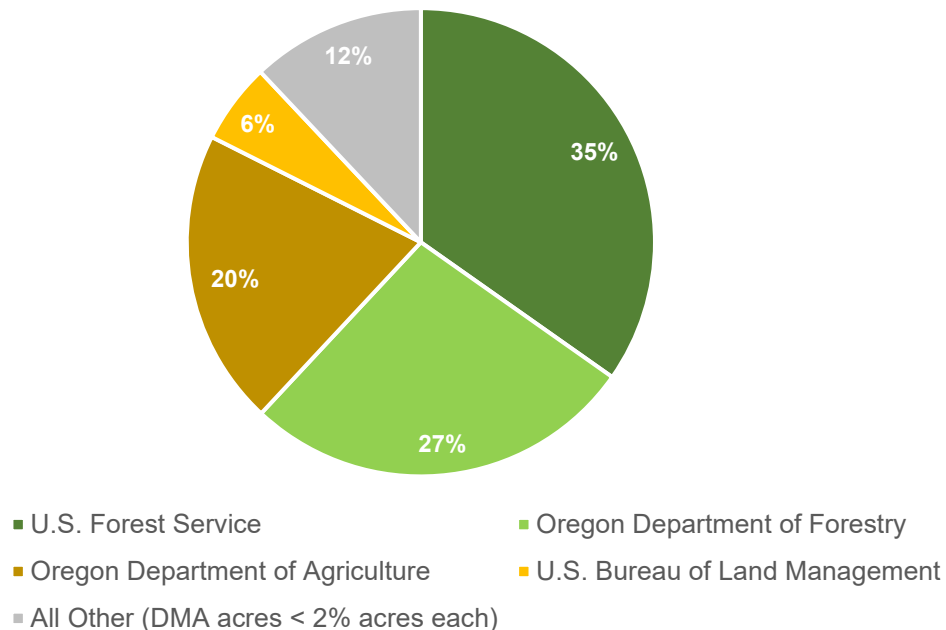


Figure 3: Percent Estimated DMA Acres in Willamette Subbasins TMDL

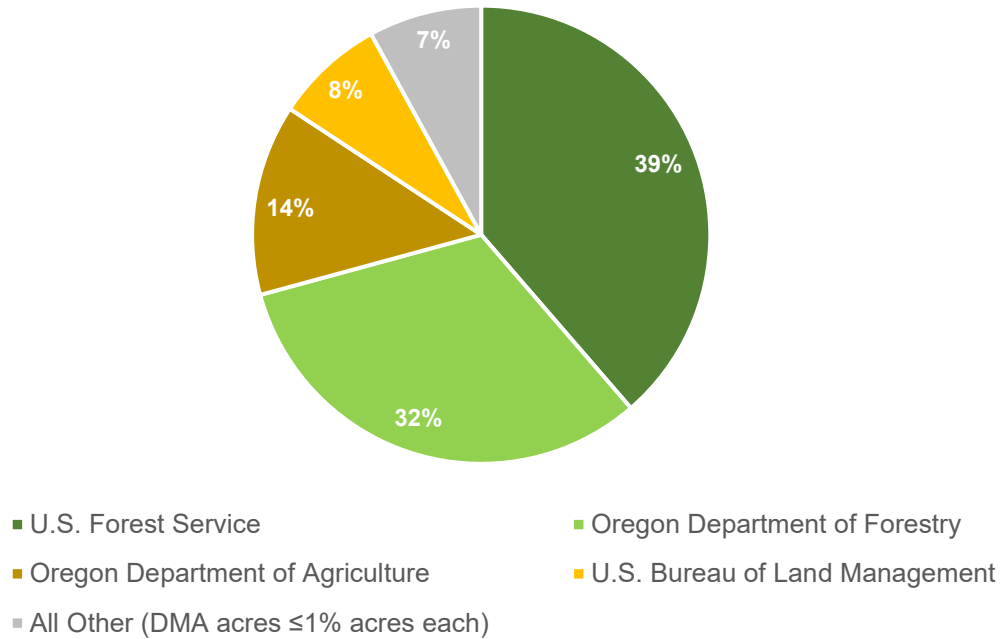


Figure 4: Percent Estimated DMA Acres 150 Feet from Streamline

5.1.1 Responsible persons including DMAs not required to develop a TMDL implementation plan

Some responsible persons, including DMAs will not be required to submit implementation plans at this time for the following reasons: (1) they do not have ownership or jurisdiction over land management activities within the riparian area, and so are unable to implement actions identified in Table 2 in this WQMP; or (2) have limited riparian area under their jurisdiction.

Table 4 identifies the entities that are named as responsible persons and DMAs in this TMDL that are not required to develop and submit an implementation plan at this time. DEQ may require implementation plans from these entities in the future if ownership or jurisdiction of riparian areas increases, or other data or information indicates a TMDL implementation plan is needed to achieve temperature allocations and shade targets identified in this TMDL. DEQ may revise the WQMP or issue individual orders to notify them of the required schedule for submitting an implementation plan.

Table 4: List of Responsible Persons including Designated Management Agencies for which no TMDL implementation plan is required

	Designated Management Agency	DMA Type
1	Tualatin	City
2	Curry County	County
3	Lincoln County	County
4	Washington County	County
5	Bonneville Power Administration	Federal
6	Pacific Power and Light	Private Utility
7	Portland Terminal Railroad Company	Railroad
8	Vennel Farms Railroad Company	Railroad
9	Willamette Shore Trolley	Railroad
10	Oregon Pacific Railroad	Railroad
11	BNSF Railway	Railroad
12	Central Oregon & Pacific Railroad	Railroad
13	TriMet	Railroad
14	Willamette Valley Railway	Railroad
15	Albany & Eastern Railroad	Railroad
16	Port of Coos Bay	Railroad
17	Portland & Western Railroad	Railroad
18	Union Pacific Railroad	Railroad
19	Ash Creek Water Control District	Responsible Person
20	East Valley Water District	Responsible Person
21	Santiam Water Control District	Responsible Person
22	West Labish Water Control District	Responsible Person
23	Palmer Creek Water District Improvement Co.	Responsible Person
24	G A Miller Drainage District No 1	Responsible Person
25	Sidney Irrigation District	Responsible Person
26	Hawn Creek District Improvement Co.	Responsible Person
27	Creswell Water Control District	Responsible Person
28	Creswell Irrigation District	Responsible Person
29	East Valley Water District	Responsible Person
30	Grand Prairie Water Control District	Responsible Person
31	Junction City Water Control District	Responsible Person
32	Lacomb Irrigation District	Responsible Person
33	Lake Labish Water Control District	Responsible Person
34	Muddy Creeks Irrigation Project	Responsible Person
35	Multnomah County Drainage District	Responsible Person
36	North Lebanon Water Control District	Responsible Person
37	Sauvie Island Drainage Improvement Company	Responsible Person
38	Scappoose Drainage Improvement Company	Responsible Person
39	Oregon Department of Environmental Quality	State
40	Oregon Department of State Lands	State
41	Department of Geology and Mineral Industries	State
42	Oregon Water Resources Department	State

5.2 Existing implementation plans

ORAR 340-042-0040(I)(H) requires identification of any source or sector-specific implementation plans available at the time of TMDL issuance. Following the issuance of the 2006 Willamette

Basin and 2008 Molalla-Pudding TMDLs and WQMPs, DEQ required responsible persons including DMAs to develop implementation plans that included specific management strategies and best management practices to meet load allocations for temperature. Reporting requirements for many of these entities included an annual progress report and a comprehensive assessment of activities every five years. For information on each DMA, including which DMAs are existing DMAs, see Appendix A. DEQ notes that not all existing DMAs have DEQ-approved TMDL implementation plan. Existing DMAs will need to update their current implementation plans for temperature to ensure any new requirements in this WQMP are met.

In addition, certain statewide rules, programs and management plans for the forestry, agricultural are intended, in part, to reduce or control nonpoint sources of pollution. The programs described in OAR 340-042-0080(2)&(3), respectively, represent existing implementation plans for non-federal forest and agricultural lands, and their sufficiency is discussed below.

5.2.1 Adequacy of Forest Practices Act to meet TMDL load allocations

Waterway protection measures were established in 1994 for state and private forest practices in Oregon, as codified in Oregon Revised Statutes 527.610 through 527.992, Oregon's Forest Practices Act (OAR 629-600 through 629-665) and Oregon's Plan for Salmon and Watersheds (Executive Order 99-01). As provided in ORS 527.770, forest operations conducted in accordance with the Forest Practices Act and other voluntary measures, are generally considered to be in compliance with water quality standards. However, as provided in OAR 340-042-0080(2), revisions to the Forest Practices Act rules may be required when DEQ determines that these rules are not adequate to implement load allocations in an approved TMDL. Periodic revisions to these rules occurred between the 1990s through 2022, with studies by ODF and DEQ showing that the rules adopted prior to 2022 were not adequate to meet the Oregon temperature criterion for protecting cold water. More information is provided in **Section xx** of the TMDL Technical Support Document. DEQ determined in this TMDL that the generally applicable Forest Practices Act rules in effect prior to 2022 were not adequate to implement the TMDL load allocations for excess solar radiation loading on small and medium fish-bearing streams to meet the temperature criteria.

With the publication of the Private Forest Accord Report and subsequent passage of Senate Bill 1501, 1502 and HB 4055, Forest Practices Act rule revisions were adopted by the Board of Forestry in October 2022 and additional amendments are anticipated through 2025. Implementation of these rules, which include increased riparian widths and additional tree retention, may be effective at meeting shade allocations. In addition, as revised rules become effective, implementation of more stringent measures to protect water quality on private forestlands are anticipated to be applied, including in the Willamette Subbasins. These rules are not expected to result in after-the-fact restoration of riparian areas harvested under previous rules. Therefore, effective shade is likely to be deficient for those riparian areas adjacent to small and medium salmon, steelhead and bull trout streams that were harvested prior to implementation of the new rules. The trajectory for providing future riparian shade on these streams is highly variable because it is based on the rules in effect at the time of harvest and the date of replanting. Multiple years will be needed for potential water quality improvements to be realized so that DEQ can evaluate adequacy of the revised rules in meeting the load allocations and surrogate measures required by the Willamette Subbasins temperature TMDL.

For these reasons, ODF is required to develop a TMDL implementation plan to be submitted to DEQ for review and approval.

As agreed to in the 2021 Memorandum of Understanding between DEQ and ODF, DEQ will work with ODF to identify additional regulatory or non-regulatory measures that could be implemented by rule revisions, stewardship agreements, incentive programs or other means to provide reasonable assurance of achieving TMDL solar radiation load allocations. Collaboration on these additional measures will occur during development of ODF's implementation plan.

5.2.2 Adequacy of Agricultural Water Quality Management programs in attaining TMDL load allocations and effective shade surrogate measures

The Oregon Legislature passed the Agricultural Water Quality Management Act in 1993, which directed Oregon Department of Agriculture to adopt rules as necessary and to develop plans to prevent water pollution from agricultural activities (ORS 568.900 to 568.933 and ORS 561.191 and OAR chapter 603, divisions 90 and 95). Subsequently, ODA worked with Local Advisory Committees and Soil and Water Conservation Districts to develop Agricultural Water Quality Area Rules and Area Plans for 38 watershed-based management areas across the state.

The Willamette Subbasins TMDL includes eight ODA Agricultural Water Quality Management Areas that each have an Area Plan (TSD, section X). DEQ participates in ODA's Area Plan review process by providing water quality status and trends for each management area, as well as assessments of land conditions, agricultural activities and implementation gaps that likely contribute to water quality impairments. The Area Plans for the eight management areas included in this TMDL were reviewed by DEQ within the last three years, however not all reviews resulted in Area Plan revisions.

Water temperature continues to be identified as impaired on Oregon's Section 303d list for Willamette Basin streams, in part due to the lack of adequate riparian vegetation in agriculturally influenced riparian areas (Section 9.1.2.1.1). DEQ's assessments of Area Plans identified protecting, maintaining and establishing riparian vegetation as a high priority to achieve TMDL load allocations. However, ODA's Area Plans lack specific measurable goals related to riparian conditions that will achieve TMDL shade measures.

The agricultural Area Rules and Area Plans that regulate and guide riparian management in the Willamette Subbasins TMDL project area do not identify quantitative targets for effective shade based on site specific factors, including stream width or orientation (TSD, Section X). DEQ also notes the disparity between ODA's implementation of their Area Rules for "site capable vegetation" in riparian areas and the riparian conditions needed to meet effective shade measures in this TMDL. It has also not been demonstrated that voluntary landowner implementation of Area Plans will bridge the gap between current riparian conditions and what is needed to meet TMDL allocations.

DEQ concluded that current Ag WQ program Area Rules combined with implementation of Area Plans' voluntary measures are not adequate in all locations to provide the riparian vegetation requirements and targets that are necessary to meet TMDL effective shade allocations and temperature water quality criteria. Therefore, ODA is required to develop a TMDL implementation plan to be submitted to DEQ for review and approval.

5.2.3 Adequacy of Bureau of Land Management streamside management strategies in attaining TMDL load allocations and effective shade surrogate measures

Streamside vegetation on BLM managed lands in the Willamette Subbasins / Lower Columbia-Sandy Subbasins are currently managed based on BLM’s Northwestern and Coastal Oregon Resources Management Plan (BLM, 2016).

Table 5 provides a summary of the riparian buffer distance for different types of waterbodies. BLM calls these areas riparian reserves. The reserve distance is defined based on the site-potential tree height. The site-potential tree height is the average maximum height of the tallest dominant trees (200 years or older) for a given site class. BLM states that site-potential tree heights generally range from 140 feet to 240 feet, depending on site productivity. Within the riparian reserve clearcut harvesting is prohibited. Some tree removal or thinning activities are allowed based certain circumstances such as to protect public safety, or to keep roads and other infrastructure clear of debris. Tree removal for yarding corridors, skid trails, road construction, stream crossings, and road maintenance or improvement are allowed where there is no operationally feasible and economically viable alternative. On fish bearing streams and perennial streams, between 0 and 120 feet slope distance there is no thinning except for treatments related to sudden oak death or for individual tree cutting or tipping that achieve restoration or habitat enhancement objectives. On intermittent, non-fish bearing streams, the same management strategy is applied but only from 0 to 50 feet.

Table 5: Summary of BLM riparian reserve buffer distance for different waterbody features

Feature	Riparian Reserve Distance measured as slope distance
Fish-bearing streams and perennial streams	One site-potential tree height distance from the ordinary high water line or from the outer edge of the channel migration zone for low-gradient alluvial shifting channels, whichever is greatest, on each side of the stream
Intermittent, non fish-bearing streams	Class I and II subwatersheds: One site-potential tree height distance from the ordinary high water line on each side of the stream
	Class II subwatersheds: 50 feet from the ordinary high water line on each side of a stream
Unstable areas that are above or adjacent to stream channels and are likely to deliver material such as sediment and logs to the stream if the unstable area fails	The extent of the unstable area; where there is stable area between such an unstable areas and a stream, and the unstable area has the potential to deliver material such as sediment and logs to the stream, extend the Riparian Reserve from the stream to include the intervening stable area as well as the unstable area
Lakes, natural ponds and reservoirs > 1 acres, and wetland > 1 acres	100 feet extending from the ordinary high water line
Natural ponds < 1 acres, wetlands < 1 acres (including seeps and springs), and constructed water impoundments (e.g. canal ditches and pump chances) of any size	25 feet extending from the ordinary high water line

DEQ's finds that BLM's streamside vegetation management strategies on fish-bearing streams, perennial streams, and intermittent, non-fish bearing streams in class III subwatersheds are adequate and will likely lead to achievement of the TMDL load allocation and effective shade targets. Riparian reserves located on intermittent, non-fish bearing streams in Class I and Class II subwatersheds may not be adequate to achieve the load allocation or effective shade targets. At these locations thinning is authorized between 50 and 120 feet slope distance. The thinning must maintain at least 30 percent canopy cover and 60 trees per acre expressed as an average. Thinning at these levels within 120 feet slope distance from the stream may reduce effective shade and contribute to stream warming. The amount of effective shade reduction and temperature response will depend on the thinning intensity and spacing of thinning treatments (Roon et al 2021).

5.2.4 U.S. Forest Service: Adequacy of streamside management strategies in attaining TMDL load allocations and effective shade surrogate measures

Streamside vegetation on USFS lands in the Willamette Subbasins / Lower Columbia-Sandy Subbasins are currently managed based on Northwest Forest Plan (USFS and BLM 1994). As part of the plan, the Aquatic Conservation Strategy was developed to restore and maintain the ecological health of watersheds and aquatic ecosystems, including salmon and steelhead habitat on federal lands managed by USFS. Maintaining and restoring water quality is one of the stated objectives of the Aquatic Conservation Strategy. These aquatic ecosystems and the streamside adjacent areas are called riparian reserves. Many of the reserve distances are defined based on the site-potential tree height. The Northwest Forest Plan states a site-potential tree height is the average maximum height of the tallest dominant trees (200 years or older) for a given site class. The following is a description of the riparian buffer distance for different types of waterbodies. The text was extracted from USFS and BLM (1994), Attachment A, Standards and Guidelines, Section C, pages C-3- through C-31.

Fish-bearing streams - Riparian Reserves consist of the stream and the area on each side of the stream extending from the edges of the active stream channel to the top of the inner gorge, or to the outer edges of the 100-year floodplain, or to the outer edges of riparian vegetation, or to a distance equal to the height of two site-potential trees, or 300 feet slope distance (600 feet total, including both sides of the stream channel), whichever is greatest.

Permanently flowing nonfish-bearing streams - Riparian Reserves consist of the stream and the area on each side of the stream extending from the edges of the active stream channel to the top of the inner gorge, or to the outer edges of the 100-year floodplain, or to the outer edges of riparian vegetation, or to a distance equal to the height of one site-potential tree, or 150 feet slope distance (300 feet total, including both sides of the stream channel), whichever is greatest.

Constructed ponds and reservoirs, and wetlands greater than 1 acre - Riparian Reserves consist of the body of water or wetland and: the area to the outer edges of the riparian vegetation, or to the extent of seasonally saturated soil, or the extent of unstable and potentially unstable areas, or to a distance equal to the height of one site-potential tree, or 150 feet slope distance from the edge of the wetland greater than 1 acre or the maximum pool elevation of constructed ponds and reservoirs, whichever is greatest.

Lakes and natural ponds - Riparian Reserves consist of the body of water and: the area

to the outer edges of the riparian vegetation, or to the extent of seasonally saturated soil, or to the extent of unstable and potentially unstable areas, or to a distance equal to the height of two site-potential trees, or 300 feet slope distance, whichever is greatest.

Seasonally flowing or intermittent streams, wetlands less than 1 acre, and unstable and potentially unstable areas - This category applies to features with high variability in size and site-specific characteristics. At a minimum, the Riparian Reserves must include:

- The extent of unstable and potentially unstable areas (including earthflows),
- The stream channel and extend to the top of the inner gorge,
- The stream channel or wetland and the area from the edges of the stream channel or wetland to the outer edges of the riparian vegetation, and
- Extension from the edges of the stream channel to a distance equal to the height of one site-potential tree, or 100 feet slope distance, whichever is greatest.

DEQ's finds that USFS's streamside vegetation management strategies on fish-bearing streams, perennial streams non-fish bearing streams, constructed ponds and reservoirs, lakes and natural ponds, and wetlands greater than 1 acre are adequate and will likely lead to achievement of the TMDL load allocation and effective shade targets. Vegetation management strategies on intermittent streams, and wetlands less than one acres may not be adequate to achieve the load allocation or effectiveness shade targets.

5.3 Implementation plan requirements

As required in OAR 340-042-0080(4)(a)(A)-(E), implementation plans must include:

- Management strategies that the entity will use to achieve load allocations and reduce pollutant loading;
- Timeline for strategy implementation and a schedule for completing measurable milestones;
- Performance monitoring and a plan for periodic review and revision of implementation plans; and,
- Any other analyses or information specified in the WQMP.

The following subsections provide detail on each component required by this WQMP to be included in implementation plans. DEQ will work with each entity required to develop a TMDL implementation plan to ensure that all requirements are included with sufficient detail for the plan to be approved on the schedule required in Section 5.4.

5.3.1 Management strategies

Each responsible person and DMA that is required to develop a TMDL implementation plan must include applicable priority management strategies from Table 2 and/ or potentially other practices and actions appropriate for activities and landscape conditions specific to the entities' pollutant sources or source sectors.

Implementation plans must identify all areas or activities within a DMA's jurisdiction or responsibility and identify locations where management strategies should be targeted to prevent or reduce pollutant loading. Implementation plans must also identify areas that might not need action beyond protection. Completion of a comprehensive inventory of a DMA's jurisdictional

area serves as an initial step for understanding where management actions are needed and when these can be implemented. This inventory should focus on assessment of landscape and riparian conditions and near-stream activities and practices.

5.3.2 Proposed Shade Assessment Requirement

Responsible persons, including DMAs are responsible for implementing streamside vegetation management strategies. Each responsible person and DMA that is required to submit an implementation plan must use one of the following comparisons to prioritize areas for restoration of overstory riparian vegetation to achieve the solar load allocation within their jurisdiction, ownership, or project area:

- (a) The shade gap, which is the percent difference between current effective shade and site potential effective shade (also referred to as restored condition); or,
- (b) Compare current riparian vegetation characteristics to a restored riparian condition.

DEQ conducted a vegetation height and shade gaps analysis within approximately 150-ft of modeled waterbodies in the Lower Willamette and Southern Willamette Subbasins, as detailed in Tables 9.5 and 9.6 in the TMDL Rule. Although DEQ was not able to conduct a shade gap analysis for the entire Willamette Basin, shade curves for specific unmodeled areas are presented in Figures 9.1-9.22 in the TMDL Rule.

Responsible persons including DMAs must use location-specific methods for determining whether effective shade allocations along the temperature impaired Willamette Subbasins assessment units are met. The location specific methods are:

1. Measure effective shade at the stream surface using standard stream monitoring equipment, such as the Solar Pathfinder™, or advanced methods using hemispherical imagery. Determine vegetation type, canopy density, stream width and stream orientation. Compare these results to **Table xx** in the TMDL.
2. Confirm and protect or establish overstory, woody vegetation in a 120-foot width buffer zone from the stream bank.
3. Conduct modeling using the Heat Source model (as used in this TMDL) or another method approved by DEQ (through the implementation plan process).

The WQMP does not require responsible persons, including DMAs to establish a 120-foot buffer width from each stream bank. The preferred method for showing compliance with effective shade allocations is measuring the effective shade. The literature review in the draft TMDL TSD in **Section XX** indicates that a 120-foot buffer of effective shade will not cause stream temperature increases for many waterbodies. Other factors like channel width may also impact the amount of effective shade needed to reduce solar radiation.

The shade assessment described above must be completed within the timeframe specified below for the following responsible persons, including DMAs.

State and federal agencies: By end of Year Three of the TMDL implementation plan
All other RPs including DMAs: By end of Year Five of the TMDL implementation plan

5.3.3 Timeline and schedule

Each implementation plan must include commitment to enact specific management strategies on a reasonable timeline, with a schedule specified for meeting measurable milestones to document progress. To meet the intent of this requirement, entities should develop management strategies using the SMART elements: Specific, Measurable, Achievable, Relevant, Time-bound (Doran, 1981).

Timelines and milestone schedules should be informed by the comprehensive inventory of the area of jurisdiction and control, as described in Section 5.3.1 above, and consideration of all relevant factors of the entity's specific situation. Identification of management strategy implementation timelines that differ from those estimated by DEQ to be effective in achieving load allocations must include an explanation of why the revised timelines are reasonable and how the timelines will be met.

5.3.4 Reporting on performance monitoring and plan review and revision

5.3.4.1 Reporting on performance monitoring

Each implementation plan must include a commitment to prepare annual reports on performance monitoring and a date by which they will be submitted to DEQ. These reports must include implementation tracking for each of the identified management strategies, progress toward timelines and measurable milestones specified in the implementation plan and evaluation of the effectiveness of the strategies.

DMAs should track implementation actions by accounting for the numbers, types and locations of projects, best management practices, education activities or other actions taken to improve or protect water quality. Most DMAs will track implementation actions they are directly responsible for completing; however some DMAs may need to track and report on actions that they implement through their support of other land managers, e.g. private landowners. Projects that implement temperature-related practices listed in OWEB's OWRI Online List of Treatments must be reported once to the OWRI database (OWEB 2023, OWEB 2023a) upon project completion. The conservation practices should also be noted in DMA annual reports to DEQ to document progress and track implementation actions over time. Because DEQ utilizes OWRI's database to track implementation of many voluntary management practices, unreported actions may not be credited in evaluating progress on TMDL implementation. DEQ will also consider DMA reporting on restoration activities to other DEQ-approved publicly accessible databases.

Implementation plans must include periodic assessment of whether implementation activities, which may include structural and non-structural best management practices or BMPs, are effective in improving management practices, land condition or community behaviors. Annual reports must summarize the status and results of these evaluations on the relevant time scale. Reports in year five must summarize implementation and effectiveness over the preceding four years.

5.3.4.2 Implementation plan review and revision

Implementation plans must be reviewed, revised as appropriate, and approved by DEQ every five years. DEQ will use implementation and effectiveness evaluations from annual reports, combined with any results of environmental monitoring, for this review. If implementation plan revisions are needed to correct deficiencies or otherwise ensure the plan is effective following

the year five review, DEQ will identify a date for submission of the revised plan for DEQ approval.

5.3.5 Implementation public involvement

As required in OAR 340-042-0040(I)(L), implementation plans prepared by designated management agencies must include a plan to involve the public in implementation of management strategies. Public engagement and education must be included to meet this requirement.

5.3.6 Maintenance of strategies over time

As required in OAR 340-042-0040(I)(M), implementation plans prepared by responsible persons, including designated management agencies, should include discussion of planned efforts to maintain management strategies over time.

5.3.7 Implementation costs and funding

As required in OAR 340-042-0040(I)(N), this section provides a general discussion of costs and funding for implementing management strategies. Implementation of management strategies to reduce or prevent pollution into waters of the state may incur financial capital or operating costs. These costs vary in relation to pollutant sources and loading, proximity to waterways and type or extent of preventative controls already in place. Certain management practices, such as preventative infrastructure maintenance, may result in long-term cost savings to DMAs or landowners.

OAR 340-042-0040(I)(N) also indicates that sector-specific or source-specific implementation plans may provide more detailed analyses of costs and funding for specific management strategies in the plan. DEQ requires each DMA to provide a fiscal analysis of the resources needed to develop, execute and maintain the programs and projects described in implementation plans to the extent that these costs can be accounted for or estimated. DEQ recommends that all responsible persons prepare the following level of economic analysis:

- Staff salaries, supplies, volunteer coordination, regulatory fees
- Installation, operation and maintenance of management measures
- Monitoring, data analysis and plan revisions
- Public education and outreach efforts
- Ordinance development (if needed to implement a management strategy)

This analysis should be in five-year increments to estimate costs, demonstrate sufficient funding is available to begin implementation and identify potential future funding sources to sustain management strategy implementation.

There are multiple sources of local, state and federal funds available for implementation of pollutant management strategies and control practices. Table 6 provides a partial list of funding and assistance programs available in Oregon that may be used to support planning and implementation activities that improve water quality in the Willamette Basin.

Table 6: Partial list of funding programs available in the Willamette Subbasins

Program	General Description	Contact
Clean Water State Revolving Fund	Loan program for below-market rate loans for planning, design, and construction of various water pollution control activities.	DEQ
Conservation Reserve Enhancement Program (CREP)	Provides annual rent to landowners who enroll agricultural lands along streams. Also cost-shares conservation practices such as riparian tree planting, livestock watering facilities, and riparian fencing.	NRCS, SWCDs, ODF
Conservation Reserve Program (CRP)	Competitive CRP provides annual rent to landowners who enroll highly erodible lands. Continuous CRP provides annual rent to landowners who enroll agricultural lands along seasonal or perennial streams. Also cost-shares conservation practices such as riparian plantings.	NRCS, SWCDs
Conservation Stewardship Program (CSP)	Provides cost-share and incentive payments to landowners who have attained a certain level of stewardship and are willing to implement additional conservation practices.	NRCS, SWCDs
Emergency Watershed Protection Program (EWP)	Available through the USDA-Natural Resources Conservation Service. Provides federal funds for emergency protection measures to safeguard lives and property from floods and the products of erosion created by natural disasters that cause a sudden impairment to a watershed.	NRCS, SWCDs
Emergency Forest Restoration Program (EFRP)	Available through the USDA-Natural Resources Conservation Service. Helps owners of non-industrial private forests restore forest health damaged by natural disasters.	USDA, ODF
Oregon 319 Nonpoint Source Implementation Grants	Fund projects that reduce nonpoint source pollution, improve watershed functions and protect the quality of surface and groundwater, including restoration and education projects.	DEQ, SWCDs, Watershed Councils
Environmental Quality Incentives Program (EQIP).	Cost-shares water quality and wildlife habitat improvement activities, including conservation tillage, nutrient and manure management, fish habitat improvements, and riparian plantings.	NRCS, SWCDs
Farm and Ranchland Protection Program (FRPP)	Cost-shares purchases of agricultural conservation easements to protect agricultural land from development.	NRCS, SWCDs, ODF
Federal Reforestation Tax Credit	Provides federal tax credit as incentive to plant trees.	Internal Revenue Service
Grassland Reserve Program (GRP)	Provides incentives to landowners to protect and restore pastureland, rangeland, and certain other grasslands.	NRCS, Farm Service Agency, SWCDs
Landowner Incentive Program (LIP)	Provides funds to enhance existing incentive programs for fish and wildlife habitat improvements.	U.S. Fish and Wildlife Service, ODFW
Oregon Watershed Enhancement Board (OWEB)	Provides grants for a variety of restoration, assessment, monitoring, and education projects, as well as watershed council staff support. 25 percent local match requirement on all grants.	SWCDs, Watershed Councils, OWEB

Program	General Description	Contact
Oregon Watershed Enhancement Board Small Grant Program	Provides grants up to \$10,000 for priority watershed enhancement projects identified by local focus group.	SWCDs, Watershed Councils, OWEB
Partners for Wildlife Program	Provides financial and technical assistance to private and non-federal landowners to restore and improve wetlands, riparian areas, and upland habitats in partnership with the U.S. Fish and Wildlife Service and other cooperating groups.	U.S. Fish and Wildlife Service, NRCS, SWCDs
Public Law 566 Watershed Program	Program available to state agencies and other eligible organizations for planning and implementing watershed improvement and management projects. Projects should reduce erosion, siltation, and flooding; provide for agricultural water management; or improve fish and wildlife resources.	NRCS, SWCDs
Resource Conservation & Development (RC & D) Grants	Provides assistance to organizations within RC & D areas in accessing and managing grants.	Resource Conservation and Development
ODF Small Forestland Investment in Stream Habitat (SFISH) Grants	Provides funding for Small Forestland Owners (SFO's) to improve road conditions and stream crossings as part of forest operations.	ODF, ODFW
State Forestation Tax Credit	Provides for reforestation of under-productive forestland not covered under the Oregon Forest Practices Act. Situations include brush and pasture conversions, fire damage areas, and insect and disease areas.	ODF
Forest Stewardship Program	Provides cost share dollars through USFS funds to family forest landowners to have management plans developed.	ODF
Western Bark Beetle Mitigation	ODF administers a cost share program for forest management practices pertaining to bark beetle mitigation for forest health and is funded through the USFS.	ODF, USFS
State Tax Credit for Fish Habitat Improvements	Provides tax credit for part of the costs of voluntary fish habitat improvements and required fish screening devices.	ODFW
Wetlands Reserve Program (WRP)	Provides cost-sharing to landowners who restore wetlands on agricultural lands.	NRCS, SWCDs
Wildlife Habitat Tax Deferral Program	Maintains farm or forestry deferral for landowners who develop a wildlife management plan with the approval of the Oregon Department of Fish and Wildlife.	ODFW, SWCDs, NRCS
Funding Resources for Watershed Protection and Restoration	EPA's Funding Resources for Watershed Protection and Restoration (EPA, 2023) contains links to multiple funding sources	various

5.4 Schedule for implementation plan submittal

OAR 340-042-0040(4)(l)(I) specifies that the WQMP contain a schedule for submittal of implementation plans. As stated in OAR 340-042-0080(4)(a), entities identified in the WQMP with responsibility for developing implementation plans are required to prepare and submit an implementation plan for DEQ approval according to the schedule in the WQMP.

Within 18 months of EQC adoption of the Willamette Basin mainstem TMDL (planned for February 2025), persons, including DMAs, responsible for developing implementation plans must submit implementation plans to DEQ for review and approval.

OAR 340-012-0055(2)(e) identifies failure to timely submit or implement a TMDL implementation plan, as required by DEQ order or rule, as a Class II violation. OAR 340-012-0053(1) identifies failure to report by the reporting deadline, as required by DEQ order or rule, as a Class I violation.

Should a sector or sector-wide DMA fail to submit an approvable TMDL implementation plan or fail to timely implement, DEQ may pursue enforcement under OAR 340-012-0055(e) or identify individual sources (landowners/operators) as persons responsible for developing and implementing TMDL implementation plans to address the load allocations relevant for the sector. DEQ may revise the WQMP or issue individual orders to identify additional responsible persons and notify them of the required schedule for submitting source-specific implementation plans.

Following the issuance of the TMDL and this WQMP, DEQ may determine that nonpoint source implementation plans are not necessary for certain entities identified in the WQMP based on available information or new information provided by those entities. For these entities, DEQ will provide a written determination why a plan is not necessary. This determination could be based on a variety of factors, such as inaccurate identification within the geographic scope of the TMDLs, or documentation that an entity is not a source of pollution or does not discharge pollutants to a waterbody within the geographic scope of a TMDL.

Once approved, DEQ expects implementation plans to be fully implemented according to the timelines and schedules for achieving measurable milestones specified within the plans. Reports on tracking and evaluation of implementation progress must be submitted annually on the date specified in the approved implementation plan (section 5.3). Implementation plans must be reviewed and revised as appropriate for DEQ approval every five years and submitted on the date specified in DEQ's approval letter for an implementation plan.

6. Monitoring and evaluation of progress

OAR 340-042-0040(4)(l)(K) requires that the WQMP include a plan to monitor and evaluate progress toward achieving the TMDL allocations and associated water quality standards for the impairments addressed in the TMDL. Additional objectives of monitoring efforts are to assess progress towards reducing excess pollutant loads and to better understand variability associated with environmental or anthropogenic factors. This section summarizes DEQ's approach, including the required elements of identification of monitoring responsibilities and the plan and schedule for reviewing monitoring information to make TMDL revisions, as appropriate.

There are two fundamental components to DEQ's approach to monitoring and evaluating TMDL progress: 1) tracking the implementation and effectiveness of activities committed to by responsible persons in DEQ-approved implementation plans, and 2) periodically monitoring the physical, chemical and biological parameters necessary to assess water quality status and trends for the impairments that constitute the basis for this TMDL.

With input from partners, DEQ will develop detailed water column sampling and analysis plans to finalize the first iteration of the Monitoring Strategy after the issuance of the TMDL and WQMP. DEQ will continue to work with partners to implement the sampling and analysis and periodically refine the strategy as needed.

6.1 Persons responsible for monitoring

Section 5.1 identifies responsible persons, including Designated Management Agencies that are responsible for developing TMDL implementation plans and implementing the management strategies described on the timelines committed to in approved plans. Section 5.3 details the content required in implementation plans and annual reports, as well as the schedules for their submittal. Responsible persons including DMAs must track and report on management actions implemented, milestones met and periodic evaluation of performance monitoring. This documentation makes up the primary monitoring information DEQ reviews in gaging progress toward meeting TMDL goals.

DEQ is also requiring ODA, ODF, BLM, and USFS to undertake monitoring actions in areas within their jurisdiction or ownership to help determine the status of instream water quality and landscape conditions associated with water quality. This effort will be progressive, starting with review of existing data and monitoring locations, then adjusted as needed to improve understanding of current water quality status and develop a trend monitoring network. These four agencies have jurisdiction over approximately 93% of riparian areas in the Willamette Subbasins TMDL. For these reasons, DEQ believes it is appropriate for these large agencies to collaborate with DEQ on a Monitoring Strategy that is expected to be developed following the completion of the Willamette Basin Mainstem TMDL. DEQ encourages and invites other DMAs to collaborate with DEQ on collecting water quality data, especially DMAs that have been collecting temperature data as part of TMDL implementation or other related programs.

The objectives for monitoring and assessment will be described in DMA implementation plans and will include but are not limited to:

1. Provide information necessary to determine locations for applying management strategies or to assess the effectiveness of those strategies.
2. Refine information on source-specific or sector-specific pollutant loading.
3. Provide information necessary to demonstrate progress towards meeting load allocations.
4. Provide information used to identify roles and participate in collaborative effort among responsible persons to characterize water quality status and trends.
5. Provide information integral to an adaptive management approach to inform and adjust management strategies over time.

Environmental media and water column monitoring activities conducted by responsible persons including DMAs to meet TMDL objectives, data collection and management must be performed in adherence to Quality Control procedures and Quality Assurance protocols established by U.S. EPA or other appropriate organizations. This requirement will be met through developing or adapting Quality Assurance Project Plans and/or project-specific Sampling and Analysis Plans.

For water column monitoring, QA/QC documentation must be submitted to DEQ for review and approval based on a schedule in the approved TMDL implementation plan. Existing QAPPs or SAPs may be revised as needed. Alternatively, responsible persons can agree to participate in a collaborative monitoring plan under an umbrella QAPP. DEQ staff will coordinate QAPP development with responsible persons including DMAs upon request in advance of submission. Resources for developing quality assurance project plans and sampling and analysis plans are available on DEQ's water quality monitoring website (DEQ, 2023).

6.2 Plan and schedule for reviewing monitoring information and revising the TMDL

DEQ recognizes that it will take time before management practices identified in a WQMP are fully implemented and effective in reducing and controlling pollution. DEQ also recognizes that despite best efforts, natural events beyond the control of humans may interfere with or delay attainment of the TMDL. Such events include, but are not limited to, floods, fire, insect infestations, and drought. In addition, DEQ recognizes that technology and practices for controlling nonpoint source pollution will continue to develop and improve over time. DEQ will use adaptive management to refine implementation as technology, and knowledge about these approaches progress.

Adaptive management is a process that acknowledges and incorporates improved technologies and practices over time to refine implementation. A conceptual representation of the TMDL adaptive management process is presented in Figure 5.

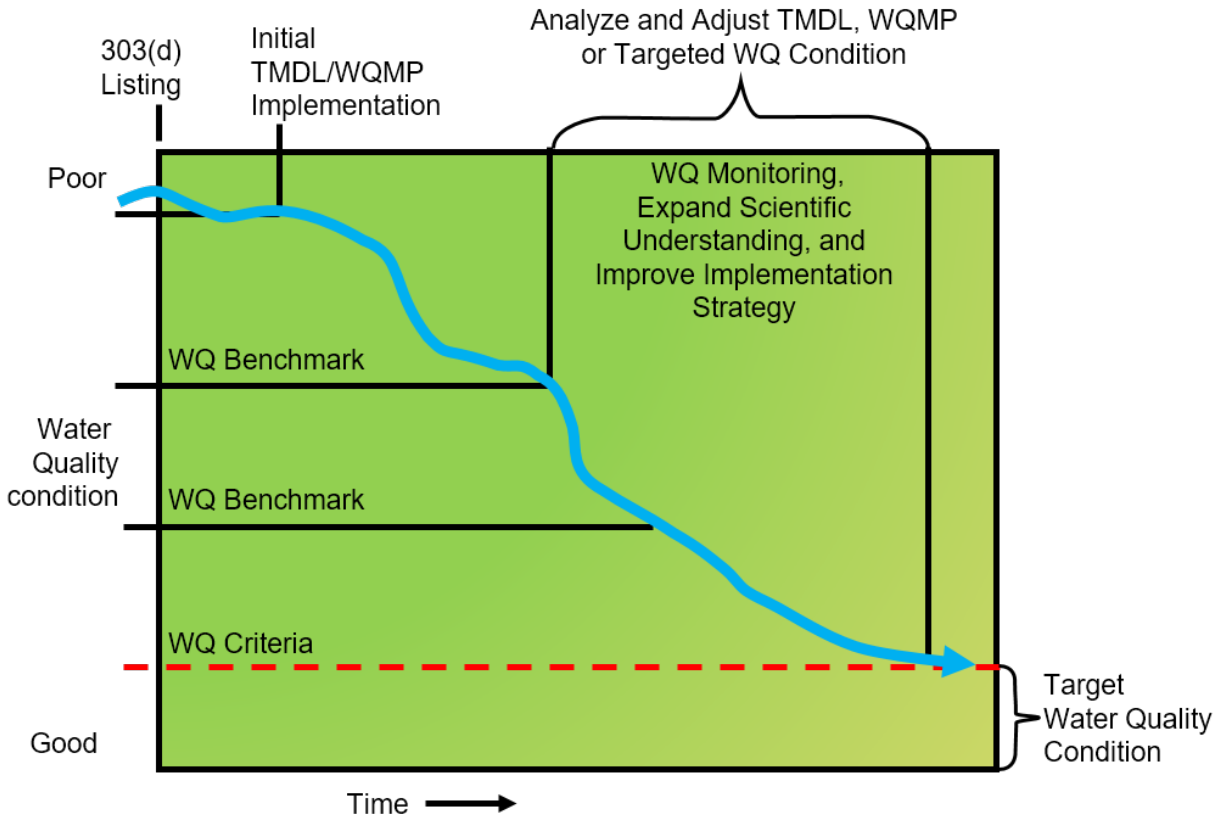


Figure 5: Conceptual representation of adaptive management

DEQ considers entities complying with DEQ-approved TMDL implementation plans to be in compliance with their respective requirements contained in the TMDLs. The annual reports and Year Five Reviews submitted to DEQ by each of the responsible persons including DMAs in the Willamette Basin will be evaluated individually and collectively. DEQ will use this information to determine whether management actions are supporting progress towards TMDL objectives, or if changes in management actions and/or TMDLs are needed.

Annually, DEQ will review annual reports, participate with responsible persons including DMAs in review of monitoring information, and participate in implementing the Willamette Basin Monitoring Strategy.

Every five years, DEQ will collectively evaluate annual reports and all available monitoring data and information to assess progress on meeting the goals of the TMDLs and WQMP.

- DEQ will require responsible persons including DMAs to revise their implementation plans to address deficiencies where DEQ determines that implementation plans or effectiveness of management strategies are inadequate.
- DEQ and partners will revise sampling and analysis plans or other aspects of the Monitoring Strategy where progress toward meeting Monitoring Strategy objectives is not being made.
- DEQ will consider TMDL revisions if DEQ's evaluation of water monitoring data and supporting information indicate that the TMDL load allocations for a given pollutant-impairment are insufficient to meet state numeric criteria or narrative criteria, or insufficient to protect the designated beneficial uses.

- DEQ will follow all public participation requirements, including convening a local technical or rulemaking advisory committee to provide input, on TMDL revisions per OAR 340-042-0040(7).

7. Reasonable Assurance of Implementation

OAR 340-042-0030(9) defines Reasonable Assurance as “a demonstration that a TMDL will be implemented by federal, state or local governments or individuals through regulatory or voluntary actions including management strategies or other controls.” OAR 340-042-0040(4)(I)(J) requires a description of reasonable assurance that management strategies and sector-specific or source-specific implementation plans will be carried out through regulatory or voluntary actions.

The Clean Water Act section 303(d) requires that a TMDL be “established at a level necessary to implement the applicable water quality standard.” Federal regulations define a TMDL as “the sum of the individual wasteload allocations for point sources and load allocations for nonpoint sources and natural background” [40 CFR 130.2(i)].

In addition, federal antidegradation rules at 40 CFR 131.12(a)(2), require states to “assure that there shall be achieved the highest statutory and regulatory requirements for all new and existing point sources and cost-effective and reasonable best management practices for nonpoint source control,” when allowing any lowering of water quality.

When a TMDL is developed for waters impaired by point sources only, the existence of the NPDES regulatory program and the issuance of NPDES permits provide the reasonable assurance that the wasteload allocations in the TMDL will be achieved. That is because federal regulations implementing the Clean Water Act require that water quality-based effluent limits in permits be consistent with “the assumptions and requirements of any available [wasteload allocation]” in an approved TMDL [40 CFR 122.44(d)(1)(vii)(B)]. And as a factor in consideration of allocation distribution among sources, OAR 340-042-0040(6)(g) states that “to establish reasonable assurance that the TMDL’s load allocations will be achieved requires determination that practices capable of reducing the specified pollutant load: (1) exist; (2) are technically feasible at a level required to meet allocations; and (3) have a high likelihood of implementation.” This three point test is consistent with EPA past practice and guidance on determining reasonable assurance and supports federal antidegradation rules and Oregon’s antidegradation policy (340-041-0004).

Where a TMDL is developed for waters impaired by both point and nonpoint sources, it is the state’s and EPA’s best professional judgment as to the three point test in OAR 340-042-0040(6)(g) on reasonable assurance that the TMDL’s load allocations will be achieved.

Where there is a demonstration that nonpoint source load reductions can and will be achieved; a determination that reasonable assurance exists and allocation of greater loads to point sources is appropriate. Without a demonstration of reasonable assurance that relied-upon nonpoint source reductions will occur, reductions to point sources wasteload allocations are needed.

The Willamette Basin TMDLs were developed to address both point and nonpoint sources with load reduction allocations proportional to estimated source contributions and in consideration of opportunities for effective measures to reduce those contributions. There are several elements that combine to provide the reasonable assurance to meet federal and state requirements, including for antidegradation. Education, outreach, technical and financial assistance, permit administration, permit enforcement, responsible person's implementation and DEQ enforcement of TMDL implementation plans will all be used to ensure that the goals of this TMDL are met.

7.1 Accountability Framework

Reasonable assurance that needed load reductions will be achieved for nonpoint sources and antidegradation requirements and narrative water quality criteria will be met is based primarily on an accountability framework incorporated into the WQMP, together with the implementation plans of persons responsible for implementation. This approach is similar to the accountability framework adopted by EPA for the Chesapeake Bay TMDL, which was adopted in 2010. Figure 6 presents the accountability framework elements, which are intended to work in concert to demonstrate reasonable assurance of implementation.

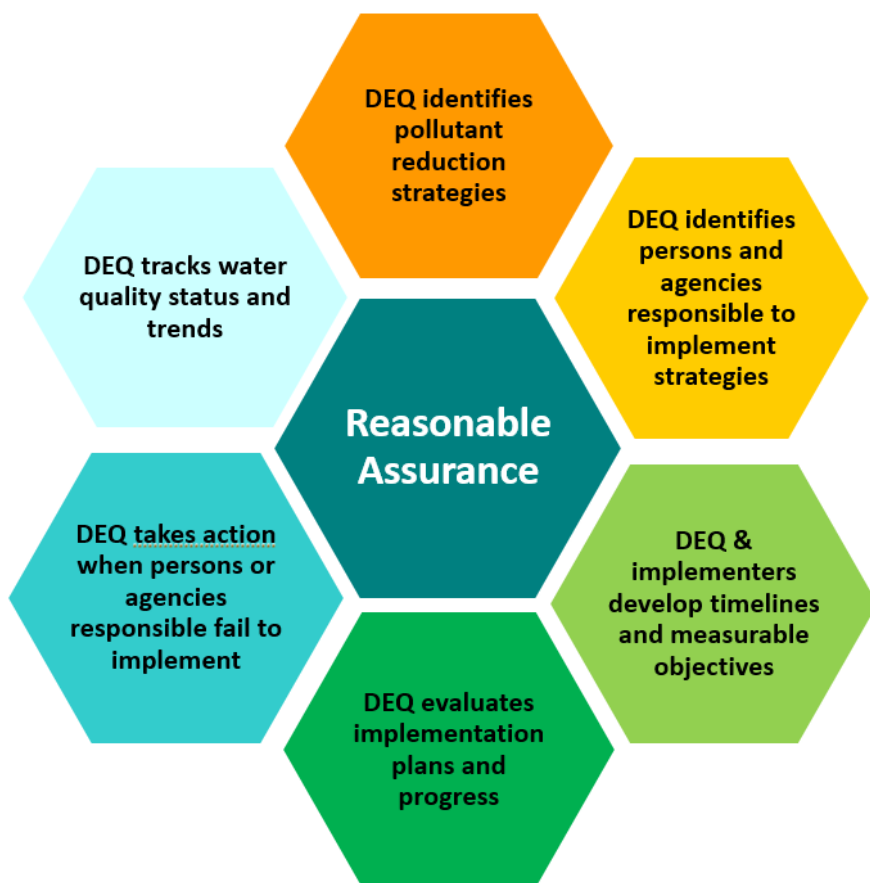


Figure 6: Representation of the reasonable assurance accountability framework led by DEQ

Pollutant reduction strategies are identified in Section 2 and more specific strategies, practices and actions will be detailed in each required implementation plan, to be submitted per the timelines in Section 5.4. These strategies and actions are comprehensively implemented through a variety of regulatory and non-regulatory programs. Many of these are existing strategies and actions that are already being implemented within the watershed and demonstrate reduced pollutant loading. These strategies are technically feasible at an appropriate scale to meet the allocations. A high likelihood of implementation is demonstrated because DEQ reviews the individual implementation plans and proposed actions for adequacy and establishes a monitoring and reporting system to track implementation and respond to any inadequacies. In Oregon, forestry and agricultural related nonpoint source best management strategies are actualized through implementation of state Forest Practices Act and agricultural Water Quality Management Area Plans and Rules. In Sections 5.2.1 and 5.2.2 DEQ determined that ODF and ODA must also develop and implement TMDL implementation plans that describe strategies specific to the Willamette River Subbasins. This adds to the accountability for implementation of cost-effective and reasonable best management and further assures that antidegradation requirements and narrative criteria will be met.

Approximately 154 responsible persons, including Designated Management Agencies, responsible for implementation of pollutant reduction strategies are identified in Appendix A. General timelines, milestones and measurable objectives are identified in Sections 3 and 4.2, respectively. More specific timelines, milestones and measurable objectives will be specified in each required implementation plan. These elements support timely action by both DEQ and persons/agencies responsible for implementation so that enforcement and adaptive management actions can be triggered and evaluation of attainment of TMDL goals occurs.

DEQ periodically reviews reporting by persons and agencies responsible for implementing pollutant reduction strategies to track the management strategies being implemented and evaluate achievements against established timelines and milestones.

Following up on reviews to track progress of implementation plans, DEQ will take appropriate action if the DMAs or responsible persons fail to develop or effectively implement their implementation plan or fulfill milestones. DEQ's actions can include enforcement or engagement in voluntary initiatives. DEQ uses both, as appropriate within the process, to achieve optimal pollutant reductions. In some cases, DEQ will also take enforcement actions where necessary based on authorities listed in Section 8 or raise the issue to the Environmental Quality Commission as provided in OAR 340-042-0080.

DEQ tracks water quality status and trends concurrently with implementation of management strategies. DEQ relies on a system of interconnected evaluations, which include DMAs meeting measurable objectives, effectiveness demonstration of pollutant management strategies, accountability of implementation, discharge monitoring and instream monitoring. DEQ also periodically evaluates water quality data collected through ambient and specific monitoring programs, including monitoring plans developed specifically for the Willamette Basin, as presented in Section 6. The *Assessment and Monitoring Strategy to Support Implementation of Mercury Total Maximum Daily Loads for the Willamette Basin* is one such plan, which was developed in partnership with EPA. DEQ regularly prepares Status and Trends reports and conducts water quality assessments on status of all waterways in Oregon every two years, as

required by the Clean Water Act for submittal to EPA for approval as DEQ's Integrated Report. Together, these data and evaluations allow refinement of focus on specific geographic areas or discharges and appropriate implementation of adaptive management actions to attain, over time, the objectives of the TMDL.

7.2 Reasonable Assurance Conclusions

DEQ's implementation approach is multi-faceted and requires many targeted management practices across the entire basin to reduce anthropogenic pollutants, regardless of source origination.

The management strategies and practices that must be employed to reduce excess solar radiation loading are spatially distributed and involve multiple responsible persons. Also, highly variable lag times are anticipated following the establishment of shade-producing vegetation to decrease solar radiation reaching streams. For these reasons, there is some uncertainty about the pace of achieving the needed reductions necessary in the Willamette Subbasins to attain water quality criteria. DEQ's WQMP addresses this uncertainty by including an extensive monitoring, reporting, and adaptive component that is designed to match the accountability framework used by EPA in its Chesapeake Bay TMDL (2010).

The rationale described in this document stems from robust evaluations, implements an accountability framework and provides opportunities for adaptive management to maximize pollutant reductions. Together this approach provides reasonable assurance to meet state and federal requirements, including for antidegradation, and attain the goals of the TMDL.

8. Legal Authorities

As required in Oregon Administrative Rule 340-042-0040(4)(I)(O), this section cites legal authorities relating to implementation of management strategies.

Clean Water Act, Section 303(d)

The DEQ is the Oregon state agency responsible for implementing the Clean Water Act in Oregon. Section 303(d) of the 1972 Federal Clean Water Act as amended requires states to develop a list of rivers, streams and lakes that cannot meet water quality standards without application of additional pollution controls beyond the existing requirements on industrial sources and sewage treatment plants. These waters are referred to as "water quality limited." Water quality limited waterbodies must be identified by the EPA or by a state agency which has this authority. In Oregon, the responsibility to delegate water quality limited waterbodies rests with DEQ and DEQ's list of water quality limited waters is updated every two years. The list is referred to as the 303(d) list. Section 303 of the Clean Water Act further requires that TMDLs be developed for all waters on the 303(d) list. The Oregon Environmental Quality Commission granted DEQ authority to implement TMDLs through OAR 340-042, with special provisions for agricultural lands and nonfederal forestland as governed by the Agriculture Water Quality Management Act and the Forest Practices Act, respectively. The EPA has the authority under the Clean Water Act to approve or disapprove TMDLs that states submit. When a TMDL is officially submitted by a state to EPA, EPA has 30 days to take action on the TMDL. In the case where EPA disapproves a TMDL, EPA must issue a TMDL within 30 days. A TMDL defines the

amount of pollution that can be present in the waterbody without causing water quality standards to be violated. A WQMP is developed to describe a strategy for reducing water pollution to the level of the load allocations and waste load allocations prescribed in the TMDL, which is designed to restore the water quality and result in compliance with the water quality standards. In this way, the designated beneficial uses of the water will be protected for all users.

Endangered Species Act, Section 6

Section 6 of the 1973 federal Endangered Species Act, as amended, encourages states to develop and maintain conservation programs for federally listed threatened and endangered species. In addition, Section 4(d) of the ESA requires the National Marine Fisheries Service to list the activities that could result in a “take” of species they are charged with protecting. With regard to this TMDL, NMFS’ protected species are salmonid fish. NMFS also described certain precautions that, if followed, would preclude prosecution for take even if a listed species were harmed inadvertently. Such a provision is called a limit on the take prohibition. The intent is to provide local governments and other entities greater certainty regarding their liability for take.

NMFS published their rule in response to Section 4(d) in July of 2000 (see 65 FR 42421, July 10, 2000). The NMFS 4(d) rule lists 12 criteria that will be used to determine whether a local program incorporates sufficient precautionary measures to adequately conserve fish. The rule provides for local jurisdictions to submit development ordinances for review by NMFS under one, several or all of the criteria. The criteria for the Municipal, Residential, Commercial and Industrial Development and Redevelopment limit are listed below:

1. Avoid inappropriate areas such as unstable slopes, wetlands, and areas of high habitat value;
2. Prevent stormwater discharge impacts on water quality;
3. Protect riparian areas;
4. Avoid stream crossings – whether by roads, utilities, or other linear development;
5. Protect historic stream meander patterns;
6. Protect wetlands, wetland buffers, and wetland function;
7. Preserve the ability of permanent and intermittent streams to pass peak flows (hydrologic capacity);
8. Stress landscaping with native vegetation;
9. Prevent erosion and sediment run-off during and after construction;
10. Ensure water supply demand can be met without affecting salmon needs;
11. Provide mechanisms for monitoring, enforcing, funding and implementing; and
12. Comply with all other state and federal environmental laws and permits.

Oregon Revised Statute Chapter 468B

DEQ is authorized by law to prevent and abate water pollution within the State of Oregon. Particularly relevant provisions of this chapter include:

ORS 468B.020 Prevention of pollution

- (A) Pollution of any of the waters of the state is declared to be not a reasonable or natural use of such waters and to be contrary to the public policy of the State or Oregon, as set forth in ORS 468B.015.

- (B) In order to carry out the public policy set forth in ORS 468B.015, the Department of Environmental Quality shall take such action as is necessary for the prevention of new pollution and the abatement of existing pollution by:
- a) Fostering and encouraging the cooperation of the people, industry, cities and counties, in order to prevent, control and reduce pollution of the waters of the state; and
 - b) Requiring the use of all available and reasonable methods necessary to achieve the purposes of ORS 468B.015 and to conform to the standards of water quality and purity established under ORS 468B.048.

ORS 468B.110 provides DEQ and the EQC with authority to take actions necessary to achieve and maintain water quality standards, including issuing TMDLs and establishing wasteload allocations and load allocations.

NPDES and WPCF Permits

DEQ administers two different types of wastewater permits in implementing Oregon Revised Statute (ORS) 468B.050. These are: the NPDES permits for waste discharge into waters of the United States; and Water Pollution Control Facilities permits for waste disposal on land. The NPDES permit is also a federal permit and is required under the Clean Water Act. The WPCF permit is a state program.

401 Water Quality Certification

Section 401 of the CWA requires that any applicant for a federal license or permit to conduct any activity that may result in a discharge to waters of the state must provide the licensing or permitting agency a certificate from DEQ that the activity complies with water quality requirements and standards. These include certifications for hydroelectric projects and for 'dredge and fill' projects. The legal citations are: 33 U.S.C. 1341; ORS 468B.035 – 468B.047; and OAR 340-048-0005 – 340-048-0040.

USACE Dam Operation and Management

In association with other federal statutes, including House Document No. 531 Volume V, the River and Harbor Act, the Flood Control Act, and the Water Resources Development Act, the USACE is charged with operating its projects in compliance with the federal Clean Water Act, and in accordance with all federal, State, interstate and local requirements, administrative authority, and process and sanctions respecting the control and abatement of water quality pollution as per Title 1 Section 313 (33 U.S.C. 1323).

Oregon Forest Practices Act

The Oregon Department of Forestry is the designated management agency for regulating land management actions on non-federal forestry lands that impact water quality (ORS 527.610 to 527.992, and OAR 629 Divisions 600 through 665). The Board of Forestry has adopted water protection rules, including but not limited to OAR Chapter 629, Divisions 625, 630, and 635-660, which describe best management practices for forest operations. The Oregon Environmental Quality Commission, Board of Forestry, DEQ, and ODF have agreed that these pollution control measures will primarily be relied upon to result in achievement of state water quality standards. Statutes and rules also include provisions for adaptive management that provide for revisions to FPA practices where necessary to meet water quality standards. These provisions are described in ORS 527.710, ORS 527.765, OAR 629-035-0100, and OAR 340-042-0080.

Agricultural Water Quality Management Act

The Oregon Department of Agriculture is responsible for the prevention and control of water pollution from agricultural activities as directed and authorized through the Agricultural Water Quality Management Act, adopted by the Oregon legislature in 1993 (ORS 568.900 to ORS 568.933). It is the lead state agency for regulating agriculture for water quality (ORS 561.191). The Agricultural Water Quality Management Plan Act directs the ODA to work with local communities to develop water quality management plans for specific watersheds that have been identified as violating water quality standards and have agriculture water pollution contributions. The agriculture water quality management plans are expected to identify problems in the watershed that need to be addressed and outline ways to correct the problems. Water Quality area rules for areas within the Willamette Basin include OAR 603-095-2100 to 1160, OAR 603-095-2300 to 2360, OAR 603-095-2600 to 2660, and OAR 603-095-3700 to 3760.

Local Ordinances

Local governments are expected to describe in their implementation plans their specific legal authorities to carry out the management strategies necessary to meet the TMDL allocations. If new or modified local codes or ordinances are required to implement the plan, the DMA will identify code development as a management strategy. Legal authority to enforce the provisions of a city's NPDES permit would be a specific example of legal authority to carry out specific management strategies.

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APPENDIX A:

Proposed list of responsible persons including designated management agencies

No.	Designated Management Agencies/Responsible Persons	DMA Type	Total Acres in Subbasins	Acres 150ft from stream	DMA/RP Status	TMDL Plan Needed?
1	Adair Village	City	483	55	existing	yes
2	Albany	City	11,237	1,041	existing	yes
3	Aumsville	City	788	103	existing	yes
4	Aurora	City	315	45	existing	yes
5	Brownsville	City	834	96	existing	yes
6	Canby	City	3,185	122	existing	yes
7	Coburg	City	653	68	existing	yes
8	Corvallis	City	14,020	1,508	existing	yes
9	Cottage Grove	City	2,403	127	existing	yes
10	Creswell	City	1,432	114	existing	yes
11	Dallas	City	3,998	757	existing	yes
12	Detroit	City	661	132	existing	yes
13	Donald	City	283	18	existing	yes
14	Dundee	City	848	33	existing	yes
15	Estacada	City	1,434	207	existing	yes
16	Eugene	City	31,614	3,019	existing	yes
17	Fairview	City	1,773	343	existing	yes
18	Falls City	City	787	241	existing	yes
19	Gates	City	399	106	existing	yes
20	Gervais	City	308	19	existing	yes
21	Gladstone	City	1,578	30	existing	yes
22	Gresham	City	11,952	1,594	existing	yes
23	Halsey	City	259	36	existing	yes
24	Happy Valley	City	7,402	1,508	existing	yes
25	Harrisburg	City	826	98	existing	yes
26	Hubbard	City	444	29	existing	yes
27	Idanha	City	530	147	existing	yes
28	Independence	City	1,908	165	existing	yes
29	Jefferson	City	529	77	existing	yes
30	Johnson City	City	43	13	existing	yes
31	Junction City	City	1,992	280	existing	yes
32	Keizer	City	4,298	171	existing	yes
33	Lake Oswego	City	5,807	962	existing	yes
34	Lebanon	City	4,306	383	existing	yes
35	Lowell	City	534	76	existing	yes
36	Lyons	City	544	56	existing	yes

No.	Designated Management Agencies/Responsible Persons	DMA Type	Total Acres in Subbasins	Acres 150ft from stream	DMA/RP Status	TMDL Plan Needed?
37	Mill City	City	526	52	existing	yes
38	Millersburg	City	2,804	401	existing	yes
39	Milwaukie	City	3,241	284	existing	yes
40	Molalla	City	1,642	74	existing	yes
41	Monmouth	City	1,462	135	existing	yes
42	Monroe	City	342	23	existing	yes
43	Mt. Angel	City	677	18	existing	yes
44	Newberg	City	3,692	312	existing	yes
45	Oakridge	City	1,241	153	existing	yes
46	Oregon City	City	6,437	440	existing	yes
47	Philomath	City	1,597	165	existing	yes
48	Portland	City	73,674	9,339	existing	yes
49	Salem	City	31,373	2,942	existing	yes
50	Sandy	City	1,768	197	existing	yes
51	Scappoose	City	2,098	212	new	yes
52	Scio	City	262	40	existing	yes
53	Scotts Mills	City	225	46	existing	yes
54	Silverton	City	2,455	597	existing	yes
55	Springfield	City	10,323	1,004	existing	yes
56	St. Helens	City	1,973	368	new	yes
57	St. Paul	City	184	6	existing	yes
58	Stayton	City	1,923	241	existing	yes
59	Sublimity	City	595	25	existing	yes
60	Sweet Home	City	3,441	616	existing	yes
61	Tangent	City	2,230	252	existing	yes
62	Troutdale	City	1,214	166	new	yes
63	Tualatin	City	401	7	existing	no
64	Turner	City	911	124	existing	yes
65	Veneta	City	1,658	207	existing	yes
66	West Linn	City	4,335	629	existing	yes
67	Westfir	City	192	68	existing	yes
68	Wilsonville	City	4,869	420	existing	yes
69	Wood Village	City	563	18	existing	yes
70	Woodburn	City	3,596	276	existing	yes
71	Benton County	County	27,798	3,456	existing	yes
72	Clackamas County	County	79,838	13,597	existing	yes
73	Columbia County	County	15,374	3,409	new	yes
74	Curry County	County	3	0.5	new	no
75	Lane County	County	121,090	19,240	existing	yes

No.	Designated Management Agencies/Responsible Persons	DMA Type	Total Acres in Subbasins	Acres 150ft from stream	DMA/RP Status	TMDL Plan Needed?
76	Lincoln County	County	89	43	new	no
77	Linn County	County	35,141	5,962	existing	yes
78	Marion County	County	43,290	5,978	existing	yes
79	Multnomah County	County	4,089	1,170	existing	yes
80	Polk County	County	20,855	4,029	existing	yes
81	Washington County	County	2,130	156	new	no
82	Yamhill County	County	10,131	1,355	new	yes
83	Bonneville Power Administration	Federal	1,018	252	new	no
84	U.S. Bureau of Land Management	Federal	351,837	110,202	existing	yes
85	U.S. Fish and Wildlife Service	Federal	10,912	1,568	existing	yes
86	U.S. Forest Service	Federal	2,201,208	549,814	existing	yes
87	US Army Corps of Engineers	Federal	29,289	5,884	existing	yes
88	Pacific Power and Light	Private Utility	35	1	new	no
89	Eugene Water and Electric Board	Public Utility	not assessed	not assessed	existing	yes
90	Portland General Electric	Public Utility	not assessed	not assessed	new	yes
91	Albany & Eastern Railroad	Railroad	304	52	new	no
92	BNSF Railway	Railroad	148	9	new	no
93	Central Oregon & Pacific Railroad	Railroad	182	32	new	no
94	Oregon Pacific Railroad	Railroad	44	2	new	no
95	Port of Coos Bay	Railroad	315	57	new	no
96	Portland & Western Railroad	Railroad	1,898	261	new	no
97	Portland Terminal Railroad Company	Railroad	0.1	0.1	new	no
98	TriMet	Railroad	102	38	new	no
99	Union Pacific Railroad	Railroad	3,788	630	new	no
100	Vennel Farms Railroad Company	Railroad	2	0.2	new	no
101	Willamette Shore Trolley	Railroad	6	1	new	no
102	Willamette Valley Railway	Railroad	255	51	new	no
103	Ash Creek Water Control District	Responsible Person	not assessed	not assessed	new	no
104	Creswell Water Control District	Responsible Person	not assessed	not assessed	new	no
105	Creswell Irrigation District	Responsible Person	not assessed	not assessed	new	no
106	East Valley Water District	Responsible Person	not assessed	not assessed	new	no
107	East Valley Water District	Responsible Person	not assessed	not assessed	new	no

No.	Designated Management Agencies/Responsible Persons	DMA Type	Total Acres in Subbasins	Acres 150ft from stream	DMA/RP Status	TMDL Plan Needed?
108	G A Miller Drainage District No 1	Responsible Person	not assessed	not assessed	new	no
109	Grand Prairie Water Control District	Responsible Person	not assessed	not assessed	new	no
110	Hawn Creek District Improvement Co.	Responsible Person	not assessed	not assessed	new	no
111	Junction City Water Control District	Responsible Person	not assessed	not assessed	new	no
112	Lacomb Irrigation District	Responsible Person	not assessed	not assessed	new	no
113	Lake Labish Water Control District	Responsible Person	not assessed	not assessed	new	no
114	Muddy Creeks Irrigation Project	Responsible Person	not assessed	not assessed	new	no
115	Multnomah County Drainage District	Responsible Person	not assessed	not assessed	new	no
116	North Lebanon Water Control District	Responsible Person	not assessed	not assessed	new	no
117	Palmer Creek Water District Improvement Co.	Responsible Person	not assessed	not assessed	new	no
118	Santiam Water Control District	Responsible Person	not assessed	not assessed	new	no
119	Sauvie Island Drainage Improvement Company	Responsible Person	not assessed	not assessed	new	no
120	Scappoose Drainage Improvement Company	Responsible Person	not assessed	not assessed	new	no
121	Sidney Irrigation District	Responsible Person	not assessed	not assessed	new	no
122	West Labish Water Control District	Responsible Person	not assessed	not assessed	new	no
123	Metro (Portland Metropolitan Government)	Special District	not assessed	not assessed	existing	yes
124	Water and Environment Services	Special District	not assessed	not assessed	existing	yes
125	Department of Geology and Mineral Industries	State	2,055	258	existing	no
126	Oregon Department of Agriculture	State	1,296,218	191,934	existing	yes
127	Oregon Department of Environmental Quality	State	0	0	existing	no
128	Oregon Department of Fish & Wildlife	State	10,080	1,359	new	yes
129	Oregon Department of Forestry	State	1,721,083	456,567	existing	yes
130	Oregon Department of State Lands	State	336	37	existing	no
131	Oregon Department of Transportation	State	30,997	4,856	existing	yes
132	Oregon Parks and Recreation Department	State	19,440	3,219	existing	yes

No.	Designated Management Agencies/Responsible Persons	DMA Type	Total Acres in Subbasins	Acres 150ft from stream	DMA/RP Status	TMDL Plan Needed?
133	Oregon Water Resources Department	State	not assessed	not assessed	new	no
134	Port of Columbia County	Transportation	619	71	new	yes
135	Port of Portland	Transportation	5,497	556	existing	yes

APPENDIX B: NPDES Permit Issuance Dates

Permit Type	Planned Issuance Date	Legal Name	Common Name	WQ File No.	Permit No.	EPA No.
NPDES-IW-B21	2026	J.H. Baxter & Co., Inc.	J.H. Baxter & Co., Inc.	6553	102432	OR0021911
NPDES-IW-B21	2026	Mcfarland Cascade Pole & Lumber Company	Mcfarland Cascade Pole & Lumber Co	54370	102392	OR0031003
NPDES-IW-B20	2024	Arauco North America, Inc	Duraflake	97047	100668	OR0000426
NPDES-IW-B20	2025	Kingsford Manufacturing Company	Kingsford Manufacturing Company - Springfield Plant	46000	102153	OR0031330
NPDES-IW-B20	2026	Murphy Company	Murphy Veneer, Foster Division	97070	101777	OR0021741
NPDES-IW-B19	2024	Hull-Oakes Lumber Co.	Hull-Oakes Lumber Co.	107228	101466	OR0038032
NPDES-IW-B19	2025	Sanders Wood Products, Inc.	RSG Forest Products - Liberal	72596	100929	OR0021300
NPDES-IW-B19	2027	Seneca Sawmill Company	Seneca Sawmill Company	80207	101893	OR0022985
NPDES-IW-B17	2027	Oregon Department of Fish & Wildlife	ODFW - Marion Forks Hatchery	64495	101917	OR0027847
NPDES-IW-B17	2023	USDO; Fish & Wildlife Service	USFW - Eagle Creek National Fish Hatchery	91035	101522	OR0000710
NPDES-IW-B16	2024	Arclin U.S.A. LLC	Arclin	16037	101235	OR0021857
NPDES-IW-B16	2025	Blount, Inc.	Blount Oregon Cutting Systems Division	63545	101162	OR0032298
NPDES-IW-B16	2025	Boeing Company, The	Boeing Of Portland - Fabrication Division	9269	101761	OR0031828
NPDES-IW-B16	2026	Columbia Helicopters, Inc.	Columbia Helicopters	100541	101906	OR0033391
NPDES-IW-B16	2027	Eugene Water & Electric Board	EWEB Carmen-Smith	28393	101329	OR0000680
NPDES-IW-B16	2024	Georgia-Pacific Chemicals LLC	Georgia-Pacific Chemicals LLC	32864	101474	OR0002101
NPDES-IW-B16	2025	Georgia-Pacific Chemicals LLC	GP Millersburg Resin Plant	32650	102603	OR0032107

Permit Type	Planned Issuance Date	Legal Name	Common Name	WQ File No.	Permit No.	EPA No.
NPDES-IW-B15	2027	Fujimi Corporation	Fujimi Corporation - SW Commerce Circle	107178	103033	OR0040339
NPDES-IW-B15	2025	Oregon Department of Corrections	ODC - Oregon State Penitentiary	109727	101619	OR0043770
NPDES-IW-B15	2024	Port of Portland & Co-Applicants	Portland International Airport	107220	101647	OR0040291
NPDES-IW-B15	2027	SFPP, L.P.	SFPP, L.P.	103159	103042	OR0044661
NPDES-IW-B15	2023	Sunstone Circuits, LLC	Sunstone Circuits	26788	101015	OR0031127
NPDES-IW-B15	2027	Valley Landfills, Inc.	Coffin Butte Landfill	104176	101545	OR0043630
NPDES-IW-B10	2027	Arclin Surfaces, Inc.	Arclin	81714	101544	OR0000892
NPDES-IW-B08	2026	Oregon Metallurgical, LLC	ATI Albany Operations	64300	102223	OR0001716
NPDES-IW-B05	2026	JLR, LLC	JLR, LLC	32536	101253	OR0001015
NPDES-IW-B04	2023	Foster Poultry Farms, Inc.	Foster Farms	97246	101590	OR0026450
NPDES-IW-B04	2023	Norpac Foods, Inc.	Norpac Foods - Brooks Plant No. 5	84791	100907	OR0021261
NPDES-IW-B04	2024	Norpac Foods, Inc.	Norpac Foods-Plant #1, Stayton	84820	101265	OR0001228
NPDES-DOM-Db	2025	Alpine County Service District	Alpine Community	100101	101923	OR0032387
NPDES-DOM-Db	2026	Aumsville, City Of	Aumsville STP	4475	101784	OR0022721
NPDES-DOM-Db	2027	Aurora, City Of	Aurora STP	110020	101772	OR0043991
NPDES-DOM-Db	2027	Brownsville, City Of	Brownsville STP	11770	102206	OR0020079
NPDES-DOM-Db	2025	Corvallis MHC LLC	Knoll Terrace MHC	46990	102611	OR0026956
NPDES-DOM-Db	2027	Creswell, City Of	Creswell STP	20927	101639	OR0027545
NPDES-DOM-Db	2027	Diamond Hill L.L.C.	Sherman Bros. Trucking	36646	101557	OR0021954
NPDES-DOM-Db	2026	Gervais, City Of	Gervais STP	33060	101665	OR0027391
NPDES-DOM-Db	2025	Halsey, City Of	Halsey STP	36320	101297	OR0022390
NPDES-DOM-Db	2027	Junction City, City Of	Junction City STP	44509	102396	OR0026565
NPDES-DOM-Db	2026	Lane Community College	Lane Community College	48854	102116	OR0026875
NPDES-DOM-Db	2023	Molalla, City Of	Molalla STP	57613	101514	OR0022381

Permit Type	Planned Issuance Date	Legal Name	Common Name	WQ File No.	Permit No.	EPA No.
NPDES-DOM-Db	2027	Philomath, City Of	Philomath WWTP	103468	102060	OR0032441
NPDES-DOM-Db	2026	Scio, City Of	Scio STP	79633	101503	OR0029301
NPDES-DOM-Db	2027	Tangent, City Of	Tangent STP	87425	102247	OR0031917
NPDES-DOM-Db	2025	Veneta, City Of	Veneta STP	92762	102480	OR0020532
NPDES-DOM-Db	2024	Water Environment Services	Wes (Boring STP)	16592	100968	OR0031399
NPDES-DOM-Db	2025	Willamette Leadership Academy	Willamette Leadership Academy	34040	101441	OR0027235
NPDES-DOM-Da	2025	Coburg, City Of	Coburg Wastewater Treatment Plant	115851	102979	OR0044628
NPDES-DOM-Da	2026	Estacada, City Of	Estacada STP	27866	101542	OR0020575
NPDES-DOM-Da	2025	Falls City, City Of	Falls City STP	28830	101808	OR0032701
NPDES-DOM-Da	2027	Hubbard, City Of	Hubbard STP	40494	101640	OR0020591
NPDES-DOM-Da	2025	Lakewood Homeowners, Inc.	Lakewood Utilities, Ltd	96110	101781	OR0027570
NPDES-DOM-Da	2027	Mt. Angel, City Of	Mt. Angel STP	58707	101802	OR0028762
NPDES-DOM-Da	2027	Oakridge, City Of	Oakridge STP	62886	102443	OR0022314
NPDES-DOM-Da	2023	Sandy, City Of	Sandy WWTP	78615	102492	OR0026573
NPDES-DOM-Da	2026	US Forest Service	Timberlake STP	90948	101498	OR0023167
NPDES-DOM-Da	2027	Westfir, City Of	Westfir STP	94805	100811	OR0028282
NPDES-DOM-C1a	2023	Dallas, City Of	Dallas STP	22546	101518	OR0020737
NPDES-DOM-C1a	2026	Silverton, City Of	Silverton STP	81395	101720	OR0020656
NPDES-DOM-C1a	2025	Woodburn, City Of	Woodburn WWTP	98815	101558	OR0020001
GEN03	2024	Oregon Department of Fish & Wildlife	ODFW - Roaring River Hatchery	64525		
GEN03	2024	Oregon Department of Fish & Wildlife	ODFW - Willamette Fish Hatchery	64585		
GEN01	2023	Americold Logistics, LLC	Americold Logistics, LLC	87663		
GEN01	2023	First Premier Properties	Spinnaker li Office Building	110603		
GEN01	2023	Forrest Paint Co.	Forrest Paint Co.	100684		
GEN01	2023	Herbert Malarkey	Malarkey Roofing	52638		

Permit Type	Planned Issuance Date	Legal Name	Common Name	WQ File No.	Permit No.	EPA No.
		Roofing Company				
GEN01	2023	Holiday Retirement Corp	Holiday Plaza	108298		
GEN01	2023	Hydro Extrusion Portland, Inc.	Hydro Main Plant	3060		
GEN01	2023	Miller Paint Co Inc	Miller Paint Company	103774		
GEN01	2023	Owens-Brockway Glass Container Inc.	Owens-Brockway Glass Container Plant	65610		
GEN01	2023	PCC Structurals, Inc.	PCC Structurals, Inc. - (SSB) Small Structurals Bus. Ops.	71920		
GEN01	2023	Sundance Lumber Company, Inc.	Sundance Lumber Company, Inc.	107401		
GEN01	2023	Ventura Foods, LLC	Ventura Foods, LLC	103832		