



OAK LODGE SANITARY DISTRICT

Protecting our valuable water resources

June 3, 2013

Mr. Doug Drake
Lower Willamette Basin Coordinator
NWR Region Water Quality
2020 SW 4th Avenue, Suite 400
Portland, OR 97201

RE: Oak Lodge Sanitary District, 5-year TMDL Implementation Plan Report

Mr. Drake,

OLSD is pleased to submit to the DEQ our progress to date for our TMDL Implementation Plan. The District's plan was approved in June, 2009, and we have implemented the required measures per the approved plan. Please see the attached matrix – the approved plan included this matrix, and we added the righthand column to indicate the current implementation plan status.

Also attached is OLSD's approval of the 2009 plan from the DEQ, and our TMDL Implementation Plan.

We would appreciate written acknowledgement that DEQ received this report prior to the June 20, 2013 due date. If you have any questions, or require clarification of the information provided, please do not hesitate to contact me at 503.653.1653 X 105, or on email at klstreeter@olsd.net.

Thank you,

Karen L. Streeter, PWS
Manager, Planning and Development
Oak Lodge Sanitary District

Oregon DEQ: 5-Year TMDL Reporting Matrix
DMA: Oak Lodge Sanitary District

STRATEGY	ACTIONS	MEASURE	TIMELINE and STATUS	MILESTONE	Addresses:			5-Year Implementation Plan Status
					Bacteria TMDL	Temperature TMDL	Mercury TMDL	
Source Control	Illicit discharge controls	None required	Currently in place and ongoing	Ongoing activity with annual report to Oregon DEQ	X	X	X	Yes, implemented per requirements
	Promotion of energy/water efficiency technologies	None required	Currently in place and ongoing	Ongoing activity		X		Yes, implemented per requirements
	Enforce OLSD and State septic system ban within District	None required	Currently in place and ongoing	Ongoing activity	X			Implemented per requirements, included in OLSD code, current 2 remaining septic systems in OLSD
	Require that construction and repair of sanitary facilities meet DEQ, OLSD, and county plumbing codes	Summary of activities in annual report	Currently in place and ongoing	Ongoing activity with annual report to Oregon DEQ	X			Yes, implemented per requirements
	Implement dental BMP program	Develop dental education plan	OLSD will provide disposal information to District dentists over the next 3 years	Ongoing activity			X	No plan formally developed currently
	Implement Industrial Pretreatment Program	Summary of activities in annual report	Currently in place and ongoing	Ongoing activity in compliance with NPDES permit	X	X	X	Yes, implemented per requirements
Explore Technical Options	Explore technical options for effluent temperature control, including: 1. Shading/covering of tankage 2. Evaluate secondary treatment process in regards to blower temperatures and biomass caloric demands 3. Evaluate disinfection system for temperature impacts 4. Evaluate hyperbaric cooling for discharge 5. Evaluate heat exchange or subsurface heat discharge 6. Evaluate cooling of recycle flows 7. Evaluate reducing surface area of tankage	Potential options will be studied, designed and implemented as part of the OLSD Capital Improvement Program	OLSD anticipates upgrading of sanitary facilities over the next 20 years	Ongoing activity		X		Yes, implemented, Major Water Reclamation Facility upgrade completed in 2012
SSO control in the collection system	Implement infiltration and inflow reduction/control activities	Summary of activities in annual report	Currently in place and ongoing	Ongoing activity with annual report to Oregon DEQ	X			Yes; I&I Assessment initiated for certain collection system lines
	Collection system maintenance (cleaning, joint repair, etc.)	Summary of activities in annual report	Currently in place and ongoing	Ongoing activity with annual report to Oregon DEQ	X			Yes, implemented per requirements
	Collection system upgrades	Summary of activities in annual report	Currently in place and ongoing	Ongoing activity with annual report to Oregon DEQ	X			Yes, implemented per requirements
Biosolids	Provide biosolids stabilization and reuse as required by NPDES permit	Summary of activities in annual report	Currently in place and ongoing	Ongoing activity with annual report to Oregon DEQ	X			Yes; no biosolids applied in District
NPDES permit	Comply with NPDES permit requirements for temperature monitoring and thermal load WLA	When included in NPDES permit, report in DMR	To be developed	Comply with NPDES permit requirements		X		Per 2012 MS4 permit, WLA due to be completed 11/1/15
	Comply with disinfection permit requirements	Measure and report in DMR	Currently in place and ongoing	Comply with NPDES permit requirements	X			Yes, UV Disinfection
	Stormwater requirements(1200Z)	Report performance in annual report	Currently in place and ongoing	Comply with NPDES permit requirements	X		X	Yes, testing and inspection ongoing
	Overflow controls	Overflows reported to DEQ	Currently in place and ongoing	Comply with NPDES permit requirements	X		X	Implemented per TMDL Plan and NPDES Permit
	Comply with NPDES permit requirements for toxics effluent monitoring	Demonstrate compliance with Mercury water quality criteria at edge of mixing zone	Currently in place and ongoing	Comply with NPDES permit requirements			X	New permit pending, testing to occur per new permit

SURFACE WATER MANAGEMENT PROGRAM

Oak Lodge Sanitary District Newsletters mailed quarterly to District residents with surface water management related articles (PE and O Measure 2)	Summary of activities in annual report	Currently in place and ongoing	Ongoing activity with annual report to Oregon DEQ	X	X	X	Yes, implemented per requirements
Catch Basin Stenciling by volunteers within the District to raise public awareness of the ultimate destination of the runoff and the potential environmental impacts (PE and O Measure 3)	Summary of activities in annual report	Currently in place and ongoing	Ongoing activity with annual report to Oregon DEQ	X	X	X	Yes, implemented per requirements
Education Brochures provided to the public in the main lobby and mailed to any resident who requests information on which we have a brochure; New brochures are produced periodically as there is a need (PE and O Measure 4)	Summary of activities in annual report	Currently in place and ongoing	Ongoing activity with annual report to Oregon DEQ	X	X	X	Yes, implemented per requirements
The OLSD Website was developed and is maintained to provide information to the public; Articles, regulations, announcements, reports, links and other pertinent storm and surface water information options are available on the website (PE and O Measure 5)	Summary of activities in annual report	Currently in place and ongoing	Ongoing activity with annual report to Oregon DEQ	X	X	X	Yes, implemented per requirements

Public Education and Outreach	OLSD participation in Regional Educational Activities and in the regional consortium allows for wider dissemination of water quality messages both in the District and throughout the metro area (PE and O Measure 6)	Summary of activities in annual report	Currently in place and ongoing	Ongoing activity with annual report to Oregon DEQ	X	X	X	Yes, implemented per requirements
	Surface Water Management Citizens Advisory Committee meets regularly to review surface water management issues and plans (PE and O Measure 7)	Summary of activities in annual report	Currently in place and ongoing	Ongoing activity with annual report to Oregon DEQ	X	X	X	Yes, implemented per requirements
Illicit Discharge Detection and Elimination	Visual inspections of major outfalls are conducted semi-annually and also whenever staff receives any information that there maybe an evidence of illicit discharge present (Ill Dis Measure 1)	Summary of activities in annual report	Currently in place and ongoing	Ongoing activity with annual report to Oregon DEQ	X	X	X	Yes, implemented per requirements
	Oak Lodge Sanitary District performs quarterly water quality monitoring at fixed sites and specific monitoring at areas of concern (Ill Dis Measure 2)	Summary of activities in annual report	Currently in place and ongoing	Ongoing activity to Oregon DEQ	X	X	X	Yes, implemented per requirements
	Periodic inspections of significant industrial users are performed to check for potential pollution problems (Ill Dis Measure 3)	Summary of activities in annual report	Currently in place and ongoing	Ongoing activity to Oregon DEQ	X	X	X	Yes, implemented per requirements
	All pollution-related complaints are investigated by District staff; Site visits are made, the extent of the problem determined, sample and perform chemical analysis, perform emergency response, and work with the property owner to correct the situation (Ill Dis Measure 4)	Summary of activities in annual report	Currently in place and ongoing	Ongoing activity with annual report to Oregon DEQ	X	X	X	Yes, implemented per requirements
Planning	Erosion Prevention and Sediment Control measures required for all activities that cause disturbance of soil on sites less than 1 acre in size; (Larger sites are covered by 1200-C permits issued through Clackamas County) Plans are required, permits are issued, and sediment and erosion control measures must be installed and maintained; The site and measures are inspected regularly (Planning Measure 2)	Record number of plans reviewed and permits issued as part of this Planning Measure	Currently in place and ongoing	Ongoing activity with annual report to Oregon DEQ	X		X	Yes, implemented per requirements
	Development Review measures for new development/redevelopment taking place within the District (Planning Measure 3)	Record number of development plans	Currently in place and ongoing	Ongoing activity with annual report to Oregon DEQ	X	X	X	Yes, implemented per requirements
	Sensitive Land Measures in riparian zones; Developers are required to protect, maintain, or mitigate activities in stream areas; 25 feet of creek corridor protected to maintain water quality, with mitigation required should encroachments be necessary (Planning Measure 4)	Summary of activities in annual report	Currently in place and ongoing	Ongoing activity with annual report to Oregon DEQ	X	X	X	Yes, implemented per requirements
	Development Review measures for new development/re-development taking place within the District; Sanitary sewer connections are mandatory - no septic tanks or drain fields are allowed; Sanitary facilities must meet Oak Lodge Sanitary District, DEQ, and Plumbing Code requirements	Record number of development plans reviewed annually; A summary of activities is in the annual report	Currently in place and ongoing	Ongoing activity with annual report to Oregon DEQ	X	X		Yes, implemented per requirements
	Implementation of OLSD Stormwater Capital Improvement Plan; CIP has 10 year plan for improving stormwater facilities to improve water quality in the District	Summary of activities in annual report	Currently in place and ongoing	Ongoing activity with annual report to Oregon DEQ	X	X		Yes, implemented per requirements
	Trapped sumps in catch basins and Water Quality Manholes and detention capacity required for new developments; (Planning Measure 1 and Structural Measure 1)	Regularly clean and maintain trapped sumps, which have been	Currently in place and ongoing	Ongoing activity with annual report to Oregon DEQ	X		X	Yes, implemented per requirements
	Water quality manholes	Water quality	Currently in place and ongoing	Ongoing activity with annual report to Oregon DEQ	X			Yes, implemented per requirements
	BMP Implementation and Adaptive Management to evaluate and improve the existing stormwater infrastructure in the District; (Planning Measure 5)	Summary of activities in annual report	Currently in place and ongoing	Ongoing activity with annual report to Oregon DEQ	X	X	X	Yes, implemented per requirements
Operations and Maintenance	Street sweeping of major arterials is conducted by the Oregon Department of Transportation (McLoughlin Blvd) and Clackamas County (major roadways with either curbs and/or bike paths) (O & M Measure 1)	Summary of activities in annual report	Currently in place and ongoing	Ongoing activity with annual report to Oregon DEQ	X		X	Yes, implemented per requirements
	Water quality sampling done quarterly at 5 specific sites and at other random sites	Summary of activities in annual report	Currently in place and ongoing	Ongoing activity with annual report to Oregon DEQ	X		X	Yes, implemented per requirements
	Water quality sump cleaning performed on a 4-year cycle, or whenever the sediment reaches a specific point (O & M Measure 2)	Summary of activities in annual report	Currently in place and ongoing	Ongoing activity with annual report to Oregon DEQ	X		X	Yes, implemented per requirements
	Catch basins/area drains in the District are periodically inspected and maintained; They are cleaned or repaired the catch basin sumps on a regular basis or when the sediment/leaf accumulation reaches a specific point (O & M Measure 3)	Summary of activities in annual report	Currently in place and ongoing	Ongoing activity with annual report to Oregon DEQ	X		X	Yes, implemented per requirements
	Detention system maintenance is carried out in those developments with which the District has a maintenance agreement with the property owners (O & M Measure 4)	Summary of activities in annual report	Currently in place and ongoing	Ongoing activity with annual report to Oregon DEQ	X		X	Yes, implemented per requirements
	Storm sewer pipes are periodically inspected and maintained as necessary within the District; The pipes are cleaned or repaired when the sediment/leaf accumulation reaches a specific point or to correct specific damage (O & M Measure 5)	Summary of activities in annual report	Currently in place and ongoing	Ongoing activity with annual report to Oregon DEQ	X		X	Yes, implemented per requirements
	Storm sewer ditches are periodically inspected and maintained as necessary within the District; The ditches are cleaned or repaired when the sediment/leaf accumulation reaches a specific point (O & M Measure 6)	Summary of activities in annual report	Currently in place and ongoing	Ongoing activity with annual report to Oregon DEQ	X		X	Yes, implemented per requirements
Structural	A GIS System and Asset Management Database are being implemented by Oak Lodge Sanitary District; The GIS system will map the storm drainage facilities within the District, and an asset management database will be developed from the GIS information (O & M Measure 7)	Summary of activities in annual report	Currently in place and ongoing	Ongoing activity with annual report to Oregon DEQ	X		X	Yes, implemented per requirements
	Detention capacity required for new development with more than 2600 square feet of new impervious surface; The detention facilities trap oil and sediments, reduce the site runoff, reduce stream velocities, and prevent flooding (Structural Measure 4)	Summary of activities in annual report	Currently in place and ongoing	Ongoing activity with annual report to Oregon DEQ	X	X	X	Yes, implemented per requirements



Oregon

Theodore Kulongoski, Governor

Department of Environmental Quality

Northwest Region
2020 SW 4th Ave, Suite 400
Portland, OR 97201
(503) 229-5263
FAX (503) 229-6945
TTY (800) 735-2900

June 26, 2009

Brett Arvidson
Manager of Planning and Engineering
Oak Lodge Sanitary District
14611 SE River Road
Oak Grove, OR 97267

RECEIVED

JUN 26 2009

Oak Lodge Sanitary District

Subject: Willamette Basin TMDL Implementation Plan Approval

Dear Mr. Arvidson,

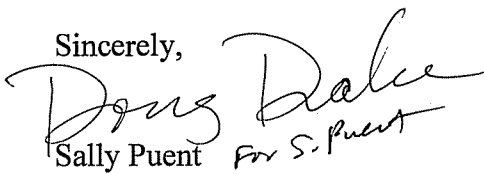
The purpose of this letter is to inform you that the Oregon Department of Environmental Quality (DEQ) has reviewed the Willamette TMDL Implementation Plan (Plan) submitted by Oak Lodge Sanitary District (OLSD). The Plan serves as the Implementation Plan for the Willamette River and its tributaries under your jurisdiction. The Plan meets the intent and requirements of a TMDL Implementation Plan as specified in Oregon Administrative Rules (OAR 340-042-0080(3) (a) – (e)) and is approved, with the following caveat:

- DEQ understands that Oak Lodge Sanitary District is in the process of obtaining a renewal of their MS4 Phase I Stormwater permit. In order to demonstrate continued improvement, DEQ expects that the next round of MS4 permits – and their associated Stormwater Management Plans – will include additional provisions to better align with the TMDL Implementation plans and achieve water quality goals.

We are confident that the requirements of the next permit will strengthen and enhance what we approve today. Also, over time, we will be able to synchronize the submission of both annual reports (Implementation and Stormwater Management Plans) which should optimize all our efforts.

This TMDL Implementation Plan represents a substantial amount of work by OLSD. DEQ applauds OLSD's strong commitment to protect and improve water quality in the Willamette Basin and is looking forward to OLSD's continuing protection and restoration efforts as the Plan is put into action. Please feel free to contact me at 503-229-5379 should you have any questions or concerns related to TMDL implementation.

Sincerely,


Sally Puent For S. Puent

Manager, Watershed Protection Section
NWR Oregon DEQ

cc: Nina DeConcini, ODEQ



Oak Lodge Sanitary District

Willamette Basin TMDL Implementation Plan

March 2008

Revised June 2009

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Appendix A

TMDL Implementation Plan Matrix

Appendix B

OLSD Surface Water Management Plan

1. Background and Implementation Plan Goals

The Willamette River and numerous tributaries do not currently meet several water quality standards including bacteria, Mercury, and temperature. These standards assure that beneficial uses of the river and tributaries, such as swimming, fish consumption, and fish rearing, are protected. When water quality standards are not met, the federal Clean Water Act requires states to list these water bodies in a listing (303(d) list), and to develop a Total Maximum Daily Load (TMDL) for the affected water bodies. A TMDL determines the quantity of constituents that can be added to the river without exceeding water quality standards.

On September 21, 2006, the Oregon Department of Environmental Quality (DEQ) issued the Willamette Basin TMDL as an Order, and submitted the TMDL to the Environmental Protection Agency (EPA) for approval. The TMDL was approved by EPA on September 29, 2006. DEQ intended to issue an additional Order regarding the Mercury components of the plan. As of February 26, 2008, DEQ has not issued this Order.

As part of the Willamette TMDL, DEQ developed a Water Quality Management Plan (WQMP) to describe the overall framework for implementing the Willamette Basin TMDL. The WQMP includes a description of activities, programs, legal authorities, and other measures for which ODEQ and other designated management agencies (DMAs) have regulatory responsibility. The Oak Lodge Sanitary District (OLSD) will implement TMDL requirements under the auspices of NPDES wastewater discharge permit 101063 and MS4 permit 101348.

Chapter 14 of the Willamette River TMDL requires preparation of TMDL implementation plans. Along with other cities and agencies in the Willamette Basin, OLSD will develop a TMDL implementation plan because it operates a municipal wastewater treatment plant with a permit to discharge treated effluent into the Willamette River, and manages stormwater discharges to the Willamette River from its jurisdictional area. The District serves an estimated population of 32,000 in unincorporated Clackamas County, which includes small portions of the cities of Gladstone and Milwaukie.

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. The improvements in water quality that will result from the implementation of the activities described in this Plan will in most cases not be realized in the short term, may take several decades to be measurable, or may be unattainable.

It should be noted that the Willamette River and Kellogg Creek originate outside the jurisdictional area of OLSD and therefore already contain levels of TMDL pollutants resulting from natural causes, and various land uses and activities before they reach the District's jurisdictional area. In this Implementation Plan, the District recognizes that it is only responsible for mitigating or improving the water quality that results from activities

within the District's jurisdiction. These mitigation and improvement measures may not be sufficient to improve the water quality of the listed water bodies so that standards are met.

2. Water Quality Assessment

TMDLs have been developed for the Lower Willamette River for bacteria, temperature, and Mercury. Previous sampling and study work indicates that the OLSD generally does not significantly contribute to the temperature, bacteria and Mercury conditions in the mainstem Willamette.

Concerns Associated with Pollutants

Temperature

At times, the Willamette River and its tributaries are too warm to support healthy salmon and trout populations. Some of these cold water fish, including lower Columbia Coho, spring Chinook, and winter Steelhead, are threatened with extinction and elevated stream temperatures have contributed to their decline. Warm water interferes with adult salmon and trout migration and spawning. Warm water also decreases chances of juvenile survival, affects egg and embryo development, alters juvenile fish growth rates, and decreases their ability to compete with temperature-tolerant fish species for habitat and food. Salmon and trout are also more susceptible to disease when water temperatures are elevated.

Due to tidal effects, channel morphology, flow characteristics, and other factors the Willamette River along the District boundary is considered a fish transitory area. The District's contribution to the temperature concerns and ability to influence these concerns is extremely limited.

Bacteria

People can be affected by bacteria present in water when enjoying water contact recreation activities such as swimming, wading, wind surfing, water skiing, boating, or fishing. Ingestion or contact with water contaminated with bacteria can cause skin and respiratory ailments, gastroenteritis, and other illnesses in humans.

Bacteria in surface waters originates from both human and non-human sources. The District's TMDL Implementation Plan limits its concern to anthropogenic sources of bacteria.

Mercury

The accumulation of Mercury in fish is a well-recognized environmental problem throughout the United States. Mercury is a potent toxin that can cause damage to the brain and nervous system. Small children and developing fetuses are most sensitive to Mercury's

toxic effects. The primary pathway through which humans are exposed to Mercury is through the consumption of fish or seafood containing elevated levels of Mercury. As discussed in the TMDL document, the sources and impacts of Mercury are not well understood and require further study. DEQ intends to further define the management of Mercury concerns in a separate order.

3. Management Strategies

The matrix of activities included as Appendix A includes a summary of activities implemented or planned by OLSD. For each activity the corresponding management strategies, progress to date, future planned activities, and the pollutant affected by the activity are listed.

The matrix includes the following categories of activities:

WASTEWATER PROGRAM

Bacteria

1. SSO control in the collection system
 - I/I reduction/control activities
 - Collection system maintenance (cleaning, joint repair, etc.)
 - Collection system upgrades
2. Source control
 - Illicit discharge controls
 - Implement Industrial Pretreatment Program
 - Enforce OLSD and County septic system ban
 - Require that construction and repair of sanitary facilities meet DEQ, OLSD, and County plumbing codes
3. Biosolids handling
 - Provide biosolids stabilization and reuse as required by NPDES permit
4. NPDES permit
 - Comply with NPDES permit requirements for disinfection
 - Stormwater requirements(1200Z)
 - Overflow controls

Temperature

1. Source control
 - Illicit discharge controls.
 - Promotion of energy/ water efficiency technologies
 - Implement Industrial Pretreatment Program

2. Explore technical options for effluent temperature control, including:
 - Shading/covering of tankage
 - Evaluate secondary treatment process in regards to blower temperatures and biomass caloric demands
 - Evaluate disinfection system for temperature impacts
 - Evaluate hyperbaric cooling for discharge
 - Evaluate heat exchange or subsurface heat discharge
 - Evaluate cooling of recycle flows
 - Evaluate reducing surface area of tankage

3. NPDES permit
 - Comply with NPDES permit requirements for temperature monitoring and thermal load WLA

Mercury

1. Source control
 - Illicit discharge controls.
 - Implement dental best management practice (BMP) program
 - Implement Industrial Pretreatment Program

2. NPDES permit
 - Stormwater requirements (1200Z)
 - Overflow controls
 - Comply with NPDES permit requirements for toxics effluent monitoring.

SURFACE WATER MANAGEMENT PROGRAM

As required by the MS4 permit, The OLS D has an approved stormwater management plan dated April 27, 2006. Page 14-21 of the Willamette Basin TMDL provides that a TMDL implementation plan should complement, not recreate, a stormwater management plan. In response to the 303(D) List, the Oak Lodge Sanitary District Stormwater Management Plan did specifically address temperature, bacteria, and Mercury prior to TMDL adoption. A copy of this approved stormwater management plan is appended to this TMDL Implementation Plan.

This stormwater management plan describes the best management practices used to reduce urban stormwater pollution into the Willamette River. The OLS D implementation of TMDL surface water requirements will be in response to the MS4 permit requirements, including the stormwater management plan authority through MS4 program. A summary of the best management practices used in relation to TMDL pollutants is as follows:

Temperature

The water quality temperature criterion for the Lower Willamette is 20 degrees Celsius. The Lower Willamette exceeds this standard during the summer months. OLS D MS4 waters do not reasonably cause or contribute to the degradation for the rationales listed below:

1. The Willamette River exceeds the water quality criteria prior to reaching the OLS D boundary.
2. OLS D encompasses only 3349 acres, which is a minute fraction of the Willamette River watershed.
3. The Willamette River ambient temperatures generally exceed measured local creek temperatures. OLS D stormwater discharges provide cooling to the main river.
4. The District monitors temperature through quarterly sampling. Data shows that creek temperatures generally do not exceed the 20 degrees Celsius standard. *(Source: OLS D 2004-2005 Surface Water Management Program Annual Report)*
5. The District, through its development ordinances, requires conservation of the riparian areas and the associated shade canopy.

The current BMPs, especially the sensitive lands requirement, combined with the lack of significant impact described above, can be considered effective in meeting the water quality bacteria standard.

BMP Measures for Temperature

As noted above, OLS D stormwater discharges do not generate significant thermal loads on the river. The main mechanism for warming stormwater involves the heating of exposed surfaces due to solar radiation. BMPs include creating new shade or maintaining existing shade, educating the public about shading, and preventing the illicit discharge of hot water to improve the temperature of the receiving waters. The following OLS D BMPs address warming of receiving waters (See Appendix D of the Stormwater Management Plan for descriptions of the BMPs):

- Planning Measure 3 - Development Review Measures
- Planning Measure 4 - Sensitive Land Measures
- Planning Measure 5 - BMP Implementation and Adaptive Management
- Public Education/Outreach Measure 2 - OLS D Newsletters
- Public Education/Outreach Measure 4 - Educational Brochures
- Public Education/Outreach Measure 5 - OLS D Website
- Public Education/Outreach Measure 6 - OLS D Participation in Regional Educational Activities
- O&M Measure 7 - Implementation of GIS System and Asset Management Database
- Illicit Discharge Measure 1 - Visual Inspection of Outfalls
- Illicit Discharge Measure 2 - Water Quality Monitoring
- Illicit Discharge Measure 3 - Industrial Inspections and Inventory
- Illicit Discharge Measure 4 - Pollution Complaint Investigation

Surrogate Shade

The TMDL requires MS4 permit holders to utilize effective shade as a surrogate measure for temperature. Using the District's geographical information system, the Districts evaluated approximate 34,000 linear feet of stream corridor for existing shade and potential shading. Figure 1 rates the stream shading potential for the streams and creeks in the District.

This analysis shows:

- 67.2% of the District stream corridors are fully shaded
- 5.7% of the District has no potential for additional shading due to physical factors such as roads or other encumbrances
- 16.2% currently is moderately shaded, and 4.1% of this high potential area lies on public land with potential for immediate installation of shading measures. The remaining 12.1% lies on private property and future potential shading would require property owner participation.
- 14.9% of the District stream corridors are considered open, and 4.6% of these open have a high potential for immediate shading due to public ownership or development activities. The remaining 10.3% lies on private property and future potential shading would require property owner participation.

The District will use its sensitive lands ordinance and capital improvement programs to implement high potential shade areas over the next 10 years. The District will encourage the planting of shade in other identified private areas when possible.

Mercury

Mercury has been identified as exceeding the water quality standards. Recent DEQ work on Mercury in the Willamette Basin indicates a need for further study of both the sources of and the formation of methyl Mercury. At this time, DEQ has not issued the legal order for implementation of the Mercury provisions of the TMDL document. Without this legal guidance, specific practices regarding Mercury cannot be determined.

Mercury sources occur naturally in the Willamette Basin and municipal sources are considered an extremely small fraction of the overall Mercury mass balance (*Source: Willamette Basin Draft Total Maximum Daily Load Water Quality Management Plan*). The OLSD MS4 waters do not reasonably cause or contribute to the degradation for these rationales:

1. The Willamette River exceeds the water quality criteria prior to reaching the OLSD boundary.
2. OLSD encompasses only 3349 acres, which is a minute fraction of the Willamette River watershed.
3. Major industrial users with Mercury processes do not exist in the District.
4. The Willamette River TMDL does not identify MS4 discharges as a significant source of Mercury.
5. Stream sediments seem to be a major source of Mercury, not stormwater outfalls.
6. Mercury is not a significant component of municipal stormwater discharges in the Portland Metro area. Recent data obtained by the City of Portland and the USGS show MS4 discharges at or below water quality standards. (Note: in FY 2008/2009 the District sampled surface water for Mercury and found on-detectable levels.)

Considering the lack of a significant source of Mercury in the District and a definite need for understanding of the Mercury physical processes in the environment, the current BMPs are considered effective.

BMP Measures for Mercury:

Mercury exists naturally in soils and sediments. Small amounts of Mercury may be deposited from the atmosphere from wind transport of soil or air pollution. Barring any major source of Mercury, the only available BMPs involve sediment/erosion control and illicit discharge measures. The OLSD BMPs that address Mercury are (See Appendix D of the Stormwater Management Plan for descriptions of the BMPs):

- Planning Measure 1 - Trapped Sumps in Catch Basins and Water Quality Manholes
- Planning Measure 2 - Erosion Control Measures
- Planning Measure 3 - Development Review Measures
- Planning Measure 5 - BMP Implementation and Adaptive Management
- Structural Measure 1 - Trapped Sumps in Catch Basins and Water Quality Manholes
- Structural Measure 4 - Detention Installation Requirements
- O&M Measure 1 - Street Sweeping
- O&M Measure 2 - Water Quality Sump Cleaning
- O&M Measure 3 - Catch Basin/Area Drain Cleaning and Maintenance
- O&M Measure 4 - Detention System Maintenance
- O&M Measure 6 - Ditch Cleaning and Maintenance
- Illicit Discharge Measure 1 - Visual Inspection of Outfalls
- Illicit Discharge Measure 2 - Water Quality Monitoring
- Illicit Discharge Measure 3 - Industrial Inspections and Inventory
- Illicit Discharge Measure 4 - Pollution Complaint Investigation

Bacteria

Fecal coliform have been identified as exceeding water quality standards in the Lower Willamette during the fall, winter, and spring timeframes. The indicator organism for Oregon surface waters is now E. coli. The OLSD MS4 discharges do not reasonably cause or contribute to the degradation due to the rationales listed below:

1. The Willamette River exceeds the water quality criteria prior to reaching the OLSD boundary.
2. OLSD encompasses only 3349 acres, which is a minute fraction of the Willamette River watershed.
3. The Willamette River ambient bacteria levels greatly exceed the OLSD measured creek bacteria levels.
4. The District monitors fecal coliform through quarterly sampling. Data shows some sporadic bacteria levels above the standard, but generally bacteria levels meet the water quality standard during the fall/winter/spring flow months. (Reference OLSD 2004-2005 Surface Water Management Program Annual Report)

5. All the residences, commercial facilities and industrial users in the District are connected to the sanitary sewer system. New septic tanks or other alternate sanitary systems are not allowed.
6. Recent DNA sampling studies show that the sources of bacteria in MS4 discharges consist of mostly natural sources such as birds, mammals, rodents, etc. These DNA studies indicate that natural sources are the primary cause of bacterial pollution, not urbanization. (*Source: microbial tracking studies for Clean Water Service, City of Blaine Washington, City of Boise Idaho, and City of Seattle*).
7. Water quality measurements indicate that the Willamette River has seen improvements in bacteria levels over the last 5 years.

With bacteria levels resulting largely from natural sources, and with the lack of a significant impact created by OLS D, the current BMPs are considered effective.

BMP Measures for Bacteria

As noted above, fecal coliform and E. coli bacteria occur naturally due to wildlife activities. While fecal bacteria can manifest in visible debris, generally the suspended form creates the water quality concern. Filtration and sedimentation do not reduce the amount of bacteria in suspension. Some natural processes, such as sunlight and soil filtration, can reduce bacteria levels, but the performance of these processes is highly variable and difficult to predict.

The best approach to reduce bacteria levels in stormwater involves removing the human sources of bacteria, improving the natural removal processes, and sedimentation (removal of material prior to suspension). The OLS D BMPs that address these mechanisms are (See Appendix D of the Stormwater Management Plan for descriptions of the BMPs):

- Planning Measure 1 - Trapped Sumps in Catch Basins and Water Quality Manholes
- Planning Measure 2 - Erosion Control Measures
- Planning Measure 3 - Development Review Measures
- Planning Measure 4 - Sensitive Land Measures
- Planning Measure 5 - BMP Implementation and Adaptive Management
- Public Education/Outreach Measure 2 - OLS D Newsletters
- Public Education/Outreach Measure 3 - Catch Basin Stenciling
- Public Education/Outreach Measure 4 - Educational Brochures
- Public Education/Outreach Measure 5 - OLS D Website
- Public Education/Outreach Measure 6 - OLS D Participation in Regional Educational Activities
- Public Education/Outreach Measure 7 - SWM Citizens Advisory Committee
- Structural Measure 1 - Trapped Sumps in Catch Basins and Water Quality Manholes
- Structural Measure 4 - Detention Installation Requirements
- O&M Measure 1 - Street Sweeping
- O&M Measure 2 - Water Quality Sump Cleaning
- O&M Measure 3 - Catch Basin/ Area Drain Cleaning and Maintenance
- O&M Measure 4 - Detention System Maintenance
- O&M Measure 5 - Pipe Cleaning and Maintenance
- O&M Measure 6 - Ditch Cleaning and Maintenance

O&M Measure 7 - Implementation of GIS System and Asset Management Database
Illicit Discharge Measure 1 - Visual Inspection of Outfalls
Illicit Discharge Measure 2 - Water Quality Monitoring
Illicit Discharge Measure 3 - Industrial Inspections and Inventory
Illicit Discharge Measure 4 - Pollution Complaint Investigation

4. Performance Monitoring

OLSD will track TMDL Implementation Plan activities and report to DEQ as required by the District's NPDES and MS4 permit. The District reports performance on a monthly or annual basis depending on permit conditions. In addition, the District will review and revise this Implementation Plan as needed following DEQ reevaluation of the TMDL, or if required by DEQ.

5. Evidence of Compliance with Land Use Requirements

As a special district, the OLSD lacks land use authority. Per direction from DEQ, this TMDL implementation plan does not required a land use compatibility statement.

6. Additional Submittals

1. Fiscal Analysis.

OLSD is a sanitary district formed and operating under ORS 450. OLSD began enactment of a surface water management program in July 1993 and sanitary system in 1960. The District has enacted both a Sanitary Sewer Ordinance and Stormwater Management Ordinance. These ordinances and subsequent revisions provide the regulatory framework for developing and implementing a surface water management plan and program with the District's jurisdictional boundary.

Also included in these ordinances are provisions for the assessment and collection of fees and charges associated with operating the program. Monthly service charges are collected from each developed property within the District as incurred charges for the provision, operation, maintenance, repair and replacement of surface water management, and sanitary services. Additional fees are assessed for new and redevelopment plan review, and compliance determination. The revenue generated by these fees and charges is applied to the cost of providing the various services and activities for both the sanitary and surface water management programs including capital facility construction. All revenue generated by the fees and charges associated within the surface water management program and sanitary program are retained within the individual program. All expenses generated within the sanitary and the surface water management programs are funded through program-generated fees and charges.

As the District continues its programs into the future, the District will use the adaptive management process for implementing changes to the Surface Water Program.

2. Description of Legal Authority (by District).

As a sanitary district formed under ORS 450, OLSD believes its Rules and Regulations for Surface Water Management, contained in its Ordinance 1001, its Sanitary Sewer Code, and all amendments thereto, provide adequate legal authority to comply with the TMDL implementation requirements.

The District under ORS 450 cannot provide land use regulation. Clackamas County provides local land use regulation through the Clackamas County Zoning and Development Ordinance and Comprehensive Plan. Under State law and the Comprehensive Plan, Oak Lodge Sanitary District implements its requirements bar participating in Clackamas County Land Use Actions.

3. Cold Water Refugia

Due to jurisdictional limitations and river morphology, the OLSD has limited opportunity to address mainstem cold water refugia. The District's boundary stops at the normal high water elevation. The District lacks land use authority to regulate activities below that elevation.

Because the Willamette River cuts through the Portland West Hills, it narrows in the area of Oak Lodge because of the rock formations. This narrow channel geometry precludes shallows and eddies that provide refugia. Additionally, the steep river banks negate potential for main stream shading. This steep rocky geology also precludes improving the habitat without major channel disturbances. The deep river channel may provide temperature refuge all along the District boundary.

The outlets for River Forest, Boardman, and Rinearson Creek provide the most potential for refugia. Any protection or regulation of these outlets would derive from the District's sensitive land ordinances and participation in County land use regulation.

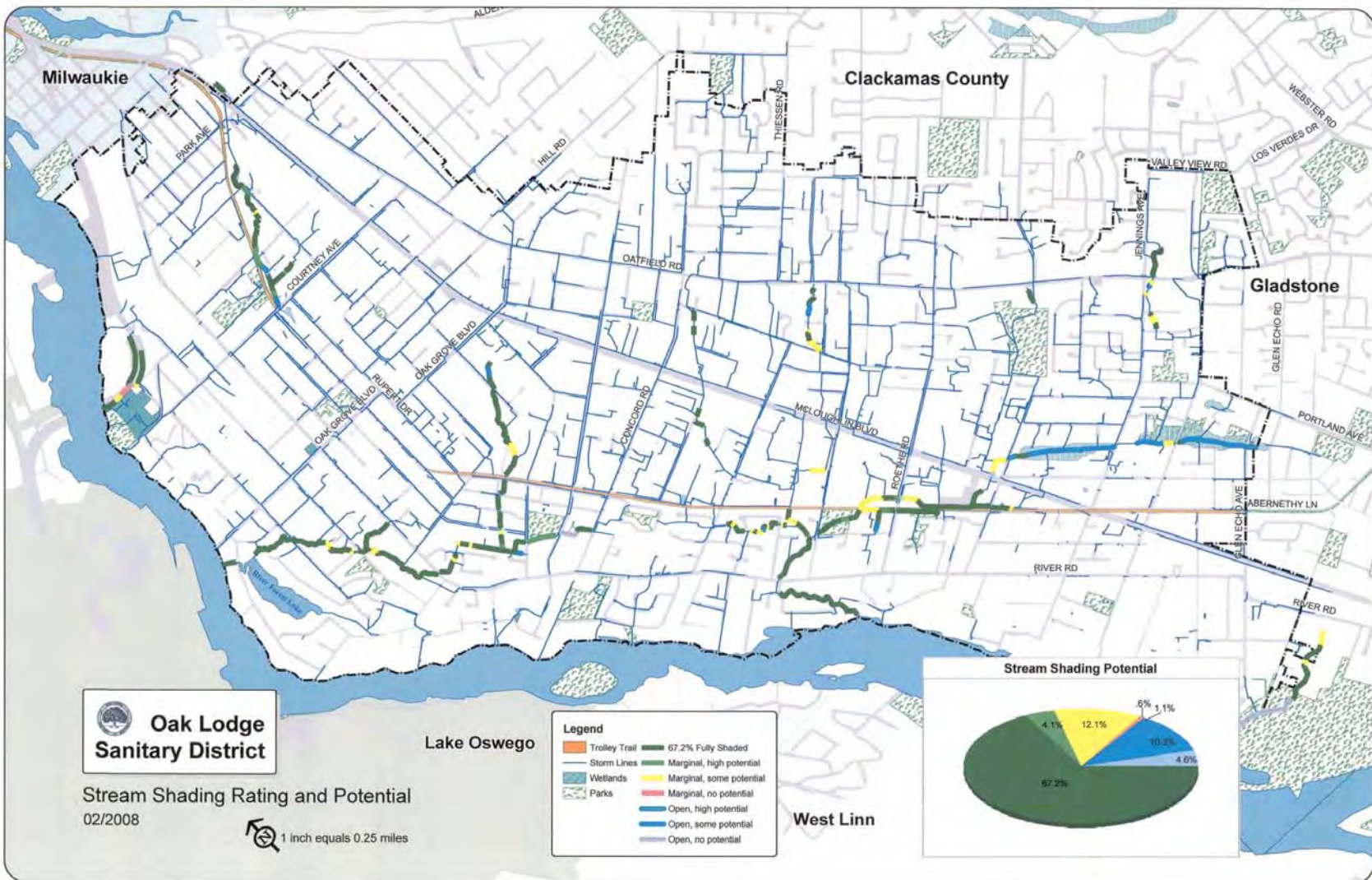


FIGURE 1
 Stream Shading Rating and Potential

APPENDIX A Oak Lodge Sanitary District TMDL Implementation Matrix

WASTEWATER PROGRAM

STRATEGY	ACTIONS	MEASURE	TIMELINE and STATUS	MILESTONE	Bact	Temp	Hg
Source Control	Illicit discharge controls	None required	Currently in place and ongoing	Ongoing activity with annual report to Oregon DEQ	X	X	X
	Promotion of energy/water efficiency technologies	None required	Currently in place and ongoing	Ongoing activity		X	
	Enforce OLSD and State septic system ban within District	None required	Currently in place and ongoing	Ongoing activity	X		
	Require that construction and repair of sanitary facilities meet DEQ, OLSD, and county plumbing codes	Summary of activities in annual report	Currently in place and ongoing	Ongoing activity with annual report to Oregon DEQ	X		
	Implement dental BMP program	Develop dental education plan	OLSD will provide disposal information to District dentists over the next 3 years	Ongoing activity			X
	Implement Industrial Pretreatment Program	Summary of activities in annual report	Currently in place and ongoing	Ongoing activity in compliance with NPDES permit	X	X	X
Explore Technical Options	Explore technical options for effluent temperature control, including: 1. Shading/covering of tankage 2. Evaluate secondary treatment process in regards to blower temperatures and biomass caloric demands 3. Evaluate disinfection system for temperature impacts 4. Evaluate hyperbaric cooling for discharge 5. Evaluate heat exchange or subsurface heat discharge 6. Evaluate cooling of recycle flows 7. Evaluate reducing surface area of tankage	Potential options will be studied, designed and implemented as part of the OLSD Capital Improvement Program	OLSD anticipates upgrading of sanitary facilities over the next 20 years	Ongoing activity		X	
SSO control in the collection system	Implement infiltration and inflow reduction/control activities	Summary of activities in annual report	Currently in place and ongoing	Ongoing activity with annual report to Oregon DEQ	X		
	Collection system maintenance (cleaning, joint repair, etc.)	Summary of activities in annual report	Currently in place and ongoing	Ongoing activity with annual report to Oregon DEQ	X		
	Collection system upgrades	Summary of activities in annual report	Currently in place and ongoing	Ongoing activity with annual report to Oregon DEQ	X		

APPENDIX A Oak Lodge Sanitary District TMDL Implementation Matrix

STRATEGY	ACTIONS	MEASURE	TIMELINE and STATUS	MILESTONE	Bact	Temp	Hg
Biosolids	Provide biosolids stabilization and reuse as required by NPDES permit	Summary of activities in annual report	Currently in place and ongoing	Ongoing activity with annual report to Oregon DEQ	X		
NPDES permit	Comply with NPDES permit requirements for temperature monitoring and thermal load WLA	When included in NPDES permit, report in DMR	To be developed	Comply with NPDES permit requirements		X	
	Comply with disinfection permit requirements	Measure and report in DMR	Currently in place and ongoing	Comply with NPDES permit requirements	X		
	Stormwater requirements(1200Z)	Report performance in annual report	Currently in place and ongoing	Comply with NPDES permit requirements	X		X
	Overflow controls	Overflows reported to DEQ	Currently in place and ongoing	Comply with NPDES permit requirements	X		X
	Comply with NPDES permit requirements for toxics effluent monitoring	Demonstrate compliance with Mercury water quality criteria at edge of mixing zone	Currently in place and ongoing	Comply with NPDES permit requirements			X

APPENDIX A Oak Lodge Sanitary District TMDL Implementation Matrix

SURFACE WATER MANAGEMENT PROGRAM

STRATEGY	ACTIONS	MEASURE	TIMELINE and STATUS	MILESTONE	Bact	Temp	Hg
Public Education and Outreach	Oak Lodge Sanitary District Newsletters mailed quarterly to District residents with surface water management related articles (PE and O Measure 2)	Summary of activities in annual report	Currently in place and ongoing	Ongoing activity with annual report to Oregon DEQ	X	X	X
	Catch Basin Stenciling by volunteers within the District to raise public awareness of the ultimate destination of the runoff and the potential environmental impacts (PE and O Measure 3)	Summary of activities in annual report	Currently in place and ongoing	Ongoing activity with annual report to Oregon DEQ	X	X	X
	Education Brochures provided to the public in the main lobby and mailed to any resident who requests information on which we have a brochure; New brochures are produced periodically as there is a need (PE and O Measure 4)	Summary of activities in annual report	Currently in place and ongoing	Ongoing activity with annual report to Oregon DEQ	X	X	X
	The OLSD Website was developed and is maintained to provide information to the public; Articles, regulations, announcements, reports, links and other pertinent storm and surface water information options are available on the website (PE and O Measure 5)	Summary of activities in annual report	Currently in place and ongoing	Ongoing activity with annual report to Oregon DEQ	X	X	X
	OLSD participation in Regional Educational Activities and in the regional consortium allows for wider dissemination of water quality messages both in the District and throughout the metro area (PE and O Measure 6)	Summary of activities in annual report	Currently in place and ongoing	Ongoing activity with annual report to Oregon DEQ	X	X	X
	Surface Water Management Citizens Advisory Committee meets regularly to review surface water management issues and plans (PE and O Measure 7)	Summary of activities in annual report	Currently in place and ongoing	Ongoing activity with annual report to Oregon DEQ	X	X	X
	Illicit Discharge Detection and Elimination	Visual inspections of major outfalls are conducted semi-annually and also whenever staff receives any information that there maybe an evidence of illicit discharge present (Ill Dis Measure 1)	Summary of activities in annual report	Currently in place and ongoing	Ongoing activity with annual report to Oregon DEQ	X	X
Oak Lodge Sanitary District performs quarterly water quality monitoring at fixed sites and specific monitoring at areas of concern (Ill Dis Measure 2)		Summary of activities in annual report	Currently in place and ongoing	Ongoing activity with annual report to Oregon DEQ	X	X	X
Periodic inspections of significant industrial users are performed to check for potential pollution problems (Ill Dis Measure 3)		Summary of activities in annual report	Currently in place and ongoing	Ongoing activity with annual report to Oregon DEQ	X	X	X
All pollution-related complaints are investigated by District staff; Site visits are made, the extent of the problem determined, sample and perform chemical analysis, perform emergency response, and work with the property owner to correct the situation (Ill Dis Measure 4)		Summary of activities in annual report	Currently in place and ongoing	Ongoing activity with annual report to Oregon DEQ	X	X	X

APPENDIX A Oak Lodge Sanitary District TMDL Implementation Matrix

STRATEGY	ACTIONS	MEASURE	TIMELINE and STATUS	MILESTONE	Bact	Temp	Hg
Planning	Erosion Prevention and Sediment Control measures required for all activities that cause disturbance of soil on sites less than 1 acre in size; (Larger sites are covered by 1200-C permits issued through Clackamas County) Plans are required, permits are issued, and sediment and erosion control measures must be installed and maintained; The site and measures are inspected regularly (Planning Measure 2)	Record number of plans reviewed and permits issued as part of this Planning Measure	Currently in place and ongoing	Ongoing activity with annual report to Oregon DEQ	X		X
	Development Review measures for new development/redevelopment taking place within the District (Planning Measure 3)	Record number of development plans reviewed annually; A summary of activities is in the annual report	Currently in place and ongoing	Ongoing activity with annual report to Oregon DEQ	X	X	X
	Sensitive Land Measures in riparian zones; Developers are required to protect, maintain, or mitigate activities in stream areas; 25 feet of creek corridor protected to maintain water quality, with mitigation required should encroachments be necessary (Planning Measure 4)	Summary of activities in annual report	Currently in place and ongoing	Ongoing activity with annual report to Oregon DEQ	X	X	X
	Development Review measures for new development/re-development taking place within the District; Sanitary sewer connections are mandatory - no septic tanks or drain fields are allowed; Sanitary facilities must meet Oak Lodge Sanitary District, DEQ, and Plumbing Code requirements	Record number of development plans reviewed annually; A summary of activities is in the annual report	Currently in place and ongoing	Ongoing activity with annual report to Oregon DEQ	X	X	
	Implementation of OLSD Stormwater Capital Improvement Plan; CIP has 10 year plan for improving stormwater facilities to improve water quality in the District	Summary of activities in annual report	Currently in place and ongoing	Ongoing activity with annual report to Oregon DEQ	X	X	
	Trapped sumps in catch basins and Water Quality Manholes and detention capacity required for new developments; (Planning Measure 1 and Structural Measure 1)	Regularly clean and maintain trapped sumps, which have been required in all new catch basins for the last 10 years; Record number of new installations as part of new development	Currently in place and ongoing	Ongoing activity with annual report to Oregon DEQ	X		X
	Water quality manholes	Water quality manholes have been required in all new detention systems for the past 10 years	Currently in place and ongoing	Ongoing activity with annual report to Oregon DEQ	X		
	BMP Implementation and Adaptive Management to evaluate and improve the existing stormwater infrastructure in the District; (Planning Measure 5)	Summary of activities in annual report	Currently in place and ongoing	Ongoing activity with annual report to Oregon DEQ	X	X	X

APPENDIX A Oak Lodge Sanitary District TMDL Implementation Matrix

STRATEGY	ACTIONS	MEASURE	TIMELINE and STATUS	MILESTONE	Bact	Temp	Hg
Operations and Maintenance	Street sweeping of major arterials is conducted by the Oregon Department of Transportation (McLoughlin Blvd) and Clackamas County (major roadways with either curbs and/or bike paths) (O & M Measure 1)	Summary of activities in annual report	Currently in place and ongoing	Ongoing activity with annual report to Oregon DEQ	X		X
	Water quality sampling done quarterly at 5 specific sites and at other random sites	Summary of activities in annual report	Currently in place and ongoing	Ongoing activity with annual report to Oregon DEQ	X		X
	Water quality sump cleaning performed on a 4-year cycle, or whenever the sediment reaches a specific point (O & M Measure 2)	Summary of activities in annual report	Currently in place and ongoing	Ongoing activity with annual report to Oregon DEQ	X		X
	Catch basins/area drains in the District are periodically inspected and maintained; They are cleaned or repaired the catch basin sumps on a regular basis or when the sediment/leaf accumulation reaches a specific point (O & M Measure 3)	Summary of activities in annual report	Currently in place and ongoing	Ongoing activity with annual report to Oregon DEQ	X		X
	Detention system maintenance is carried out in those developments with which the District has a maintenance agreement with the property owners (O & M Measure 4)	Summary of activities in annual report	Currently in place and ongoing	Ongoing activity with annual report to Oregon DEQ	X		X
	Storm sewer pipes are periodically inspected and maintained as necessary within the District; The pipes are cleaned or repaired when the sediment/leaf accumulation reaches a specific point or to correct specific damage (O & M Measure 5)	Summary of activities in annual report	Currently in place and ongoing	Ongoing activity with annual report to Oregon DEQ	X		X
	Storm sewer ditches are periodically inspected and maintained as necessary within the District; The ditches are cleaned or repaired when the sediment/leaf accumulation reaches a specific point (O & M Measure 6)	Summary of activities in annual report	Currently in place and ongoing	Ongoing activity with annual report to Oregon DEQ	X		X
	A GIS System and Asset Management Database are being implemented by Oak Lodge Sanitary District; The GIS system will map the storm drainage facilities within the District, and an asset management database will be developed from the GIS information (O & M Measure 7)	Summary of activities in annual report	Currently in place and ongoing	Ongoing activity with annual report to Oregon DEQ	X		X
Structural	Detention capacity required for new development with more than 2600 square feet of new impervious surface; The detention facilities trap oil and sediments, reduce the site runoff, reduce stream velocities, and prevent flooding (Structural Measure 4)	Summary of activities in annual report	Currently in place and ongoing	Ongoing activity with annual report to Oregon DEQ	X	X	X