



City of Oregon City, Oregon

National Pollutant Discharge Elimination System Municipal Separate Storm Sewer System Discharge Permit and Willamette River TMDL

2016–2017 Annual Report

Prepared for the

Oregon Department of Environmental Quality

November 1, 2017



Assisted By:



CITY OF OREGON CITY

**NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
MUNICIPAL STORMWATER SYSTEM ANNUAL REPORT**

JULY 1, 2016 – JUNE 30, 2017

I, the undersigned, hereby submit this National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater System Annual Report in accordance with NPDES Permit No. 101348. I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person, or persons, who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

for Eric Hand, Wastewater/Storm Supervisor
Martin Montalvo
Public Works Operations Manager
City of Oregon City

Date

10/25/17

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1.0 Introduction

1.1 NPDES MS4 Permit Background and Permit Renewal

The Oregon Department of Environmental Quality (DEQ) regulates stormwater runoff from the City of Oregon City (City) through the National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Permit No. 101348, issued to Clackamas County and its co-permittees. Clackamas County co-permittees include the City of Oregon City along with the cities of Lake Oswego, Gladstone, West Linn, Milwaukie, Wilsonville, Happy Valley, Johnson City, and Rivergrove, the Oak Lodge Water Services District, and Clackamas County. Each co-permittee is a relatively small community, most having populations under 30,000 with some (Johnson City, Rivergrove) having populations significantly smaller.

The City's NPDES MS4 permit was reissued March 16, 2012, after a multi-year negotiation process with DEQ and an additional year-long delay related to an appeal. The 2012 reissued permit was not appealed, and thus maintains an effective date of March 16, 2012.

The 2012 permit expired on March 1, 2017. Per Schedule B.6, a Permit Renewal Application Package shall be submitted to DEQ at least 180 days prior to permit expiration. However, Schedule F, Section A.4 states that DEQ may grant permission to submit an application less than 180 days in advance, but no later than the permit expiration date. On April 21, 2016, the City submitted a permit renewal submission extension request to DEQ. DEQ granted this request on June 17, 2016 and established a due date for the permit renewal application no later than February 28, 2017.

Oregon City submitted its Permit Renewal Application on February 27, 2017. The Permit Renewal Application required an evaluation of proposed program and Stormwater Management Plan (SWMP) modifications, development of TMDL benchmarks, mapping, a maximum extent practicable (MEP) evaluation, updates to the City's environmental monitoring program, and an evaluation of proposed service area expansions and associated pollutant load estimates. The City's NPDES MS4 permit is now on administrative extension; renewal date is unknown at this time.

Each co-permittee is required to submit an annual report, summarizing accomplishments and implementation of their individual SWMPs. This annual report documents stormwater management activities from July 1, 2016 to June 30, 2017 in conjunction with the City's 2012 NPDES MS4 permit. Although an updated SWMP was prepared and submitted as part of the Permit Renewal Application, the City's 2012 SWMP remains the effective NPDES MS4 program document for purposes of this annual report.

1.2 Document Organization

The following table (Table 1) outlines the organization of this annual report document, with respect to the annual reporting requirements per Schedule B.5 of the City's NPDES MS4 permit.

Table 1: Summary of the NPDES MS4 Annual Report Requirements

Annual reporting requirement	Location in document
a) Status of implementing SWMP elements, including progress in meeting measurable goals.	Appendix A
b) Status of any public education effectiveness evaluation conducted during the reporting year, and a summary of how results were used in adaptive management.	Appendix A
c) Summary of the adaptive management process implementation during the reporting year including new BMPs.	Section 2.0
d) Proposed changes to SWMP program elements to reduce TMDL pollutants to the MEP.	Section 2.0
e) A summary of total stormwater program expenditures and funding sources over the reporting fiscal year, and those anticipated in the next fiscal year.	Section 3.0
f) A summary of monitoring program results, including monitoring data that is accumulated throughout the reporting year.	Section 4.0 & Appendix B
g) Any proposed modifications to the monitoring plan necessary to ensure that adequate data and information are collected to conduct stormwater program assessments.	Section 4.0
h) A summary describing the number and nature of enforcement actions, inspections, and public education programs. ^a	Section 6.0 and Appendix A
i) An overview, as related to MS4 discharges, describing land use changes, UGB expansions, land annexations, and new development activities. The number of new post-construction permits issued and estimate of new and replaced impervious surface must also be included.	Section 5.0
j) A summary related to MS4 discharges describing concept planning or other activities in preparation of UGB expansions or land annexations.	Section 5.0 and Appendix A
NA) Additional efforts conducted by the City.	Section 6.0

^a Enforcement actions, inspections, and public education programs are included in the City's SWMP as BMPs, and are reported along with the status of implementing all components of the SWMP in Appendix A.

Each section of this report corresponds to the specific permit requirements in Schedule B.5. This report emphasizes efforts and activities associated with individual Best Management Practices (BMPs) from the City's 2012 SWMP, as summarized in Appendix A.

Per Section 5.5 of the City's Willamette Basin TMDL Implementation Plan, an annual progress report is to be submitted to DEQ. This requirement is addressed by inclusion with this report as Appendix D.

2.0 Adaptive Management Process Implementation

2.1 Adaptive Management Program

In accordance with the issuance of the City's renewed NPDES MS4 permit (in 2012), the City was required to document their adaptive management approach to assess annually and modify, as necessary, existing and new SWMP components. The City submitted their approach to DEQ on November 1, 2012.

Historically, the City has implemented adaptive management principals to annually refine implementation methods and data collection activities in conjunction with their effective SWMP and BMPs. More significant modifications to SWMP activities occur every five years, in

conjunction with their permit renewal application and updated permit requirements. The City's adaptive management approach (submitted November 1, 2012) maintains consistency with the City's historical approach for implementing adaptive management principals.

Annually, as the City completes their NPDES MS4 annual report, the City reviews SWMP implementation through BMP-specific measureable goals and tracking measures. The City collects data and feedback from staff responsible for implementing and reporting on each BMP to gauge whether implementation was deemed to be effective or whether there are suggested improvements to be made. Suggested adjustments to BMP implementation will include consideration of resource availability, budget/ funding, and overall need.

Every 5 years, during the permit renewal process and SWMP update effort, additional factors are considered as part of the City's overall adaptive management process. These factors include more detailed information related to BMP implementation, such as:

1. Whether technology or information is available that would help improve or refine BMPs,
2. How representative are the measureable goals and tracking measures to the BMP objective, and
3. Are resources available to make changes to the measureable goals and BMP objectives?

Additionally, at the end of the permit term, technical investigations and studies are required in conjunction with compliance dates outlined in the permit. Such studies include (but are not limited to) a water quality trends analysis, pollutant load reduction evaluation, hydromodification assessment, and a retrofit assessment. All studies will help target and identify specific issues that need to be addressed to maintain waterbody health and help formulate BMP activities (measureable goals and tracking measures) that can be used to support improvements.

During the permit renewal application process that was implemented this fiscal year, the City, with the assistance of a consultant, reviewed the adaptive management evaluation factors and the studies listed above. This information informed the City's MEP evaluation and proposed SWMP changes submitted as part of the Permit Renewal Application. Proposed program changes were categorized as an organizational change, a removed activity (due to completion), an implementation change (due to identified efficiencies and adjustments to internal processes and procedures), and a change due to consolidation of activities. An updated (2017) SWMP was also included, reflecting refinement of BMPs, measurable goals, and tracking measures, for use in future permit negotiations and reissuance.

2.2 SWMP Updates for the 2016–2017 Reporting Year

The 2016-2017 reporting year is the fifth full year in which the City's effective 2012 SWMP has been implemented. For the 2016-2017 permit year, no updates were made to the 2012 SWMP or BMP measureable goals and tracking measures beyond those submitted to DEQ in May 2012. It should be noted that a summary of proposed SWMP modifications was submitted with Oregon City's Permit Renewal Application on February 27, 2017, but those modifications have not been implemented pending reissuance of the permit.

2.3 Modifications to Monitoring Plan

In June 2016 the City, as a participant in the Comprehensive Clackamas County NPDES MS4 Stormwater Monitoring Plan (CCCSMP), proposed modifications to the CCCSMP due to an

upcoming change in laboratory services. Modifications requested were primarily in methods used for analysis. Per Schedule B.2.e of the permit, and 7.2 of the Plan, the City submitted to DEQ a 30-day notice of the proposed CCCSMP modification for the Department's review and approval. As the City did not receive a response from DEQ within 30 days, the proposed modifications were deemed approved without written approval.

3.0 Summary of Program Expenditures

A summary of the City of Oregon City's revenue and expenditures for the 2016–2017 fiscal year and a projection of the City's revenue and expenditures for the 2017–2018 fiscal year are provided in Table 2, below. Projection of expenditures is considered draft at this time.

521 Storm Drain (Stormwater) Division

City of Oregon City

Table 2

	Fiscal Year			
	2015/16 Audited Actual	2016/17 Unaudited Actual	2017/18 Adopted Budget	2018/19 Adopted Budget
Beginning Fund Balance	\$ 1,018,371	\$ 1,047,499	\$ 1,140,500	\$ 817,612
Prior Period Adjustment	66,770			
Beginning Fund Balance, restated	1,085,141			
Stormwater Fee Rates (per EDU per month)	Rate = \$9.05 / \$9.35 3% rate increase	Rate = \$9.35 / \$9.65 3% rate increase	Rate = \$9.65 / \$9.65 1.5% rate increase	Rate = \$9.65 / \$9.65 0% rate increase
Revenues				
Charges for Service	2,528,428	2,575,980	2,560,200	2,560,200
Intergovernmental	-	31,822	28,000	-
Interest Income	3,603		3,000	3,000
Miscellaneous Income	13,097	2,284	13,312	13,312
Erosion Control Permits	52,566	42,204	51,500	51,500
Project Management	31,183	21,775	26,409	26,409
TOTAL Revenues	2,628,877	2,674,064	2,682,421	2,654,421
Expenditures				
Personnel Services	1,085,946	993,869	1,180,857	1,237,977
Materials & Services	552,529	524,940	889,452	790,252
Capital Outlay Totals	401,712	155,610	530,000	575,000
Total Transfers	626,332	583,950	405,000	405,000
TOTAL Expenditures	2,666,519	2,258,369	3,005,309	3,008,229
Change in Fund Balance	(37,642)	415,695	(322,888)	(353,808)
Ending Fund Balance	\$ 1,047,499	\$ 1,463,194	\$ 817,612	\$ 463,804
Capital Outlay - Details				
Operations New Equip. >\$5000	\$ -	\$ 7,559	\$ -	\$ -
Capital Construction	401,712	148,051	530,000	575,000
	\$ 401,712	\$ 155,610	\$ 530,000	\$ 575,000
Transfers - Details				
Transfer to Building Reserve	\$ 300,000	\$ 300,000	\$ 300,000	\$ 300,000
Transfer to Equipment Replacement	105,000	105,000	105,000	105,000
Interdept. Transfers	221,332	178,950	-	-
	\$ 626,332	\$ 583,950	\$ 405,000	\$ 405,000

4.0 Monitoring Data

4.1 Development of the Comprehensive Clackamas County Stormwater Monitoring Plan (CCCSMP)

Per the 2004 NPDES MS4 permit requirements (Schedule B), the City of Oregon City, along with Clackamas County and other co-permittees, was required to develop and implement a stormwater monitoring program. Given the effort associated with implementing an effective environmental monitoring program that adequately met all permit requirements and objectives, Clackamas County (i.e., CCSD#1 and SWMACC) and six other co-permittees including the City of Oregon City agreed to consolidate efforts and prepare one comprehensive stormwater monitoring plan. This plan, called the Comprehensive Clackamas County Stormwater Monitoring Plan (CCCSMP), was prepared for submittal with the 2006 NPDES Permit Annual Compliance Reports. The CCCSMP was implemented beginning July 1, 2007 and minor editorial changes were made in 2008.

In conjunction with requirements of the 2012 reissued NPDES MS4 permit, the 2007/2008 CCCSMP was reviewed for consistency with revised monitoring objectives. Monitoring locations and frequencies were adjusted to reflect requirements of the 2012 Permit. Additional efforts related to mercury monitoring, pesticide monitoring, macroinvertebrate (biologic) monitoring, and geomorphic monitoring were added to the CCCSMP. A description of the proposed time-composite sampling methodology was included as an appendix to the CCCSMP. Additional information such as quality assurance procedures were also added in conjunction with Schedule B.2 of the 2012 Permit.

The updated (2012) CCCSMP was submitted to DEQ in September 2012. Comments from DEQ were received in October 2012, and final revisions to the 2012 CCCSMP were submitted to DEQ June 30, 2013. For this reporting year (2016–2017), the 2012 CCCSMP was the effective, implemented monitoring plan for the City of Oregon City.

In 2016 the City, in collaboration with other co-permittees, participated in a series of workshops to propose modifications to the CCCSMP due to completion of monitoring obligations under the 2012 NPDES MS4 permit. The update reflected completion of some select, one-time monitoring obligations under the 2012 permit and refinement of monitoring locations, parameters, and activities based on information collected over the last permit term. Key modifications include the following:

- Inclusion of Oak Lodge Water Services District and the City of Wilsonville instream, stormwater, and biologic monitoring activities
- Removal of mercury and pesticide monitoring activities, as those obligations have been met
- Removal of biochemical oxygen demand (BOD) and total volatile solids (for co-permittees outside of the Tualatin basin) from the analyte list, because of the limited usefulness of the collected data to date
- Adjustment of analytical methods and reporting limits based on consistency with Code of Federal Regulations (CFR) Title 40 and current laboratory capabilities
- Adjustment of monitoring locations to ensure geographic distribution of data and to continue to inform trends analyses
- Inclusion of routine instream sampling, in addition to targeted dry weather/wet weather instream sampling activities

- Removal of Clackamas County Service District #1's (CCSD #1's) geomorphic monitoring activities from the Plan, as physical conditions are evaluated during biologic (macroinvertebrate) monitoring activities
- Minor editorial updates to improve clarity and consistency with current practices

Per Schedule B.2.e of the permit and 7.2 of the CCCSMP, the City and other CCCSMP participants submitted to DEQ a 30-day notice of the proposed CCCSMP modifications for the Department's review and approval on December 16, 2016. As no response was received from DEQ within 30 days, the proposed modifications were deemed approved without written approval. Implementation of the 2017 CCCSMP began July 1, 2017.

As described in the CCCSMP, the NPDES MS4 stormwater monitoring program requires two components. The first component is program monitoring, which involves the tracking and assessment of programmatic activities, as described in the individual permittees SWMP, through the use of performance indicators or metrics. Results of the program monitoring are reported in Appendix A as the annual tracking measures. The second component is environmental monitoring, which includes visual monitoring and the actual collection and analysis of samples. Visual monitoring efforts for the 2016–2017 reporting year included dry weather field screening, as described in the City's SWMP under the BMP 1-2: "Conduct Annual Dry Weather Field Screening." Results of the visual monitoring efforts are reported in Appendix A under the applicable BMP. Environmental monitoring also consists of instream sample collection and outfall sample collection, and the City's sampling efforts are outlined in more detail in Sections 4.2 and 4.3 and in the CCCSMP. Results of the instream and outfall sample collection efforts for this reporting year are provided in Appendix B.

4.2 CCCSMP Updates and Modifications for the 2016–2017 Reporting Year

Requirements for environmental monitoring are outlined in the City's NPDES MS4 permit (dated March 16, 2012). Specific for the 2016 – 2017 reporting year, the City made a change in laboratory services effective July 1, 2016 and select analytical methods and method detection levels have been updated. All analysis is still conducted by laboratories accredited by the Oregon Environmental Laboratory Accreditation Program.

4.3 Summary of Monitoring Data

In accordance with the 2012 CCCSMP, Oregon City is required to conduct instream and outfall monitoring. Instream monitoring is required at six locations reflecting four tributaries to the Willamette River. Outfall monitoring is required at two outfall locations that discharge to the Clackamas River. Time-weighted composite (during storm events) and single grab samples are taken in accordance with the frequencies outlined in Table 3 below.

During the 2016 – 2017 monitoring year, the City of Oregon City collected all required instream (four monitoring events at six sites) and outfall (three events at two sites) samples. An additional outfall sampling event was conducted to make up for reduced number of samples collected in the previous reporting year.

Complete sampling results are summarized in Appendix B. The sampling results presented have been formatted to simplify the data review process.

Table 3: 2016–2017 Oregon City Monitoring Locations and Required Frequencies

Site #	Location	Sample Type	Required Frequency	Weather
In-Stream Monitoring				
OC010is	Abernethy Creek at 17082 Holly Ln (Holly Ln Bridge)	Grab & Composite	4/year	Dry Weather (2/year) and Storm Event (2/year)
OC011is	Abernethy Creek at 316 17th St (17th at railroad trestle)	Grab & Composite	4/year	Dry Weather (2/year) and Storm Event (2/year)
OC012is	Coffee Creek behind 415 S McLoughlin (outfall at Willamette)	Grab & Composite	4/year	Dry Weather (2/year) and Storm Event (2/year)
OC013is	Park Place Creek behind 13530 Redland Rd	Grab & Composite	4/year	Dry Weather (2/year) and Storm Event (2/year)
OC014is	Singer Creek at the north end of Singer Creek Park (Linn Ave)	Grab & Composite	4/year	Dry Weather (2/year) and Storm Event (2/year)
OC015is	Singer Creek 502 7th St (MH - 37138 located on Center St)	Grab & Composite	4/year	Dry Weather (2/year) and Storm Event (2/year)
Outfall Monitoring				
OC006ofm	Clackamas River at O.C. Shopping Center	Composite	3/year	Storm Event
OC007ofm	Clackamas River at Clackamette Cove	Composite	3/year	Storm Event

5.0 Overview of Planning and Land Use Changes, UGB Expansions and New Development Activities

5.1 Summary of Land-Use Changes and UGB Expansions

The following land use/ zoning change was approved between July 1, 2016 and June 30, 2017:

- Zone Changes:
 - o ZC 16-01: 35.65 Acres rezoned from Clackamas County FU-10 (Future Urban – 10 Acre) to R-10 Single Family Residential
- Annexations:
 - o AN 16-01, AN 16-02: Two single family residential lots
 - o AN 16-03: 117 Acres Urban FU-10 Zoning
 - o AN 16-04: 35.65 Acres proposed for R-10 Single Family Residential

5.2 Summary of Development Activities within the UGB

During the reporting year 2016 – 2017, there were 42 development applications reviewed and approved for compliance with water quality/water quantity standards. These included detailed development plans (7), site plan and design review (13), subdivisions (8), minor partitions (4), geologic hazard development (8), and concept plans (2). Estimated total new and replaced impervious surface area related to development projects that commenced during the reporting year equals 21.23 acres.

There were four public improvement projects (CIPs), including water quality and/or flow control projects, for this reporting period. All four were constructed in-house. Details of these projects can be found in Appendix A.

6.0 Additional Activities

The following stormwater-related activities occurred within the City and are not currently documented in Appendix A.

Schedule A.4.e – Public Involvement and Participation

The final draft of the CCCSMP was posted on the city website for public review from November 9, 2016 through November 23, 2016. No comments were received.

Oregon City's NPDES MS4 Permit Renewal Application was posted on the city website for public review from January 13, 2017 through February 13, 2017. No comments were received.

The final draft of Oregon City's 2016 – 2017 Annual Report was posted on the city website for public review from October 11, 2017 through October 24, 2017. No comments were received.

BMP 4-5 – Ensure Municipal Staff Training in Stormwater Pollution Prevention

There were seven stormwater staff meetings conducted during the 2016 – 2017 reporting period. Dates, topics, and attendees are summarized below in Table 4.

Table 4 – Staff Meetings and Training

Date/Time	Attendees	BMP's /Topics	Items Discussed	Next Steps/Program Adjustments
8/11/16	Aleta Froman-Goodrich, Bob Knorr, Mario de la Rosa, Wendy Marshall, from Brown and Caldwell (B&C) Alissa Maxwell	Stormwater Design Standards Implementation Workshop	Post-construction stormwater requirements and City review and approval process	Continue with Implementation of updated design standards.
11/8/16 3:00-5:30	Jonathan Archibald, John Lewis, Aleta Froman-Goodrich, Eric Hand, Tom Morisette, Gail Johnson, Mario de la Rosa, from B&C Alissa Maxwell, Ryan Retzlaff, Matt Grzegorzewski	Stormwater Master Plan CIP Strategy Workshop	Modeled flooding – replicate real experiences? Project list inclusive of highest priority areas? Designate CIP projects and programmatic efforts	City staff to review potential project matrix and begin initial prioritization. B&C to update model with discussion results.
11/22/16 1:00-3:00	Martin Montalvo, Gail Johnson, Chris Dunlop, from B&C Krista Reininga, Alissa Maxwell	NPDES Permit Renewal	Mapping requirements SWMP modifications MEP	Reviewed 2008 renewal package, gave direction to Chris for maps needed for 2017 renewal package; reviewed SWMP and listed desired modifications; quick overview of MEP evaluation requirements. B&C to draft docs for Oregon City review.
1/18/17 8:30 – 9:30	Martin Montalvo, Gail Johnson, Kris Hikari (Friends of Trees)	TMDL	Partnership for outreach to private property owners for TMDL tree planting, with initial focus on areas near cold water refugia.	Kris to supply proposal with cost estimate. OC to get current ownership data (from GIS) and possible lidar imaging to update maps.
1/25/17	Jonathan Archibald, Eric Hand, Tom Morisette, John Lewis, Aleta Froman-Goodrich, from B&C Alissa Maxwell, Ryan Retzlaff	Stormwater Master Plan Update	Stormwater pollution prevention capital projects and priorities	Continue work on master plan update.

Table 4 – Staff Meetings and Training

Date/Time	Attendees	BMP's /Topics	Items Discussed	Next Steps/Program Adjustments
5/8/17	Jonathan Archibald, John Lewis, Martin Montalvo, Aleta Froman-Goodrich, Eric Hand, from B&C Ryan Retzlaff, Krista Reininga	Stormwater Master Plan Update	Stormwater pollution prevention capital projects and priorities	Continue work on master plan update.
6/19/17 3:00 – 3:30	Eric Hand, Gail Johnson, Tom Morisette, Rick Brown, Chuck Finnegan, Chad Renhard, Patrick Armstrong, David Batten, Brian Monnin	Private Water Quality Facilities Inspection & Maintenance (PWQF) Program Update (BMP 8-4)	PWQF Standard Operating Procedure was updated in April 2017. Reviewed program elements with Water Quality and Storm/Sewer staff.	Staff to be alert for maintenance issues in PWQF around Oregon City; report to water quality staff, manager, or lead.

Appendix A

Oregon City SWMP Implementation Status

Key to Pollutant Symbols: A full circle (●) indicates the BMP is expected to address the parameter. An empty circle (○) indicates the BMP may be expected to address the parameter. A blank cell indicates that the effect of the BMP is unknown at this time.

Appendix A. Status of Implementing Components of Oregon City's 2012 Stormwater Management Plan (SWMP)							
BMP or activity	Addresses bacteria?	Addresses mercury?	Responsible department	Measurable goals (2012 SWMP)	Tracking measures (2012 SWMP)	Annual report information: tracking measure status, Permit year 2016 – 2017	Additional detail related to activities conducted
Element 1. Illicit Discharge Detection and Elimination							
BMP 1-1: Implement the Illicit Discharge Elimination Program	●	●	Oregon City Public Works Department (OCPW)	- Document and implement updated Standard Operating Procedures (SOPs) for the Illicit Discharge Detection and Elimination (IDDE) Program by November 1, 2012. - Conduct actions to remove identified illicit discharges in conjunction with timeframes outlined in OC's NPDES MS4 Permit. - Track and record all identified illicit discharges and how such discharges were removed.	- Track status of documenting and updating the IDDE SOP. - Track the number, location, type of discharge, resolution, and enforcement action for any illicit discharge investigation conducted.	- The IDDE SOP was updated on 7/29/16 (see BMP 1-2, item 5). - No illicit discharge investigations were deemed necessary as a result of annual dry weather field screening conducted during this reporting period.	OC developed an IDDE SOP (effective date: November 1, 2012), in conjunction with other Clackamas County co-permittees. The SOP includes guidelines for identification and enforcement of illicit discharges.
BMP 1-2: Conduct Annual Dry Weather Field Screening	○	○	OCPW	- Conduct dry-weather field screening once per year, at a minimum, at major outfalls. - Characterize dry weather flows as permissible, non-permissible, or unknown. - Conduct sampling, analysis, and investigations for non-permissible and unknown dry weather discharges. - Maintain maps of major outfalls and dry weather field screening locations. - Notify the OCPW Operations Manager of all identified illicit discharges and take necessary steps to eliminate them. - Update procedures for dry weather field screening by November 1, 2012.	- Track the number and location of outfalls inspected annually. - Summarize inspection results and track the number and location of outfalls requiring monitoring and/or investigations. - Report the outcome and resolution of any investigation activities. - Report the outcome and resolution of any code enforcement actions. - Track the status of updating standard procedures.	- Nine outfalls were inspected as part of annual dry weather field screening activities. - Outfalls were inspected on 8/16/16. Flow was observed at one of the outfalls; discharge, a trickle, was characterized as permissible. - N/A - N/A - On 7/29/16 OC updated the IDDE SOP that includes procedures for conducting dry weather field screening. Priority sites 1 and 2 were relocated to address staff safety concerns. One site was added (site 9) as a result of a reported illicit discharge.	- Dry weather screening was conducted at the following outfalls: 99E and 6th Street (manhole 33556): 12-inch 427 Main Street (manhole 33558): 15-inch - Abernethy Road at Tri-Lett: 15-inch - Clackamas River Drive: 48-inch - Metro Wetlands Pond: 48-inch - Falcon Drive: 30-inch - Berry Hill: 24-inch - Beavercreek at Hwy 213: 24-inch - Behind 1651 Beavercreek Road: 48-inch
BMP 1-3: Implement the Spill Response Program	○	○	Clackamas Fire District #1 (Hazardous Materials Team) and OCPW	- Respond to reports of hazardous and non-hazardous spills and follow the OC <i>Spill Response Plan</i>. - Report all hazardous and non-hazardous spills to DEQ as necessary.	- Indicate the number of spills reported to OCPW and DEQ. - Track responses to reported spills. - Indicate sources, causes, and types of discharges resulting from spill activities. - Track any changes to the OC <i>Spill Response Plan</i>.	- Twelve spills were reported to OCPW during the 2016-2017 reporting period. - Responses were appropriate for each spill. See list below. - One spill required DEQ reporting. Eleven spills were considered minor (non-reported) resulting primarily from vehicle accidents, mechanical failure, or materials spilled on roadway and had no discharge to receiving waters. - Stormwater quality pond, 1328 Josephine St. – oily sheen observed on pond. Spilled product unknown, amount unknown; likely diesel from concrete forms related to new homes being constructed up stream. OCPW responded and deployed absorbent booms and pads, performed upstream inspections; no responsible party was determined. Spill was reported to DEQ. - Four spills regarding fuel and oil sheen on roadway - cleaning with absorbent material, sweeping, and proper disposal. All were minor and none required DEQ reporting. - Six spills regarding gravel or debris spilled on roadway. All were minor and none required DEQ reporting. - One spill regarding soap-laden mop bucket dumped into a catch basin; minor and did not require DEQ reporting. - There were no changes to the OC <i>Spill Response Plan</i> during this reporting period.	
Element 2. Industrial and Commercial Facilities							
BMP 2-1: Screen Existing and New Industrial Facilities	○	○	OCPW	- Review the business license inventory for 1200Z industries once over the permit term. - Notify DEQ of any existing or new industrial facilities within OC that may be subject to an industrial stormwater NPDES permit.	Track the number of existing or new facilities subject to a stormwater industrial NPDES permit during the permit term.	The Water Quality Coordinator continued to review all new business license applications for potential water quality-related issues. 125 business license applications were reviewed during the 2016-2017 reporting period. The screening did not identify any additional facilities potentially subject to an industrial stormwater permit.	DEQ provided additional guidance on industrial facility screening in June 2013. OC's consultant has coordinated with DEQ related to the methodology and process for identifying "potential" 1200-Z permittees.
BMP 2-2: Implement an Industrial/Commercial Inspection Program for High Priority Facilities	○	○	OCPW	- Pursue approval to hire staff to implement a business inspection program. - Develop a priority list of industrial/commercial facilities for inspection.	- Track the number of inspections conducted. - Report on inspection results and follow up actions.	- One inspection (two businesses at same location) was conducted during the 2016-2017 reporting period. - Inspection of Unobtanium Inc & DB Steel, 1800 Main Street, occurred on 3/23/17. One issue noted – spent sand from sandblasting activities was stored outdoors awaiting recycling. Owner to fabricate a covered storage container. OC will do follow-up visit prior to wet season to ensure sand is appropriately protected.	- OC has not hired additional staff to implement the business inspection program. - OC developed an Industrial/Commercial Facility Inspection Program SOP July 1, 2013. The SOP includes procedures and guidelines related to facility screening, DEQ

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Appendix A. Status of Implementing Components of Oregon City's 2012 Stormwater Management Plan (SWMP)							
BMP or activity	Addresses bacteria?	Addresses mercury?	Responsible department	Measurable goals (2012 SWMP)	Tracking measures (2012 SWMP)	Annual report information: tracking measure status, Permit year 2016 – 2017	Additional detail related to activities conducted
				- Investigate 25% of OC's manufacturing businesses once during the permit term. - Develop an industrial/commercial inspection procedure by July 1, 2013.	3) Report on status of documenting and updating procedures.	3) Table 2 of the Industrial/Commercial Facility Inspection Program SOP was updated January 2017 to reflect current Oregon City manufacturing-related business license holders. The 2013 Table 2 identified 31 facilities. The updated table identifies 36 manufacturing businesses potentially subject to inspection.	notification of potential industrial stormwater permit needs, and high pollutant source facility inspections. OC investigated more than 25% of manufacturing businesses once during the permit term.
Element 3. Construction Site Runoff Control							
BMP 3-1: Implement the Erosion Control Ordinances	●	○	OCPW	- Review erosion control plans for all developments greater than 1,000 square feet. - Require erosion and sediment control plans not in compliance with standards to be amended and approved prior to construction. - By November 1, 2014, adopt the Clackamas County <i>Erosion Control Manual</i> or revise OC's manual in accordance with the NPDES MS4 permit requirements.	1) Record the number of erosion control plan reviews completed and approved. 2) Track the number of erosion control permits issued annually. 3) Report on the status of adopting the Clackamas manual or updating OC's manual.	1) 147 erosion control plans were reviewed and approved. 2) 147 erosion control permits were issued. 3) OC has adopted the Clackamas County <i>Erosion Control Manual</i> , in conjunction with its update of the City's <i>Stormwater and Grading Design Standards</i> manual.	
BMP 3-2: Provide Educational Information to Construction Site Operators	○	○	OCPW	- Continue to provide OC's most current erosion control manual on OC website. - Continue to offer discounts on erosion control permits to contractors completing the Erosion Control Certification Program.	1) Track the number of contractors receiving a discount on erosion control permit fees.	1) One contractor received a discount on permit fees.	
BMP 3-3: Conduct Erosion Control Inspections	●	○	OCPW	- Conduct a minimum of three erosion control inspections at each permitted site. - Conduct appropriate enforcement activities for erosion control violations.	1) Record the number of erosion control inspections conducted annually. 2) Report the number of notices of non-compliance issued during inspections.	1) A total of 583 erosion control inspections were conducted this permit year. Due to the time frames with which construction occurs, some sites had all three required inspections, and some sites have only had one or two inspections at this time (construction is still ongoing). 2) 20 notices of non-compliance were issued. Ten stop work orders were issued.	1) The total number of inspections are comprised of: 187 initial site visits, Inspection 1 187 random inspections, Inspection 2 209 final inspections, Inspection 3
Element 4. Education and Outreach							
BMP 4-1: Provide Public Education and Outreach Materials Regarding Stormwater Management	○	○	OCPW	- Include a water quality related article in each City newsletter, distributed to citizens three times per year. - Participate in the Regional Coalition for Clean Rivers and Streams (Coalition). - Seek out opportunities to partner with other agencies/jurisdictions/organizations to educate and promote watershed health and low impact development. - Periodically install signs near water quality structures and around OC promoting water quality. - Sponsor the volunteer catch basin stenciling program. - Distribute an annual water quality report to OC residents.	1) Track the number, types, and topics of public educational materials distributed to the public. 2) Report any large scale public educational campaigns initiated during a given year. 3) Track coordinated public outreach activities with other permittees.	1) The following educational activities were conducted (see Appendix C for details): - A total of five water quality-related articles were included in Trail News. - OC participated in one special event and promoted a second one on the city website. - The March 2017 utility bill included a message about picking up after pets. - Mailed 14,686 postcards announcing availability of the Annual Water Quality Report on OC's website. - Stormwater banner displayed at City Hall (6/20/17 – 7/3/17). 2) No large scale public educational campaigns were initiated. 3) Coordinated efforts included: - Continued to sponsor the “Water...Do Your Part” campaign via KOIN media outlets. - Continued participation in the Coalition for Clean Rivers and Streams. - Continued participation with other agencies to promote water quality education through Clackamas River Water Providers.	OC continues to conduct catch basin marking and stenciling to increase public awareness. During this reporting period 480 catch basins were either stenciled with the message “Dump No Waste – Drains to Stream” or had “No Dumping, Drains to Waterway” markers installed.
BMP 4-2: Participate in a Public Education Effectiveness Evaluation	○	○	OCPW	Coordinate with other local, Phase I jurisdictions in providing/compiling information regarding a public education effectiveness evaluation by July 1, 2015.	1) Report on activities conducted annually.	1) OC submitted a Public Education Effectiveness Evaluation Summary to DEQ on June 29, 2015.	The Association of Clean Water Agencies (ACWA) Stormwater Committee completed a coordinated effort to compile existing educational survey information and develop conclusions to inform how public education efforts result in behavioral change. The study was conducted by DHM Consulting with cost shared among interested Phase I and Phase II communities, including OC.
BMP 4-3: Conduct Staff Training for Pest Management	○	○	OCPW and Parks	- Ensure OCPW and Parks Dept. staff conducting pest management activities are certified for spraying activities according to OSHA requirements. - Ensure licensed staff attends annual refresher courses.	1) Track the number of employees licensed for spraying activities. 2) Report number of employees that attended initial or refresher training.	1) Staff licensed for spraying activities: OCPW = 6; Parks Dept. = 3 2) Three OCPW staff and three Parks Department staff attended refresher training classes during the reporting period.	Annual refresher training is not required. OCPW and Parks Department staff attend refresher training per requirements of their licensing.
BMP 4-4:	○	○	OCPW	Provide non-hazardous spill response training annually through monthly safety meetings.	1) Track spill-related training and education.	1) Spill response training was conducted on July 19, 2016 and February 21, 2017.	

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Appendix A. Status of Implementing Components of Oregon City's 2012 Stormwater Management Plan (SWMP)							
BMP or activity	Addresses bacteria?	Addresses mercury?	Responsible department	Measurable goals (2012 SWMP)	Tracking measures (2012 SWMP)	Annual report information: tracking measure status, Permit year 2016 – 2017	Additional detail related to activities conducted
Conduct Staff Training in Spill Response				Coordinate annual training and refresher courses for staff initially responding to spills using OSHA hazardous materials educational resources.			
BMP 4-5: Ensure Municipal Staff Training in Stormwater Pollution Prevention	○	○	OCPW	- Conduct municipal training for employees associated with stormwater management in OC. - Coordinate with other Clackamas County co-permittees regarding regional water quality efforts. - Participate in training and advisory committee opportunities available through state and local agencies and groups. - Conduct regular stormwater staff meetings once or twice a year.	- Track the number of employees receiving training in stormwater management annually. - Track OC staff participation in groups, committees, and organizations relevant to stormwater quality management. - Track regular stormwater staff meetings and staff attendance at those meetings.	- OCPW Employees receiving training in stormwater management: - Three employees attended APWA Conferences (10/11/16 & 4/10-13/17) - Two employees attended ESC training (12/13/16 & 1/24/17) - One employee completed online ESC sessions per certification requirements (12/19-20/16) - One employee attended Urban Pest Management/IPM training (2/1/17) - Two employees attended Vegetated Private Water Quality Management (6/21-22/17) - OC staff participates in the following groups and organizations: - ACWA - active participant in the ACWA Stormwater committee and Phase I Stormwater subcommittee - Continued collaboration with other co-permittees on Comprehensive Clackamas Stormwater Monitoring Program - Greater Oregon City Watershed Council - Clackamas County Water Education Team - Regional Coalition for Clean Rivers and Streams - There were seven stormwater staff meetings conducted during the 2016-2017 reporting period.	3) Dates, topics, and attendees are summarized in Table 4 in Section 6.0 of the annual report.
Element 6. Post-Construction Site Runoff							
BMP 6-1: Implement Municipal Construction Standards	●	●	OC Community Development	Per OC's Development Code, review all new development and applicable redevelopment for conformance with current city stormwater standards and ordinances.	- Track the number of development applications reviewed and approved for compliance with stormwater regulations. - Track the number, type, and drainage area of treatment facilities constructed annually.	42 development applications were reviewed and approved for compliance with water quality/water quantity standards. For applications that proceed to the construction phase all constructed treatment facilities will be noted in the appropriate reporting period. - Four public treatment/detention facilities were constructed, one public existing regional treatment/detention facility was reconstructed and enlarged; one private infiltration swale; several public street-side vegetated swales; four private soaker trench infiltrators; two private StormTech Chambers; two rain garden treatment facilities (one public); two private treatment/detention facilities; one private Contech water quality manhole; one private Contech Filter System; and 10 Trap and Siphon Catch Basins were constructed during the reporting period of 7/1/2016 through 6/30/2017: - Total drainage area = 40.8 acres	- Details of treatment facility construction: - TP 14-06 Small Slopes Subdivision (8-Lot Subdivision): Public newly constructed treatment/detention facility, all stormwater drainage inlet basins are sumped; - TP 15-02 Boulder Run (19-Lot Subdivision): Public newly constructed treatment/detention facility, all stormwater drainage inlet basins are sumped; - TP 15-03 Pavilion Park III (25-Lot Subdivision): Public newly re-constructed and enlarged treatment/detention facility, all stormwater drainage inlet basins are sumped; - TP 15-05 Lucille Riggs Landing (32-Lot Subdivision): Public newly constructed treatment/detention facility, all stormwater drainage inlet basins are sumped; - TP 15-07 Ed's Orchard (41-Lot Subdivision): Public newly constructed treatment/detention facility, all stormwater drainage inlet basins are sumped; - MP 13-01 Hunter Ave Partition (3-Lot Partition): Private newly constructed one Infiltration Swale, and two future StormTech Chambers when new single family houses constructed; - MP 15-01 Woodlawn Partition (3-Lot): Public newly constructed several street-side vegetated swales, all stormwater drainage inlet basins are sumped; - SP 13-03 Swan 4-Plex (Site Plan): Private newly constructed four private soaker trench infiltrators; - SP 13-06 Royal Flush Plumbing (Site Plan): Private two newly constructed StormTech Chambers and one vegetated swale;

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							- SP 15-02 Carnegie Library Expansion (Site Plan): City of Oregon City, one newly constructed vegetated planter; - DP 14-04 Oregon City School District Transportation Maintenance Facility (Detailed Development Plan): Private newly constructed two treatment/detention facilities, one Contech water quality manhole, one Contech Filter System, 10 Trap and Siphon Catch Basins, all stormwater drainage inlet basins are sumped; - DP 16-02 Hilltop Retail Building Commercial Site (Detailed Development Plan): Private newly constructed vegetated planter, all stormwater drainage inlet basins are sumped.
BMP 6-2: Review and Update Code and Development Standards related to Stormwater Quality Control	●	●	OC Community Development	- Review OC's current/planned stormwater treatment and detention standards for compliance with new NPDES MS4 permit language. - Review OC's current public works development code provisions to ensure that applicable barriers to LID or green infrastructure (GI) are minimized and eliminated where practicable. - If necessary, update OC's post-construction stormwater design standards and code language by November 1, 2014.	- Track progress related to review of OC's code and development standards per provisions in the NPDES MS4 permit. - Track any code/standards modifications made by ordinance.	- The update has been completed to OC's <i>Stormwater and Grading Design Standards</i> to meet the current NPDES MS4 permit language. The update prioritizes the use of LID and GI to the maximum extent practicable and addresses flow duration. - OC reviewed and updated the Oregon City Municipal Code Chapter 13.12 Stormwater Management, the <i>Stormwater and Grading Design Standards</i> manual, and the <i>Erosion and Sediment Control Standards</i> manual. The updated manuals were adopted through Resolution 15-14 and the associated municipal code update was adopted by Ordinance 15-1006 on May 20, 2015. No modifications were made during this reporting period.	
Element 7. Pollution Prevention for Municipal Operations							
BMP 7-1: Conduct Street Sweeping and Roadway Repair Activities	●	●	OCPW	Sweep city streets every 3-4 months on average, more frequently in high traffic areas and during leaf pick up and following deicing activities.	- Track the average number of citywide sweeps per year. - Estimate the miles of streets swept per year. - Track volume of debris removed.	7.07 city-wide sweeps were conducted for this reporting period. - During the 2016-2017 reporting period, 5,285 miles of roadway were swept. 1,628 cubic yards of debris were removed as a result of sweeping and leaf pickup activity.	
BMP 7-2: Minimize Pollutant Discharges Associated with Landscape Management Practices	○	○	OCPW and Parks	- All chemical applicators, both contractor and city, must follow state laws related to the use of pesticides. - Applicators will complete spray reports for the application of chemicals.	Track any program changes regarding chemical application practices used by OC.	Both city and contracted chemical applicators comply with 2300-A, pesticide general permit requirements. Pesticide applications are kept at least three feet away from any water's edge. There were no program changes regarding chemical application practices used by OC.	
BMP 7-3: Implement a Program to Reduce the Impact of Stormwater Runoff from Municipal Facilities	○	○	OCPW	- By July 1, 2013, inventory municipal facilities subject to this permit requirement. - By July 1, 2013, identify whether there is a need for additional strategies to minimize discharge from these facilities.	Track updates to strategies used to minimize pollutant discharge from municipal waste storage facilities	OC developed a Stormwater Pollution Prevention Strategy document for municipal operations (SWPPS) July 1, 2013. The SWPPS includes a description of each of OC's six facilities that treat, store, or transport municipal waste. Additionally, it identifies potential pollutant sources as well as short and long term pollution reduction strategies. OC discontinued use of two facilities identified in the 2013 SWPPS due to the sites being sold and developed. One new replacement site was identified in May 2017. The SWPPS will be updated during the 2017-2018 reporting period to reflect these changes.	
BMP 7-4: Control Infiltration and Cross Connections to the City's Stormwater Conveyance System	●		OCPW	- Review new and redevelopment for possible cross-connections. - Eliminate cross connections upon identification.	Report whether any cross connections were discovered and describe follow up activities.	No cross connections were discovered during this reporting period.	- Dye tests are performed by OCPW upon request from plumbing inspector if there are questions regarding sewer connections. - New construction storm and sanitary stub out standards have been revised – sanitary remains 4-inch-diameter pipe, storm was increased to 6-inch-diameter pipe to avoid confusion in future.

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							Routine storm sewer video inspection continues and cross-connections are repaired when identified.
BMP 7-5: Coordinate with Local Fire Department related to Pollutant Discharge from Fire Fighting Training Activities			OCPW	- By November 1, 2012, contact Clackamas Fire District #1 to determine what activities are conducted to minimize pollutant discharges associated with firefighting training activities. - As applicable, provide educational information to Clackamas Fire District #1 by November 1, 2012.	1) Track contacts made with Clackamas Fire District #1.	1) No contacts were made during this reporting period.	On 9/12/12 OC's Water Quality Coordinator contacted Clackamas Fire District #1 to discuss firefighting training activities conducted in OC. Per an email dated 9/13/12 the Battalion Chief for Training & Safety confirmed that all foam drills were conducted at their primary training facility in Clackamas. Any training activities at the four OC stations use water only.
BMP 7-6: Conduct Master Planning and Implement Capital Projects for Stormwater Quality Enhancement	●	●	OCPW	- The <i>Citywide Master Plan</i> will be updated by the end of the permit term. - Prioritize CIPs by funding availability and water quality/flood control benefit. - Update maps to include location and drainage area of any new stormwater quality CIPs.	1) Track master planning activities. 2) Track number and cost of major (water quality) CIP projects and discuss added benefit. 3) Map the location and drainage area of water quality related CIPs.	1) The update to OC's <i>City-wide Drainage Master Plan</i> continues with the assistance of a consultant. Project prioritization workshops and public outreach events were conducted during the 2016 – 2017 reporting period. The master plan is substantially complete and awaiting City review and approval. 2) A total of four water quality-related CIP projects were constructed during this reporting period. - All four projects were completed in-house, for a total cost of \$55,000. 3) Mapping: - The in-house CIP projects have been mapped.	2) Following are details of the in-house CIP projects completed during this reporting period: Installed 8 sumped catch basins (water quality benefit), 2 MHs, and 90 feet of pipe; repurposed 495 feet of 6" water line to storm line (flood control and maintenance benefit).
Element 8. Stormwater Management Facilities Operation and Maintenance							
BMP 8-1: Conduct Stormwater Conveyance System Cleaning and Maintenance	●	●	OCPW	- Maintain, repair, and/or replace conveyance system components when needed, based on ongoing inspections. - Update the stormwater system map when discrepancies are found.	1) Estimation of the volume of debris removed per year during public conveyance system cleaning activities (in conjunction with BMP 8-2).	See BMP 8-2.	
BMP 8-2: Conduct Catch Basin Cleaning and Maintenance	●	●	OCPW	- Inspect at least 33% of the public catch basins annually. - Schedule the repair, and replacement of catch basins as needed, based on inspections. - Update the stormwater system map when discrepancies are found.	1) Track the percentage of total public catch basins inspected and/or maintained annually. 2) Track the volume of sediment removed during cleaning activities conducted annually (also includes volume from BMP 8-1). 3) Track the number of catch basin replacements annually. 4) Track the number of public catch basins added to OC's catch basin inventory annually.	1) 36% of public catch basins were maintained during this reporting period. 2) 160 cubic yards of sediment were removed (includes sediment from pipes, culverts, manholes, open channels, and catch basins). 3) Three catch basins were replaced. Seven catch basins repaired. 4) Eight catch basins were added to, and two catch basins were removed from, OC's inventory.	36% = 1,579 public catch basins
BMP 8-3: Public Structural Control Facility Cleaning and Maintenance	●	●	OCPW	- Inspect and maintain public structural control facilities in accordance with documented frequencies and procedures. - Update the public structural control facility inventory as needed. - Update the stormwater system map in accordance with new public facility installations and when discrepancies are found.	1) Track the number of public structural facilities inspected and maintained. 2) Track the volume of sediment removed during cleaning. 3) Track changes to the public structural control facility inventory as needed.	1) 272 public structural facilities and 20,992 square feet of bioswale were inspected during the reporting period. (Bioswale reporting was changed from lineal footage to square footage this year for ease of reporting). See the next column for maintenance details. 2) 25 cubic yards of sediment were removed during maintenance/cleaning. 3) Additional public structural facilities added to inventory: Added 7 stormwater quality ponds	1) The following public structural facilities were inspected and maintained during the reporting period: - ponds = 84 inspected; 84 maintained - bioswales = 20,992 sq ft maintained - rain gardens = 3 inspected; 3 maintained - detention pipes = 27 inspected; 3 cleaned - water quality vaults = 4 inspected; no maintenance required - pollution control/flow control manholes = 154 inspected; 47 cleaned

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BMP 8-4: Private Structural Control Facility Cleaning and Maintenance	●	●	OCPW	- Require new private water quality facilities to submit maintenance agreements to OC. - Compile an inventory of existing private structural water quality facilities and work to collect maintenance agreements for these by July 1, 2013. - Implement an inspection strategy for private water quality facilities by July 1, 2013.	- Track the number of maintenance agreements submitted to OC each year. - Track progress related to the inventory and mapping of existing private structural facilities. - Track the status of updating the inventory and map of private water quality facilities. - Track the status of developing procedures in accordance with permit requirements.	- OC continues to require maintenance agreements for private water quality facilities. Two maintenance agreements were received during this reporting period. - Files have been reviewed for existing private structural facilities. An inventory list has been created. - Initial mapping is complete; refinements ongoing. - OC developed SOPs for public water quality facilities and private water quality facilities July 1, 2013. The SOPs outline procedures for ongoing mapping and inventory activities, as well as facility inspections. For private facilities, OC requires a maintenance agreement and submission of annual inspection records.	- The following are details for the newly constructed private water quality facilities: - DP 14-04 Oregon City School District Transportation Maintenance Facility (Detailed Development Plan): Private newly constructed two treatment/detention facilities, one Contech water quality manhole, one Contech Filter System, 10 Trap and Siphon Catch Basins, all stormwater drainage inlet basins are sumped; - SP 13-03 Swan 4-Plex (Site Plan): Private newly constructed four private soaker trench infiltrators. - The SOP for private water quality facilities was reviewed and minor adjustments made (April 28, 2017) to better align terminology with the updated Maintenance Covenant and Access Easement. Stormwater staff training was held June 19, 2017.

Appendix B

Oregon City Monitoring Data

Outfall Monitoring - Oregon City 2016 - 2017									
Location - Oregon City Shopping Center									
Sample Site # OC006									
Stream Name - Clackamas River									
Land Use - Commercial									
		Results							
		Composite Rain Event 1/18/2017	Composite Rain Event 2/8/2017	Composite Rain Event 3/24/2017	Composite Rain Event 4/24/2017	Statistics			Notes
Analysis	Units					High	Low	Mean	
Total Phosphate Seal	mg/L	0.21	0.14	0.06	0.07	0.21	0.06	0.12	(1)
Dissolved Oxygen - Winkler	mg/L	10	10	8.8	7.5	10.0	7.5	9.1	
Dissolved Oxygen - Field	mg/L	11.88	11.42	9.95	9.19	11.88	9.19	10.61	
Dissolved Oxygen - Field	% Saturation	93.1	91.9	90.5	87.1	93.1	87.1	90.7	
Conductivity - Field	µS/cm	99.1	50.9	41.1	62.9	99.1	41.1	63.5	
Temperature - Field	°C	4.2	5.8	11.1	12.6	12.6	4.2	8.4	(2)
pH - Field	Std Units	7.16	7.02	6.62	6.85	7.16	6.62	6.91	
Dissolved Copper	µg/L	2.71	1.89	1.94	2.43	2.71	1.89	2.24	
Copper	µg/L	9.88	9.40	5.72	4	9.88	4.00	7.25	
Dissolved Lead	µg/L	<0.2	<0.2	<0.2	<0.2	ND	ND	ND	
Lead	µg/L	3.9	3.92	2.66	2.37	3.92	2.37	3.21	(3)(4)
Dissolved Zinc	µg/L	55.7	42.5	28.8	29.4	55.7	28.8	39.1	
Zinc	µg/L	77.5	58.4	42.4	36.9	77.5	36.9	53.8	
E. coli - Colilert	MPN/100mL	365	649	727	2421	2421	365	1041	
Ammonia Nitrogen Low Seal	mg/L	<0.1	0.2	<0.1	0.1	0.2	ND	0.1	
Nitrate-Nitrite	mg/L	0.1739	0.0621	<0.01	0.224	0.2240	ND	0.1	(2)
Ortho Phosphate Seal	mg/L	0.353	0.15	0.118	<0.1	0.353	ND	0.2	(2)
Total Dissolved Solids	mg/L	80	23	26	38	80	23	42	(2)
Total Solids	mg/L	110	110	30	50	110	30	75	
Total Suspended Solids	mg/L	50	32	20	10	50	10	28	
Volatile Solids	mg/L	30	20	30	20	30	20	25	
Hardness	mg/L	28	8.4	8	15.6	28.0	8.0	15.0	
BOD	mg/L	4	2	<2	3	4	ND	2.3	(2)
Storm Event Rainfall	Inches	1.12	0.26	0.69	0.41	N/A	N/A	N/A	(2)(5)

Notes:

(1) Dissolved Oxygen (Winkler Method) samples are taken once per sampling event as QA/QC for electronic meter.

(2) Per DEQ request, an "ND" designation is understood to be "less than the lower reporting limit" and treated as 0 for calculations. N/A is Not Applicable. NM is Not Measured.

(3) MPN = Most Probable Number

(4) Shading indicates samples that exceed the E. coli standard of 406 MPN/100mL.

(5) Rainfall totals from the start of the event through sample collection.

Outfall Monitoring - Oregon City 2016 - 2017									
Location - Clackamette Cove									
Sample Site # OC007									
Stream Name - Clackamas River									
Land Use - Industrial									
		Results							
		Composite Rain Event 1/18/2017	Composite Rain Event 2/8/2017	Composite Rain Event 3/24/2017	Composite Rain Event 4/24/2017	Statistics			Notes
Analysis	Units					High	Low	Mean	
Total Phosphate Seal	mg/L	0.51	1.98	0.12	0.42	1.98	0.12	0.8	(2)
Dissolved Oxygen - Winkler	mg/L	N/M	N/M	N/M	N/M	N/M	N/M	N/M	
Dissolved Oxygen - Field	mg/L	11.97	8.98	8.03	10.2	11.97	8.03	9.80	
Dissolved Oxygen - Field	% Saturation	89.2	71.9	71.6	90.7	90.7	71.6	80.9	
Conductivity - Field	µS/cm	293	176.1	209.6	239	293.0	176.1	229.4	
Temperature - Field	°C	2.3	5.6	10.6	10.7	10.7	2.3	7.3	
pH - Field	Std Units	10.19	7.53	7	8.43	10.19	7.00	8.29	
Dissolved Copper	µg/L	18.5	5.18	2.44	4.86	18.50	2.44	7.75	(2)
Copper	µg/L	31.7	49.70	5.39	15.8	49.7	5.39	25.65	
Dissolved Lead	µg/L	<0.2	<0.2	<0.2	<0.2	ND	ND	ND	
Lead	µg/L	4.34	12.7	1.4	4.33	12.70	1.40	5.69	
Dissolved Zinc	µg/L	17.5	23.2	41.5	9.59	41.50	9.59	22.95	
Zinc	µg/L	28	122	35.5	36.6	122.0	28.0	55.5	
E. coli - Colilert	MPN/100mL	1	980	2421	86	2421	1	872	
Ammonia Nitrogen Low Seal	mg/L	0.4	0.6	0.3	0.3	0.6	0.3	0.4	(2)
Nitrate-Nitrite	mg/L	0.352	0.5574	0.52	0.2787	0.5574	0.2787	0.4270	
Ortho Phosphate Seal	mg/L	<0.1	<0.1	0.123	<0.1	0.123	ND	0.031	
Total Dissolved Solids	mg/L	210	140	121	164	210	121	159	
Total Solids	mg/L	380	1300	170	340	1300	170	548	
Total Suspended Solids	mg/L	250	1170	20	191	1170	20	408	
Volatile Solids	mg/L	130	90	30	30	130	30	70	
Hardness	mg/L	110	66	86	126	126	66	97	(2)(5)
BOD	mg/L	20	2	4	4	20	2	8	
Storm Event Rainfall	Inches	1.12	0.26	0.69	0.41	N/A	N/A	N/A	

Notes:

(1) Dissolved Oxygen (Winkler Method) samples are taken once per sampling event as QA/QC for electronic meter.

(2) Per DEQ request, an "ND" designation is understood to be "less than the lower reporting limit" and treated as 0 for calculations. N/A is Not Applicable. NM is Not Measured.

(3) MPN = Most Probable Number

(4) Shading indicates samples that exceed the E. coli standard of 406 MPN/100mL.

(5) Rainfall totals from the start of the event through sample collection.

Instream Monitoring - Oregon City 2016 - 2017									
Location - 17082 Holly Ln (Holly Ln Bridge)									
Sample Site # OC010									
Stream Name - Abernethy Creek (Upstream)									
		Results							
		Grab Sample Dry Weather 8/24/2016	Composite Rain Event 10/20/2016	Composite Rain Event 2/15/2017	Grab Sample Dry Weather 5/22/2017	Statistics			Notes
Analysis	Units					High	Low	Mean	
Total Phosphate Seal	mg/L	0.18	0.1	0.09	0.08	0.18	0.08	0.11	(1)(2)
Dissolved Oxygen - Winkler	mg/L	5.8	8.7	N/M	N/M	8.7	5.8	7.3	
Dissolved Oxygen - Field	mg/L	7.85	9.89	11.24	9.70	11.24	7.85	9.67	
Dissolved Oxygen - Field	% Saturation	85.9	94.1	96.8	97.1	97.1	85.9	93.5	
Conductivity - Field	µS/cm	136.7	76.7	57.6	64.5	136.7	57.6	83.9	
Temperature - Field	°C	19.7	13.0	7.8	15.7	19.7	7.8	14.1	(2)
pH - Field	Std Units	7.30	6.5	7.30	7.28	7.30	6.50	7.10	
Dissolved Copper	µg/L	<1	<1	<1	<1	ND	ND	ND	
Copper	µg/L	4.37	2.8	3.26	1.58	4.37	1.58	3.00	
Dissolved Lead	µg/L	<0.2	<0.2	<0.2	<0.2	ND	ND	ND	
Lead	µg/L	0.71	1.1	0.99	0.44	1.10	0.44	0.81	(2)
Dissolved Zinc	µg/L	<4	<4	4.67	<4	4.67	ND	1.17	
Zinc	µg/L	5.29	9.25	10.7	6.3	10.70	5.29	7.89	(3)
E. coli - Colilert	MPN/100mL	74	101	120	111	120	74	102	
Ammonia Nitrogen Low Seal	mg/L	<0.1	<0.1	0.2	0.1	0.2	ND	0.1	(2)
Nitrate-Nitrite	mg/L	0.27	0.92	1.45	1.1	1.45	0.27	0.93	(2)
Ortho Phosphate Seal	mg/L	<0.1	<0.1	0.12	<0.1	0.12	ND	0.03	
Total Dissolved Solids	mg/L	123	67	55	52	123	52	74	
Total Solids	mg/L	140	20	70	50	140	20	70	
Total Suspended Solids	mg/L	12	12	45	15	45	12	21	
Volatile Solids	mg/L	10	<1	70	30	70	ND	37	(2)
Hardness	mg/L	54	26	18	24.8	54	18	31	
BOD	mg/L	<2	<2	<2	<2	ND	ND	ND	(2)
Storm Event Rainfall	Inches	N/A	0.41	0.56	N/A	N/A	N/A	N/A	(2)(5)

Notes:

(1) Dissolved Oxygen (Winkler Method) samples are taken once per sampling event as QA/QC for electronic meter.

(2) Per DEQ request, an "ND" designation is understood to be "less than the lower reporting limit" and treated as 0 for calculations. N/A is Not Applicable. NM is Not Measured.

(3) MPN = Most Probable Number

(4) Shading indicates samples that exceed the E. coli standard of 406 MPN/100mL.

(5) Rainfall totals from the start of the event through sample collection.

Instream Monitoring - Oregon City 2016 - 2017									
Location - 316 17th St (at Railroad Trestle)									
Sample Site # OC011									
		Stream Name - Abernethy Creek (Downstream)							
		Results							
		Grab Sample Dry Weather 8/24/2016	Composite Rain Event 10/20/2016	Composite Rain Event 2/15/2017	Grab Sample Dry Weather 5/22/2017	Statistics			Notes
Analysis	Units					High	Low	Mean	
Total Phosphate Seal	mg/L	0.21	0.11	0.12	0.11	0.21	0.11	0.14	(2)
Dissolved Oxygen - Winkler	mg/L	NM	NM	NM	7.80	7.80	7.80	7.80	
Dissolved Oxygen - Field	mg/L	7.39	9.58	11.26	9.12	11.26	7.39	9.34	
Dissolved Oxygen - Field	% Saturation	78.6	92.5	95.8	93.5	95.8	78.6	90.1	
Conductivity - Field	µS/cm	208.4	82.4	63.2	80.9	208.4	63.2	108.7	
Temperature - Field	°C	18.4	13.7	7.9	16.5	18.4	7.9	14.1	(2)
pH - Field	Std Units	7.41	7.0	7.23	7.33	7.41	7.00	7.24	
Dissolved Copper	µg/L	<1	<1	<1	<1	ND	ND	ND	
Copper	µg/L	2.3	3.1	5.19	2.00	5.19	2.00	3.15	
Dissolved Lead	µg/L	<0.2	<0.2	<0.2	<0.2	ND	ND	ND	
Lead	µg/L	0.65	1.1	1.94	0.55	1.94	0.55	1.06	(2)
Dissolved Zinc	µg/L	<4	4.96	<4	<4	4.96	ND	1.24	
Zinc	µg/L	7.3	5	15.1	6.3	15.1	5.0	8.4	(3)
E. coli - Colilert	MPN/100mL	110	107	166	88	166	88	118	
Ammonia Nitrogen Low Seal	mg/L	<0.1	<0.1	0.2	0.1	0.2	ND	0.1	(2)
Nitrate-Nitrite	mg/L	0.283	0.95	1.28	1.2	1.28	0.28	0.93	(2)
Ortho Phosphate Seal	mg/L	<0.1	<0.1	<0.1	<0.1	ND	ND	ND	
Total Dissolved Solids	mg/L	171	75	62	73	171	62	95	
Total Solids	mg/L	160	40	190	100	190	40	123	
Total Suspended Solids	mg/L	7	17	107	29	107	7	40	
Volatile Solids	mg/L	20	20	60	20	60	20	30	(2)
Hardness	mg/L	68	28	20	28	68	20	36	
BOD	mg/L	<2	<2	<2	<2	ND	ND	ND	
Storm Event Rainfall	Inches	N/A	0.41	0.56	N/A	N/A	N/A	N/A	

Notes:

(1) Dissolved Oxygen (Winkler Method) samples are taken once per sampling event as QA/QC for electronic meter.

(2) Per DEQ request, an "ND" designation is understood to be "less than the lower reporting limit" and treated as 0 for calculations. N/A is Not Applicable. NM is Not Measured.

(3) MPN = Most Probable Number

(4) Shading indicates samples that exceed the E. coli standard of 406 MPN/100mL.

(5) Rainfall totals from the start of the event through sample collection.

Instream Monitoring - Oregon City 2016 - 2017 Location - Behind 415 S McLoughlin Blvd Sample Site # OC012 Stream Name - Coffee Creek									
		Results							
		Grab Sample Dry Weather 8/24/2016	Composite Rain Event 10/20/2016	Composite Rain Event 2/15/2017	Grab Sample Dry Weather 5/22/2017	Statistics			Notes
Analysis	Units					High	Low	Mean	
Total Phosphate Seal	mg/L	0.17	0.11	0.07	0.07	0.17	0.07	0.11	(2)
Dissolved Oxygen - Winkler	mg/L	NM	NM	NM	NM	NM	NM	NM	
Dissolved Oxygen - Field	mg/L	9.34	9.89	11.15	9.97	11.15	9.34	10.09	
Dissolved Oxygen - Field	% Saturation	96.5	97.7	98.4	97.4	98.4	96.5	97.5	
Conductivity - Field	µS/cm	87.2	83.9	71.9	84.0	87.2	71.9	81.8	
Temperature - Field	°C	16.8	14.6	9.3	15.0	16.8	9.3	13.9	(2)
pH - Field	Std Units	7.13	6.9	7.13	7.22	7.22	6.90	7.10	
Dissolved Copper	µg/L	<1	1.2	1.5	<1	1.5	ND	0.7	
Copper	µg/L	2.9	3.6	6.02	1.85	6.02	1.85	3.59	
Dissolved Lead	µg/L	<0.2	<0.2	<0.2	<0.2	ND	ND	ND	
Lead	µg/L	1.82	1.4	2.00	0.51	2.00	0.51	1.43	(2)
Dissolved Zinc	µg/L	4.77	16	17.2	9.79	17.20	4.77	11.94	
Zinc	µg/L	14.4	30.5	44.2	18.0	44.2	14.4	26.8	
E. coli - Colilert	MPN/100mL	115	980	152	816	980	115	516	
Ammonia Nitrogen Low Seal	mg/L	<0.1	<0.1	0.3	0.1	0.3	ND	0.1	
Nitrate-Nitrite	mg/L	1.97	2.27	1.53	3.1	3.10	1.53	2.22	(2)
Ortho Phosphate Seal	mg/L	<0.1	<0.1	<0.1	<0.1	ND	ND	ND	
Total Dissolved Solids	mg/L	74	66	44	6	74	6	48	
Total Solids	mg/L	120	40	100	70	120	40	83	
Total Suspended Solids	mg/L	14	11	31	4	31	4	15	
Volatile Solids	mg/L	30	20	50	20	50	20	30	(2)
Hardness	mg/L	30	26	20	29.6	30.0	20.0	26.4	
BOD	mg/L	<2	<2	<2	<2	ND	ND	ND	
Storm Event Rainfall	Inches	N/A	0.41	0.56	N/A	N/A	N/A	N/A	

Notes:

- (1) Dissolved Oxygen (Winkler Method) samples are taken once per sampling event as QA/QC for electronic meter.
- (2) Per DEQ request, an "ND" designation is understood to be "less than the lower reporting limit" and treated as 0 for calculations. N/A is Not Applicable. NM is Not Measured.
- (3) MPN = Most Probable Number
- (4) Shading indicates samples that exceed the E. coli standard of 406 MPN/100mL.
- (5) Rainfall totals from the start of the event through sample collection.

Instream Monitoring - Oregon City 2016 - 2017									
Location - Behind 13530 Redland Rd									
Sample Site # OC013									
Stream Name - Park Place Creek									
		Results							
		Grab Sample Dry Weather 8/24/2016	Composite Rain Event 10/20/2016	Composite Rain Event 2/15/2017	Grab Sample Dry Weather 5/22/2017	Statistics			Notes
Analysis	Units					High	Low	Mean	
Total Phosphate Seal	mg/L	0.41	0.09	0.19	0.15	0.41	0.09	0.21	(1) (2)
Dissolved Oxygen - Winkler	mg/L	NM	NM	6.7	NM	6.7	6.7	6.7	
Dissolved Oxygen - Field	mg/L	3.06	5.49	8.55	5.85	8.55	3.06	5.74	
Dissolved Oxygen - Field	% Saturation	31.8	53.0	74.1	57.4	74.1	31.8	54.1	
Conductivity - Field	µS/cm	303.0	220.0	217.5	277.0	303.0	217.5	254.4	
Temperature - Field	°C	17.1	13.7	8.6	14.8	17.1	8.6	13.6	(2)
pH - Field	Std Units	6.82	6.7	6.97	6.87	6.97	6.70	6.84	
Dissolved Copper	µg/L	<1	1.7	1.8	<1	1.8	ND	0.9	
Copper	µg/L	2.2	3.2	7.34	2.19	7.34	2.19	3.73	
Dissolved Lead	µg/L	<0.2	<0.2	<0.2	<0.2	ND	ND	ND	
Lead	µg/L	1.19	0.9	2.97	0.06	2.97	0.06	1.05	(2)
Dissolved Zinc	µg/L	4.09	7.52	11.4	8.76	11.40	4.09	7.94	
Zinc	µg/L	9.0	13.8	42.9	11.9	42.9	9.0	19.4	
E. coli - Colilert	MPN/100mL	72	261	155	89	261	72	144	
Ammonia Nitrogen Low Seal	mg/L	0.4	0.3	0.7	0.7	0.7	0.3	0.5	
Nitrate-Nitrite	mg/L	<0.01	1.19	1.41	2.55	2.55	ND	1.29	(2)
Ortho Phosphate Seal	mg/L	<0.1	<0.1	<0.1	<0.1	ND	ND	ND	(2)
Total Dissolved Solids	mg/L	213	145	137	196	213	137	173	(2)
Total Solids	mg/L	250	90	270	140	270	90	188	
Total Suspended Solids	mg/L	43	4	58	22	58	4	32	
Volatile Solids	mg/L	20	30	80	30	80	20	40	
Hardness	mg/L	120	84	74	104	120	74	96	
BOD	mg/L	<2	<2	<2	<2	ND	ND	ND	(2)
Storm Event Rainfall	Inches	N/A	0.41	0.56	N/A	N/A	N/A	N/A	(2)(5)

Notes:

(1) Dissolved Oxygen (Winkler Method) samples are taken once per sampling event as QA/QC for electronic meter.

(2) Per DEQ request, an "ND" designation is understood to be "less than the lower reporting limit " and treated as 0 for calculations. N/A is Not Applicable. NM is Not Measured.

(3) MPN = Most Probable Number

(4) Shading indicates samples that exceed the E. coli standard of 406 MPN/100mL.

(5) Rainfall totals from the start of the event through sample collection.

Instream Monitoring - Oregon City 2016 - 2017 Location - North end of Singer Creek Park Sample Site # OC014 Stream Name - Singer Creek (Upstream)									
		Results							
		Grab Sample Dry Weather 8/24/2016	Composite Rain Event 10/20/2016	Composite Rain Event 2/15/2017	Grab Sample Dry Weather 5/22/2017	Statistics			Notes
Analysis	Units					High	Low	Mean	
Total Phosphate Seal	mg/L	0.18	0.06	0.11	0.09	0.18	0.06	0.11	(2)
Dissolved Oxygen - Winkler	mg/L	NM	NM	NM	NM	NM	NM	NM	
Dissolved Oxygen - Field	mg/L	9.59	9.93	11.10	10.19	11.10	9.59	10.20	
Dissolved Oxygen - Field	% Saturation	95.7	97.2	98.5	97.4	98.50	95.70	97.20	
Conductivity - Field	µS/cm	89.8	76.4	83.0	77.3	89.8	76.4	81.6	
Temperature - Field	°C	14.8	13.8	9.3	14.0	14.8	9.3	13.0	(2)
pH - Field	Std Units	7.07	7.2	7.39	7.24	7.39	7.07	7.23	
Dissolved Copper	µg/L	<1	<1	<1	<1	ND	ND	ND	
Copper	µg/L	3.6	2.3	6.82	2.00	6.82	2.00	3.68	
Dissolved Lead	µg/L	<0.2	<0.2	<0.2	<0.2	ND	ND	ND	
Lead	µg/L	2.58	1.4	2.16	1.23	2.58	1.23	1.84	(2)
Dissolved Zinc	µg/L	<4	4.66	6.21	<4	6.21	4.66	2.72	(2)
Zinc	µg/L	11.7	10.6	17.8	9.25	17.80	9.25	12.34	(2)
E. coli - Colilert	MPN/100mL	1203	1733	201	50	1733	50	797	(3)(4)
Ammonia Nitrogen Low Seal	mg/L	<0.1	<0.1	0.1	0.1	0.1	ND	0.05	(2)
Nitrate-Nitrite	mg/L	1.55	2.60	2.49	3.4	3.40	1.55	2.51	(2)
Ortho Phosphate Seal	mg/L	<0.1	<0.1	0.445	<0.1	0.45	ND	0.11	
Total Dissolved Solids	mg/L	72	68	56	64	72	56	65	
Total Solids	mg/L	210	120	120	90	210	90	135	
Total Suspended Solids	mg/L	52	7	34	20	52	7	28	
Volatile Solids	mg/L	30	20	80	30	80	20	40	(2)
Hardness	mg/L	28	26	22	26.4	28	22	26	
BOD	mg/L	<2	<2	<2	<2	ND	ND	ND	
Storm Event Rainfall	Inches	N/A	0.41	0.56	N/A	N/A	N/A	N/A	

Notes:

(1) Dissolved Oxygen (Winkler Method) samples are taken once per sampling event as QA/QC for electronic meter.

(2) Per DEQ request, an "ND" designation is understood to be "less than the lower reporting limit " and treated as 0 for calculations. N/A is Not Applicable. NM is Not Measured.

(3) MPN = Most Probable Number

(4) Shading indicates samples that exceed the E. coli standard of 406 MPN/100mL.

(5) Rainfall totals from the start of the event through sample collection.

Instream Monitoring - Oregon City 2016 - 2017 Location - 502 7th St (Manhole # 37138) Sample Site # OC015 Stream Name - Singer Creek (Downstream)									
		Results							
		Grab Sample Dry Weather 8/24/2016	Composite Rain Event 10/20/2016	Composite Rain Event 2/15/2017	Grab Sample Dry Weather 5/22/2017	Statistics			Notes
Analysis	Units					High	Low	Mean	
Total Phosphate Seal	mg/L	0.82	0.09	0.17	0.09	0.82	0.09	0.29	(2)
Dissolved Oxygen - Winkler	mg/L	NM	NM	NM	NM	NM	NM	NM	
Dissolved Oxygen - Field	mg/L	9.24	10.02	11.30	10.28	11.30	9.24	10.21	
Dissolved Oxygen - Field	% Saturation	97.6	97.7	98.2	98.4	98.4	97.6	98.0	
Conductivity - Field	µS/cm	102.1	89.9	66	89.6	102.1	66.0	86.9	
Temperature - Field	°C	17.8	13.9	9	13.7	17.8	9.0	13.6	
pH - Field	Std Units	7.11	7.0	7.31	7.37	7.37	7.00	7.20	(2)
Dissolved Copper	µg/L	1.0	1.0	1.4	<1	1.4	1.0	0.9	
Copper	µg/L	26.2	3.4	3.14	2.52	26.20	2.52	8.82	
Dissolved Lead	µg/L	<0.2	<0.2	<0.2	<0.2	ND	ND	ND	(2)
Lead	µg/L	31.7	2.5	6.11	2.20	31.70	2.20	10.63	(2)
Dissolved Zinc	µg/L	<4	8.29	9.78	<4	9.78	ND	4.52	(2)
Zinc	µg/L	134	18.9	44.4	14.6	134.0	14.6	53.0	(3)(4)
E. coli - Colilert	MPN/100mL	2420	2420	548	46	2420	46	1359	
Ammonia Nitrogen Low Seal	mg/L	<0.1	<0.1	<0.1	<0.1	ND	ND	ND	
Nitrate-Nitrite	mg/L	1.15	2.23	1.37	2.8	2.80	1.15	1.89	(2)
Ortho Phosphate Seal	mg/L	<0.1	<0.1	<0.1	<0.1	ND	ND	ND	(2)
Total Dissolved Solids	mg/L	106	73	51	67	106	51	74	
Total Solids	mg/L	520	140	180	90	520	90	233	
Total Suspended Solids	mg/L	381	18	88	35	381	18	131	
Volatile Solids	mg/L	80	40	70	20	80	20	53	
Hardness	mg/L	36	28	20	30.4	36	20	29	
BOD	mg/L	<2	<2	<2	<2	ND	ND	ND	(2)
Storm Event Rainfall	Inches	N/A	0.41	0.56	N/A	N/A	N/A	N/A	(2)(5)

Notes:

(1) Dissolved Oxygen (Winkler Method) samples are taken once per sampling event as QA/QC for electronic meter.

(2) Per DEQ request, an "ND" designation is understood to be "less than the lower reporting limit " and treated as 0 for calculations. N/A is Not Applicable. NM is Not Measured.

(3) MPN = Most Probable Number

(4) Shading indicates samples that exceed the E. coli standard of 406 MPN/100mL.

(5) Rainfall totals from the start of the event through sample collection.

Appendix C

Public Education and Outreach Information

**Public Education and Awareness Activities
July 1, 2016 – June 30, 2017**

Summary of Activities

Date	Event	Location	Contact Total	Program/Subject
8/8/16	Trail News – Autumn	N/A	All OC residents; available on website	Only Rain Down the Storm Drain – Keep Storm Drains Clear; Erosion Prevention and Sediment Control
8/19/16 – 9/11/16	Down the River Clean-up	Clackamas River	All residents and site users	Event added to “Latest News” on OC website
11/7/16	Trail News – Winter	N/A	All OC residents; available on website	Grow Smart, Grow Safe
2/27/17	Trail News – Spring	N/A	All OC residents; available on website	TMDL (temperature) and encourage riparian planting
3/21/17	12 th Annual Celebrating Water Event	Clackamas Community College	540*	One staff member provided stormwater awareness display
3/31/17	Message on Utility Bill	N/A	Utility bill recipients	Pick up pet waste
5/8/17	Trail News – Summer	N/A	All OC residents; available on website	Reducing Bacteria Levels in our Rivers & Streams is a Challenge
5/19/17	Annual Water Quality Report	N/A	14,686**, available on city website	Water Quality information
6/20/17 – 7/3/17	Stormwater Banner Display at City Hall	625 Center St Oregon City OR	Visitors & staff at City Hall	Display featuring Oregon City’s major streams; tips to improve water quality
2016-2017	KOIN Public Service Announcements	N/A	Metro area	Television & web information about water quality
2016-2017	Regional Coalition for Clean Rivers & Streams	N/A	Metro area	Pollution prevention messages via website
2016-2017	Clackamas River Water Providers	N/A	Residents with the Clackamas River as drinking water source	Various programs to promote source water protection, water conservation, and water quality awareness

*450 students, 15 teachers, and 75 chaperones

**A postcard was mailed to each Oregon City address announcing the on-line availability of the annual water quality report. Those with limited internet access were encouraged to request a printed copy of the report.

Specific Activity Information

Trail News Articles

Autumn 2016

Only Rain Down the Storm Drain – Keep Storm Drains Clear

- Dispose of leaves properly, not in street
- Clear blocked catch basins if safe to do so
- Call Oregon City Public Works (OCPW) if flooding occurs

Erosion Prevention and Sediment Control

- Oregon City’s Stormwater Management Plan Element #3
- Explanation of this requirement
- What happens when no erosion control measures are in place
- Explanation of Oregon City’s Erosion and Sediment Control Plan and permit requirements
- Link to OC Erosion & Sediment Control page

Winter 2016 – 2017

Grow Smart, Grow Safe (www.growsmartgrowsafe.org)

- Introduced the app for the website “Grow Smart, Grow Safe”
- Website has suggestions for choosing safer products for lawns and gardens
- Learn how to build healthy soil and discover Integrated Pest Management

Spring 2017

Help Us Improve Water Quality in Oregon City

- Problems caused by loss of riparian vegetation
- Planting native riparian vegetation and trees is a relatively simple and cost-effective solution
- Links provided to OC TMDL Implementation Plan, Greater Oregon City Watershed Council, and Clackamas River Basin Council

Summer 2017

Reducing Bacteria Levels in our Rivers & Streams is a Challenge – We Need Your Help!

- Certain locations along the Willamette and Clackamas Rivers have too much harmful bacteria
- Ways to help reduce bacteria – pick up after pets, refrain from feeding wild birds, ensure septic tanks, if used, are functioning properly

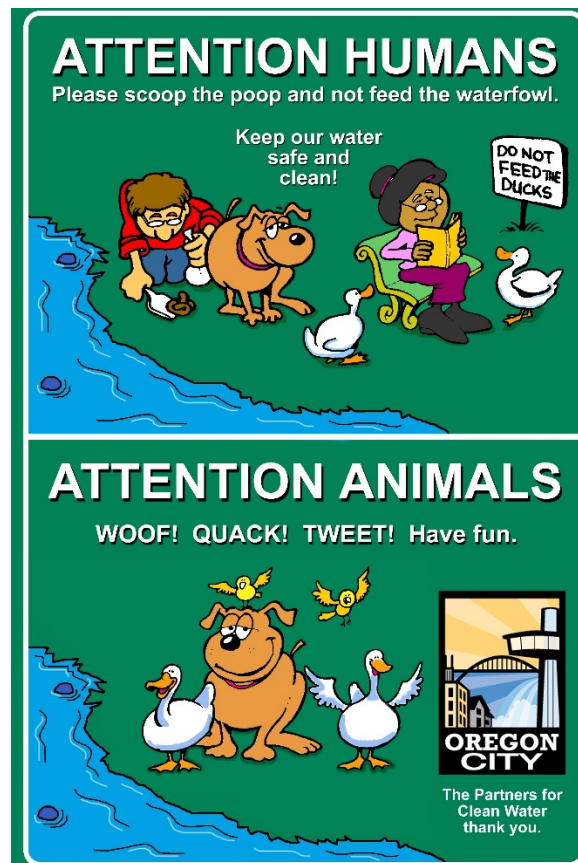


Figure 1: Graphic Included with Summer 2017 Train News Article About Reducing Bacteria Levels

Special Events

The 14th Annual Down the (Clackamas) River Clean Up – 9/11/16

This event was promoted on the Oregon City website (8/19/16 – 9/9/16).

12th Annual Celebrating Water Event – 3/21/17

One OCPW staff member participated in this annual educational event, held at Clackamas Community College. 450 4th and 5th grade students, along with 15 teachers and 75 chaperones, had the opportunity to learn about water conservation and water quality protection, among other water-related topics. The 2017 booth featured an interactive display entitled “Take the Stormwater Runoff Challenge”. A crossword puzzle of the same name was provided as a hand-out. Also featured was a stormwater banner display highlighting Oregon City’s major drainage basins with ways to protect and improve water quality.

Miscellaneous Items

Message on Utility Bill (mailed 3/31/17)

Pet waste left behind isn’t fertilizer...it’s *pollution*...leave no pile behind! Pet waste washes into our storm drains and pollutes our streams; it also carries pathogens such as E. coli and Salmonella. Pick up after your pet when on walks and in your own yard, too.

Annual Water Quality Report – 5/19/17

The 2017 report included the following topics specific to stormwater:

- Oregon City’s compliance with our NPDES permit and a link to our NPDES documents webpage
- Pollution prevention suggestions:
 - Lawn and garden care
 - Vehicle care
 - Roof treatments
 - Pressure washing
 - Pet waste
- For those with a stream flowing through their property, explanation of why a healthy riparian area is beneficial for reducing water temperature
- Photos/graphics with accompanying captions:
 - OC Catch basin marker with the caption “To report illegal dumping or to participate in our Catch Basin Marking & Stenciling Program call 503.657.8241”
 - Photo of “DogiPot” with discussion of the importance of picking up after pets

Beginning on May 19, 2017, a total of 14,686 postcards were mailed to Oregon City residents announcing the on-line availability of the annual water quality report. Those with limited internet access were encouraged to request a printed copy of the report.



Figure 2: Photo on 2017 Annual Water Quality Report Postcard

Stormwater Banner Display at City Hall – 6/20/17 – 7/3/17

Visitors to City Hall (625 Center St), as well as city staff, could view our stormwater banner display featuring Oregon City's largest basins and streams. Included are the following suggestions to prevent stormwater runoff pollution and to improve water quality:

- Never dump anything down storm drains or into streams
- Sweep driveways and patios clean instead of hosing them down
- Repair your vehicles if they are leaking oil, antifreeze, or other fluids
- Take your car to a car wash, or wash it on the lawn instead of the driveway
- Minimize your use of fertilizers and pesticides; consider going organic
- Plant native trees and shrubs; if you have a stream flowing through your property streamside plantings will help reduce the temperature of the water
- Pick up after your pet

The banner includes contact information for the Greater Oregon City Watershed Council and how to obtain additional information about Oregon City's Stormwater Management Plan.

Clackamas River Water Providers – ongoing throughout the year

Oregon City, through its association with South Fork Water Board, partners with other agencies that use the Clackamas River for potable water, to promote source water protection and water conservation. Programs include water quality monitoring and a pesticide outreach program. For specific information, and to read their annual report, visit the CRWP website at www.clackamasproviders.org.

The Oregon City Website – ongoing throughout the year

A wide variety of information pertaining to stormwater, water quality, and Oregon City's NPDES MS4 permit is available to the public at www.orcity.org.

Collaboration with Other Agencies

“Water...Do Your Part” Campaign on KOIN Channel 6 Television and Website (<http://koin.com/water-do-your-part/>)

Oregon City continues to partner with other agencies in the Portland metro area in sponsoring public education messaging via KOIN media outlets. The campaign identifies simple things that can be done to keep our rivers and streams healthy. The following topics were highlighted on their website, social media, and television during the 2016-2017 campaign:

- Fall Lawn Care
- Be Rain Ready
- Hot Tub
- RV Waste
- Pet Waste
- Wildlife Garden
- Native Plants
- Pesticides
- Invasives
- Cigarette butts/Littering
- Metro Garden
- Car Washing

Regional Coalition for Clean Rivers and Streams

Oregon City is one of the Clean River Partners of Clackamas County. As such, the city continues to support the effort, along with other agencies in the Portland metro area, to educate the public about the impact of stormwater runoff pollution on the health of our rivers and streams. For specific information about the current campaign – The River Starts Here – visit the Coalition website at <http://theriverstartshere.org/>.

Appendix D

Willamette River TMDL Implementation Plan Annual Report

City of Oregon City
Willamette River TMDL Implementation Plan
Annual Progress Report
Year 3
November 1, 2017

Introduction

The City of Oregon City (City) submitted its first Willamette River Total Maximum Daily Load Implementation Plan (TMDL Plan) to the Oregon Department of Environmental Quality (DEQ) on March 31, 2008. Comments from DEQ were received and addressed by the City, and DEQ approved the City's TMDL Plan in May 2009. On March 10, 2014 DEQ requested an update to the City's TMDL Plan which the City provided on May 30, 2014. The July 1, 2016 – June 30, 2017 reporting year is the third year of implementation for this updated TMDL Plan. This annual report provides a summary of the City's efforts during this reporting year.

Background

The City's TMDL Plan identifies and describes management strategies that the City will implement to address nonpoint sources of pollution generated in the Clackamas and Middle Willamette River subbasins in the Willamette River watershed. The TMDL parameters of concern for these subbasins include temperature, bacteria, and mercury.

Management strategies for bacteria and mercury are summarized in the TMDL Plan, but compliance with the TMDL for these parameters is covered by the City's National Pollutant Discharge Elimination System (NPDES) municipal separate storm sewer system (MS4) stormwater permit. DEQ includes requirements within the City's NPDES MS4 permit as they pertain to TMDL pollutants associated with point sources of stormwater runoff. The NPDES MS4 permit requires best management practices (BMPs) to be applied to address sources of pollution in stormwater runoff. The NPDES permit also requires Oregon City to develop TMDL pollutant load reduction benchmarks to show progress towards meeting TMDL wasteload allocations. Finally, the NPDES MS4 permit requires adaptive management to ensure that stormwater programs are expanded and refined over time to ensure continued progress towards meeting wasteload allocations. The City was reissued their NPDES MS4 permit on March 16, 2012. The City's effective (2012) Stormwater Management Plan (SWMP) outlines BMPs to comply with the reissued permit and address bacteria and mercury.

Stormwater runoff in the Willamette Valley is not considered a problem with respect to temperature, and therefore, temperature is not addressed under City's NPDES MS4 permit. Management strategies for temperature were developed and identified in the TMDL Plan. Historically, riparian vegetation removal and channel modifications result in reduced baseflow, reduced stream shade, and increased instream temperatures. As part of the first TMDL Plan, a Geographic Information System-based evaluation of the City's stream corridors was conducted to evaluate existing shade conditions and identify opportunities for riparian vegetation enhancement. Strategies to address temperature were identified, and a timeline and schedule for implementation were provided in the first TMDL Plan.

Implementation Status

The City's NPDES MS4 permit addresses the Willamette River TMDL requirements for bacteria and mercury. Progress towards implementing BMPs to address bacteria and mercury are summarized in Appendix A of this 2016–2017 NPDES MS4 Annual Report and TMDL Implementation Annual Report.

As required by Schedule D.3.b of the NPDES MS4 permit, Oregon City submitted a TMDL Wasteload Allocation Attainment Assessment (WLAAA) on October 29, 2015. Four hypothetical BMP scenarios were evaluated to determine what types of BMPs and coverage levels would be needed to achieve the established TMDL wasteload allocations for bacteria (*E. coli*). A financial analysis of the cost to construct and maintain these BMPs was included in the evaluation.

Results from the WLAAA indicate that achievement of the waste load allocation for *E. coli* is not practical or feasible with current structural stormwater treatment BMPs given the City's practical and physical constraints and current fiscal abilities. The City continues its work towards reducing pollutant loads and hydromodification impacts by looking for opportunities for new water quality facilities, incorporating treatment measures into transportation and road improvement projects whenever feasible, and investigating retrofit opportunities on City-owned properties.

The City's progress towards implementing strategies to address temperature is summarized in Table D-1 of this annual report. Such strategies include public education and outreach activities, implementation of development standards to promote infiltration, and shade preservation and planting activities. As described in the TMDL Plan, the City has committed to contributing \$5,000 per year for the next five years (2014 – 2019) of TMDL implementation to enhance riparian vegetation. Table D-1 lists how this commitment has been addressed during the 2016 – 2017 reporting period.

Table D-1 City of Oregon City TMDL Implementation Plan Progress Report 2016 – 2017 Summary of Strategies to Address Temperature							
Best Management Practice or Activity	Responsible Division	Commitment/ Implementation Strategy <i>What will be done in the next five years</i>	Measurable Goal <i>Specific ways to implement strategy (Fiscal analysis as needed)</i>	Performance Measure <i>How implementation will be demonstrated</i>	Timeline <i>When goal will be achieved</i>	Milestone <i>Intermediate indicators of progress</i>	Status <i>Progress update for reporting period (Gap analysis discussion as needed)</i>
Public Education	Oregon City Public Works (OCPW)	Attend regularly scheduled coordination meetings with the Greater Oregon City Watershed Council (GOCWC).	Attend a minimum of one meeting during the implementation period.	Track meetings attended.	Ongoing throughout the cycle.	Receive and review draft meeting agendas.	OCPW staff attended four GOCWC meetings during the 2016-2017 reporting period.
		Include articles regarding temperature-related issues and shade planting projected in the City newsletter and through direct mailings.	Ensure a minimum of one temperature-related piece of educational material during the implementation period.	Record temperature-related educational materials.	Ongoing throughout the cycle.	Ensure temperature-related article for spring Trail News.	Temperature-related articles were disseminated by OCPW in the following: - Spring 2017 Trail News 2017 Annual Water Quality Report See Appendix C of the City's 2016-2017 NPDES MS4 Annual Report for specific details.
Implement Stormwater Design Standards	OCPW	Implement provisions of Chapters 13 and 17 of the City's development code, which includes provisions for use of infiltration-based stormwater treatment systems and tree planting.	Update design standards to include LID and additional infiltration-based guidelines for stormwater treatment during the implementation period.	Track modifications to the City's development standards related to use of LID and BMPs for new and redevelopment.	Ongoing throughout the cycle.	N/A	As reported in the 2014-2015 Annual Report, the City's Municipal Code Chapter 13.12 Stormwater Management, the <i>Stormwater and Grading Design Standards</i> manual, and the <i>Erosion and Sediment Control Standards</i> manual were updated. No modifications were made during this reporting period.
Preservation of Existing Shade	Planning and OCPW	Continue to enforce regulations pertaining to the protection of riparian vegetation and buffer areas.	Continue to implement Chapter 17.49 of the City's development code to address Title 3 and Title 13.	Track any enforcement actions taken to protect existing shade.	Ongoing throughout the cycle.	N/A	One enforcement action taken. Seven Natural Resource Overlay District (NROD) (Chapter 17.49) applications processed: - One Type III discretionary application for exemption - Two Type II NROD applications requiring impact analysis and mitigation submitted approved - Four Type I NROD exemption applications approved
Planting Activities for Identified Shade Opportunity Areas	OCPW	Conduct planting, plant maintenance, and supplemental irrigation activities for the identified shade opportunity areas.	Utilize annual committed funds towards shading and planting activities for identified opportunity areas. (\$5,000 allocated annually for planting activities.)	Track ground truthing activities to refine priority opportunity areas.	Public priority areas by June 2015.	Recruit intern for ground truthing activities.	As reported in the 2014-2015 Progress Report, an intern was hired (7/7/14 – 9/24/14) for ground truthing activities. No intern was recruited during the 2016-2017 reporting period.
				Track planting activities for public, high priority areas.	Ongoing throughout the cycle.	Review priority list annually by December 1st; select next area for planting.	No high priority areas were planted during this reporting period. OCPW staff met with a representative from a local nonprofit in hopes of collaboration for planting on private priority sites; attempt was unsuccessful. Other options for planting are being investigated.
				Track planting activities for other identified shade opportunity areas.	Ongoing throughout the cycle.	Review as planting opportunities arise.	The following were planted just upstream from medium priority site NC-7: 4 Douglas Fir 4 Big Leaf Maple 4 Western Red Cedar 30 native shrubs Total cost - \$240.00
				Track any re-vegetation and maintenance activities required.	Ongoing throughout the cycle.	Evaluate need for re-planting annually by June 30th.	All 84 stormwater quality facilities and 20,992 sq ft of swales were evaluated for re-planting within the designated time frame. Re-vegetation and Maintenance Activities: planted 173 native plants and grasses (\$250)