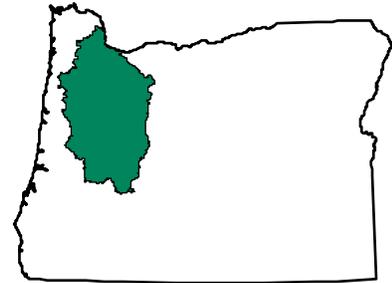


WILLAMETTE BASIN TMDL

CHAPTER 14:

WATER QUALITY MANAGEMENT PLAN (WQMP)



State of Oregon
Department of
Environmental
Quality

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CHAPTER 14: WATER QUALITY MANAGEMENT PLAN (WQMP)

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BACKGROUND

A Total Maximum Daily Load (TMDL) defines the amount of a pollutant that can be present in a waterbody without causing water quality criteria to be exceeded. In December 2002 the State of Oregon's Environmental Quality Commission (EQC) adopted Oregon Administrative Rule (OAR) Chapter 340, Division 42, commonly referred to as the TMDL rule. The rule defines ODEQ's responsibilities for developing, issuing, and implementing TMDLs as required by the federal Clean Water Act (CWA).

A Water Quality Management Plan is one of the 12 TMDL elements called for in the TMDL rule. OAR 340-042-0040-(4)(I) states:

- (I) *Water quality management plan (WQMP). This element provides the framework of management strategies to attain and maintain water quality standards. The framework is designed to work in conjunction with detailed plans and analyses provided in sector-specific or source-specific implementation plans.*

ODEQ developed this Water Quality Management Plan (WQMP) to describe the overall framework for implementing the Willamette Basin TMDL. It includes a description of activities, programs, legal authorities and other measures for which ODEQ and other designated management agencies (DMAs) have regulatory responsibility. A DMA is "a federal, state or local governmental agency that has legal authority of a sector or source contributing pollutants, and is identified as such by the Department of Environmental Quality in a TMDL." TMDL implementation activities will be carried out under existing regulatory authorities, programs and water quality restoration plans as well as by TMDL implementation plans that certain DMAs will develop in fulfillment of the requirements of this TMDL.

TMDLs, the WQMP, and associated implementation plans and activities are designed to restore water quality to comply with water quality standards. In this way designated beneficial uses, such as aquatic life, drinking water supplies, and water contact recreation, will be protected.

PURPOSE

This WQMP is divided into two parts.

Part 1 fulfills the requirements of a WQMP as stipulated in the TMDL rule (**OAR 340-042-0040-(4)(I)**). These elements, listed below, serve as the outline for Part 1 of this WQMP.

- A. Condition assessment and problem description
- B. Goals and objectives
- C. Proposed management strategies
- D. Timeline for implementing management strategies
- E. Relationship of management strategies to attainment of water quality standards
- F. Timeline for attainment of water quality standards
- G. Identification of responsible participants or DMAs
- H. Identification of sector-specific implementation plans
- I. Schedule for preparation and submission of implementation plans
- J. Reasonable assurance
- K. Monitoring and evaluation
- L. Public involvement
- M. Planned efforts to maintain management strategies over time
- N. Costs and funding
- O. Citation to legal authorities

Part 2 covers basin-specific TMDL implementation requirements relating to storm water management and implementation of the temperature and mercury TMDLs.

PART 1 – ELEMENTS OF THE WQMP

(A) Condition Assessment and Problem Description

Condition assessment and problem description are summarized in the table in Appendix 14.A. The table contains the 303(d) listed waterbodies addressed and the subbasin they are in, as well as the water quality criterion exceeded. See Chapters 2 – 13 for TMDLs addressed in this Willamette Basin TMDL.

(B) Goals and Objectives

The overarching goal of this WQMP is to achieve compliance with water quality standards for temperature, bacteria and mercury in the Willamette River Basin as addressed through the Willamette Basin TMDL.

(C) Proposed Management Strategies

The management measures to meet the TMDL load and wasteload allocations differ depending on the source of the pollutant. This section of the plan describes management measures, organized by categories of pollutant sources, which may be used to meet the TMDL load allocations and wasteload allocations. The list is not intended to be comprehensive nor prescriptive. Each DMA is responsible for source assessment and identification, which may result in additional categories. DMAs are also responsible for identifying the appropriate management strategies to address the sources over which they have jurisdiction.

New Development and Construction

- Planning Procedures
- Permitting/Design
- Construction Control Activities
- Inspection/Enforcement
- Education and Outreach

Existing Development

- Storm Drain System
- Street and road Maintenance
- Operations and Maintenance
- Septic Systems
- Parking Lots
- Commercial and Industrial Facilities
- Fertilizers, Pesticides, Other Toxics
- Animal Waste
- Illicit Connections and Illegal Dumping
- Education and Outreach
- BMP Monitoring and Evaluation
- Instream Monitoring
- BMP Implementation Monitoring

Residential

- Illegal Dumping
- Illicit Discharges and Cross Connections
- Septic Systems
- Animal Waste
- Education and Outreach

Commercial and Industrial

- Illegal Dumping

- Illicit Discharges and Cross Connections
- Education and Outreach

Riparian Area Management

- Rural/Urban Residential Riparian
- Protection/Enhancement
- Stream bank Stabilization
- Public Governmental Facilities
- Parks/Public Waterbodies (Ponds, etc.)
- Municipal Yard Operations and Maintenance
- Other Public Facilities
- Education and Outreach
- BMP Monitoring and Evaluation
- Instream Monitoring
- BMP Implementation Monitoring

Forestry Practices

- Implement Forest Practices Act
- Implement Federal Forest Lands & Resource Management Plans
- Riparian Protection/Enhancement
- Replace/Restore Roads/Culverts
- Yard Operations and Maintenance
- Stream bank Stabilization
- Wildfire Prevention/Suppression
- Uplands Management
- Inspection/Enforcement
- Season of Use
- Education and Outreach
- BMP Monitoring and Evaluation
- Instream Monitoring
- BMP Implementation Monitoring

Agricultural Practices

- Implement SB 1010 Ag Water Quality Management Area Plans
- Animal Waste/Livestock Management
- Nutrient Management Plans
- Riparian Protection/Enhancement
- Wetland Protection/Enhancement
- Reconnect Sloughs and Rivers
- CAFO Program Implementation
- Uplands Management
- Stream bank Stabilization
- Season of Use
- Education and Outreach
- BMP Monitoring and Evaluation
- Instream Monitoring
- BMP Implementation Monitoring

Dam Operation and Maintenance

- Develop and Implement Temperature Management Plans (TMP)
- Water Quality Monitoring
- Facility Yard Operations and Maintenance

Planning and Assessment

- Source Assessment/Identification
- Source Control Planning

Transportation

- Road Construction
- Road Maintenance and Repair
- Education and Outreach

(D) Timeline for Implementing Management Strategies

(a) Schedule for revising permits

TMDL Wasteload Allocations are implemented through National Pollution Discharge Elimination System (NPDES) permits that ODEQ issues to industrial and municipal point sources that discharge into Willamette Basin waterways. NPDES permits are issued for five years and are revised as appropriate upon renewal. Following approval of the Willamette TMDL, new and renewed permits will include TMDL waste load allocations for temperature. Wasteload allocations for mercury will not be implemented in permits until they are established through the completion of Phase II of the mercury TMDL, expected in 2011. Between now and then, certain point sources will be working on identifying and implementing mercury reduction strategies, as described in Part 2 of this chapter.

(b) Schedule for achieving appropriate incremental and measurable WQ targets

The types of water quality problems addressed through this TMDL are not amenable to quick fixes. Depending on the pollutant and source of that pollutant, it may take several TMDL iterations, decades of habitat restoration, or years of implementing a specific management strategy before measurable water quality improvements are achieved. NPDES permits and TMDL Implementation Plans will describe, to the extent possible, more specific schedules for achieving appropriate water quality targets.

(c) Schedule for implementing control actions

NPDES wastewater permits typically require new numeric effluent limits resulting from a TMDL to be implemented during the next five-year permit cycle. For other types of control actions, the timelines for implementing these actions will be identified in sector- or source-specific TMDL implementation plans.

(d) Schedule for completing other measurable milestones

TMDL implementation plans will include timelines for completing other measurable milestones as appropriate.

(E) Relationship of management strategies to attainment of water quality standards

For point sources of pollution, ODEQ will issue permits that include specific discharge limitations and compliance schedules that ensure water quality standards are met or will be attained within a reasonable timeline. Permits are reviewed and renewed on a 5-year cycle.

For nonpoint source pollution, sector- or source-specific TMDL implementation plans will include specific management strategies and timelines. DMAs will be expected to prepare an annual report and undertake an evaluation of the effectiveness of their plans every five years to gauge progress toward attaining water quality standards. If it is determined that an implementation plan is not sufficient to achieve the load allocation, the DMA will be required to revise the plan accordingly. All of these actions, taken together, will result in attainment of water quality standards.

(F) Timeline for attainment of water quality standards

Estimates of time for meeting standards and full protection of beneficial uses were made based on existing plans, assumptions developed for the TMDLs, and estimates of system potential vegetation growth for reducing stream temperature. Temperature and channel morphology improvements are

dependent on growth of site appropriate riparian vegetation and other land management actions. System potential shade varies tremendously by stream size thus affecting restoration timing. For example, system potential shade for a small stream may take 10 years versus 20 years for a larger stream. Two examples of milestone goals would be the ability to measure increases in instream shade by 2020 and to achieve instream temperatures that meet salmonid requirements by 2050.

A reduction in the amount of mercury bound to river bottom sediment represents the longest timeframe for attainment of TMDL allocations. This is because the control measure is the natural attenuation of mercury from the riverine system as mercury inputs are reduced from other source categories such as air deposition or storm water discharges. Such reductions are envisioned to take 50 to 100 years and as a result, the eventual goal of eliminating the fish consumption advisory may take nearly as long.

Achieving water quality standards for bacteria will take approximately 20 years and involve a variety of strategies. For example, full implementation of the Portland Combined Sewer Overflow (CSO) project will be achieved in 2011. Measures to reduce point source and nonpoint source storm water runoff will take a number of years to fully implement and achieve the level of control needed to end bacteria criteria exceedences. The identification of leaking septic systems and leaks in the sewer systems is also time and resource intensive.

These time frames are approximate and implementation will occur as specific plans are implemented or developed and as funding becomes available. In many instances, more definitive timelines will be specified in TMDL implementation plans.

(G) Identification of Responsible Persons

While all inhabitants of the basin share responsibility for preventing water pollution, certain entities are recognized under this TMDL as having specific responsibilities for implementing the TMDL and are required to take necessary actions to meet their assigned load and wasteload allocations. This section identifies the DMAs responsible for implementing management strategies and developing and revising sector-specific or source-specific implementation plans to accomplish that.

The management strategies necessary to meet the TMDL load and wasteload allocations differ based upon the source of pollution and the responsibilities and resources of the DMAs. Many DMAs are already implementing or planning to implement management strategies for improving and protecting water quality, but may need to take additional actions to meet the TMDL allocations. However, as a general principle, DMAs are not responsible for controlling pollution arising from land use activities occurring outside of their jurisdictional authority.

For certain DMAs, TMDL implementation responsibilities will be carried out through existing regulatory and non-regulatory programs and activities. These DMAs, and examples of the programs and activities they will implement to achieve TMDL allocation, include those listed below:

Oregon Department of Environmental Quality

- NPDES Permitting and Enforcement
- WPCF Permitting and Enforcement
- Municipal Separate Storm Sewer System (MS4) Discharge Permits
- 401 Hydroelectric Certifications
- 401 Dredge and Fill Certifications
- On-Site Septic System Permitting and Enforcement (except where delegated to specific counties)
- Nonpoint Source TMDL Implementation Program
- Technical Assistance
- Financial Assistance

Oregon Department of Agriculture

- Agricultural Water Quality Management Plan Development, Revision, Implementation & Enforcement
- CAFO Permitting and Enforcement

- Technical Assistance
- Rules under Senate Bill (SB)1010 to clearly address TMDL and Load Allocations as necessary
- Riparian area management
- Oregon Conservation Reserve Enhancement Program

Oregon Department of Forestry

- Forest Practices Act (FPA) Implementation
- Revise statewide FPA rules and/or adopt subbasin specific rules as necessary
- Riparian area management

Other DMAs are required to develop TMDL implementation plans that describe the management measures they will take to achieve their load allocations. These DMAs are listed below. TMDL implementation plans must be submitted to ODEQ for approval within 18 months of the issuance of the TMDL. DMAs that wish to may submit a joint TMDL implementation plan. The required elements of these plans, and the process for monitoring progress under these plans and revising them as necessary, are described later in this chapter.

State Agencies

- Parks and Recreation Department
- Department of State Lands
- Oregon Department of Transportation (ODOT)

Note that ODOT, and the other State Agencies listed above, have additional regulatory and non-regulatory programs and activities in existence. Examples of ODOT's programs and activities include:

- Construction, operation, and maintenance of state highways and state highway stormwater systems
- Develop programs related to Oregon's system of highways, roads, and bridges; railways; public transportation services; transportation safety programs
- Provide services and facilities in ways that protect and enhance the environment
- Implementation of Pollution Control Plan and Erosion Control Plan

Federal Land Management Agencies

- U.S. Forest Service
- U.S. Fish and Wildlife Service
- U.S. Bureau of Land Management
- US Army Corps of Engineers
- Metro (Portland Metropolitan Government)
- Port of Portland
- Eugene Water and Electric Board

Counties

- Benton
- Clackamas
- Lane
- Linn
- Marion
- Multnomah
- Polk
- Washington*
- Yamhill

*Washington County already has a TMDL implementation plan in place that addresses temperature and bacteria because of earlier TMDLs. The County is only responsible for updating this plan to address mercury.

Cities

Because the geographic scope of this TMDL differs for different parameters, the TMDL implementation plan requirements differ for different cities.

- Cities in the Yamhill and Molalla-Pudding subbasins are not required to develop TMDL implementation plans at this time. This is because this TMDL only addresses mercury in those subbasins; it does not address temperature, bacteria or other 303(d) listed parameters. These parameters will be addressed through the completion of TMDLs for these three subbasins, which is expected to occur by 2008. ODEQ is delaying the requirement for submitting a TMDL implementation plan for these cities until completion of those TMDLs so they are able to develop a single comprehensive implementation plan rather than having to go through two phases of plan development. This will also enable ODEQ to focus more attention on DMAs throughout the rest of the basin that need assistance in the development of their TMDL Implementation Plans. The cities in the Yamhill and Molalla-Pudding subbasins that are exempt from the requirement to submit a TMDL Implementation Plan at this time include:
 - Amity, Aurora, Barlow, Canby, Carlton, Cornelius, Dayton, Donald, Hubbard, Lafayette, McMinnville, Molalla, Mt. Angel, Scotts Mills, Sheridan, Silverton, Willamina, Woodburn, Yamhill
- Cities in the Tualatin Subbasin already have TMDL implementation plans in place, or are covered by another DMA's implementation plan, because TMDLs in this basin are already in place. These cities are only required to update their plans as necessary to address mercury. These include:
 - Banks, Beaverton, Durham, Forest Grove, Gaston, Gervais, Hillsboro, King City, Lake Oswego, North Plains, Sherwood, Tigard, Tualatin
- All other cities are required to develop and submit TMDL implementation plans that address the TMDL pollutants and any additional requirements described in Part II of this chapter to ODEQ within 18 months following issuance of this TMDL. These include:
 - Adair Village, Albany, Aumsville, Brownsville, Coburg, Corvallis, Cottage Grove, Creswell, Dallas, Damascus, Detroit, Dundee, Durham, Estacada, Eugene, Fairview, Falls City, Gates, Gladstone, Gresham, Halsey, Happy Valley, Harrisburg, Idanha, Independence, Jefferson, Johnson City, Junction City, Keizer, Lebanon, Lowell, Lyons, Maywood Park, Mill City, Millersburg, Milwaukie, Monmouth, Monroe, Newberg, Oakridge, Oregon City, Philomath, Portland, Rivergrove, Salem, Sandy, Scio, Sodaville, Springfield, Stayton, Sublimity, Sweet Home, St. Paul, Tangent, Turner, Veneta, Waterloo, Westfir, Wilsonville, Wood Village,

To assist DMAs in the development of TMDL implementation plans, Appendix 14.B includes information on potential sources of pollution and possible management strategies for controlling those sources. The source categories include urban, forestry, agriculture, dams, marinas, ports, and airports. The information in the Appendix is provided as a resource only; it is not comprehensive nor is it intended to be prescriptive. ODEQ does not prescribe the actions a DMA must take to meet an allocation.

A summary of each subbasins TMDL pollutant parameters addressed in this TMDL submittal is listed in Table 14.1.

Table 14.1 Summary of Willamette Basin TMDL parameters by subbasin addressed by this TMDL submittal.

Subbasin	TMDL Parameter
Lower Willamette	Bacteria, Temperature, Toxics: Mercury, others
Tualatin	Mercury
Clackamas	Bacteria, Mercury, Temperature
Middle Willamette	Bacteria, Dieldrin, Mercury, Temperature
Molalla - Pudding	Mercury
Yamhill	Mercury
North Santiam	Mercury, Temperature, Bacteria Planning Target
South Santiam	Mercury, Temperature, Bacteria Planning Target
Upper Willamette	Bacteria, Dissolved Oxygen, Temperature, Mercury, Turbidity
McKenzie	Mercury, Temperature, Bacteria Planning Target
Middle Fork	Mercury, Temperature, Bacteria Planning Target
Coast Fork	Bacteria, Mercury, Temperature
Willamette River	Bacteria, Mercury, Temperature

(H) Identification of sector-specific or source-specific implementation plans that are available at the time the TMDL is issued

The following organizations are known to have either completed or drafted implementation plans at the time this Willamette Basin TMDL/WQMP is issued:

- BLM and USFS Water Quality Restoration Plans (WQRPs)
- ODA Agricultural Water Quality Management Area Plans (OAR 603-095):
 - Clackamas Subbasin Agricultural Water Quality Management Area Plan
 - Lower Willamette Valley Agricultural Water Quality Management Area Plan
 - Southern Willamette Valley Agricultural Water Quality Management Area Plan
 - Middle Willamette Agricultural Water Quality Management Area Plan
 - Upper Willamette & Upper Siuslaw Agricultural Water Quality Management Area Plan
 - South Santiam Agricultural Water Quality Management Area Plan
 - Yamhill Agricultural Water Quality Management Area Plan
 - Tualatin River Subbasin Agricultural Water Quality Management Area Plan
 - Molalla-Pudding-French Prairie-North Santiam Agricultural Water Quality Management Area Plan

Note: ODA plans are updated every two years. TMDL load allocations will be incorporated at that time. ODEQ expects that all DMA Implementation Plans will be developed, reviewed, and updated as appropriate.

(I) Schedule for preparation and submission

(Sector-specific or source-specific implementation plans by responsible persons/DMA's and processes that trigger revisions to these implementation plans)

The issuance of this TMDL triggers the requirement for a number of DMA's to develop and submit TMDL implementation plans to ODEQ for approval within 18 months (see Section G of this chapter for a list of affected DMA's). These DMA's will be sent a letter following issuance of the TMDL to notify them of this requirement. The exact due date for submittal will be based upon the date of that letter.

OAR 340-042-0080(3) defines the required elements of a TMDL implementation plans. The main elements are as follows:

- Management strategies the DMA will use to achieve load allocation(s) and reduce pollutant loading;

- A timeline for implementing management strategies and a schedule for completing measurable milestones;
- Performance monitoring with a plan for periodic review and revision of the implementation plan;
- Evidence of compliance with applicable statewide land use requirements;
- Any other required elements if specified in Part II of this chapter;

Following approval of the TMDL implementation plan, DMAs will be expected to submit to ODEQ an annual status report briefly describing the status of management strategies that implement TMDL pollutant allocations or reductions. Every fifth year DMAs will need to submit an evaluation report. The report will describe the effectiveness of the management strategies identified in the TMDL Implementation Plan and put into place during the preceding four years. The report will indicate whether implementation of their plan is adequately meeting the pollutant reduction goals. If they determine it does not, the report will describe the steps they will take to modify their plan.

In addition, DMAs may be required to review and revise their TMDL implementation plan as needed following ODEQ's reevaluation or revision of the TMDL.

(J) Description of reasonable assurance

This element is intended to provide reasonable assurance that TMDL load allocations will be implemented, and that the TMDL and associated allocations will be met.

There are several programs that are either already in place or will be put in place to help ensure that the Willamette TMDL waste load and load allocations will be implemented. Some of these are traditional regulatory programs such as specific requirements under NPDES discharge permits. Other programs address nonpoint sources through the authority of other state or federal agencies (for forested and agricultural lands or federal dam operation) and voluntary efforts. The key authorities and programs that ensure TMDL implementation will be carried out are described below.

POINT SOURCES

NPDES Permits

ODEQ issues National Pollutant Discharge Elimination System (NPDES) permits for discharge of wastes or pollutants into waters of the United States. The NPDES is a federal permit required by the Clean Water Act; ODEQ has been delegated authority to issue NPDES permits by USEPA. As permits are renewed, they will be revised to ensure that all 303(d) related issues and TMDL allocations are addressed in the permit.

Municipal Separate Storm Sewer System (MS4) Discharge Permits

ODEQ administers two different types of storm water permits based on the size of the community and location within an Urbanized Area as defined by the US Bureau of Census. Phase 1 MS4 permits are issued to the largest communities generally serving a population of greater than 100,000. This permit program has been in existence since 1995. There are six Phase 1 permits in the Willamette Basin, covering portions of the Portland metropolitan area and the cities of Salem and Eugene. Phase 2 MS4 permits will be issued to jurisdictions within Urbanized Areas with populations of 50,000 or greater, which are not already a part of the Phase 1 permit program. These permits will cover portions of Portland metropolitan area, Salem, and Eugene urban areas and the entire Corvallis urbanized area. As permits are renewed, they will be revised to ensure that all 303(d) related issues and TMDL allocations are addressed in the permit.

NONPOINT SOURCES

Federal Lands

The Bureau of Land Management (BLM) and US Forest Service (USFS) are DMAs for federal lands in the Willamette Basin. In July 2003, both agencies signed memoranda of agreement with ODEQ defining how water quality rules and regulations regarding TMDLs will be met. The agencies are developing, or have already developed, Water Quality Restoration Plans (WQRPs) which will be the equivalent of Implementation Plans. In addition, BLM and USFS developed *the Northwest Forest Plan (NWFP) Temperature TMDL Implementation Strategies, Evaluation of the Northwest Forest Plan Aquatic Conservation Strategy (ACS) and Associated Tools* (the Strategy). ODEQ conditionally approved the Strategy in September 2005 as the temperature TMDL implementation mechanism under the Clean Water Act.

Non Federal Forest Lands

The Oregon Department of Forestry (ODF) is the DMA, by statute, for water quality protection from nonpoint source discharges or pollutants resulting from forest operations on non federal forestlands in the Willamette Basin, as well as statewide. Water protection rules are applied per OAR 629-635-0000 through 629-660-0060. Forest operators conducting operations in accordance with the Forest Practices Act (FPA) are considered to be in compliance with water quality standards. The FPA does have provisions for both criminal and civil penalties if forest operators do not comply with water protection regulations.

Examples of forestland water protection best management practices include:

- Roads not located in riparian management areas, flood plains, or wetlands;
- Stream crossing structures designed for 50 year flows;
- Maintain riparian management area vegetation and minimize disturbance to beds and banks of streams, lakes, and all wetlands more than ¼ acre;
- Minimize slash that may enter waters of the state during felling, bucking, limbing or yarding;

For additional information about the Oregon Department of Forestry link to <http://www.odf.state.or.us/>.

Agricultural Lands

The Oregon Department of Agriculture (ODA) is the DMA responsible for regulating agricultural activities that affect water quality through the Agricultural Water Quality Management Act (SB1010) and Senate Bill 502.

SB1010 directs ODA to work with local communities, including farmers, ranchers, and environmental representatives, to develop Agricultural Water Quality Management Area Plans and rules in the Willamette Basin, as well as statewide. SB502 stipulates that ODA "*shall develop and implement any program or rules that directly regulate farming practices that are for the purpose of protecting water quality and that are applicable to areas of the state designated as exclusive farm use zones or other agricultural lands.*" Further, ODA policy states that plans and rules will be "*reviewed on a biennial basis and ODA in consultation with ODEQ will assess whether the plan and rules are sufficient to meet and address water quality concerns established under the 303(d) or TMDL process or other triggering mechanisms*". Progress reports, which are submitted to the Board of Agriculture after the biennial review process, are developed based on data collected by Local Management Agencies and ODA on progress of implementation of the plans and rules. Reports to the Board of Agriculture and Director will include statistics on numbers of farm plans developed and types of management practices being employed. These reports will be available to ODEQ for review in assessing implementation progress.

Local Management Agencies are funded to conduct outreach and education, develop individual farm plans for operations in the planning area, work with landowners to implement management practices, and help landowners secure funding to cost-share water quality improvement practices. Local Management Agencies are generally the Soil and Water Conservation Districts working under contract to ODA.

In addition, ODA, like other state agencies, has the ability to assess civil penalties when local operators do not follow their local Agricultural Water Quality Management Area rules.

Examples of best management practices that protect water quality on agricultural lands include:

- Conservation tillage;
- Manure, pasture, and nutrient management;
- Plant cover crops on sloping lands or erosion-sensitive areas;
- Provide streamside buffer of site appropriate vegetation;
- Irrigate pasture or crops according to soil moisture and plant water needs to prevent soil erosion and excess nutrient loss;
- Construct farm road fords appropriately; install water bars or rolling dips to divert runoff to roadside ditches; and
- Apply pesticides according to label instructions.

Urban and Rural Lands

Oregon cities and counties have authority to regulate land use activities through city and county ordinances and local comprehensive land use plans. The Oregon land use planning system, administered through the Oregon Department of Land Conservation and Development, requires local jurisdictions to address water quality protection through Statewide Planning Goals 5 and 6.

Cities, counties and other entities (e.g., special districts, ports) identified as a DMA under this TMDL are responsible for developing and implementing TMDL implementation plans that describe the management strategies they will take to control nonpoint source pollution arising from land use activities under their jurisdiction. ODEQ encourages DMAs to work cooperatively to address these requirements when such an approach would be advantageous.

Federal Actions Resulting in Discharges to Waters of the State

Section 401 of the federal Clean Water Act provides that an applicant for a federal permit to conduct an activity that may result in a discharge to waters of the State must provide the permitting agency with a water quality certification issued by the State from which the discharge originates. A water quality certification is the mechanism by which the State evaluates whether an activity may proceed and meet water quality standards. Certifications may be denied if there is no configuration by which the activity can proceed and meet standards. It may be approved if the activity can be conducted as proposed and meet standards, or it may be approved with conditions, which if met, will ensure that water quality standards are met. In the State of Oregon, the Department of Environmental Quality is the designated agency for issuing these certifications.

Section 401 also provides authority for state water quality programs to certify that federal actions involving the award of licenses for hydroelectric projects will not violate applicable state water quality requirements. In the case of hydroelectric projects, the Federal Energy Regulatory Commission (FERC) administers the licensing program and ODEQ certifies the project's application for licensing or relicensing. In addition, 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 § 313 (33 U.S.C. 1323).

(K) Plan to monitor and evaluate progress toward achieving TMDL allocations and WQS

The intent of this element is to demonstrate long-term recovery, better understand natural variability, track management strategy and BMP effectiveness, and determine whether implementation of TMDL load allocations are achieving water quality standards. Monitoring and evaluation has three basic components: 1) monitoring the implementation of TMDL implementation plans and activities as described in this document; 2) evaluating the effectiveness of management practices; and 3) tracking water quality trends to ensure TMDL wasteload and load allocations are being achieved and water quality criteria are being met.

The information generated by each of these organizations will be pooled and used to determine whether management actions are having the desired effects or if changes in management actions and/or TMDLs are needed.

Although monitoring plans have not been developed yet in response to an approved TMDL, it is anticipated that monitoring efforts will consist of some or all of the following activities:

- Reports on the numbers and locations of projects, BMPs implemented and education activities completed
- Water quality monitoring to assess the effectiveness of implementation activities and track progress towards achieving water quality numeric criteria
- Monitoring riparian vegetation communities and shade to assess progress towards achieving system potential targets established in the TMDL

The following entities share responsibilities for collecting and reporting on the data needed to address the monitoring objectives described above:

- **Oregon Department of Environmental Quality:** In support of the ODEQ mission statement of restoring and protecting Oregon's water, air, and land, the Watershed Assessment section of ODEQ's Laboratory Division collects representative, valid environmental data through physical, chemical, and biological sampling and assessment. The Watershed Assessment section conducts water quality monitoring on several scales; ambient water quality monitoring of 151 fixed sites statewide, TMDL location-specific monitoring studies conducted on a TMDL priority schedule, and through support of over 40 watershed councils statewide and their volunteer monitoring studies. The ongoing ambient effort provides data for trends analyses. Except for special monitoring studies connected with the development of TMDLs, ODEQ's monitoring will not focus on specific monitoring for TMDL implementation. ODEQ will undertake additional mercury monitoring, as will specific point sources, for the 2011 TMDL update. This will include additional sampling of instream mercury levels to better understand pollutant loading and environmental fate.
- **Oregon Department of Forestry:** The Forest Practices Monitoring Program is responsible for monitoring the implementation and effectiveness of the forest practice rules and reporting those findings and recommendations to the Board of Forestry on an annual basis (OAR 629-635-0110 3d). The Board of Forestry considers the findings and recommendations and takes appropriate action with regard to rule revision. The role of monitoring is further articulated in the forest practice rules with regard to the water protection rules as per OAR 629-635-0110(3) and under statute with regard to stewardship plans referenced in 527.662(d) and sensitive resource sites referenced in 527.710 (3).

The Forest Practices Monitoring Strategic Plan focuses on four types of monitoring to address forest practice program and Oregon Plan for Salmon and Watersheds (OPSW) goals and objectives. The monitoring strategy encompasses understanding of natural variability, implementation of best management practices ((BMPs) and BMP effectiveness. The monitoring types include implementation, effectiveness, trend, and validation.

Implementation - The process of evaluating whether forest practice rules were complied with and whether voluntary measures were implemented. The objective is to assess whether the activities or rules were carried out as intended. An example of an implementation monitoring question is: "Was streamside vegetation maintained in accordance with the water protection rules?"

Effectiveness - The process of evaluating whether forest practices regulations achieve the desired goals for resource protection. The objective of this type of monitoring is to assess whether forest practice rules had the anticipated effect. An example of an effectiveness question is: "Are the water protection rules effective at preventing increases in stream temperatures that otherwise might occur from forest management activities?"

Trend - The process of evaluating patterns over time and space. The objective in this type of monitoring is to determine the range of conditions across the landscape and how such conditions change over time in response to management, restoration, and the OPSW. An example of a trend monitoring question is: "What are the riparian conditions in the Coast Range and how do those vary over time?"

Validation - The process of evaluating whether the original assumptions used to build the regulations were correct. The objective is to assess whether the assumptions underlying the design of the Forest Practices Act or specific rules were valid. An example of a validation monitoring question is: "Will the desired future condition of riparian area be met under the forest practices riparian management strategies?" Because validation monitoring requires addressing complex cause-and-effect questions, these issues will usually be pursued through research and other studies.

As part of the FPMP, ODF completed an analysis of forest practice compliance on non-federal forest lands in Oregon. This monitoring project determined rates of compliance for a large suite of forest practice rules, and the occurrence of water quality violations resulting from non-compliance. The monitoring project report and monitoring strategy are available on the ODF website at: http://www.odf.state.or.us/divisions/protection/forest_practices/fmp .

- **Oregon Department of Agriculture:** Under Senate Bill 1010 legislation, ODA is responsible for developing basin plans and rules known as Agricultural Water Quality Management Area Plans and Rules (Plans and Rules). These plans and rules are developed in consultation with Local Advisory Committees (LACs). Monitoring and reporting of plan and rules implementation and water quality improvements, with respect to agricultural lands in the basin, is the responsibility of ODA. Water quality and landscape monitoring is being conducted by ODA to evaluate plan and rules effectiveness and in support of the plan and rules reviews. ODA will use all available data to assess instream concentrations of nitrate/nitrite, dissolved oxygen, total phosphorus, *E. coli*, TSS, and pH for trend monitoring.

ODA is also collecting data from aerial photographs on landscape conditions such as types of riparian vegetation. Other ground-based data are being collected on stream bank stability, shade, erosion, and vegetation use by livestock. These data can be consolidated to assess the condition of watersheds in the planning area.

- **Oregon Department of Transportation:** Oregon Department of Transportation (ODOT) has worked with ODEQ to develop a statewide TMDL program focused on managing TMDL pollutants associated with the operation, construction, and maintenance of ODOT highways. The ODOT TMDL program identifies sediment and temperature as primary TMDL pollutants of concern and outlines the Best Management Practices (BMPs) that ODOT uses to control these and other pollutants related to highway activities. ODOT measures the effectiveness of its TMDL program by measuring implementation of ODOT water quality BMPs, by performing research to assess effectiveness of representative BMPs, and by collecting data on ODOT storm water pollutants through research or miscellaneous ODOT water quality investigations. ODOT is now working with ODEQ to expand or refine ODOT monitoring activities to ensure they meet all ODEQ TMDL monitoring requirements.

The implementation of ODOT BMPs is measured through various ODOT tracking and inventory efforts. Examples include: inventorying water quality facilities installed as part of ODOT highway construction projects, tracking completion and implementation of spill prevention and storm water management plans developed for ODOT maintenance yards, compiling the ODOT Maintenance Progress Report which documents annual water resource protection efforts and BMPs performed by ODOT Maintenance forces. Tracking the implementation of ODOT water quality BMPs documents ODOT's efforts to manage TMDL pollutants as well as ODOT's efforts to meet a variety of other related water resource protection requirements.

ODOT measures the effectiveness of select or representative BMPs primarily through research projects. Research is performed on specific ODOT BMPs or highway practices to determine impacts they may have on the environment or how they influence pollutant transport or pollutant loads. ODOT uses research data and findings to characterize the pollutant loads associated with its highway facilities and operations and to adjust existing management practices to better control TMDLs or related pollutants. ODOT research projects tied to pollutant control, conducted since 2000, are listed below. Detailed descriptions of this research are available online at the ODOT website.

Current Research includes the following:

- Water Quality Facility Investigation
- Monitor Bioengineering Stabilization Project
- Culvert Condition Assessment and Database Development
- Assessing Effects of Flocculants to Manage Turbidity
- Dynamic Revetments for Coastal Erosion Stabilization

ODOT also collects data on TMDLs and other pollutants associated with its storm water system through the pollutant monitoring that is performed as part of ODOT's National Pollutant Discharge Elimination System (NPDES) storm water management program. Storm water issues and problems routinely arise during ongoing maintenance of the ODOT storm water system and drive this monitoring. ODOT reports on this monitoring annually to ODEQ in NPDES annual reports. Examples include investigations of illicit discharges, characterization of ODOT storm water associated with ODOT highways or yards, and investigations of water quality problems associated with specific ODOT incidents or activities.

- **Cities and Counties:** Larger jurisdictions conduct their own water quality monitoring assessments and may maintain permanent monitoring networks. Smaller jurisdictions may need to cooperate with local watershed councils, Soil and Water Conservation Districts, or other partners. The Portland, Salem, and Eugene urban areas will be required to conduct specific storm water monitoring in conjunction with their NPDES storm water permits. It should be noted, however, that the monitoring requirements established under a storm water permits might not fully cover all TMDL parameters. For example, temperature is generally not considered to be a significant contributor to stormwater pollution and thus it is not addressed through a storm water permit. NPDES permitted jurisdictions may have to submit a TMDL implementation plan to address pollutants not addressed under their storm water management plan as well as pollutants arising from nonpoint sources (i.e., outside of their storm water conveyance systems).
- **BLM and USFS:** Districts and regional offices are responsible for developing Water Quality Restoration Plans (WQRP) that describe any monitoring activities to be conducted by either agency.
- **USACE:** The Corps has installed water temperature probes above and below many of the reservoirs operated by the Corps. This information will be used to look at alternatives and determine the effects of the reservoir on watersheds.

ODEQ will collect and review information from TMDL implementation plan reports on an annual basis and will periodically review available environmental data. A more comprehensive review of data and information will take place in conjunction with the next scheduled evaluation of the TMDL, currently scheduled for 2013.

(L) Plan for public involvement in implementing management strategies

ODEQ believes that public involvement is essential to any successful water quality improvement process. When developing and implementing TMDL implementation plans, DMAs will determine how best to provide for public involvement based on their local needs and requirements.

ODEQ will also promote public involvement through direct association and contact with existing groups that have an interest in Willamette Basin TMDLs, such as watershed councils, League of Cities, Association of Counties, SB1010 Local Advisory Committees, the Tribes, federal and state agencies, and others.

(M) Description of planned efforts to maintain management strategies over time

The strategies, legal authorities and funding sources described elsewhere in this chapter help ensure that management strategies will be maintained over time.

- In addition, ODEQ will be working on several fronts to ensure management strategies are carried out: ODEQ administers various permitting, technical and financial assistance programs that play a role in implementing, overseeing and supporting TMDL implementation activities.
- ODEQ works with other state and federal agencies to ensure their activities are consistent with TMDL requirements and water quality protection in general.
- ODEQ will review TMDL implementation plans and reports to ensure DMAs are identifying and implementing the management measures necessary to achieve TMDL load and wasteload allocations.

(N) Costs and funding

The purpose of this element is to describe estimated costs and demonstrate there is sufficient funding available to begin implementation of TMDL allocations and improve water quality. DMAs will be expected to provide a fiscal analysis of the resources needed to develop, execute, and maintain the management strategies described in their TMDL Implementation Plans.

There are many sources of local, state, and federal funds. The following is a partial list of assistance programs available in the Willamette Basin:

<u>Program</u>	<u>Agency/Source</u>
Oregon Plan for Salmon and Watersheds	OWEB
Environmental Quality Incentives Program	USDA-NRCS
Wetland Reserve Program	USDA-NRCS
Conservation Reserve Enhancement Program	USDA-NRCS
Stewardship Incentive Program	ODF
Access and Habitat Program	ODFW
Partners for Wildlife Program	USDI-FSA
Water Projects	OWRD
Nonpoint Source Water Quality Control (319) Grants	ODEQ-USEPA
Statewide Planning Goals Technical Assistance Grants	DLCD
Oregon Community Foundation	OCF
Watershed Initiative Grants	USEPA
Clean Water State Revolving Fund (SRF) Low Interest Loans	ODEQ

Grant funds are available for improvement projects on a competitive basis. Field agency personnel assist landowners in identifying, designing, and submitting eligible projects for these grant funds. For private landowners, the recipient and administrator of these grants is generally the local Soil and Water Conservation District.

(O) Citation of legal authorities

The implementation of TMDL waste load and load allocations and the associated implementation plans are generally enforceable by ODEQ, other state and federal agencies, or local governments. It is envisioned that sufficient initiative exists to achieve water quality goals with minimal enforcement. Should the need for additional effort emerge, it is expected that the responsible agency will work with land managers to overcome impediments to progress through education, technical support or enforcement. Enforcement may be necessary in instances of insufficient action towards progress. This could occur first through direct intervention from land management agencies (e.g. ODF, ODA, counties and cities), and secondarily through ODEQ. The latter may be based on departmental orders to implement management strategies leading to attainment of water quality standards.

CLEAN WATER ACT, SECTION 303(D)

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. Waters that need this additional help are referred to as "water quality limited" (WQL). Water quality limited waterbodies must be identified by the USEPA or by a state agency which has been delegated this responsibility by USEPA. In Oregon, this responsibility rests with ODEQ. ODEQ generally updates the list of water quality limited waterbodies every two years. The list is commonly referred to as the 303(d) list. Section 303 of the Clean Water Act further requires that TMDLs be developed for all waterbodies on the 303(d) list. ODEQ also has this responsibility.

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.

OREGON REVISED STATUTES

The ODEQ is authorized by law to prevent and abate water pollution within the State of Oregon pursuant to the following statute:

*ORS 468B.020 **Prevention of pollution** (1) 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.*

(2) In order to carry out the public policy set forth in ORS 468B.015, ODEQ 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.*

NPDES AND WPCF PERMIT PROGRAMS

ODEQ 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 (WPCF) 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. As permits are renewed they will be revised to ensure that all 303(d) related issues are addressed in the permit.

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 ODEQ 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 U.S. Army Corps of Engineers (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 (ODF) is the designated management agency for regulation of water quality on non-federal forest lands. The Board of Forestry has adopted water protection rules, including but not limited to OAR Chapter 629, Divisions 635-660, which describes BMPs for forest operations. The Environmental Quality Commission, Board of Forestry, ODEQ, and ODF have agreed that these pollution control measures will be relied upon to result in achievement of state water quality standards.

ODF and ODEQ 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, ORS 183.310, OAR 340-041-0026, OAR 629-635-110, and OAR 340-041-0120.

SENATE BILL 1010

The Oregon Department of Agriculture has primary responsibility for control of pollution from agricultural sources. This is accomplished through the Agriculture Water Quality Management (AWQM) program authorities granted ODA under Senate Bill 1010 adopted by the Oregon State Legislature in 1993. 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.

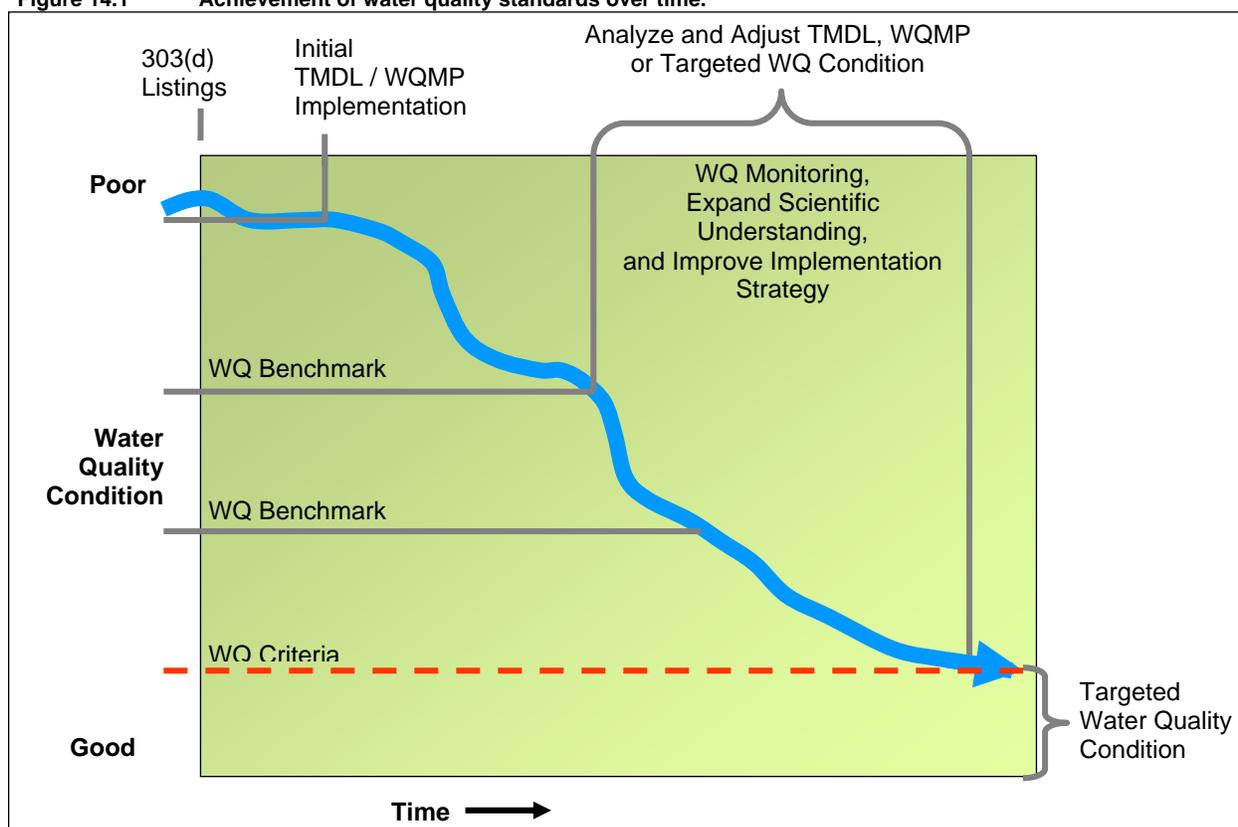
LOCAL ORDINANCES

Local governments are expected to describe in their Implementation Plans their specific legal authorities to carry out the management strategies chosen to meet the TMDL allocations. Legal authority to enforce the provisions of a City's NPDES permit would be a specific example of legal authority to carry out management strategies.

(P) Adaptive Management

Adaptive management is an iterative process to achieve water quality standards over time (see Figure 14.1). Achieving water quality standards will be accomplished through the TMDL process and through implementation of individual DMA Implementation Plans, ODA Agricultural Water Quality Management Area Plans, ODF Forest Practices Act BMPs, ODEQ permitting programs, coordinated monitoring efforts, and TMDL iterations or progress checks every five to ten years. Review will be accomplished through the development of a Quality Assurance Project Plan for monitoring, data collection, data assessment, and then making revisions as appropriate. Together these efforts will be used to evaluate progress in achieving water quality standards. If water quality standards are not being met, individual management strategies can be modified to better address problems. When water quality standards are met, water quality improvement efforts can be reduced as the focus shifts to monitoring, maintenance, and prevention of water quality standard exceedances. ODEQ’s TMDL Implementation Plan Internal Management Directive addresses how DMAs apply adaptive management to their TMDL implementation efforts.

Figure 14.1 Achievement of water quality standards over time.



PART 2: TMDL - SPECIFIC IMPLEMENTATION REQUIREMENTS

This part of the WQMP describes TMDL implementation requirements that are unique to this TMDL. It covers expectations related to storm water management (to address mercury and bacteria), basin-specific measures for implementing the temperature TMDL, and specific actions that ODEQ and selected point sources will carry out as part of the “path forward” to the development of a final mercury TMDL in 2011.

ODEQ expects DMAs to demonstrate they are addressing these measures through their TMDL Implementation Plans or other mechanisms as described below, or through an alternative approach if agreed to by ODEQ. ODEQ encourages DMAs to work cooperatively to address these requirements when such an approach would be advantageous.

Storm Water Management to Control Bacteria and Mercury

Storm water discharges from both point source and nonpoint source discharges can be a significant source of bacteria and mercury found in surface waters. Storm water can also be a source of other 303(d) listed pollutants as well as nonlisted pollutants. For these reasons, ODEQ has established the following requirements for storm water management in the Willamette Basin. These measures will help address the bacteria and mercury load reductions required by this TMDL as well as provide additional pollution prevention benefits.

The requirements differ depending on whether or not a municipality is covered (or will be covered) by a Municipal Separate Storm Sewer System (MS4) NPDES permit.

DMAs Covered by a MS4 Permit (including those that have applied to be covered under a Phase II permit)

An MS4 permit requires a municipality to develop a storm water management plan that addresses a number of control measures as specified in the permit. An MS4 permit also requires the municipality to establish pollution load reduction benchmarks for relevant TMDL pollutants and collect water quality data to evaluate progress toward meeting those benchmarks. [Note: See the following section describing mercury implementation requirements for a more detailed description of expectations for MS4 permittees relative to controlling mercury.]

However, a storm water management plan required by an MS4 permit only addresses some, but not all, sources of TMDL pollutants. For example, storm water management plans are not required to address sources of temperature because storm water has been determined to not be a significant contributor of heat to surface waters. In addition, MS4 permits apply to a municipality’s storm sewer system and may not address nonpoint sources of TMDL pollutants.

For these reasons, ODEQ expects DMAs covered by an MS4 permit to demonstrate that they will address temperature and nonpoint sources of TMDL pollutants not addressed by the MS4 storm water management plan. For any storm water management plan that covers all TMDL parameters, the storm water management plan would suffice as an implementation plan. This may also be done by including the additional parameters in the storm water management plan at the permittees discretion. This would typically be accomplished through submittal of a TMDL Implementation Plan following the same requirements and timelines described elsewhere in this chapter. The TMDL implementation plan should address pollution reduction strategies for TMDL pollutants not addressed in the storm water management plan, and in so doing should complement rather than recreate a storm water management plan.

There are two types of MS4 permits. The first type, also known as Phase I permits, are issued to jurisdictions with a population size of 100,000 or more. These include Portland (with Port of Portland and Multnomah County), Washington County (with Clean Water Services), Gresham (with Fairview and Multnomah County), Clackamas County (and cities within the county), Salem and Eugene.

MS4 Phase II permits will be issued to jurisdictions located in census defined urbanized areas over 50,000 in population that are not party to one of the ODEQ Phase I MS4 permits. In the Willamette

Basin, these include Corvallis, Keizer, Philomath, Springfield, Wood Village, Troutdale, Turner, Benton County, Marion County, Polk County, and Lane County.

DMAs Not Covered by a MS4 Permit

Because of the potential for storm water runoff to be a significant source of TMDL pollutants, ODEQ will require DMAs with a population greater than 10,000 that are not covered under a MS4 permit to address each of the storm water control measures described below. Based upon the 2003 population data in the Oregon Blue Book, this requirement applies to the following DMAs: **Albany, Dallas, Newberg and Woodburn.**

The TMDL implementation plan for these DMAs shall include information as to the extent of the problem related to storm water and the actions that will be taken to implement these control measures to address it. The TMDL implementation plan, which must be submitted to ODEQ within 18 months following issuance of the TMDL, must include a timeline that demonstrates how these measures will be implemented within five years unless otherwise agreed to by the Department. Failure to adequately address these control measures may result in ODEQ requiring the DMA to apply for a MS4 permit as authorized by the federal Phase II storm water regulations.

Municipal Storm Water Requirements for Non-MS4 Communities identified as Designated Management Agencies (DMA):

- The TMDL Implementation Plans must include best management practices that control stormwater and minimize soil erosion to reduce runoff of mercury and bacteria.
- The DMA's TMDL Implementation Plan is due to ODEQ 18 months following the issuance of the TMDL.

URBAN/RESIDENTIAL STORM WATER CONTROL MEASURES

1. *Pollution Prevention in Municipal Operations*
 - a. The DMA must develop and implement an operation and maintenance program that includes a training component and has the ultimate goal of preventing or reducing pollutant runoff from municipal operations; and
 - b. Using training materials that are available from ODEQ, USEPA, or other organizations, the DMA's program must include employee training to prevent and reduce storm water pollution from activities including, but not limited to, park and open space maintenance, fleet and building maintenance, new municipal facility construction and related land disturbances, design and construction of street and storm drain systems, and storm water system maintenance.
2. *Public Education and Outreach on Storm Water Impacts*

The DMA must implement a public education program to distribute educational materials to the community or conduct equivalent outreach activities about the impacts of storm water discharges on water bodies and the steps that the public can take to reduce pollutants in storm water runoff.
3. *Public Involvement/Participation*

The DMA must at a minimum, comply with State, Tribal, and local public notice requirements when implementing a public involvement/participation program.
4. *Illicit Discharge Detection and Elimination*

The DMA must:

 - a. Develop, implement and enforce a program to detect and eliminate illicit discharges [as defined in 40 CFR §122.26(b)(2)] into the DMA's system;
 - b. Develop, if not already completed, a storm sewer system map, showing the location of all outfalls and the names and location of all waters of the United States and/or the State of Oregon that receive discharges from those outfalls;
 - c. To the extent allowable under State or local law, effectively prohibit, through ordinance, or other regulatory mechanism, non-storm water discharges into the DMA's storm sewer system and implement appropriate enforcement procedures and actions. Possible sanctions include non-monetary penalties (such as stop work orders), fines, bonding requirements, and/or permit denials for non-compliance.

- d. Develop and implement a plan to detect and address non-storm water discharges, including illegal dumping, to the DMA's system;
 - e. Inform public employees, businesses, and the general public of hazards associated with illegal discharges and improper disposal of waste; and
 - f. Address the following categories of non-storm water discharges or flows (illicit discharges) if the DMA identifies them as substantial contributors of pollutants to the DMA's system: water line flushing, landscape irrigation, diverted stream flows, rising ground waters, uncontaminated ground water infiltration (as defined at 40 CFR §35.2005(20)), uncontaminated pumped ground water, discharges from potable water sources, foundation drains, air conditioning condensation, irrigation water, springs, water from crawl space pumps, footing drains, lawn watering, individual residential car washing, flows from riparian habitats and wetlands, de-chlorinated swimming pool discharges, and street wash water. Discharges or flows from fire fighting activities are excluded from the effective prohibition against non-storm water and need only be addressed where they are identified as substantial sources of pollutants to waters of the United States and the State of Oregon.
 - g. The DMA must develop a process to respond to and document complaints relating to illicit discharges.
5. Construction Site Storm Water Runoff Control
The DMA must develop, implement, and enforce a program to reduce pollutants in any storm water runoff to the DMA's system from construction activities that result in a land disturbance of greater than or equal to one acre. Reduction of storm water discharges from construction activity disturbing less than one acre must be included in the DMA's program if that construction activity is part of a larger common plan of development or sale that would disturb one acre or more. The DMA's program must include the development and implementation of, at a minimum:
- a. An ordinance or other regulatory mechanism to require erosion and sediment controls, as well as sanctions to ensure compliance, to the extent allowable under State or local law;
 - b. Requirements for construction site operators to implement appropriate erosion and sediment control best management practices;
 - c. Requirements for construction site operators to prevent or control waste that may cause adverse impacts to water quality such as discarded building materials, concrete truck washout, chemicals, litter, and sanitary waste at the construction site;
 - d. Procedures for site plan review that incorporate measures to prevent or control potential water quality impacts;
 - e. Procedures for receipt and consideration of information submitted by the public; and
 - f. Procedures for site inspection and enforcement of control measures.
6. Post-Construction Storm Water Management in New Development and Redevelopment
The DMA must:
- a. Develop, implement, and enforce a program to ensure reduction of pollutants in storm water runoff from new development and redevelopment projects that disturb one acre or more, or less than one acre if they are part of a larger common plan of development or sale, and discharge into the DMA's system. The DMA's program must ensure that controls are in place that would prevent or minimize water quality impacts.
 - b. Develop and implement strategies that include a combination of structural or non-structural BMPs appropriate for the DMA's community, and
 - i. Use an ordinance or other regulatory mechanism to address post-construction runoff from new development and redevelopment projects to the extent allowable under State or local law;
 - ii. Ensure adequate long-term operation and maintenance of BMPs; and
 - iii. Ensure adequate enforcement of ordinance or alternative regulatory program.

DMA's with populations under 10,000 will be expected to give consideration to the storm water control measures in the process of developing their implementation plans. This should include a description of the extent of the problem and the actions that will be taken to address it, as appropriate. Requirements for these implementation plans are presented in ODEQ's Internal Management Directive for developing

Implementation Plans, available upon request from ODEQ's regional offices. Please contact Andy Schaedel in Portland at 503-229-6121 or Mike Wolf in Eugene at 541-686-7848.

NON-URBAN CONTROL MEASURES

Storm water runoff from agricultural and forest lands will be addressed through existing state and federal regulations and plans (e.g., SB 1010, Oregon Forest Practices Act, Water Quality Restoration Plans on BLM and USFS lands). Appendix 14.B. provides information on the types of management strategies that can be used to manage storm water runoff for each land use type.

Mercury TMDL Implementation and Path Forward

ODEQ is implementing an incremental (“phased”) approach for the Willamette mercury TMDL. This approach will move ODEQ and stakeholders from the current understanding of mercury in the Willamette Basin, as represented by the 2006 TMDL, to a better understanding that will enable ODEQ to update the TMDL in 2011. It is anticipated that the 2011 TMDL will include revised water column guidance values, revised allocations, and, potentially, water quality based effluent limits for mercury point sources.

BACKGROUND:

- There are currently multiple 303(d) listings based on fish consumption advisories for elevated mercury concentrations found in northern pikeminnow and largemouth bass. The advisories indicate that mercury is bioaccumulating in these fish species to levels that may adversely affect public health. OAR 340-041-0033 states in part that toxics may not be discharged above background concentrations where they may bioaccumulate in aquatic life to levels that adversely affect public health. The fish consumption advisories are an indication that this narrative criterion is being exceeded.
- Methylmercury, the most toxic form of mercury, is known to bioaccumulate in fish.
- Total mercury data is more readily available and less costly to obtain than methylmercury data.
- The Food Web Model was developed by ODEQ to link total mercury and methylmercury concentrations in water to methylmercury concentrations in fish.

OVERVIEW OF THE 2006 TMDL

- ODEQ has made the policy decision that the interim mercury reduction target for the mainstem Willamette is based on the median value for methylmercury bioaccumulation in the northern pikeminnow. In other words, at the water column target, there would be a fifty percent likelihood that a northern pikeminnow taken from the Willamette River would have a fish tissue concentration lower than 0.3 parts per million (ppm), the USEPA fish tissue criterion for methylmercury.
- The source characterization analysis estimates total mercury loadings from multiple source sectors including: air deposition, native soil erosion, waste water dischargers, abandoned mines, and sediment resuspension.
- Allocations, based on a reduction target, are made for each source sector. The sum of all allocations is equal to the loading capacity of the system.
- The understanding of current source loads indicates that mercury is being discharged into the Willamette and at some level will methylate and bioaccumulate. Additional data collection and mercury mass balance analysis will be conducted to expand upon the current knowledge base. Mass balance analysis is described in more detail in this document.
- Allocations will not be incorporated into permits as numeric water quality based effluent limits at this time. Instead, sector allocations will be used as evidence that a significant problem exists and efforts need to expand to deal with mercury. Consistent with the assumptions and precision of the available information, certain permitted water point sources will be required to collect mercury data and/or develop a strategy to reduce mercury discharges through the implementation of best management practices.

OVERVIEW OF IMPLEMENTATION STRATEGY AND PATH FORWARD

- The overall strategy and this path forward call for minimizing mercury releases where possible, with a goal of removing the fish consumption advisories.
- The path forward focuses on expanding the knowledge ODEQ has today through further analysis and data collection. This is intended to increase understanding of how mercury is being released, how releases relate to fish advisories, how releases can be reduced, the economic implications of such reductions, and the public health results from such reductions.
- A mercury strategy (path forward) for the TMDL outlines a multi-year effort to enhance the understanding of mercury. This path forward will include:
 - ODEQ development of a refined mercury mass balance analysis by 2011

- Further evaluation of the methodological and modeling tools employed in this study (specifically the food web model for methylmercury bioaccumulation)
- Incorporate new effluent data and mercury reduction strategies from selected water point sources
- Incorporate data from USEPA-funded mercury water point source grant
- Incorporate mercury considerations into non-point source implementing mechanisms like the Forest Practices Act (FPA) and the Senate Bill 1010 AWQM plans where applicable.
- Incorporate new USGS air deposition monitoring data for Willamette Valley and any additional air emission data that may become available.
- Focused efforts to clean up abandoned mines discharging mercury
- Explore innovative approaches for holistic reductions from facilities and activities that discharge mercury
- Additional water column and effluent sampling by ODEQ
- By 2011, additional data will be incorporated into a revised TMDL that will update targets and provide new load allocations and waste load allocations to be incorporated into future permits as necessary. In the event new information suggests improved alternative methods for establishing water column guidance values and/or load allocations, this information will be incorporated into the 2011 revisions as part of the adaptive management framework.

MERCURY MASS BALANCE ANALYSIS

Intent: Complete a mass balance analysis to provide a better understanding of how mercury cycles through the Willamette Basin, including how mercury moves from total mercury to methylmercury which is ultimately bioaccumulated in fish.

ODEQ will undertake a mass balance analysis of mercury in the Willamette Basin to provide additional information needed for development of the 2011 TMDL update. A mass balance analysis represents a conceptual/mathematical description of the fate and transport of a chemical into multiple environmental phases or media. For example, such an analysis for mercury in the Willamette Basin would consider both anthropogenic and natural inputs, as well as the partitioning of mercury (and methylmercury) into discrete environmental media (i.e. air, land, water and sediment). The concentration established in each compartment is dependent on the chemical's intrinsic properties, how it is released into the environment, and the characteristics of that environment. Mass balance models allow the integration of information on the multiple processes of partitioning, transport and transformation into a comprehensive picture of a chemical's fate in an environmental system. Additional water and air monitoring data to be collected by ODEQ, USGS, and a number of sources, will be used in this analysis.

A calibrated mass balance model for the Willamette River system would allow for the estimation of the future concentrations of total mercury and methylmercury in the Willamette River system. For this analysis, the mainstem Willamette River would be divided into 4-6 discrete segments (or reaches) on the basis of hydrologic conditions and known sources of mercury. The analysis would attempt to estimate the steady state average mass balance of total and dissolved mercury and methylmercury in each of these segments and then for the mainstem as a whole by integrating the results from each segment. Water column and bed sediment monitoring data, as well as data from regulated water point sources, abandoned mines, nonpoint sources, upstream boundary conditions, and major tributaries, would be used to calibrate this Willamette mass balance model. This analysis will permit a more complete and representative accounting of the relative contributions of total mercury and methylmercury to the Willamette River system. Without a comprehensive numeric model such as this, it would be difficult to assess the relative percentages of total mercury and methylmercury mass loads from natural and anthropogenic sources. A calibrated model would also allow sources to predict the effectiveness of remediation efforts or sector-specific source category reductions in terms of ultimately achieving reduced environmental/fish tissue concentrations.

TMDL IMPLEMENTATION STRATEGY

ODEQ will work with permitted sources and other stakeholders to collect additional data and implement a variety of mercury reduction strategies following the issuance of the 2006 TMDL.

1. Permitted wastewater dischargers (NPDES Wastewater Permits):

Intent: Require selected NPDES permittees to monitor for mercury in discharges and develop and implement mercury reduction plans as interim implementation measures for this phase of the TMDL. Begin investigations of innovative mechanisms for implementing mercury WLAs to determine whether these approaches can be used to implement numeric mercury WLAs following issuance of the 2011 mercury TMDL.

The 2006 mercury TMDL establishes sector allocations for mercury rather than source-specific WLAs because more data is needed before those allocations can be finalized. To make progress toward achieving the allocation for the water point source sector, ODEQ is requiring selected NPDES permittees to undertake the following implementation measures to refine estimates of point source contributions and to begin to plan for implementation.

Mercury Monitoring: Following the issuance of this TMDL ODEQ will notify selected major domestic and industrial, minor industrial, and MS4 NPDES permittees to collect a limited number of samples and have them analyzed for mercury, Table 14.2. The details of this sampling and analysis will be defined and implemented through existing permits. This data is needed to enhance the understanding of sources of mercury that is necessary for developing the 2011 mercury TMDL. ODEQ will augment the data collected by these sources by conducting effluent monitoring screening of various general permits or minor sources that are suspected of having mercury in their discharges. This monitoring will be funded with a grant from US EPA. This data will also enable ODEQ to determine which sources will need to conduct more extensive effluent monitoring for mercury in the future. After issuance of the 2011 TMDL, water quality based effluent limits may be placed into individual point source permits or bubble permits.

Mercury minimization plans: The major NPDES permitted sources listed below in Table 14.2 , which includes wastewater treatment facilities and pulp and paper mills covered under a NPDES major permit, will be required to develop and implement a mercury reduction strategy prior to issuance of the 2011 TMDL. Shortly after issuance of the 2006 TMDL, ODEQ will begin working with affected stakeholders to define the required elements of a mercury reduction strategy and the expectations for successful implementation of said strategy. Once this work has been completed, sources will have 12 months to submit a plan to ODEQ that fulfills those requirements. Sources are encouraged to explore opportunities to work together to jointly implement a mercury reduction strategy, as appropriate. In addition, ODEQ will establish a mechanism for tracking mercury reductions so that sources can get "credit" toward achieving the load reductions that will be established in the 2011 TMDL.

Table 14.2 List of major domestic and industrial, minor industrial, and MS4 NPDES permittees to collect mercury and methyl mercury samples.

CommonName	Category	Class	Type	Region
Major Domestic				
MWMC - EUGENE/SPRINGFIELD STP	DOM	MAJOR	NPDES-DOM-A2	WR
ROCK CREEK STP	DOM	MAJOR	NPDES-DOM-A2	NWR
SALEM WILLOW LAKE STP	DOM	MAJOR	NPDES-DOM-A2	WR
DURHAM STP	DOM	MAJOR	NPDES-DOM-A3	NWR
KELLOGG CREEK WWTP	DOM	MAJOR	NPDES-DOM-A3	NWR
ALBANY STP	DOM	MAJOR	NPDES-DOM-Ba	WR
CORVALLIS STP	DOM	MAJOR	NPDES-DOM-Ba	WR

FOREST GROVE STP	DOM	MAJOR	NPDES-DOM-Ba	NWR
HILLSBORO-WESTSIDE STP	DOM	MAJOR	NPDES-DOM-Ba	NWR
MCMINNVILLE WATER RECLAMATION FACILITY	DOM	MAJOR	NPDES-DOM-Ba	WR
TRI-CITY WPCP (SEE FILE NO. 110122)	DOM	MAJOR	NPDES-DOM-Ba	NWR
TRYON CREEK WWTP	DOM	MAJOR	NPDES-DOM-Ba	NWR
CANBY STP	DOM	MAJOR	NPDES-DOM-C1a	NWR
DALLAS STP	DOM	MAJOR	NPDES-DOM-C1a	WR
LEBANON STP	DOM	MAJOR	NPDES-DOM-C1a	WR
NEWBERG - WYNOOSKI ROAD STP	DOM	MAJOR	NPDES-DOM-C1a	WR
OAK LODGE WWTP	DOM	MAJOR	NPDES-DOM-C1a	NWR
SILVERTON STP	DOM	MAJOR	NPDES-DOM-C1a	WR
WILSONVILLE STP	DOM	MAJOR	NPDES-DOM-C1a	NWR
WOODBURN POTW	DOM	MAJOR	NPDES-DOM-C1a	WR
COTTAGE GROVE STP	DOM	MAJOR	NPDES-DOM-C2a	WR
STAYTON STP	DOM	MAJOR	NPDES-DOM-C2a	WR
SWEET HOME STP	DOM	MAJOR	NPDES-DOM-C2a	WR
Major Industrial				
ALBANY PAPER MILL	IND	MAJOR	NPDES-IW-A	WR
BLUE HERON PAPER COMPANY	IND	MAJOR	NPDES-IW-A	NWR
EVANITE FIBER-HARDBOARD DIV	IND	MAJOR	NPDES-IW-N	WR
EVERGREEN MILL - WEST LINN PAPER COMPANY	IND	MAJOR	NPDES-IW-A	NWR
FORT JAMES	IND	MAJOR	NPDES-IW-A	WR
POPE & TALBOT, INC HALSEY PULP MILL	IND	MAJOR	NPDES-IW-A	WR
SILTRONIC	IND	MAJOR	NPDES-IW-N	NWR
SP NEWSPRINT COMPANY	IND	MAJOR	NPDES-IW-A	WR
WEYERHAEUSER	IND	MAJOR	NPDES-IW-A	WR
WAH CHANG	IND	MAJOR	NPDES-IW-F	WR
DBA ALLVAC	IND	MAJOR	NPDES-IW-G	WR
Minor Industrial				
OREGON STEEL MILLS - RIVERGATE MILL	IND	MINOR	NPDES-IW-G	NWR
CASCADE GENERAL, INC.	IND	MINOR	NPDES-IW-N	NWR
CASCADE STEEL	IND	MINOR	NPDES-IW-N	WR
DURAFLAKE DIVISION	IND	MINOR	NPDES-IW-N	WR
DYNEA	IND	MINOR	NPDES-IW-N	WR
G P EUGENE RESIN PLANT	IND	MINOR	NPDES-IW-N	WR
G P MILLERSBURG RESIN PLANT	IND	MINOR	NPDES-IW-N	WR
HULL-OAKES LUMBER CO.	IND	MINOR	NPDES-IW-N	WR
J.H. BAXTER & CO., INC.	IND	MINOR	NPDES-IW-N	WR
KINGSFORD MANUFACTURING COMPANY - SPRINGFIELD PLANT	IND	MINOR	NPDES-IW-N	WR
KOPPERS	IND	MINOR	NPDES-IW-N	NWR
MCFARLAND CASCADE POLE & LUMBER CO	IND	MINOR	NPDES-IW-N	WR

PARAMETRIX ENVIRONMENTAL RESEARCH LABORATORY	IND	MINOR	NPDES-IW-N	WR
PERMAPOST	IND	MINOR	NPDES-IW-N	NWR
RSG FOREST PRODUCTS - LIBERAL	IND	MINOR	NPDES-IW-N	NWR
SLLI	IND	MINOR	NPDES-IW-N	NWR
SUNSTONE CIRCUITS	IND	MINOR	NPDES-IW-N	NWR
VAUGHN LAMINATING COMPLEX	IND	MINOR	NPDES-IW-N	WR
WALLING SAND & GRAVEL CO.	IND	MINOR	NPDES-IW-N	WR
WEYERHAEUSER COMPANY-COTTAGE GROVE	IND	MINOR	NPDES-IW-N	WR
COVANTA MARION, INC	IND	MINOR	NPDES-IW-O	WR
FOSTER PLYWOOD	IND	MINOR	NPDES-IW-O	WR
FRANK LUMBER CO. INC.	IND	MINOR	NPDES-IW-O	WR
JASPER WOOD PRODUCTS, LLC	IND	MINOR	NPDES-IW-O	WR
OREGON-CANADIAN FOREST PRODUCTS - NORTH PLAINS	IND	MINOR	NPDES-IW-O	NWR
PACIFIC WOOD PRESERVING OF OREGON	IND	MINOR	NPDES-IW-O	WR
ROYAL PACIFIC INDUSTRIES INC	IND	MINOR	NPDES-IW-O	WR
STIMSON LUMBER COMPANY - FOREST GROVE	IND	MINOR	NPDES-IW-O	NWR
U OF O - CENTRAL HEAT PLANT	IND	MINOR	NPDES-IW-O	WR
MS4 Phase I Stormwater				
CLACKAMAS COUNTY - MUNICIPAL STORMWATER MS4	STM	MAJOR	NPDES-IW-S	NWR
CLEAN WATER SERVICES, MUNICIPAL STORMWATER MS4	STM	MAJOR	NPDES-IW-S	NWR
EUGENE, CITY OF, MUNICIPAL STORMWATER MS4	STM	MAJOR	NPDES-IW-S	WR
GRESHAM, CITY OF - MUNICIPAL STORMWATER MS4	STM	MAJOR	NPDES-IW-S	NWR
PORTLAND, CITY OF - MUNICIPAL STORMWATER MS4	STM	MAJOR	NPDES-IW-S	NWR
SALEM, CITY OF, MUNICIPAL STORMWATER MS4	STM	MAJOR	NPDES-IW-S	WR

2. Permitted municipal storm water dischargers (MS4 Phase 1 and 2 permittees):

Intent: Ensure MS4 communities are addressing mercury through implementation of their MS4 permit and require MS4 Phase I permittees to collect data on mercury levels in urban storm water runoff in order to characterize these sources so they may be appropriately considered in the 2011 update of the mercury TMDL.

The recently issued Phase I MS4 permits include requirements for addressing relevant 303(d) listed and TMDL pollutants in the context of the storm water management plan. Phase II MS4 permits are expected to include these requirements as well. This is how these requirements will be applied relative to the 2006 mercury TMDL:

Because the 2006 TMDL does not establish source-specific WLAs for mercury, mercury is not considered to be a TMDL pollutant under the Phase-I MS4 permit provisions. However, mercury is a 303(d) listed pollutant in the Willamette Basin and is therefore subject to requirements found in Schedule D of the MS4 permit. Under these requirements, the MS4 permittee must qualitatively review the pollutants that are listed in the 2002 303(d) report that are relevant to MS4 storm water sources, including mercury. This review and corresponding summary of proposed actions must be incorporated into the second year annual report under the MS4 permit. The review and summary must accomplish the following:

- Determine whether there is a reasonable likelihood for storm water from the MS4 to add or contribute to water quality degradation of receiving waters through the discharge of mercury. Provide the rationale for the conclusion, including the results of an evaluation.
- If the discharges from the MS4 are a contributor for mercury, determine and describe the relationship between mercury and the MS4 discharges.

- Determine whether the BMPs in the existing Storm Water Management Plan (SWMP) are effective to address mercury. If not, describe how the plan could be adapted to more appropriately address mercury. A summary of the rationale for this determination must also be included in the report.
- If sufficient information is not available to make the determinations required above, the co-permittee must compile the additional pertinent information necessary to adequately complete these determinations.

If the 2011 mercury TMDL establishes source-specific WLAs for mercury, MS4 permittees will be responsible for addressing mercury as is required for TMDL pollutants in the MS4 permit.

In addition, MS4 Phase I permittees are required to collect information necessary to characterize mercury levels in storm water runoff as described above. This information will be used in the source assessment and mass balance analysis ODEQ will be undertaking as part of the “path forward” to the 2011 update of the Willamette TMDL (see discussion below).

3. Permitted Industrial Storm Water Dischargers

Intent: To reduce storm water runoff from industrial sources by implementing best management practices required by the 1200Z general permit. Total suspended solids benchmarks and best management practices designed to control sediments are expected to reduce mercury and bacteria among other pollutants.

4. Nonpoint Sources:

Intent: To incorporate mercury reduction strategies into the TMDL Implementation Plans from Non-MS4 DMAs, Agricultural Water Quality Management Area Plans, Forest Practices Act, plans from the federal land managers, and air sectors.

Mercury reduction strategies for nonpoint sources will be addressed as follows:

- Agricultural Water Quality Management Area Plans – Best Management Practices employed to minimize soil erosion will control mercury. Appropriate Best Management Practices should also be used to control the use of products that contain mercury, such as some fertilizers.
- Forest Practice Act - Best Management Practices employed to minimize soil erosion will control mercury.
- Federal Water Quality Restoration Plans - Best Management Practices employed to minimize soil erosion will control mercury.
- Air Sources – Best Management Practices employed to voluntarily reduce emissions from air mobile, area, and industrial sources in conjunction with Best Management Practices to control mercury movement on the landscape in urban, agriculture, and forestry environments such as through erosion control practices will help control mercury.

5. Land Sources/Mines:

Intent: To support ongoing efforts between the ODEQ Land Quality Program, BLM, and other stakeholders who are working to address mercury runoff from abandoned mines.

ODEQ will continue its efforts to remediate abandoned mine sites to minimize the flow of mercury into adjacent waterbodies.

2011 MERCURY TMDL UPDATE

Intent: Use additional information and refined methodologies to develop the final mercury TMDL by 2011, Include stakeholders in the process as appropriate.

ODEQ plans to update the 2006 TMDL in 2011. The 2011 TMDL update represents the second and final step in the development of the mercury TMDL. It will build upon the 2006 TMDL by incorporating additional monitoring data collected since 2003 and refinements or reexamination of critical assumptions made in the 2006 TMDL. Additional information will be generated as part of the mercury mass balance analysis. Starting in 2005, ODEQ began collecting additional water column samples in the Willamette River on a quarterly basis. In addition, effluent monitoring data collected by ODEQ and NPDES permittees will be used to refine the source characterization and allocation components of the 2006 TMDL. Updated air emission data and air quality monitoring data from the two new USGS air deposition sites in the Willamette Basin will continue to provide information about mercury air emissions and deposition for this update. All of these efforts will enhance the level of understanding of mercury in the Willamette Basin.

If appropriate, the updated TMDL may establish source-specific wasteload allocations which could be used to set water quality based effluent limits for water point sources that discharge significant levels of mercury. Additional regulatory controls may be implemented for water nonpoint sources as well as for sources regulated under ODEQ's Air and Land Quality Programs.

ODEQ remains committed to working with stakeholders in the Willamette Basin on the refinement and implementation of the mercury TMDL and to keeping stakeholders apprised of new developments. As work progresses on this TMDL update, ODEQ recognizes that national efforts are underway to determine the best approaches for addressing mercury 303(d) listings for impaired waterbodies. Future recommendations by the Environmental Council of the States (ECOS), the Quicksilver Caucus, or USEPA may suggest an alternate approach for addressing mercury concerns. ODEQ will continue to monitor these activities and may elect to follow a different course of action if deemed prudent.

EXPLORING INNOVATIVE APPROACHES

Intent: Explore innovative approaches to meet mercury reduction goals for facilities that have been assigned a mercury WLA.

ODEQ expects to establish source-specific WLAs in the 2011 mercury TMDL. In anticipation of this, some NPDES sources have expressed interest in exploring innovative approaches for implementing these WLAs.

One concept is a "permit bubble" that would allow a group of similar sources to join together to determine the best way to reduce mercury effluent loadings. This would allow the group to collectively solve their mercury reduction needs.

Another concept is a "multi-media bubble" that may be attractive to sources that are subject to both water and air mercury reduction requirements. This approach would provide additional flexibility in implementing strategies to achieve reductions. To be implementable, the multi-media bubble will need to address issues such as comparable baselines for water and air discharges and equivalent reductions between media.

ODEQ encourages interested point sources to explore these concepts and, if promising, enlist ODEQ's assistance to develop implementation mechanisms. All of these approaches would likely require substantial time for policy development and public review, so these efforts must get underway well in advance of the 2011 TMDL if sources want to make use of them to implement wasteload allocations.

Temperature TMDL Implementation

This section of the WQMP discusses issues related to implementation of the temperature TMDL, including implementation of Waste Load and Load Allocations (WLA), allocation of Reserve Capacity, water quality trading, cold water refugia and specific implementation issues and expectations related to hydroelectric projects and USACE dams and reservoirs in the basin.

WASTE LOAD ALLOCATIONS

For existing NPDES permitted wastewater sources, WLAs are assigned at the time of TMDL issuance and will be implemented in permits at their next scheduled renewal date following issuance of the TMDL. Renewed permits may include compliance schedules describing the timeline for the facility to implement these WLAs. Permit compliance schedules may include timelines for facility upgrades, development of trading strategies, conducting studies to determine need for reserve capacity requests, or other load reduction measures. For sources proposing to meet wasteload allocations through trading, the trading strategy must be approved by ODEQ within the 5 year cycle of the renewed permit. In order to encourage innovative and effective trading strategies, ODEQ may assign part of the available reserve capacity to sources that have an approved trading strategy as a component of their actions to achieve their WLAs. This trading strategy must include an assessment of options for limiting discharge of heat through plant upgrades, and trading will be allowed where these options are not possible. The reserve capacity allocations to encourage trading will last for 5-year intervals, which may be extended with subsequent permit renewals, and will allow the individual source greater than a single permit cycle to implement the upgrades and trading options necessary to achieve the assigned WLAs. The department will ensure that allocations of reserve capacity do not cause an increase in stream temperature at the point of maximum impact that violates the temperature water quality standard.

The WLA is valid for the life of the permit. A permittee will be allowed to “trade” all or portions of the WLA provided all policy and legal requirements are met (see additional discussion of water quality trading below). The allocation will continue with the permit into the future if needed by the source to be in compliance with the TMDL. However, if any portion of the WLA is unused by the source after a ten-year period from the time of allocation, or the permit has been terminated, the unused allocation will revert back to the reserve capacity unless the facility provides the Department with a plan that identifies the continued need for that unused allocation or the allocation has been committed in a trade to another source. Capacity that has reverted back to reserve will be available to ODEQ for allocation to other sources.

Future updates to the Willamette model, including incorporation of potential changes to boundary condition assumptions and load allocations for USACE dams following completion of the Corps' reservoir models, may trigger a reanalysis of heat source loading from mainstem point sources. If the results indicate that WLAs need to be revised, then the TMDL may be reopened by ODEQ to modify the load allocations. This would include a public comment period and issuing a TMDL Addendum. ODEQ is responsible for reopening a TMDL, assigning new load allocations, and for the ensuing public comment process.

RESERVE CAPACITY

Reserve Capacity is defined as “that portion of a receiving stream’s loading capacity which has not been allocated to point sources or nonpoint sources and natural background as wasteload allocations or load allocations, respectively. The reserve capacity includes that loading capacity which has been set aside for a safety margin and is otherwise unallocated” (OAR 340-041-0002(47)). The exact location and the amount of reserve capacity are identified in the mainstem Willamette River temperature chapter (Chapter 4) and in the individual subbasin chapters (Chapters 5 - 13).

The Reserve Capacity allocation for the mainstem Willamette is 0.05°C (1/6th of the Human Use Allowance) in most segments of the river. However, there are a few segments where the Reserve Capacity allocation is smaller in order to account for temperature loads related to existing point sources or hydro projects. Reserve Capacity on subbasin stream segments is 0.05°C where point sources are present and 0.25°C for stream segments that lack point sources.

Reserve Capacity is intended to be available to accommodate future growth as well as to provide an allocation to any existing source that may not have been identified during the development of the TMDL. Reserve Capacity will be available for use by either point sources or nonpoint sources, subject to the applicable procedures to allocate Reserve Capacity. This WQMP describes the general policy and procedures relating to the allocation of Reserve Capacity within those portions of the Willamette Basin covered by the temperature TMDL. ODEQ plans to work with stakeholders following issuance of this TMDL to develop more detailed policies and procedures. It is anticipated that ODEQ will not allocate Reserve Capacity in the Willamette Basin until this has been accomplished.

Implementation of Reserve Capacity:

On the mainstem of the Willamette River, one-half of the Reserve Capacity will become available for permanent use at the time the TMDL is issued by ODEQ. The second half of the Reserve Capacity will become permanently available following analyses for the USACE dam and reservoirs and when it is demonstrated that significant steps to implement the TMDL have been taken.

After the TMDL is issued by ODEQ, a permittee may submit an application to the permit writer for their facility requesting allocation of Reserve Capacity. Subject to refinement in more detailed policies and procedures, ODEQ has established the following approach to allocating Reserve Capacity.

On the mainstem of the Willamette River, no permanent allocations of Reserve Capacity will be granted until a reasonable time (2 years) to allow permit writers and sources to determine the impacts of wasteload and load allocations and to determine if any sources received inappropriate or insufficient allocations.

Temporary allocation from the one-half of the immediately available Reserve Capacity may be granted for facilities that are in immediate violation and meet one or more of the priorities and conditions listed below. Allocations of Reserve Capacity will be granted by ODEQ based on the following priority:

- Facilities that were not given a WLA because we simply missed them or a part of their operations in the TMDL (e.g., a second outfall that was not included in the TMDL);
- Facilities that are in immediate violation of WLAs and cannot demonstrate any alternative for achieving those WLAs and permit limits;
- Sources that need to grow and have no alternatives;
- New sources.

Prior to being granted an allocation of reserve, sources must demonstrate that there are no reasonable alternatives to an increased wasteload allocation. This reallocation of Reserve Capacity will be at the discretion of ODEQ, and the decision rests with the Director or authorized designee.

In the tributaries, all Reserve Capacity will become available for use at the time the TMDL is issued by ODEQ and can be allocated according to policies and procedures established by ODEQ following issuance of this TMDL. The rationale for this is that Reserve Capacity is part of the Human Use Allowance, which by definition represents an insignificant addition of heat to the river.

Major sources will need to conduct a temperature modeling analysis or similar analytical review to ensure that Reserve Capacity is available at the point of discharge and that the resulting discharge will not increase stream temperatures over the allotted amount at the point of maximum impact. Minor point sources may or may not require a similar analysis, depending on the overall availability of Reserve Capacity at the point of discharge or the point of maximum impact.

The existing Willamette Mainstem Model developed for the mainstem temperature TMDL will be used to analyze requests for Reserve Capacity on the mainstem. At the time of the analysis, this model will be updated to reflect any changes or trading that alter the distribution of heat loads into the river, such as new permitted discharges or termination of former discharges.

For subbasin stream segments, the availability of Reserve Capacity will be determined based on the modeling or analytical tools used to analyze the stream segment under consideration.

WATER QUALITY TRADING

In January of 2003, the USEPA Office of Water issued a Water Quality Trading Policy that describes trading and lists the general elements and provisions that USEPA believes are important for creating credible water quality trading programs. ODEQ published an Internal Management Directive for Water Quality Trading on January 13, 2006. This document outlines ODEQ's expectations for trading among sources of pollutants.

According to the USEPA policy, trading is an approach that can offer greater efficiency in achieving water quality goals on a watershed basis. It allows one source to meet its regulatory obligations by using pollutant reductions created by another source that has lower pollution control costs. ODEQ supports the use of water quality trading to help implement this TMDL.

The mechanics of a particular water quality trade will depend in part on the parameter to be traded. For example, a source needing to reduce its temperature impact could pursue water quality trading in lieu of installing expensive refrigeration equipment. By implementing a water quality trade, the source could potentially offset its temperature impact via flow augmentation or by accelerating restoration of riparian vegetation.

ODEQ has implemented water quality trading in a NPDES permit in the Tualatin Subbasin of the Willamette Basin. In the Tualatin, the sewerage agency Clean Water Services is implementing the permit which includes trading for temperature as well as for several other parameters. ODEQ is committed to working with stakeholders in the Willamette Basin to develop effective policies and procedures for implementing water quality trades within the basin.

COLD WATER REFUGIA

DMAs located along the mainstem Willamette River from river mile 50 downstream to the confluence with the Columbia River need to address cold water refugia within their TMDL Implementation Plan. This reach of the river has been designated as a migration corridor in OAR Division 41. Cold water refugia are needed along this reach to offer migrating salmonids relief from the warmer river temperatures found in the summer months. Plans shall look at identifying existing cold water refugia and provide options for protecting or enhancing such areas. Wherever localized cold water refugia have been altered through channel modification or by other means, consideration should be given to exploring options for restoring or enhancing these areas of cold water refugia where feasible.

HYDROELECTRIC 401 CERTIFICATION

Section 401 of the federal Clean Water Act (CWA) authorizes state water quality programs to certify that federal actions involving the award of licenses or permits will not violate applicable state water quality requirements. In the case of hydroelectric projects, the Federal Energy Regulatory Commission (FERC) administers the licensing program, and the ODEQ certifies the project's application for licensing or relicensing.

ODEQ issued a 401 certification for the PGE Willamette Falls Project in 2004. In 2005, PGE applied for a 401 certification for the Clackamas Project. The water quality certification typically includes operating conditions designed to give the state reasonable assurance that project operation will not violate water quality standards. This requires the facilities to operate within the human use allowance during the critical periods when temperatures exceed biologically-based numeric criteria. ODEQ will require a temperature management plan be developed for those 401 applicants that cannot meet temperature standards in the near term. As specified in OAR 340-41-0028(12)(h) the temperature management plan will require the applicant to identify a strategy to comply with water quality standards. ODEQ expects that the temperature management plan will satisfy the requirements for a TMDL implementation plan as specified in OAR 340-042-0080.

ODEQ waived 401 certification when FERC issued a license to EWEB for the Leaburg-Waltermville Project in 1997. This TMDL does not re-open the 401. However, analysis for this TMDL using the most up-to-date model for the McKenzie River demonstrates that the project has both localized and downstream impacts. Because of these impacts, ODEQ has assigned EWEB a load allocation and made them a DMA

for the purpose of implementing this load allocation. As a DMA, EWEB will be required to develop and implement a TMDL implementation plan, including a temperature management plan, as described elsewhere in this chapter. The EWEB TMP will describe those actions being taken by EWEB that will mitigate temperature impacts associated with these projects.

US Army Corps of Engineers (USACE)

This TMDL/WQMP defines USACE as a DMA for the purpose of implementing water quality improvement measures to achieve the temperature-related water quality standards. For this TMDL USACE has been designated as a nonpoint source DMA for temperature, however, there may be other situations outside of this TMDL where USACE could be considered as a point source. As a nonpoint source DMA, USACE will be required to develop a TMDL Implementation Plan to address four major topics. These include:

- Assist with collection and analysis of data necessary to support ODEQ revisions of load allocations for each of the 13 dams and reservoirs;
- Demonstrate compliance and consistency with the Biological Opinion for the Willamette River Basin Projects;
- Development of a temperature management plan that will show temperature improvements needed to achieve load allocations;
- Participate in an Interagency Management Process for temperature-related improvements in the Willamette Basin.

ODEQ does not anticipate developing Use Attainability Analyses (UAA) as part of this TMDL. Moreover, approval of UAAs or site-specific criteria (SSC) will require concurrence from a number of federal agencies. ODEQ believes it is more appropriate for these federal agencies to establish a clear process for agreement among the federal agencies on how to approach UAAs or SSCs prior to the state taking on this responsibility.

USACE TMDL Implementation Plan

The TMDL Implementation Plan will be required within 18 months from the time USACE receives notification that the TMDL has been issued. This due date is consistent with the requirement for other DMAs in this TMDL/WQMP.

It is envisioned that USACE will actively participate in additional data collection and analysis activities, in consultation with ODEQ, to refine natural thermal potential temperatures and the effects the projects have on them. The USACE has been in the process of developing models for each of the major reservoirs in the system. When completed, ODEQ will likely link these models to the existing mainstem water quality model used to develop this TMDL. The results of the reservoir models could be used to replace boundary condition assumptions used in the initial TMDL modeling. The improvements in the models would significantly improve USACEs' ability to thoroughly analyze and evaluate alternative reservoir management strategies.

At the same time that this TMDL/WQMP was being developed, USACE has been engaged in consultation with NOAA Fisheries and US Fish and Wildlife Service (USFWS) under Section 7 of the Endangered Species Act regarding continued operation and maintenance of the 13 Willamette dams. A draft Biological Opinion (BiOp) from NOAA Fisheries (April 2004) has indicated that continued operation of the dams will jeopardize continued existence of Upper Willamette chinook and winter steelhead. The effect of dams on downstream temperatures is identified as a significant limiting factor for those species. A final BiOp for the Willamette River Basin multiple-purpose projects will be completed after the issuance of this TMDL/WQMP. The BiOp will identify a Reasonable and Prudent Alternative (RPA) that NOAA Fisheries and USFWS will expect USACE to implement to avoid jeopardizing threatened and endangered cold water fish species. The RPA may include operational and/or structural changes at the dams and reservoirs to increase fish survivability. The USACE TMDL Implementation Plan will need to identify the RPAs that have been incorporated into the BiOp that will reduce heat loading in the river system.

As part of the USACE TMDL Implementation Plan, the temperature management plan will be developed to show how the dams and reservoirs may be operated or modified to reduce heat loading to the river. The existence and operations of the dams and their reservoirs contribute to excessive seasonal heating of rivers. Typically this results in the shifting of the thermal regime that results in cooler water being released in the summer and warmer water being released in the fall. Summer flow augmentation can

yield significant water quality benefits. However, the release of warmer water in the fall often occurs when salmonid spawning requires cooler water. Some of this heat loading may be reduced by operational changes and some may be reduced through structural changes at the dam such as the installation of selective withdrawal structures. There may be social, economic and environmental tradeoffs associated with each of those alternatives that need to be thoroughly evaluated before USACE can implement them. For example, a decision to increase fall flows to improve conditions for spawning might necessitate a decrease in summertime flow augmentation and the loss of the water quality benefits that result from that. ODEQ will work with USACE through the TMDL/WQMP process to determine the effects of the existence and operation of the dams. This TMDL/WQMP is not advocating for the removal of the dams in Willamette River Basin Projects and is not intended to be used by any third party in furtherance of dam removal objectives. However, ODEQ expects that operators will work actively and diligently to control and mitigate the heat input from their structures/projects.

The temperature management plan will examine operational changes at each dam and reservoir as well as analyze the potential benefit of structural modifications to the dams. The analysis will look at feasible actions that provide the maximum temperature reductions that can be made while maintaining the authorized uses of the dam. This analysis will provide a schedule for related improvements. If the analysis indicates that the heating impacts cannot be fully mitigated, then the unachievable portion of the load allocation would be identified.

MONITORING

USACE will conduct two types of monitoring relative to this TMDL: short-term implementation monitoring and long-term effectiveness monitoring. A possible monitoring strategy is described below and the TMDL Implementation Plan that will be submitted by USACE will contain a detailed description of monitoring. The monitoring program should include a Quality Assurance program reviewed by the ODEQ.

Short-term implementation monitoring will be established to evaluate specific implementation activities. As those activities are identified and plans developed, a monitoring component should also be developed for management of the activity. For example, target temperatures may be developed for management of the cold-water release from an upstream reservoir. The implementation monitoring for this activity would look at the success of meeting the target temperatures, while the long-term effectiveness monitoring would look at the overall effectiveness of this and other implementation activities over time. In the short-term, effectiveness of operational implementation actions will be monitored at existing fixed monitoring station sites.

Additional monitoring may also be needed to evaluate localized effects such as hot spots or cold water refugia that impact fish habitat needs. Detailed cross sectional and vertical transect temperature studies will be encouraged during the implementation phase to assess localized temperature effects of operational strategies and to support refined temperature modeling.

Long-term monitoring activities will be needed to develop data to support temperature management plans, operational and structural temperature enhancement measures, and achieving load reductions in the TMDL. The TMDL identifies the modeled natural river temperature as the objective to meet current water temperature standards. The comparison between modeled temperatures and observed river temperatures must take into account the stochastic nature of temperature variability. The modeled temperatures for a given river mile and time of year will vary between years as a function of the system hydrology and meteorology and thermal loadings. A statistical level of confidence will be needed in order to determine if observations of water temperature differ significantly from the appropriate numeric criteria. Therefore, one objective of the long term monitoring strategy will be to develop ways for determining consistency with state water quality regulations and the temperature TMDL allocations.

COMPLIANCE WITH THE TMDL

Implementation of the approved TMDL Implementation Plan shall be considered to demonstrate that the USACE is operating its facilities in the Willamette Basin in compliance with the TMDL and shall not be deemed to be causing or contributing to a violation of the numeric criterion even if the surface water temperature exceeds the criterion. ODEQ may validate this finding with a written statement that the operator is doing what needs to be done to comply with the Clean Water Act.

In accordance with the evolving understanding of the effects of the USACE projects on water temperature, USACE shall continue to maintain and improve, if necessary, the TMDL Implementation Plan to address TMDL load allocations.

INTERAGENCY WORKGROUP

An interagency workgroup will be established to help develop and oversee the USACE's system-wide implementation plan within one year after the TMDL is issued. Members are envisioned to include ODEQ, USACE and other federal action agencies, USEPA, appropriate state agencies, and others with interests in the water quality of the Willamette mainstem. Inclusion of all these parties will facilitate coordination of this implementation plan with activities required under the BiOp and other basinwide efforts. The activities of this workgroup will include the following:

- Monitor completion of required improvement actions and studies;
- Work with lead agency managers to ensure actions are completed on time;
- Establish due dates when not already established for BiOp or the temperature management plan improvements;
- Develop the criteria by which temperature reduction proposals will be prioritized;
- Evaluate study results;
- Accept studies or ask for changes;
- Make recommendations on proceeding with actions based on study results;
- Make recommendations on whether actions are feasible based on study results;
- Participate in a water quality standards revision process, if appropriate, in the future; and
- Develop a process to prioritize and recommend allocation of resources.

The members will make all reasonable efforts to achieve consensus. During the initial meetings of the workgroup, the process for achieving consensus will be further defined. When consensus cannot be achieved on matters relating to TMDL implementation requirements, the objecting member may request that the issue be elevated to ODEQ, as Clean Water Act determinations will be up to the State.

There are a number of workgroups or teams already in existence working on the water quality issues related to the USACE dams. These include groups focusing on this TMDL and the BiOp. It's possible that the tasks described above could be accomplished by adding it to the charter of an existing workgroup, or combination of workgroups, that have the appropriate membership.

APPENDIX 14.A : 303(D) LISTINGS ADDRESSED BY TMDLS

The following table summarizes the 303(d) listed waterbodies and parameters in the Willamette Basin included in this TMDL.

Table 14.3 Summary of Willamette Basin condition assessment and problem description.

Basin	Waterbody Name	RM	Parameter	Season	Criteria/Text
CLACKAMAS	Bargfeld Creek	0 to 2.3	E. Coli	Summer	126 organisms
CLACKAMAS	Clackamas River	0 to 15	E. Coli	6/1 - 9/30	126 organisms
CLACKAMAS	Clackamas River	0 to 22.9	Temperature	Summer	Rearing: 17.8 C
CLACKAMAS	Cow Creek	0 to 2.6	Temperature	Summer	Rearing: 17.8 C
CLACKAMAS	Cow Creek	0 to 2.6	E. Coli	10/1 - 5/31	126 organisms
CLACKAMAS	Deep Creek	1.9 to 14.1	E. Coli	Summer	126 organisms
CLACKAMAS	Eagle Creek	0 to 20	Temperature	Summer	Rearing: 17.8 C
CLACKAMAS	Fish Creek	0 to 6.8	Temperature	Summer	Rearing: 17.8 C
CLACKAMAS	North Fork Deep Creek	0 to 9	E. Coli	Summer	126 organisms
CLACKAMAS	Rock Creek	0 to 6.1	E. Coli	10/1 - 5/31	126 organisms
CLACKAMAS	Sieben Drainage Ditch	0 to 1	E. Coli	10/1 - 5/31	126 organisms
CLACKAMAS	Sieben Drainage Ditch	1 to 1.8	E. Coli	10/1 - 5/31	126 organisms
CLACKAMAS	Tickle Creek	0 to 2.3	E. Coli	Summer	126 organisms
COAST FORK	Brice Creek	0 to 11.2	Temperature	Summer	Rearing: 17.8 C
COAST FORK	Coast Fork Willamette River	0 to 31.3	Temperature	Summer	Rearing: 17.8 C
COAST FORK	Coast Fork Willamette River	0 to 31.3	Fecal Coliform	W/S/F	Geometric Mean
COAST FORK	Coast Fork Willamette River	0 to 31.3	Fecal Coliform	Summer	Geometric Mean
COAST FORK	Coast Fork Willamette River	0 to 31.3	Mercury	Year Around	public health advisories...
COAST FORK	Cottage Grove Reservoir/Coast Fork Willamette R	28.5 to 31.3	Mercury	Year Around	public health advisories...
COAST FORK	Dorena Lake/Row River	7.4 to 11.3	Mercury	Year Around	public health advisories...
COAST FORK	King Creek	0 to 1.6	Temperature	Summer	Rearing: 17.8 C
COAST FORK	Laying Creek	0 to 7.7	Temperature	Summer	Rearing: 17.8 C
COAST FORK	Martin Creek	0 to 3.4	Temperature	Summer	Rearing: 17.8 C
COAST FORK	Mosby Creek	0 to 21.2	Temperature	Summer	Rearing: 17.8 C
COAST FORK	Row River	0 to 7.4	Temperature	Summer	Rearing: 17.8 C
COAST FORK	Row River	11.3 to 20.8	Temperature	Summer	Rearing: 17.8 C
COAST FORK	Sharps Creek	0 to 12.5	Temperature	Summer	Rearing: 17.8 C
LOWER	Johnson Creek	0 to 23.7	Fecal Coliform	W/S/F	Geometric Mean
LOWER	Johnson Creek	0 to 23.7	Fecal Coliform	Summer	Geometric Mean
LOWER	Johnson Creek	0 to 23.7	Dieldrin	Year Around	Table 20
LOWER	Johnson Creek	0 to 23.7	DDT	Year Around	Table 20
LOWER	Johnson Creek	0 to 23.7	Temperature	Year Around	Administrative list removal; TMDL completed
LOWER	Kellogg Creek	0 to 5	E. Coli	10/1 - 5/31	126 organisms
LOWER	Mount Scott Creek	0 to 6.1	E. Coli	10/1 - 5/31	126 organisms
LOWER	Phillips Creek	0 to 1.2	E.Coli	10/1 - 5/31	126 organisms
LOWER	Smith Lake	1.7 to 3	pH	Summer	pH: 6.5 to 8.5
LOWER	Spring Brook Creek	0 to 2.3	Fecal Coliform	W/S/F	Geometric Mean

Basin	Waterbody Name	RM	Parameter	Season	Criteria/Text
LOWER	Spring Brook Creek	0 to 2.3	Fecal Coliform	Summer	Geometric Mean
LOWER	Tryon Creek	0 to 5	Temperature	Summer	Rearing: 17.8 C
MCKENZIE	Blue River	0 to 1.8	Temperature	S/S/F	Spawning: 12.8 C
MCKENZIE	Blue River	1.8 to 15.5	Temperature	Summer	Rearing: 17.8 C
MCKENZIE	Deer Creek	0 to 8.3	Temperature	Summer	Rearing: 17.8 C
MCKENZIE	French Pete Creek	0 to 12.9	Temperature	Summer	Bull Trout: 10.0 C
MCKENZIE	Horse Creek	0 to 14.2	Temperature	Summer	Bull Trout: 10.0 C
MCKENZIE	McKenzie River	0 to 34.1	Temperature	Summer	Rearing: 17.8 C
MCKENZIE	McKenzie River	34.1 to 54.5	Temperature	S/S/F	Rearing: 17.8 C
MCKENZIE	McKenzie River	54.4 to 83	Temperature	Summer	Bull Trout: 10.0 C
MCKENZIE	Mill Creek	0 to 2.7	Temperature	Summer	Rearing: 17.8 C
MCKENZIE	Mohawk River	0 to 25.4	Temperature	Summer	Rearing: 17.8 C
MCKENZIE	Shotgun Creek	0 to 6.6	Temperature	Summer	Rearing: 17.8 C
MCKENZIE	South Fork McKenzie R	0 to 4.5	Temperature	S/S/F	Spawning: 12.8 C
MCKENZIE	Unnamed Waterbody	0 to 1.2	Temperature	Summer	Rearing: 17.8 C
MIDDLE FORK	Anthony Creek	0 to 4.3	Temperature	Summer	Rearing: 17.8 C
MIDDLE FORK	Bohemia Creek	0 to 4.4	Temperature	9/15 - 6/30	Spawning: 12.8 C
MIDDLE FORK	Coal Creek	0 to 8.9	Temperature	Summer	Rearing: 17.8 C
MIDDLE FORK	Fall Creek	0 to 7	Temperature	Summer	Rearing: 17.8 C
MIDDLE FORK	Fall Creek	13 to 32.7	Temperature	Summer	Rearing: 17.8 C
MIDDLE FORK	Hills Creek	1.7 to 8.2	Temperature	Summer	Rearing: 17.8 C
MIDDLE FORK	Little Fall Creek	0 to 20.6	Temperature	9/15 - 6/30	Spawning: 12.8 C
MIDDLE FORK	Lost Creek	0 to 8.2	Temperature	Summer	Rearing: 17.8 C
MIDDLE FORK	Lost Creek	0 to 8.2	Temperature	9/15 - 6/30	Spawning: 12.8 C
MIDDLE FORK	Lost Creek	8.2 to 13.6	Temperature	9/15 - 6/30	Spawning: 12.8 C
MIDDLE FORK	Lost Creek	13.6 to 14.7	Temperature	Summer	Rearing: 17.8 C
MIDDLE FORK	Middle Fork	0 to 15.6	Temperature	Summer	Rearing: 17.8 C
MIDDLE FORK	Middle Fork	52.5 to 64.1	Temperature	Summer	Rearing: 17.8 C
MIDDLE FORK	Mike Creek	0 to 2.2	Temperature	Summer	Rearing: 17.8 C
MIDDLE FORK	N Fk Middle Fk	0 to 14.1	Temperature	Summer	Rearing: 17.8 C
MIDDLE FORK	N Fk Middle Fk	14.1 to 49.4	Temperature	9/15 - 6/30	Spawning: 12.8 C
MIDDLE FORK	Packard Creek	0 to 5.2	Temperature	Summer	Rearing: 17.8 C
MIDDLE FORK	Portland Creek	0 to 3	Temperature	Summer	Rearing: 17.8 C
MIDDLE FORK	Salt Creek	0 to 13.6	Temperature	Summer	Rearing: 17.8 C
MIDDLE FORK	S F Winberry Creek	0 to 3.1	Temperature	Summer	Rearing: 17.8 C
MIDDLE FORK	Unnamed Waterbody	0 to 2.3	Temperature	Summer	Rearing: 17.8 C
MIDDLE FORK	Unnamed Waterbody	0 to 2.3	Temperature	9/15 - 6/30	Spawning: 12.8 C
MIDDLE FORK	Winberry Creek	2.9 to 8	Temperature	Summer	Rearing: 17.8 C
MIDDLE	Abernethy Creek	0 to 15.5	Temperature	Summer	Rearing: 17.8 C
MIDDLE	Bashaw Creek	0 to 4.8	Fecal Coliform	Year Around	Geometric Mean
MIDDLE	Clark Creek	0 to 1.9	E. Coli	Year Around	126 organisms
MIDDLE	Mill Creek	0 to 25.7	Fecal Coliform	Year Around	Geometric Mean
MIDDLE	Patterson Creek	0 to 7.2	Temperature	Summer	Rearing: 17.8 C
MIDDLE	Pringle Creek	0 to 6.2	E. Coli	Year Around	126 organisms
MIDDLE	Pringle Creek	0 to 6.2	Temperature	Summer	Rearing: 17.8 C
MIDDLE	Rickreall Creek	0 to 24.9	Temperature	Summer	Rearing: 17.8 C
N SANTIAM	Bear Branch	0 to 9.8	Temperature	Summer	Rearing: 17.8 C
N SANTIAM	Blowout Creek	0 to 11.9	Temperature	Summer	Rearing: 17.8 C
N SANTIAM	Boulder Creek	0 to 2.4	Temperature	Summer	Rearing: 17.8 C
N SANTIAM	Chehulpum Creek	0 to 7.1	Temperature	Summer	Rearing: 17.8 C

Basin	Waterbody Name	RM	Parameter	Season	Criteria/Text
N SANTIAM	Elkhorn Creek	0 to 7.4	Temperature	Summer	Rearing: 17.8 C
N SANTIAM	Little North Santiam	0 to 25.1	Temperature	Summer	Rearing: 17.8 C
N SANTIAM	Marion Creek	0 to 6.2	Temperature	Summer	Rearing: 17.8 C
N SANTIAM	N SANTIAM River	0 to 10	Temperature	Summer	Rearing: 17.8 C
N SANTIAM	North Santiam River	0 to 10	Temperature	9/1 - 6/30	Spawning: 12.8 C
N SANTIAM	North Santiam River	10 to 26.5	Temperature	9/15 - 6/30	Spawning: 12.8 C
N SANTIAM	Santiam River	0 to 12	Temperature	Summer	Rearing: 17.8 C
N SANTIAM	Santiam River	0 to 12	Temperature	9/15 - 6/30	Spawning: 12.8 C
N SANTIAM	Stout Creek	0 to 8.9	Temperature	Summer	Rearing: 17.8 C
N SANTIAM	Unnamed Waterbody	0 to 2.8	Temperature	Summer	Rearing: 17.8 C
S SANTIAM	Beaver Creek	0 to 16	Temperature	Summer	Rearing: 17.8 C
S SANTIAM	Crabtree Creek	0 to 32.1	Temperature	Summer	Rearing: 17.8 C
S SANTIAM	Hamilton Creek	0 to 11.6	Temperature	Summer	Rearing: 17.8 C
S SANTIAM	McDowell Creek	0 to 5.7	Temperature	Summer	Rearing: 17.8 C
S SANTIAM	Middle Santiam River	5.3 to 37.1	Temperature	Summer	Rearing: 17.8 C
S SANTIAM	Neal Creek	0 to 10	Temperature	Summer	Rearing: 17.8 C
S SANTIAM	Quartzville Creek	3.3 to 26.8	Temperature	Summer	Rearing: 17.8 C
S SANTIAM	South Santiam River	0 to 25.9	Temperature	Summer	Rearing: 17.8 C
S SANTIAM	South Santiam River	0 to 25.9	Temperature	9/15 - 6/30	Spawning: 12.8 C
S SANTIAM	South Santiam River	35.7 to 63.4	Temperature	Summer	Rearing: 17.8 C
S SANTIAM	South Santiam River	35.7 to 63.4	Temperature	9/1 - 6/30	Spawning: 12.8 C
S SANTIAM	Sucker Slough	0 to 9.8	Temperature	Summer	Rearing: 17.8 C
S SANTIAM	Thomas Creek	0 to 16.2	Temperature	Summer	Rearing: 17.8 C
S SANTIAM	Thomas Creek	16.2 to 26.1	Temperature	Summer	Rearing: 17.8 C
S SANTIAM	Wiley Creek	0 to 17.2	Temperature	Summer	Rearing: 17.8 C
UPPER	A-3 Drain	0 to 0	E. Coli	6/1 - 9/30	126 organisms
UPPER	A-3 Drain	0 to 0	E. Coli	10/1 - 5/31	126 organisms
UPPER	Amazon Creek	0 to 22.6	E. Coli	6/1 - 9/30	126 organisms
UPPER	Amazon Creek	0 to 22.6	E. Coli	10/1 - 5/31	126 organisms
UPPER	Amazon Diversion Canal	0 to 1.8	Dissolved Oxygen	S/S/F	Cool water: 6.5 mg/l
UPPER	Amazon Diversion Canal	0 to 1.8	Fecal Coliform	Year Around	Geometric Mean
UPPER	Calapooia River	0 to 42.8	Temperature	Summer	Rearing: 17.8 C
UPPER	Calapooia River	0 to 42.8	Fecal Coli	W/S/F	Geometric Mean
UPPER	Coyote Creek	0 to 26.2	Dissolved Oxygen	S/S/F	Cool water: 6.5 mg/l
UPPER	Coyote Creek	0 to 26.2	Fecal Coliform	Year Around	Geometric Mean
UPPER	Ferguson Creek	0 to 10	Temperature	Summer	Rearing: 17.8 C
UPPER	Fern Ridge Reservoir/Long Tom	24.2 to 31.8	Fecal Coliform	W/S/F	Geometric Mean
UPPER	Fern Ridge Reservoir/Long Tom	24.2 to 31.8	Turbidity	Year Around	10% increase
UPPER	Long Tom River	0 to 24.2	Temperature	Summer	Rearing: 17.8 C
UPPER	Long Tom River	0 to 24.2	Fecal Coliform	W/S/F	Geometric Mean
UPPER	Luckiamute River	0 to 31.7	Fecal Coliform	W/S/F	Geometric Mean
UPPER	Marys River	0 to 13.9	Temperature	Summer	Rearing: 17.8 C
UPPER	Marys River	0 to 13.9	Fecal Coliform	W/S/F	Geometric Mean
UPPER	Muddy Creek	0 to 33	Temperature	Summer	Rearing: 17.8 C
UPPER	South Fork Berry Creek	0 to 2.1	Temperature	Summer	Rearing: 17.8 C

Basin	Waterbody Name	RM	Parameter	Season	Criteria/Text
WILLAMETTE	Willamette River	0 to 24.8	Fecal Coliform	Winter/Spring/ Fall	Geometric Mean of 200, No more than 10%>400
WILLAMETTE	Willamette River	0 to 24.8	Mercury	Year Around	public health advisories...
WILLAMETTE	Willamette River	0 to 24.8	Temperature	Summer	Rearing: 17.8 C
WILLAMETTE	Willamette River	24.8 to 54.8	Fecal Coliform	Winter/Spring/ Fall	Geometric Mean of 200, No more than 10%>400
WILLAMETTE	Willamette River	24.8 to 54.8	Mercury	Year Around	public health advisories...
WILLAMETTE	Willamette River	24.8 to 54.8	Temperature	Summer	Rearing: 17.8 C
WILLAMETTE	Willamette River	54.8 to 108	Fecal Coliform	Winter/Spring/ Fall	Geometric Mean of 200, No more than 10%>400
WILLAMETTE	Willamette River	54.8 to 108	Mercury	Year Around	public health advisories...
WILLAMETTE	Willamette River	54.8 to 108	Temperature	Summer	Rearing: 17.8 C
WILLAMETTE	Willamette River	108 to 119.7	Fecal Coliform	Winter/Spring/ Fall	Geometric Mean of 200, No more than 10%>400
WILLAMETTE	Willamette River	108 to 119.7	Mercury	Year Around	public health advisories...
WILLAMETTE	Willamette River	108 to 119.7	Temperature	Summer	Rearing: 17.8 C
WILLAMETTE	Willamette River	119.7 to 148.8	Fecal Coliform	Winter/Spring/ Fall	Geometric Mean of 200, No more than 10%>400
WILLAMETTE	Willamette River	119.7 to 148.8	Mercury	Year Around	public health advisories...
WILLAMETTE	Willamette River	119.7 to 148.8	Temperature	Summer	Rearing: 17.8 C
WILLAMETTE	Willamette River	148.8 to 174.5	Mercury	Year Around	public health advisories...
WILLAMETTE	Willamette River	148.8 to 174.5	Temperature	Summer	Rearing: 17.8 C
WILLAMETTE	Willamette River	174.5 to 186.4	Mercury	Year Around	public health advisories...
WILLAMETTE	Willamette River	174.5 to 186.4	Temperature	Summer	Rearing: 17.8 C

APPENDIX 14.B: SOURCE CATEGORIES

SOURCE CATEGORIES WITH MANAGEMENT STRATEGIES

The following listing of source categories with related management strategies can be used as a resources for DMAs needing to fulfill OAR 340-042-0040(4)(l)(C) which states:

(C) Proposed management strategies designed to meet the wasteload allocations and load allocations in the TMDL. This will include a categorization of sources and a description of the management strategies proposed for each source category.

The listing identifies potential source categories with management strategies by land uses (urban, forestry, agriculture, dams, marinas, ports and airports). While the management strategies are designed to meet waste load and load allocations DMAs are not required to use the management strategies listed. In fact, DMAs may need to add source categories or develop other management strategies that meet their specific TMDL waste load or load allocations for improving water quality.

ODEQ acknowledges that many DMAs, such as ODA, ODF, and ODOT, already have water quality protection strategies, best management practices, or programs in place. The listed management strategies are intended to assist DMAs that have not begun TMDL implementation.

WATERSHED APPROACH

Water quality improvement requires a comprehensive watershed approach to solving pollution problems. This takes into account the cumulative effects all activities in a watershed have on overall water quality. To solve water quality problems in a stream, river, lake or estuary, we need to consider the cumulative impact from all upstream sources including groundwater. Eight management strategies have been identified by the Center for Watershed Protection in Maryland for watershed protection and restoration. ODEQ believes that the strategies are equally applicable for watershed protection and restoration in Oregon. The eight strategies are:

1. Land Use Planning
2. Land Conservation
3. Aquatic Buffers
4. Better Site Design
5. Erosion Prevention and Sediment Control
6. Stormwater Best Management Practices
7. Non-Stormwater Discharges
8. Watershed Stewardship Programs

Using these tools, it is possible to develop and implement a comprehensive watershed management program and plan that identifies all necessary programmatic and structural management strategies that meet the following objectives:

POLLUTION PREVENTION

- Prevent pollutants from leaving the site during land-disturbing activities
- Protect, preserve, enhance, and restore riparian habitat and other sensitive areas
- Establish buffers to riparian and wetland and other sensitive areas
- Minimize the amount of and disconnect impervious areas
- Prevent polluted runoff by not allowing pollutants and runoff to mix
- Implement pollution prevention/good "housekeeping" for public and private operations
- Develop environmentally sound development including Low Impact Development (LID) standards

POLLUTION SOURCE REDUCTION

- Prepare a community stormwater management plan to collect and treat both existing development and any redevelopment or new development stormwater runoff
- Reduce or eliminate pollutants to a land area
- Limit the volume of surface water runoff to minimize sediment and other pollutant loading
- Protect and re-establish natural hydrology

- Conduct illicit discharge detection and elimination
- Develop strategies codified by use of ordinance or other regulatory mechanisms
- Reduce the percent of new impervious surfaces associated with new development projects
- Develop and implement a pollution prevention plan (the new BMPs and revised procedures) completed

COLLECTION AND TREATMENT

- Remove pollutants from runoff before reaching waterbody
- Promote infiltration, filtration, retention, and detention of stormwater
- Have in-place prior and during construction site runoff controls
- Implement post-construction stormwater management controls in new development and redevelopment

EDUCATION AND OUTREACH

- Develop training and education programs and materials for public officials, contractors, and others involved with the design, installation, operation, inspection, and maintenance of runoff facilities
- Conduct public education and outreach on stormwater impacts
- Encourage public involvement/participation
- Develop employee training materials and conduct training on pollution prevention/good "housekeeping" techniques

OPERATION AND MAINTENANCE

- Implement and develop an operation and maintenance activities plan
- Develop a maintenance activity schedule
- Conduct long-term inspection and maintenance

MONITORING, EVALUATION, AND REPORTING

- Conduct program implementation effectiveness monitoring of selected structural and source control BMPs
- Conduct instream monitoring
- Report on the status of compliance with any permit conditions
- Report the BMP activities planned for the next reporting period including improved or different BMPs
- Provide adequate record keeping and report results of any information collected and analyzed, including monitoring data, if any

URBAN AND RURAL (MUNICIPAL, RESIDENTIAL, COMMERCIAL AND INDUSTRIAL)

Existing Development

PROGRAMS

- Develop and implement local planning and procedures such as ordinances and design standards
- Develop and implement watershed management programs to reduce runoff pollutant concentrations and volumes from existing development and redevelopment
- Adopt site-based local controls: buffer strip and riparian zone preservation
- Prepare a stormwater management plan to ensure that existing developed areas stormwater runoff is treated prior to discharge to a waterbody
- To the extent practicable, maintain and/or re-establish natural hydrology of the watershed by maintaining post-development peak runoff rate and average volume at levels that are similar to pre-development levels
- Promote redevelopment by assessing previously contaminated soils
- Develop an illegal dumping controls program
- Identify and eliminate illicit discharges and cross connections
- Conduct onsite septic systems inspection and maintenance

- Develop and implement animal waste controls

STRUCTURAL

- Make needed improvements to existing runoff control structures
- Add where feasible and necessary BMPs to promote infiltration, filtration, retention, and detention to runoff

OPERATION AND MAINTENANCE

- Develop and implement an operation and maintenance program, e.g. stormwater system maintenance
- Develop and implement a pollution prevention/good “housekeeping” plan for public and private operations
- Perform routine maintenance of stormwater systems
- Proper maintenance plays a vital role in ensuring the proper operation and effectiveness of both structural and source controls
- Develop an activities plan with a schedule of regular and long-term inspection and maintenance

EDUCATION AND OUTREACH

- Develop training and education programs and materials for public officials, contractors, and others involved with the design, installation, operation, inspection, and maintenance of existing development BMPs
- Conduct public education and outreach on stormwater impacts
- Encourage public involvement/participation
- Develop employee training materials and conduct training on pollution prevention/good “housekeeping” techniques

MONITORING, EVALUATION, AND REPORTING

- Conduct program implementation effectiveness monitoring of selected structural and source control BMPs
- Conduct instream monitoring
- Report on the status of compliance with any permit conditions
- Report the BMP activities planned for the next reporting period including improved or different BMPs
- Provide adequate record keeping and report results of any information collected and analyzed, including monitoring data, if any

New Development

(Site Development; Construction Site Erosion, Sediment and Chemical Control; and Post Construction Stormwater Management)

PROGRAMS

- Review and amend comprehensive land use plans and ordinances as necessary (using the DLCD/DEQ Water Quality Model Code and Guidebook, 2001) such as:
 - Hillside protection overlay
 - Riparian and wetland protection overlay
 - Floodplain protection overlay
 - Etc.
- Use environmentally sound designs that cluster homes into a smaller portion of the site
- Use existing open space/landscape areas for stormwater retention and treatment
- Protect and restore buffers, riparian, wetland, and native vegetation areas
- Prepare a stormwater management plan to ensure that during and post construction stormwater runoff is treated prior to discharge to a waterbody
- No net increases of off-site runoff --maintain predevelopment site hydrology
- Limit increase of impervious areas
- Develop and implement nonstructural controls for reducing or eliminating the discharge of pollutants run off

- Promote recycling (to reduce litter)
- Ensure the proper disposal of animal waste
- Ensure that new flood management projects assess the impacts on water quality
- When conversion of forest lands to an urban land use are involved, follow the measures/procedures and obtain required permits and local government's and use approvals identified in the Forest Lands Conversion MOA among the Oregon Departments of Forestry, Environmental Quality, Agriculture, State Lands, Parks and Recreation, Fish and Wildlife, and Land Conservation and Development (in development).

STRUCTURAL

- Collect and treat stormwater with infiltration, filtration, and detention BMPs either on-site or in regional facilities prior to discharge to waters of the state such as:
 - First flush diversion systems
 - Detention/infiltration basin
 - Retention basins
 - Extended detention basins
 - Infiltration trenches
 - Porous pavement (low traffic areas only)
 - Grass swales
 - Swirl concentrators
- Use existing open space/landscape areas for stormwater retention and treatment rather than collection (piping) of stormwater
- Prior to land disturbance, prepare and implement an approved erosion/sediment/chemical control plan
- Reduce erosion and retain sediment on-site during and after construction
- Limit land disturbance activities, such as clearing and grading and cut-and-fill
- Limit disturbance of natural drainage features including buffers and vegetation
- During site development, disturb only the smallest area
- Preserve natural areas, including in-stream habitat, riparian zones, shorelines, wetlands, and highly erosive slopes
- Reduce thermal impacts of increased impervious surfaces
- Add to and retain tree coverage
- Minimize pesticide and fertilizer use and the application and generation of potential pollutants, including chemicals

OPERATION AND MAINTENANCE

- Use good "housekeeping" practices to prevent off-site transport of waste material and chemicals
- Conduct regular street cleaning operations
- Implement revegetation/lawn maintenance controls
- Provide for debris removal, such as curbside collection, home/community composting, etc.
- Develop and implement an operation and maintenance program, e.g. stormwater system maintenance
- Develop a pollution prevention/good "housekeeping" plan for public and private operations
- Conduct routine maintenance of stormwater systems
- Proper maintenance plays a vital role in ensuring the proper operation and effectiveness of both structural and source controls
- Develop an activities plan with a schedule of regular and long-term inspection and maintenance

EDUCATION AND OUTREACH

- Develop training and education programs and materials for public officials, contractors, and others involved with the design, installation, operation, inspection, and maintenance of erosion and stormwater BMPs
- Conduct public education and outreach on stormwater impacts
- Encourage public involvement/participation
- Develop employee training materials and conduct training on pollution prevention/good "housekeeping" techniques

MONITORING, EVALUATION, AND REPORTING

- Conduct program implementation effectiveness monitoring of selected structural and source control BMPs
- Conduct instream monitoring
- Report on the status of compliance with any permit conditions
- Report the BMP activities planned for the next reporting period including improved or different BMPs
- Provide adequate record keeping and report results of any information collected and analyzed, including monitoring data, if any

Pollution Prevention**PROGRAMS**

- Prevent pollutants from leaving the site during land-disturbing activities
- Protect, preserve, enhance, and restore riparian habitat and other sensitive areas
- Establish buffers to riparian and wetland and other sensitive areas
- Minimize the amount of and disconnect impervious areas
- Prevent polluted runoff by not allowing pollutants and runoff to mix
- Develop and implement pollution prevention/good “housekeeping” plan for public and private operations
- Develop environmentally sound development including Low Impact Development (LID) standards
- Develop proper procedures and areas for the storage, use, and disposal of household, commercial, and industrial hazardous chemicals, including automobile fluids, pesticides, paints, solvents, etc.
- For lawn and garden activities limit pesticide and fertilizer application
- Develop and implement a Pollution Prevention Control Plan for turf management on golf courses, parks, and recreational areas
- Reduce the discharge of pollutants into storm drains including floatables, waste oil, and litter
- Develop and implement a Pollution Prevention Control Plan for commercial activities, including parking lots, and gas stations and other entities not under NPDES purview;
- Develop and implement proper processes for disposal of pet wastes
- Provide for debris removal, such as curbside collection, home/community composting, etc.

STRUCTURAL

- Construct those structural elements of the Pollution Prevention Control Plan

OPERATION AND MAINTENANCE

- Use good “housekeeping” practices to prevent off-site transport of waste material and chemicals
- Conduct regular street cleaning operations
- Implement revegetation/lawn maintenance controls
- Implement the plan for debris removal, such as curbside collection, home/community composting, etc.
- Implement the developed operation and maintenance program, e.g. stormwater system maintenance
- Implement the developed pollution prevention/good “housekeeping” plan for public and private operations
- Conduct routine maintenance of storm sewer systems
- Proper maintenance plays a vital role in ensuring the proper operation and effectiveness of both structural and source controls
- Ensure proper maintenance because of the vital role it plays in ensuring the proper operation and effectiveness of both structural and source controls
- Develop an activities plan with a schedule of regular and long-term inspection and maintenance

EDUCATION AND OUTREACH

- Develop training and education programs and materials for public officials, contractors, and others involved with the design, installation, operation, inspection, and maintenance of erosion and stormwater BMPs
- Conduct public education and outreach on stormwater impacts

- Encourage public involvement/participation
- Develop employee training materials and conduct training on pollution prevention/good “housekeeping” techniques

MONITORING, EVALUATION, AND REPORTING

- Conduct program implementation effectiveness monitoring of selected structural and source control BMPs
- Conduct instream monitoring
- Report on the status of compliance with any permit conditions
- Report the BMP activities planned for the next reporting period including improved or different BMPs
- Provide adequate record keeping and report results of any information collected and analyzed, including monitoring data, if any

New and Existing Onsite Disposal Systems

PROGRAMS

- Obtain a DEQ and/or county permit for onsite installation and follow all applicable onsite regulations
- Develop an inspection, maintenance, and replacement of onsite systems program
- Ensure proper disposal of residuals pumped from the tank (i.e., septage)

STRUCTURAL

- Replace or fix failing onsite systems as part of the developed onsite systems program

OPERATION AND MAINTENANCE

- Use good “housekeeping” practices to prevent off-site transport of waste material and chemicals
- Develop and implement an operation and maintenance program, e.g. onsite system maintenance
- Develop a pollution prevention/good “housekeeping” plan for public and private operations
- Ensure proper maintenance because of the vital role it plays in ensuring the proper operation and effectiveness of both structural and source controls
- Develop an activities plan with a schedule of regular and long-term inspection and maintenance

EDUCATION AND OUTREACH

- Develop training and education programs and materials and conduct training for public officials, contractors, and others involved with the design, installation, operation, inspection, and maintenance of onsite systems, including mortgage institutions and realtors
- Encourage public involvement/participation

MONITORING, EVALUATION, AND REPORTING

- Conduct program implementation effectiveness monitoring of selected structural and source control BMPs
- Conduct instream monitoring
- Report on the status of compliance with any permit conditions
- Report the BMP activities planned for the next reporting period including improved or different BMPs
- Provide adequate record keeping and report results of any information collected and analyzed, including monitoring data, if any

Roads, Highways, and Bridges

PROGRAMS

- Prepare a stormwater management plan to ensure that pre- and post-construction stormwater runoff from roads, highways, and bridges is treated prior to discharge to a waterbody
- Protect sensitive ecosystems, including wetlands and estuaries, by minimizing road-building mileage in those systems, minimizing the number of water crossings, and establishing protective measures including setbacks during construction

- Site roads, highways, and bridges away from areas that are sensitive ecosystems and susceptible to erosion and sediment loss
- Develop an approved erosion, sediment, and chemical control plan prior to construction

STRUCTURAL

- Implement the approved erosion, sediment, and chemical control plan
- Implement the stormwater management plan to ensure that pre- and post-construction stormwater runoff from roads, highways, and bridges is treated prior to discharge to a waterbody
- Limit runoff of pollutants through the use and proper maintenance of structural controls
- Ensure the proper use, storage, and disposal of toxic materials to prevent significant chemical and nutrient runoff to surface water
- Construct runoff management systems to reduce pollutant concentrations in runoff from existing roads, highways, and bridges.

OPERATION AND MAINTENANCE

- Develop and implement an operation and maintenance program with a schedule of regular and long-term inspection and maintenance ensuring the proper operation and effectiveness of both structural and source controls, e.g. stormwater system maintenance and/or road maintenance actions that prevent erosion of road surfaces
- Ensure that all roads, highways and bridges runoff facilities are operated and maintained properly
- Ensure the continued effectiveness of stream crossing structures
- Limit generation of pollutants from maintenance operations by minimizing the use of pesticides, herbicides, fertilizers, and deicing salts and chemicals
- Limit generation and runoff of pollutants during highway and bridge repair operations through use reduction and prevent spillage into sensitive areas and waters of the state
- Use good “housekeeping” practices to prevent off-site transport of waste material and chemicals
- Develop and implement a plan for routine street/road/highway/bridge cleaning operations
- Develop and implement a plan for a integrated vegetation/roadside maintenance controls
- Ensure debris removal and disposal follows all environmental/land use regulations
- Develop and implement a pollution prevention/good “housekeeping” plan

EDUCATION AND OUTREACH

- Develop training and education programs and materials for public officials, contractors, and others involved with the design, installation, operation, inspection, and maintenance of erosion and stormwater BMPs
- Conduct public education and outreach on stormwater impacts
- Encourage public involvement/participation
- Develop employee training materials and conduct training on pollution prevention/good “housekeeping” techniques

MONITORING, EVALUATION, AND REPORTING

- Conduct program implementation effectiveness monitoring of selected structural and source control BMPs
- Conduct instream monitoring
- Report on the status of compliance with any permit conditions
- Report the BMP activities planned for the next reporting period including improved or different BMPs
- Provide adequate record keeping and report results of any information collected and analyzed, including monitoring data, if any

FORESTRY

PROGRAMS

- Oregon's forests are held by a rich variety of owners—federal, tribal, state, and local governments, as well as private industrial owners and family forest landowners
- Implement the Oregon Forest Practices Act Rules to regulate harvest practices and other forest operations on private, state and local forest lands
- Implement state forest management plans on state owned forests
- Implement federal forest lands and resource management plans
- Provide protection of forest resources including timber, water, soil, and fish and wildlife habitat
- Ensure riparian, wetlands and other sensitive areas protection/enhancement
- Implement forestry related management strategies of the Oregon Plan for Salmon and Watersheds

STRUCTURAL

- Conduct pre-harvest planning that includes:
 - Timing, location, and design of harvesting and road construction areas
 - The identification of sensitive areas or high-erosion-hazard or landslide areas
 - The potential for additional cumulative contributions to existing water quality impairments
- Ensure riparian management areas (RMAs), lakes, and wetlands are protected/restored to provide adequate shading to meet temperature standard, to control sediment/bank erosion, and runoff treatment
- Protect/restore stream banks for stabilization where operations &/or forest management occurs
- Ensure road construction/reconstruction follows pre-harvest developed plan layouts and designs for the road system, incorporating adequate drainage structures, and properly installing stream crossings
- Avoid constructing roads in RMAs
- Manage existing roads, harvest areas, and yarding areas to minimize erosion, maintain stability, and reduce the risk of failure or decreased effectiveness of drainage structures and stream crossings
- Develop appropriate actions for closing roads that are no longer in use
- Keep slash materials out of drainages and protect ground cover in RMAs
- Avoid the loss of litter and incorporated soil organic matter
- Revegetate disturbed areas to reduce erosion and sedimentation from harvesting and road construction, such as road fills
- Prevent pollution from petroleum products, fertilizers and pesticides use
- Use wet season activities controls

OPERATION AND MAINTENANCE

- Reforest and establish other vegetation in a timely manner to protect soil and water resources
- Limit generation of pollutants from maintenance operations by minimizing the use of pesticides, herbicides, fertilizers, and chemicals
- Use good "housekeeping" practices to prevent off-site transport of waste material and chemicals
- Develop and implement a plan for an integrated vegetation/roadside maintenance controls
- Develop and implement an operation and maintenance program with a schedule of regular and long-term inspection and maintenance ensuring the proper operation and effectiveness of both structural and source controls, e.g. road maintenance actions to prevent erosion of road surfaces
- Ensure the continued effectiveness of stream crossing structures
- Ensure all yarding operations are conducted to prevent erosion and pollution from equipment use from impacting RMAs and waters of the state
- Ensure proper maintenance because of the vital role it plays in ensuring the proper operation and effectiveness of both structural and source controls

EDUCATION AND OUTREACH

- Develop training and education programs and materials for public officials, contractors, forest land owners and others involved with the design, installation, operation, inspection, and maintenance of forestry BMPs
- Conduct public education and outreach on forestry impacts on water quality

- Encourage public involvement/participation
- Develop employee training materials and conduct training on pollution prevention/good "housekeeping techniques"

MONITORING, EVALUATION, AND REPORTING

- Conduct both program implementation and management practices effectiveness monitoring
- Investigate the cumulative effects of forest practices on forest resources
- Monitor temporal and spatial trends in forest stream conditions, including water quality
- Monitor the implementation and effectiveness of the Oregon Plan for Salmon and Watersheds
- Report on the status of compliance with requirements
- Report the BMP activities planned for the next reporting period including improved or different BMPs
- Provide adequate record keeping and report results of any information collected and analyzed, including monitoring data, if any

AGRICULTURAL

PROGRAMS

- Implement Agricultural Water Quality Management Area Plans (AgWQMAPs)
- Incorporate grazing management measures into AgWQMAPs
- Incorporate nutrient management measures into AgWQMAPs
- Incorporate riparian and wetland protection/enhancement measures into AgWQMAPs
- Implement the CAFO/AFO program
- Implement other federal related programs

STRUCTURAL (MANAGEMENT PRACTICES)

- Limit runoff of pollutants through the use and proper maintenance of management practices:
 - Pasture management such as rotational grazing
 - Fertilizer or pesticide management through minimization, proper use, and storage
 - Erosion control such as conservation tillage and cover crops
 - Runoff and sediment control such as filter strips and grassed waterways, etc.
 - Others
- Limit runoff of pollutants through the use and proper maintenance of management practices:
 - Animal waste lagoons
 - Dry storage of manure (dry stacks)
 - Terraces
 - Sediment basins
 - Fencing, etc.
 - Others
- Use existing open space/reserve areas for agricultural runoff retention and treatment
- Protect and restore buffers, riparian and wetland areas
- Ensure no net increases of off-site runoff
- Ensure the proper storage and disposal of animal waste
- Limit generation of pollutants by minimizing the use of pesticides, herbicides, fertilizers, and chemicals
- Use/retain/restore native vegetation
- Reconnect sloughs and rivers
- Ensure/restore stream bank stabilization
- Use Wet season activities controls

OPERATION AND MAINTENANCE

- Develop and implement an operation and maintenance program with a schedule of regular and long-term inspection and maintenance of agricultural BMPs
- Develop and implement a pollution prevention plan

- Use good “housekeeping” (i.e., farming/operating/maintenance) practices to prevent off-site transport of waste material and chemicals
- Debris removal
- Ensure proper maintenance by the agricultural operator because of the vital role it plays in ensuring the proper operation and effectiveness of both management practices and source controls
- Develop an activities plan with a schedule of regular and long-term inspection and maintenance

EDUCATION AND OUTREACH

- Develop training and education programs and materials for public officials, agricultural operators, and others involved with the design, installation, operation, inspection, and maintenance of agricultural runoff facilities by the Oregon Department of Agriculture (ODA) and/or the Local Management Agencies (Soil and Water Conservation Districts)
- Conduct public education and outreach on agricultural runoff impacts
- Encourage public involvement/participation
- Develop employee training materials and conduct training on pollution prevention/good “housekeeping” techniques

MONITORING, EVALUATION, AND REPORTING

- ODA conducts AgWQMAPs control measures implementation monitoring
- ODA conducts instream monitoring
- ODA evaluate the effectiveness of AgWQMAPs control measures and the overall plans
- ODA reports on the status of compliance with AgWQMAPs control measures
- ODA reports results of any information collected and analyzed, including monitoring data, if any

DAM OPERATION AND MAINTENANCE

PROGRAMS

- Conduct a water quality and habitat assessment in the siting and design of both new and expanded dams
- Develop and implement temperature management plans into implementation plans
- Develop and implement an approved erosion and sediment control plan prior to land disturbance
- Develop and implement an approved chemical and pollutant control plan
- Develop and implement an approved stormwater management plan

STRUCTURAL

- Ensure adequate erosion and sediment controls are constructed and maintained to retain sediment onsite during and after construction of dams
- Develop, construct, and implement adequate chemical and pollutant controls to ensure the proper storage and disposal of chemicals and other materials that are used in construction or maintenance activities at dams such as: concrete additives, petrochemicals, solid wastes, cement washout, pesticides and fertilizers
- Develop, construct, and implement adequate protection measures to protect/enhance water quality and instream and riparian habitats during the construction and operation of dams including excessive surface water withdrawals
- Prepare a stormwater management plan to ensure that during and post construction stormwater runoff is treated prior to discharge to a waterbody

OPERATION AND MAINTENANCE

- Ensure that all roads, highways and bridges related to the dam project are operated and maintained properly, including runoff facilities
- Limit generation of pollutants from maintenance operations by minimizing the use of pesticides, herbicides, fertilizers, and deicing salts and chemicals
- Limit generation and runoff of pollutants during dam repair operations through use reduction and prevent spillage into sensitive areas and waters of the state
- Use good “housekeeping” practices to prevent off-site transport of waste material and chemicals

- Develop and implement a plan for a integrated vegetation/roadside maintenance controls
- Ensure debris removal and disposal follows all environmental and land use regulations
- Develop and implement an operation and maintenance program with a schedule of regular and long-term inspection and maintenance ensuring the proper operation and effectiveness of both structural and source controls, e.g. stormwater system maintenance
- Develop and implement a pollution prevention/good “housekeeping” plan

EDUCATION AND OUTREACH

- Develop training and education programs and materials for public officials, contractors, and others involved with the design, installation, operation, inspection, and maintenance of erosion and stormwater BMPs
- Conduct public education and outreach on dam operation and maintenance water quality impacts
- Encourage public involvement/participation
- Develop employee training materials and conduct training on pollution prevention/good “housekeeping techniques

MONITORING, EVALUATION, AND REPORTING

- Conduct program implementation effectiveness monitoring of selected structural and source control BMPs
- Conduct instream monitoring
- Report on the status of compliance with any permit conditions
- Report the BMP activities planned for the next reporting period including improved or different BMPs
- Provide adequate record keeping and report results of any information collected and analyzed, including monitoring data, if any

MARINAS AND PORTS

PROGRAMS

- Conduct a water quality and habitat assessment in the siting and design of both new and expanded marinas and ports
- Ensure shorelines are stabilized to prevent/control erosion
- In the siting and design of marinas and ports allow for maximum flushing of the water supply for the site
- Stormwater runoff from the marina site should be collected and treated using the same BMPs identified in the Urban land uses section above
- Fueling stations should be located and designed so that, in the case of an accident, spill contaminants can be contained in a limited area
- A solid, liquid waste (e.g., used oil) and fish waste management plan should be developed and promoted through a combination of fish cleaning restrictions, public education, and proper disposal

STRUCTURAL

- Site marinas adjacent to deep waters to eliminate or minimize the need for dredging
- Fueling stations should have fuel containment equipment as well as a spill contingency plan
- New and expanding marinas should install pump-out, pump station, and restroom facilities
- Adequate liquid waste (e.g., used oil), solid waste and fish cleaning collection and disposal areas should be provided
- Fueling stations should have adequate controls and clean-up materials and posted procedures in place to prevent fuel spills and oil leaks

OPERATION AND MAINTENANCE

- Develop and implement a marina or port maintenance BMP manual
- Solid wastes produced by the operation, cleaning, maintenance, and repair of boats should be properly disposed of
- Boat cleaning areas and procedures should be provided with posted signs to minimize the release of harmful hull cleaners and bottom paints to marinas and coastal waters

- Sewage pump-out facilities should be maintained in operational condition and their use encouraged to reduce untreated sewage discharges
- Measures should be developed such as posting speed signs to control boating operations in shallow areas and concentrated boating activities to reduce shoreline erosion

EDUCATION AND OUTREACH

- Public education/outreach/training programs should be instituted for boaters, as well as marina operators to prevent improper disposal of polluting materials
- Develop training and education programs and materials for public officials, contractors, and others involved with the design, installation, operation, inspection, and maintenance of runoff facilities
- Conduct public education and outreach on marina/port operation and maintenance water quality impacts
- Encourage public involvement/participation
- Develop employee training materials and conduct training on pollution prevention/good "housekeeping techniques"

MONITORING, EVALUATION, AND REPORTING

- Conduct program implementation effectiveness monitoring of selected structural and source control BMPs
- Conduct instream monitoring
- Report on the status of compliance with any permit conditions
- Report the BMP activities planned for the next reporting period including improved or different BMPs
- Provide adequate record keeping and report results of any information collected and analyzed, including monitoring data, if any

AIRPORTS

PROGRAMS

- Prepare a stormwater management plan to ensure that pre- and post-construction stormwater runoff from airport runways, industrial pads, hangers, parking areas, roads, highways, and bridges and other airport developments are treated prior to discharge to a waterbody
- Protect sensitive ecosystems, including wetlands and estuaries, by minimizing road-building mileage in those systems, minimizing the number of water crossings, and establishing protective measures including setbacks during construction
- No net increases of off-site runoff -- maintain predevelopment site hydrology
- Develop and implement nonstructural controls for reducing or eliminating the discharge of pollutants run off such as good housekeeping, minimizing exposure, preventive maintenance program, spill prevention and response procedures, routine facility inspections,
- Promote recycling (to reduce litter)
- Implement source control BMPs such as moving an outdoor operation indoors, placing storage containers for recyclable oils and hazardous materials/wastes in covered, contained areas
- Site airport developments away from areas that are sensitive ecosystems and susceptible to erosion and sediment loss
- Develop an approved erosion, sediment, and chemical control plan prior to construction

STRUCTURAL

- Implement the approved erosion, sediment, and chemical control plan
- Implement a spill prevention and response program
- Implement an aircraft deicing/anti-icing chemical control, reuse plan
- Implement the stormwater management plan to ensure that pre- and post-construction stormwater runoff from airport developments are treated prior to discharge to a waterbody
- Limit runoff of pollutants through the use and proper maintenance of structural controls including elimination of non-stormwater discharges to storm drains
- Ensure the proper use, storage, and disposal of toxic materials to prevent significant chemical and nutrient runoff to surface water

- Construct runoff management systems to reduce pollutant concentrations in runoff from existing airport developments

OPERATION AND MAINTENANCE

- Develop and implement an operation and maintenance program with a schedule of regular and long-term inspection and maintenance ensuring the proper operation and effectiveness of both structural and source controls, e.g. stormwater system maintenance and/or road/runways/other impervious surfaces maintenance actions that prevent erosion and pollutants runoff
- Ensure that all airport structures/developments runoff facilities are operated and maintained properly
- Ensure that the following activities are conducted to prevent and control pollutant runoff: runway rubber removal; aircraft lavatory service operations; aircraft, vehicle, and equipment maintenance, fueling and washing operations; and fire-fighting foam discharge clean-up/control
- Ensure the continued effectiveness of stream crossing structures
- Limit generation of pollutants from maintenance operations by minimizing the use of pesticides, herbicides, fertilizers, and deicing salts and chemicals
- Limit generation and runoff of pollutants during airport structures/developments repair operations through use reduction and prevent spillage into sensitive areas and waters of the state
- Use good "housekeeping" practices to prevent off-site transport of waste material and chemicals
- Develop and implement a plan for routine runway/street/road/highway/bridge and other airport structures cleaning operations
- Develop and implement a plan for a integrated vegetation/roadside maintenance controls
- Ensure debris removal and disposal follows all environmental/land use regulations
- Develop and implement a pollution prevention/good "housekeeping" plan

EDUCATION AND OUTREACH

- Develop training and education programs and materials for airport officials, contractors, tenants, and others involved with the design, installation, operation, inspection, and maintenance of erosion and stormwater BMPs
- Conduct public education and outreach on stormwater impacts
- Encourage public involvement/participation
- Develop employee and tenant training materials and conduct training on pollution prevention/good "housekeeping" techniques

MONITORING, EVALUATION, AND REPORTING

- Conduct program implementation effectiveness monitoring of selected structural and source control BMPs
- Conduct instream monitoring
- Report on the status of compliance with any permit conditions
- Report the BMP activities planned for the next reporting period including improved or different BMPs
- Provide adequate record keeping and report results of any information collected and analyzed, including monitoring data, if any