

CITY OF SALEM, OREGON

**NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) MUNICIPAL SEPARATE STORM SEWER SYSTEM
(MS4) PERMIT**

(Permit Number 101513, File Number 108919)

**ANNUAL REPORT
FY 2016-17**

October 11, 2017

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.

Mark Bechtel, AICP, Operations Division Manager Date

**Prepared by
City of Salem Public Works Department**



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LIST OF ACRONYMS

ACWA	Association of Clean Water Agencies
BMP	Best Management Practice
CFR	Code of Federal Regulations
CIP	Capital Improvement Plan
COE	U.S. Army Corps of Engineers
CON	Construction-related BMPs
DEQ	Oregon Department of Environmental Quality
EPA	U.S. Environmental Protection Agency
EPSC	Erosion Prevention and Sediment Control
ES	Environmental Services (City of Salem)
FEMA	Federal Emergency Management Act
GIS	Geographic Information System
IDEP	Illicit Discharge Elimination Program
IGA	Inter-governmental Agreement
ILL	Illicit discharge-related BMPs
IND	Industrial-related BMPs
MEP	Maximum Extent Practicable
mg/L	Milligrams per liter
MOA	Memorandum of Agreement
MS4	Municipal Separate Storm Sewer System
MWOG	Mid-Willamette Valley Outreach Group
ODA	Oregon Department of Agriculture
ODOT	Oregon Department of Transportation
ppm	Parts per million
RC	Residential and commercial area-related BMPs
SDC	System Development Charge
SKAPAC	Salem/Keizer Area Planning Advisory Committee
SRC	Salem Revised Code
SSORP	Sanitary Sewer Overflow Response Plan
SWMP	Stormwater Management Plan
TMDL	Total Maximum Daily Load

1 INTRODUCTION

1.1 Permit Background

In 1990, the United States Environmental Protection Agency (EPA) published its Phase I regulations governing stormwater discharges under the National Pollutant Discharge Elimination System (NPDES) program of the Clean Water Act. In Oregon, EPA has delegated the permitting of NPDES municipal separate storm sewer system (MS4) discharges to the Oregon Department of Environmental Quality (DEQ).

Under EPA's initial Phase I implementation of the program, municipalities having a population greater than 100,000 were required to obtain an NPDES MS4 permit. The City of Salem (the City) passed that threshold with the 1990 Census and was included in the program by the DEQ, with the Oregon Department of Transportation (ODOT) originally designated as a co-permittee with Salem.

The regulations established a two-part application process for obtaining an NPDES Permit to discharge municipal stormwater to "waters of the state." The City submitted the Part 1 NPDES stormwater permit application in April 1994. The supplemental Part 2 application and associated Stormwater Management Plan (SWMP) were subsequently finalized and submitted to DEQ in July 1996. DEQ issued the City's initial NPDES MS4 permit in December 1997, with an expiration date of September 2002.

An application for permit renewal was submitted to the DEQ in April 2002, and the City's second MS4 permit was issued in March 2004. The next permit renewal application was submitted to the DEQ in 2008. This application included a revised SWMP (2008 SWMP) that was developed in part using the EPA document *Municipal Separate Storm Sewer System Program Evaluation Guidance* (January 2008). Following permit negotiations, the 2008 SWMP was further revised and submitted to the DEQ on August 13, 2010.

The City's renewed (third) MS4 permit was issued on December 30, 2010. Consistent with requirements of Schedule D.6 of the renewed MS4 permit, the City re-submitted the SWMP (revised 2010 SWMP) to the DEQ on March 17, 2011. The EPA conducted an inspection of the City's MS4 program from July 31, 2012, through August 2, 2012, to assess compliance with the NPDES MS4 permit. The results of the audit were released during the FY 2013-14 reporting period, and indicated that the City was deficient in meeting its construction site runoff control requirements. An EPA Administrative Compliance Order by Consent (Consent Order) was issued for the City of Salem to: 1) develop and document its construction site plan review procedures; 2) develop and document inspection procedures for construction sites; and 3) submit a separate report of all construction site inspections annually through the expiration of the current MS4 permit. The City remedied the deficiencies in its construction site erosion control program within 90 days of the Consent Order, submitted its first annual construction site inspection report on November 1, 2013, and continues to meet the requirements of the NPDES MS4 permit and the EPA Consent Order.

The City's current permit had an expiration date of December 29, 2015. A renewal application was submitted in December 2015 (per the conditions listed under Schedule F, Section A.4) and the DEQ has confirmed (in a letter dated March 1, 2016) that the permit has been administratively extended. A copy of the MS4 permit, revised 2010 SWMP, and 2015 permit renewal application has been posted on the City's website (www.cityofsalem.net/Pages/ms4-permits-and-annual-reports.aspx) along with all subsequent annual reports associated with the current permit cycle. This document represents the City's Fiscal Year 2016-17 (FY 16-17) Annual Report, and describes the status of BMP-related activities in the revised 2010 SWMP.

1.2 Purpose and Scope

The MS4 permit area is defined as the area included within its city limits (encompassing 47 square miles), as exhibited in Figure 1. This is the area for which the City has responsibility for implementing its stormwater management program. Land use within the permit area is exhibited in Figure 2.

This NPDES MS4 Annual Report summarizes stormwater-related activities listed in the 2010 SWMP that were completed during the period of July 1, 2016, through June 30, 2017, to address the requirements of the City's current MS4 permit. The information presented in this report is based on the requirements listed in Schedule B.5 of the MS4 Permit (see Table 1).

Table 1. Annual Reporting Requirements for the MS4 Permit		
Permit Section	Reporting Requirement	Location in Annual Report
B(5)(a)	The status of implementing the stormwater management program and each SWMP program element, including progress in meeting the measurable goals identified in the SWMP.	Section 2
B(5)(b)	Status or results, or both, of any public education program effectiveness evaluation conducted during the reporting year and a summary of how the results were or will be used for adaptive management.	Section 2 (RC 5-1)
B(5)(c)	A summary of the adaptive management process implementation during the reporting year, including any proposed changes to the stormwater management program (e.g., new BMPs) identified through implementation of the adaptive management process.	Section 1.3
B(5)(d)	Any proposed changes to SWMP program elements that are designed to reduce TMDL pollutants.	Section 1.3
B(5)(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
B(5)(f)	A summary of monitoring program results, including monitoring data that are accumulated throughout the reporting year and/or assessments or evaluations.	Section 2 (MON 1-1, 1-2, and 1-3), Appendix A
B(5)(g)	Any proposed modifications to the monitoring plan that are necessary to ensure that adequate data and information are collected to conduct stormwater program assessments.	Appendix A
B(5)(h)	A summary describing the number and nature of enforcement actions, inspections, and public education programs, including results of ongoing field screening and follow-up activities related to illicit discharges.	Section 2 (ILL 2-4), Section 4, Appendix A,
B(5)(i)	An overview, as related to MS4 discharges, of concept planning, land use changes and new development activities that occurred within the Urban Growth Boundary (UGB) expansion areas during the reporting year, and those forecast for the following year including the number of new post-construction permits issued, and the estimate of the total new or replaced impervious surface area related to new development and redevelopment projects commenced during the reporting year.	Section 5
B(5)(j)	Results of ongoing field screening and follow-up activities related to illicit discharges.	Section 2 (ILL 2-4), Appendix A

1.3 Adaptive Management

The stormwater management program that is described in the City of Salem's current SWMP is the result of adaptively managing (e.g., implementing, evaluating, and adjusting) the program since first being issued an MS4 permit in 1997. The history of this adaptive management approach may be found in Section 2 of the City of Salem's "National Pollutant Discharge Elimination System Municipal Separate Storm Sewer System Permit Renewal (September 2, 2008)," and describes how the current DEQ-approved SWMP meets the 'maximum extent practicable' requirement. By adaptively managing its stormwater management program, the City of Salem continues to reduce the discharge of pollutants from its stormwater system.

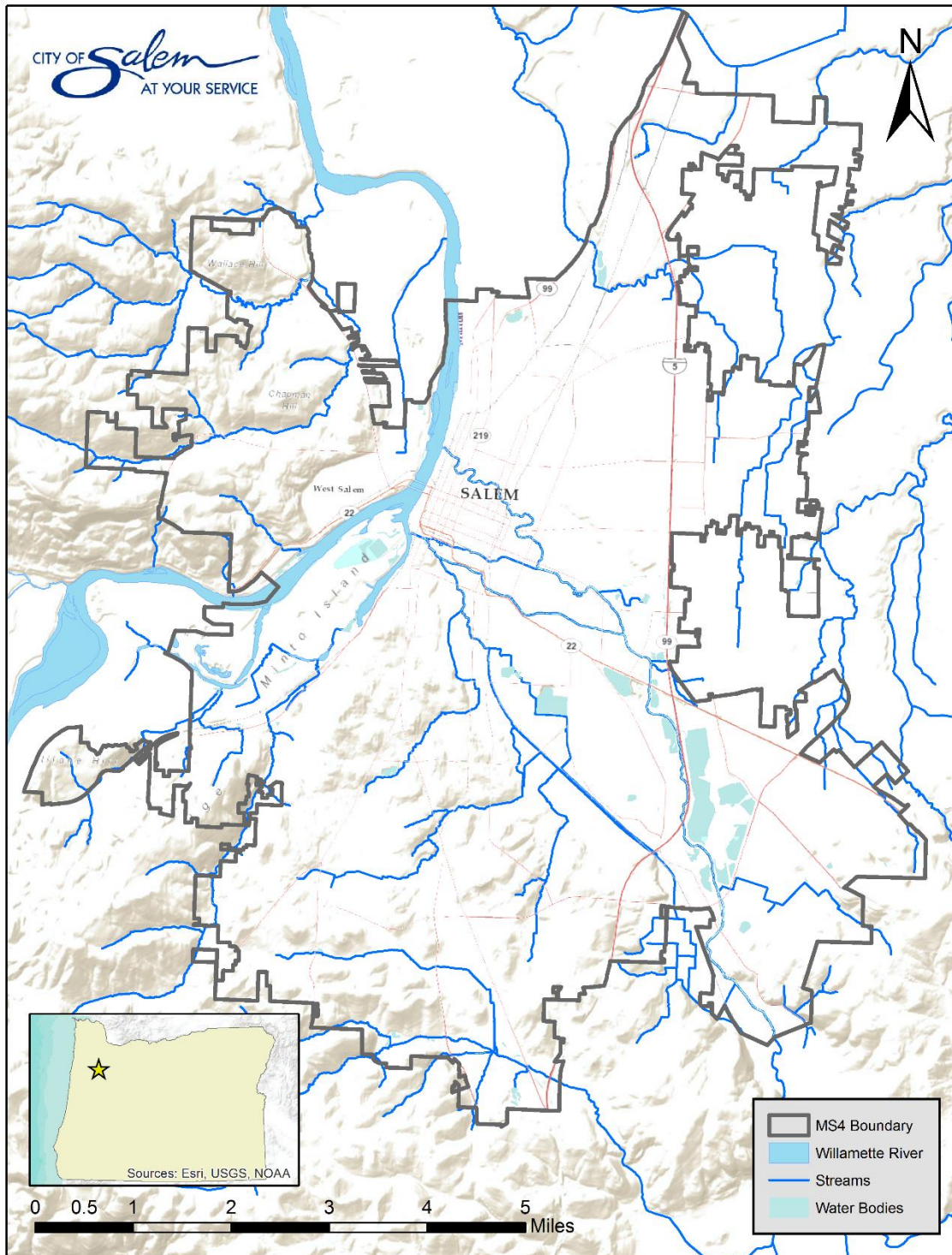
Consistent with Schedule D.4 of the MS4 permit, City staff submitted an "Adaptive Management Approach" to the DEQ on October 24, 2011, that will continue to be adhered to through expiration of the MS4 permit. This approach involves both an annual review of BMP activities and collected data, as well as a comprehensive assessment of BMP activities in preparation for MS4 permit renewal.

Per the Adaptive Management Approach, a series of 12 meetings were held with staff across the City in reporting year (FY 14-15) to review BMP activities completed over the permit term, information received through the annual adaptive management process, and to complete a comprehensive assessment of BMP activities listed in the 2010 SWMP. Information collected through this assessment informed the proposed SWMP modifications that were submitted to the DEQ as part of the MS4 Permit Renewal Package in December 2015. The proposed revisions were posted on the City's website for an open public comment period prior to submittal to DEQ.

In preparation of this annual report and as described in the Adaptive Management Approach, City staff were again asked to consider if changes in BMP activities were anticipated or proposed in the next fiscal year (FY 17-18). No additional changes to the SWMP were proposed during this reporting period.

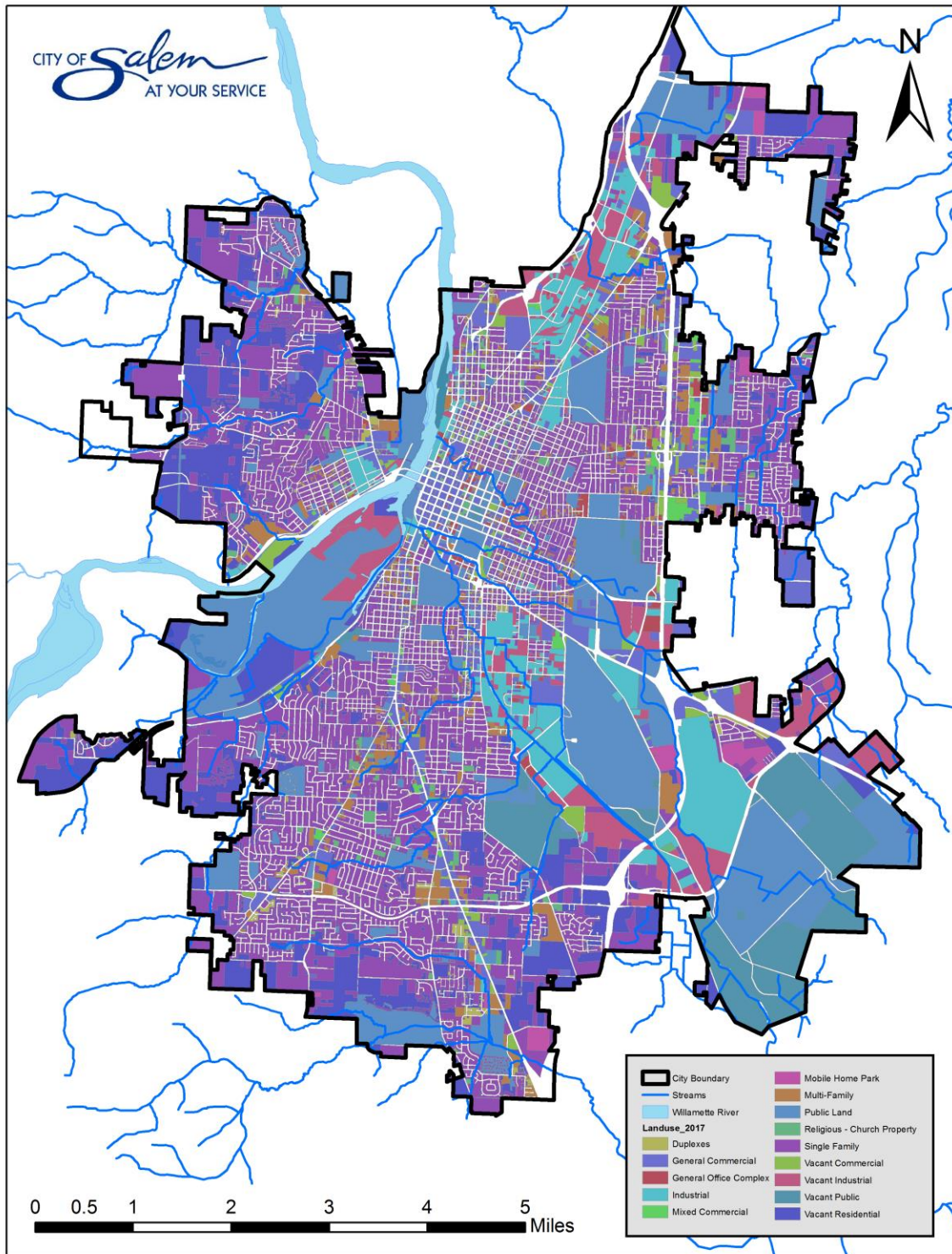
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Figure 1. Permit Area Map



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Figure 2. Land Use



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2 STATUS OF THE STORMWATER MANAGEMENT PLAN

The primary objective of the SWMP is to provide an outline of City activities that will satisfy the NPDES Phase I stormwater regulatory requirements (the MS4 permit) [40 CFR 122.26(d)(2)(iv)]. The intent of the regulations is to allow each permittee the opportunity to design a stormwater management program tailored to suit the individual and unique needs and conditions of the permit area, and reduce the discharge of pollutants from the stormwater sewer system to the maximum extent practicable.

The status of BMP activities listed in the 2010 SWMP is discussed in this section of the Annual Report. BMPs within the SWMP have been categorized into five types:

1. Structural and source controls for residential and commercial areas (RC);
2. A program for the control of illicit discharges and improper disposal into the storm drainage system (ILL);
3. A program to monitor and control pollutants from industrial facilities, hazardous waste treatment, storage and disposal facilities, and municipal landfills (IND);
4. A program to implement and maintain structural and non-structural BMPs to reduce pollutants from construction sites (CON); and
5. A program to conduct water quality monitoring activities within the MS4 drainage system and City waterways (MON).

Each BMP identified in the 2010 SWMP is discussed in this report with the following information:

- A table describing BMP tasks, associated measurable goals, and tracking measures as stated in the 2010 SWMP.
- A summary of activities completed during fiscal year 2016-2017 (July 1, 2016 through June 30, 2017) that demonstrates progress toward meeting the measurable goals and tracking measures.

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Table 2. RC1—Planning

<u>Task Description</u>	<u>Measurable Goals</u>	<u>Tracking Measures</u>	<u>FY 2016-17 Activities</u>
RC 1-1: Provide City-wide Master Planning for stormwater to address both water quality and water quantity. As part of master planning efforts, continue to evaluate new detention and water quality opportunities within the Urban Growth Boundary (UGB), and consider sites in upstream areas that may affect Salem, and in downstream areas that may be affected by runoff from Salem.	Maintain Master Plan and complete next update within the MS4 permit cycle.	Track schedule for updating Master Plan. Report on Master Plan update actions.	An updated Stormwater Master Plan has been drafted. The draft includes supporting content such as background, regulatory context, goals, policies, and financial planning. With the exception of the Battle Creek basin, the Public Facilities Plan and the other basin plans are based on the material carried forward from the City's 2000 Stormwater Master Plan. The Battle Creek Basin Plan is new and contains the results of comprehensive data collection and computer modeling. Data collection, survey work, and modeling are currently being conducted on the next basin plan to be produced, which will be for Mill Creek/Pringle Creek basins. These two basins, analyzed separately in 2000, have been combined for this master plan update owing to the hydraulic connectivity between them. The updated Mill/Pringle Creek Basin Plans will be incorporated into the draft before public outreach begins. Additionally, options regarding when and how to update floodplain maps are being evaluated.
RC 1-2: Develop and maintain watershed management plans by developing a prioritized schedule and implementing watershed management plans based on available funding. Develop the Pilot Pringle Creek Watershed Management Plan as a model for the City's other prioritized urban watersheds. Identify capital improvement needs and potential "early action" activities and projects to ensure that the plan has a strong implementation component.	Complete a hydromodification study and retrofit plan by November 1, 2014. Incorporate recommendations and early action items of watershed management plans with completion of hydromodification study and retrofit plan. Develop strategy for completing future watershed management plans by November 1, 2014.	Report on completion of hydromodification study. Report on completion of retrofit plan. Track implementation actions of Pringle Creek Watershed Management Plan. Report on strategy for completing future watershed management plans.	The Hydromodification Assessment and Stormwater Retrofit Plan were completed and submitted to the DEQ on October 28, 2014. During reporting period 2015/2016, City staff and contracted professionals conducted survey work and developed a list of early action activities (taking into consideration data collected from the 2013 Hydromodification Assessment), to inform the Battle Creek Basin Plan. During reporting period 2016/2017, City staff and contracted professionals conducted survey work and developed a list of early action activities (taking into consideration data collected from the 2013 Hydromodification Assessment), to inform the and Pringle Creek and Mill Creek Basin Plans currently being developed per the updated Stormwater Master Plan (See RC 1-1). Preliminary findings were reviewed with City staff in October 2017. During the reporting period 2016/2017, City staff and contracted professionals worked on developing a stormwater retrofit prioritization tool based upon the strategies outlined in the Stormwater Retrofit Plan. This tool will enable City staff to organize and prioritize potential stormwater retrofit projects for the City's Capital Improvement Program, and it is anticipated to be completed in reporting year 2017/2018.
RC 1-3: City staff will continue to update the official "waterways" map for use by City staff in applying various regulations and standards. As studies are performed that warrant the revision of the designated waterways, including groundtruthing, that information will be incorporated into the update process.	Compile database of maps and waterways references. Complete field groundtruthing by end of FY 2011-12. Update map by end of FY 2012-13.	Track completion of groundtruthing and map updates.	GIS data for waterways was migrated from ESRI shapefile format to a latest feature class format and is now stored in a centralized GIS database. Additional attributes were added to waterways data in GIS that helps City staff in integrating any work done on waterways to GIS.
RC 1-4: City staff will meet a minimum of once per year to discuss coordination of efforts relating to stormwater. Topics may include the following, as they are applicable: grant funding, outreach, program review, annual report, monitoring, sharing of data, adaptive management, review/update of documents and programs, training needs, documentation of protocols, coordination of databases, involvement of inspections, maintenance, and operations in plan review and program development, checklists, effective Erosion Prevention and Sediment Control Program including enforcement, strategizing addressing hotspots, plan review, stormwater BMPs, and development of written enforcement strategy. Provide factsheets/manuals to new employees at the City to inform them about the City's efforts for pollution prevention. At least annual trainings will be provided to specified City of Salem employees involved in MS4-related activities regarding the permit, including its intentions and their responsibilities in relation to the MS4. Feedback for improving processes will be encouraged and brought to the coordination meeting(s). Training needs will be determined by City staff meeting mentioned above. Consider adding stormwater pollution prevention training as an action item of the FY 2011-12 Environmental Action Plan that addresses pollution prevention on a city-wide level.	Conduct annual formal coordination meetings for stormwater, more often if necessary. Conduct annual training of employees involved in MS4-related positions, more often if necessary.	Prepare an annual meeting summary. Track changes made to the implementation of the stormwater program based on coordination discussions. Track major items of coordination. Track training attendance. Share and document training suggestions for MS4 implementation changes.	City staff from a variety of workgroups continued to participate in MS4 coordination meetings throughout the 2016-17 reporting year in order to review and complete MS4 program tasks. These coordination meetings included but were not limited to the following MS4 related efforts: public education & outreach (routine coordination meetings for the annual "Mid-Valley Erosion Control and Stormwater Summit"), internal MS4 communication & coordination, Mill & Pringle Creek Master Planning data needs, Dry Weather Outfall Screening procedures, Operations & Maintenance, stormwater facility inspections, potential revisions to the Stormwater Design Standards listed in Admin Rule 109-004), Integrated Pest Management Plan needs/updates, and processes for prioritizing potential stormwater retrofit projects per the previously submitted Retrofit Plan. An "Employee Guide for Pollution Prevention" was previously developed that is now distributed to all new employees during employee orientation. Public Works Operations employees receive annual training on spill prevention and response, good housekeeping, and chemical storage. Staff involved with pesticide applications receive annual trainings pertaining to licensing requirements. Staff continued to participate in Oregon Association of Clean Water Agencies (ACWA) Stormwater subcommittees this last year (see RC1 Task 8).

Task Description	Measurable Goals	Tracking Measures	FY 2016-17 Activities
RC 1-5: Coordinate with other agencies such as NGOs, private environmental groups, and watershed councils.	Develop a list of contacts and identify issues of coordination.	Document any MOAs.	<p><u>Clean Rivers Coalition:</u></p> <p>The Clean Rivers Coalition is a group of agencies and non-profit organizations building a statewide stormwater outreach campaign. Public Works staff attend regular meetings. Items of coordination included the following:</p> <ul style="list-style-type: none">* developing and finalizing organizational charter* determining finances* drafting and submitting grant proposal* developing memorandum of understanding and intergovernmental agreements* planning and implementation of the October 2016 Outreach Forum that included assessing branding, awareness, and messaging options for the outreach strategy. Attendance: 34 <p><u>Claggett Creek Watershed Council:</u></p> <p>Public Works personnel assist the watershed council upon request. This year, staff provided information regarding a watershed story map.</p> <p><u>Friends of Trees:</u></p> <p>The City of Salem contracted with FOT again this year to assist with riparian and upland tree plantings. The groups hosted one crew lead training event, one tree care event, and seven tree and shrub planting events.</p> <p>533 volunteers planted a total of 3,774 trees/shrubs (69 large-stock upland trees, 995 small-stock native riparian trees, and 2710 native riparian shrubs).</p> <p>The dates and places of the events follow:</p> <p>10/22/2016 16-17 Crew Leader Training (Salem Audubon Reserve)</p> <p>11/5/2016 Royal Oaks Park</p> <p>11/19/2016 Judson Middle School</p> <p>12/3/2016 Eola Ridge Park</p> <p>1/21/2017 Minto Island Conservation Area*</p> <p>2/11/2017 Eola Ridge Park</p> <p>3/11/2017 Judson Middle School</p> <p>4/1/2017 McKay School Park</p> <p>4/29/2017 Eola Ridge Park Tree Care</p> <p><u>Glenn-Gibson Watershed Council:</u></p> <p>Public Works staff attend the monthly council meetings. Items of coordination included the following:</p> <p>Follow-up maintenance activities for Eola Ridge Park, where the City of Salem provided matching funds for the clearing of invasive species and restorative native plantings. This was an OWEB small grant project that leveraged the partnership of the Glenn-Gibson Watershed Council, the Polk County Soil and Water Conservation District, Friends of Trees, and the City of Salem Public Works Department.</p> <p>During the reporting period, City staff provided a presentation to the council on the results from the 2013 hydromodification assessment within the Glenn-Gibson Watershed. This information will enable the council to assist private property homeowners in securing resources for streambank improvements.</p> <p><u>Mid-Willamette Outreach Group</u></p> <p>Staff attend monthly meetings to coordinate issues and events.</p> <p>On January 24, 2017, the Mid-Willamette Outreach Group (MWOG) hosted their sixth Erosion Control and Stormwater Management Summit (Summit). New this year, MWOG offered a Certified Erosion and Sediment Control Lead (CESCL) course through the Northwest Environmental Training Center. Event Attendance: Summit: 54, CESCL: 36, Total: 90</p>

Task Description	Measurable Goals	Tracking Measures	FY 2016-17 Activities
			<p>The group hosted four classes (~100 students) at the Water Festival on May 9, 2017. Eight courses were provided by MWOOG staff and associates and were dedicated to water and watershed health.</p> <p>Since November 2016, MWOOG and Chemeketa Community College have been in discussion regarding the potential partnership between the two entities for establishing a certification for a vegetated stormwater quality facility maintenance course. Research and development continues. The pilot workshop is scheduled for October 2017 with a full workshop to be delivered in spring 2018.</p> <p><u>Oregon Green Schools:</u></p> <p>Public Works personnel sit on the board and the executive committee of Oregon Green Schools. Staff attend monthly meetings and provides overall direction for the organization. Highlights for the year include submitting and receiving a DEQ grant to address waste reduction in rural communities, developing a strategic plan, and hosting the annual Oregon Green School Summit on April 14, 2017.</p> <p><u>Salem Environmental Education:</u></p> <p>Salem Environmental Education is a newer local organization that has invited staff to become a board member. Staff has attended three meetings in support of SEE. SEE is dedicated to providing and supporting environmental education in the Salem community for citizens of all ages.</p> <p>The City provided support this year by partnering to bring “River Currents” (a series of riverside presentations) to the public; providing staff for presentations for the neighborhood outreach program; and providing staff and funding for their environmental STEM program through the watershed protection and preservation grant. The City of Salem will be providing greater support for SEE in FY 2017-18.</p> <p><u>Salem No Ivy Coalition:</u></p> <p>City of Salem staff continued to help coordinate ivy pull events at local parks.</p> <p>The City of Salem and the Salem No Ivy Coalition hosted 12 events, with 680 volunteer hours, and rescued 660 trees from choking ivy.</p> <p><u>Straub Environmental Center:</u></p> <p>Staff attended monthly board meetings on 7/19, 8/16, 9/20, 10/4, 11/15, and 1/17. Staff also attended education committee meetings on 9/28, 10/4 and 10/19. Due to the organization’s shift of focus, staff no longer sit on the board of SEC. However, the City still supports the organization by providing grants for programming; event planning and coordination (such as that for EcoFest on June 17); and program coordination (such as that provided for the two-week session with the Northwest Youth Corps’ where they focused on environmental jobs). This effort was planned in FY 2016-17 and implemented in FY 2017-18.</p>
RC 1-6: The City will work with Marion and Polk Counties and the City of Keizer to coordinate stormwater management programs and activities within the greater Salem-Keizer Urban Growth Boundary. Coordination may include the establishment of appropriate intergovernmental agreements (IGAs) regarding potential uniform stormwater design standards, operations and maintenance activities, and public education and involvement efforts within the UGB.	<p>Review and update the October 2000 SKAPAC Stormwater Management Agreement by the end of the permit term to reflect each jurisdiction’s respective MS4 Permit and SWMP.</p>	<p>Report on significant coordination activities or programs.</p> <p>Report on completion of SKAPAC Agreement and other IGAs.</p>	<p>Staff from the City of Salem, City of Keizer, and Marion County made a collective decision during the 2013-14 reporting period that the existing SKAPAC Agreement adequately addresses any concerns the jurisdictions may have regarding potential development activities in identified Stormwater Agreement Areas. No updates to the agreement were deemed necessary during this reporting period. SKAPAC participants will continue to meet if needed to review public or private development projects that may impact the agreement.</p> <p>Stormwater staff continued to work with Marion County, the Marion Soil and Water Conservation District, the City of Keizer, the City of Albany, and the City of Corvallis through the Mid-Willamette Valley Outreach Group (MWOOG) to coordinate outreach pertaining to Erosion Prevention and Sediment Control and Low Impact Development practices (see RC 5 and CON 1). There were no new IGAs developed during this reporting period.</p>
RC 1-7: Evaluate existing detention facilities and potential new detention sites for potential conjunctive uses (as water quality facilities and for retrofiting opportunities). Continue to perform facility site searches to locate ponds, wetlands, vegetated swales and other water quality facilities as existing water quantity and quality facilities are evaluated and potential new sites are identified. Coordinate with RC1-1 and RC1-2.	<p>Complete a retrofit plan before end of year four of the MS4 permit cycle.</p> <p>Develop a strategy to identify and prioritize potential retrofit projects by November 1, 2013.</p> <p>Identify a minimum annual budget for stormwater retrofit projects as part of the retrofit strategy by November 1, 2014.</p>	<p>Report on available budget and completion of retrofit project efforts.</p>	<p>The Stormwater Retrofit Plan was completed and submitted to DEQ on October 28, 2014.</p> <p>During this reporting period the City budgeted \$100,000 towards the design and construction of stormwater retrofit projects as part of the City’s Capital Improvement Program. Representatives from the City’s Engineering, Stormwater Quality, and Public Works Operations sections met quarterly to review a variety of engineering projects, including stormwater retrofits.</p> <p>The \$180,000 stormwater retrofit project targeting bacteria at Eola Ridge Park in West Salem was completed on October 30, 2015, and maintenance activities at the site continued during this reporting period, which included the replacement of sand within the wetland’s forebay. During the 2015/16</p>

Task Description	Measurable Goals	Tracking Measures	FY 2016-17 Activities
			<p>reporting year, a \$10,000 OWEB grant was awarded to the Glenn-Gibson Watershed Council in partnership with Polk County Soil & Water Conservation District, Friends of Trees, and the City's Public Work's Department to remove invasive species and plant native trees and shrubs at the Park. During this reporting year, all partners implemented invasive species removal activities and community tree plantings, which have improved the habitat of the receiving waterbody immediately downstream from the retrofit site within the same city park.</p> <p>The following stormwater retrofit projects were completed during reporting period 2016/2017:</p> <ul style="list-style-type: none">• The City's Public Works Operations division constructed a stormwater retrofit project in the East Yard to control sediment from its materials storage bins. Contracted crews installed a new collection trench composed of three baffles and settling chambers, catch basin, and an oil water separator.• The street widening at the intersection of Madrona and 25th installed over 1,000 feet of water quality swales, two rain gardens, six water quality planters, one hydro-upflow filter manhole, four Contech filter catch basins, one detention pipe, and mitigated plantings associated with the installation of a new culvert. There were no stormwater treatment facilities at this site prior to this project. <p>Starting in fiscal year 2016/2017, \$100,000 was budgeted in the City's Capital Improvement Program to go directly toward the design and construction of stormwater retrofits. It is anticipated that future Capital Improvement Program budgets will include the same amount for future stormwater retrofits.</p> <p>During this reporting period, the following projects were in design, and are planned for construction in the next fiscal year. These projects include:</p> <ul style="list-style-type: none">• Airport terminal entryway with treatment swales.• Daylighting of a stormwater outfall in Woodmansee Park.• McGilchrist Street widening with stormwater treatment facilities.• 12th Street resurfacing and widening with subsurface gravel treatment wetland and treatment facilities.• Design of the Marion and 13th Streets Stormwater Improvement Project was completed in FY 2016/17, and the project will be open for bids October 2017, and construction is anticipated for December 2017. The Rain Garden is designed per City standards, and will be treating approximately 31,000 square feet of impervious area. The total basin has approximately 183,000 square feet of impervious area.
RC 1-8: The City will continue to be an active member of the Oregon Association of Clean Water Agencies (ORACWA). The City will use this medium to obtain copies of materials that have been produced by others. City staff will stay current on latest available educational and technical guidance materials.	<p>Attend a minimum of one stormwater-related workshop or conference annually. Attend groundwater-related workshops and conferences as funds allow.</p> <p>Make information obtained at these events available to other City staff.</p>	<p>Report on City participation with ORACWA events.</p>	<p>Public Works staff continued to actively participate in Oregon Association of Clean Water Agencies during the 2016-17 reporting period through attendance at Stormwater, Pretreatment, Legislative, and Water Quality Committee meetings. Two City staff attended the Annual Conference that was held in Bend on July 27-29, 2016. Three Stormwater staff members attended the ACWA Stormwater Summit on May 10, 2017.</p> <p>Information acquired through ACWA meetings/events continues to be routinely passed on to other City staff.</p>

Table 3. RC2—Capital Improvements

Task Description	Measurable Goals	Tracking Measures	FY 2016-17 Activities
RC 2-1: Implement stormwater projects (including stormwater conveyance, quantity, quality, and stream/habitat improvement) based on priorities established under the Capital Improvement Program (CIP) and the Stormwater Master Plan consistent with available funding.	Include a funding line item for CIPs in proposed stormwater budget. Review and prioritize CIPs and budget annually. Implement CIPs based on prioritization and available funding.	Track number and description of projects completed. Report updated CIP list annually.	During the 2016-17 reporting period the following projects were completed: <ul style="list-style-type: none">• Campbell & Cranston - Design and Construction for the replacement of approximately 1,300 LF of 12-inch storm pipe.• Geren Island Bank Stabilization - Project includes 180 ft. of Bio-engineering along the North Channel at Geren Island.• Flood Warning System - Installation of software and hardware to provide early flood warning system. Stormwater projects included in the 5-year Capital Improvement Plan (FY 2016-17 through FY 2020-21) is included as Appendix B of this report.
RC 2-2: Continue to coordinate capital improvement projects with the Water Resources Section to integrate multiple resource agency permitting needs. The review is intended to identify integrated opportunities and permitting needs to meet water quality-related requirements.	Review and integrate multiple resource agency permitting needs, including MS4 permit requirements, into 100% of CIP projects.	Track number of projects reviewed. Track number of projects permitted.	The Water Resource Section no longer exists. City staff in PW/ Planning provide assistance in obtaining agency permits for all work below ordinary high water (OHW). Engineering staff are knowledgeable regarding when permits are needed or will contact planning staff if they have any questions. All CIP and Operations projects that need a permit to be constructed go through the process to obtain the needed permits and the goal is being met.
RC 2-3: The City continues to acquire physical access-easements for public and private stormwater facilities. This is done by identifying existing facilities for which easements, rights-of-way, or permit-of-entry agreements are needed for stormwater facilities; and developing a plan for acquiring the same, given current funding limitations.	Within one year of completion of the hydromodification study and retrofit plan, prioritize easement acquisitions for stormwater facilities. Following prioritization, identify funding source(s) for inclusion in budget.	Report on easement acquisition and prioritization process.	Easement acquisitions have and will continue to be prioritized and pursued on a project by project basis. Acquisition costs are factored in and budgeted for along with all other associated project costs. The Retrofit Plan and Hydromodification Assessment that were submitted to the DEQ by the November 1, 2014, deadline identified prioritized areas for stormwater improvement projects. Priorities will be further defined as part of the Stormwater Master Plan update currently underway on a basin by basin basis.

Table 4. RC3—Update of Stormwater Design Standards

Task Description	Measurable Goals	Tracking Measures	FY 2016-17 Activities
RC 3-1: Continue to encourage the use of structural BMPs for stormwater quality improvement and flood peak reduction opportunities. Develop stormwater quality design and associated maintenance standards for new and redevelopment. Continue to evaluate opportunities to provide incentives for alternative stormwater management practices, including Low Impact Development (LID). Maintain and update the Stormwater Management Design Standards after they are developed.	<p>Develop incentives for LID and other stormwater quantity and quality management practices.</p> <p>Develop updated stormwater design standards to include structural stormwater quality BMPs.</p> <p>Maintain Stormwater Management Design Standards and update as needed.</p>	<p>Document revisions made to Stormwater Management Design Standards.</p> <p>Document the development of any incentives for implementation of LID techniques.</p>	<p>Incentives for Low Impact Development (LID) have been incorporated into Salem's Stormwater Utility in the form of credits that allow the impervious surface-based portion of the utility fee to be reduced based on the presence of stormwater quality and quantity facilities on the ratepayer's property. The first phase of the Stormwater Utility fee was implemented in January 2013 and the utility was fully implemented January 1, 2016. New Stormwater Design Standards were approved as Administrative Rules completed in late 2013 and have been effective since January 1, 2014. The new standards are consistent with the new stormwater regulations and include design criteria for green stormwater infrastructure.</p> <p>The stormwater design standards are in the process of being updated. A list of changes have been developed and have been reviewed with City staff as well as the engineering community. It is anticipated these changes will be fully implemented by the first quarter of 2018. This is the first major update to the design standards since they were rolled out in 2014.</p>
RC 3-2: Continue to implement process to identify and remove barriers for implementing LID techniques. Update the Stormwater Management Design Standards and associated Salem Revised Code (SRC) provisions as appropriate.	<p>Within three years of implementing the revised stormwater design standards, review and, as appropriate, modify design standards and SRC to minimize barriers to implementation of LID techniques.</p>	<p>Document the review of design standards and SRC to minimize barriers to implementation of LID techniques.</p>	<p>Barriers to implementing Low Impact Development techniques have been identified and modified through Ordinance 34-13, which was adopted by Salem City Council on November 4, 2013. Updating the Stormwater Management Design Standards related to LID techniques was completed in late 2013 and new standards became effective on January 1, 2014. These standards will continue to be updated as new information becomes available (see RC3-1).</p>
RC 3-3: City staff is implementing the Water Quality Development Standards set forth by SRC Chapter 141 for all development requiring a Willamette Greenway Permit.	<p>Implement Water Quality Development Standards in Willamette Greenway.</p>	<p>Track number of Willamette Greenway Permits issued and description of water quality measures employed.</p> <p>Track number of new facilities constructed.</p>	<p>Greenway permits are tracked through AMANDA, the City's permit tracking system. No Willamette Greenway Permits were issued during this reporting period. All new or rehabilitation projects greater than 10,000 sq. ft. in the Willamette Greenway must utilize the current Public Works Design Standards. The Public Works Stormwater Design Standards are equal to or more stringent than the earlier Willamette Greenway standards.</p>
RC 3-4: Continue to review all residential, commercial, and industrial plans submitted for City-issued building permits for compliance with the City's Stormwater Management Design Standards. Conduct inspections of completed projects prior to the City's acceptance of those projects and project close-out to ensure work was done in accordance with approved plans. Maintain database of plans reviewed and final inspections conducted. See IND1-Task 2 for standards specific to industrial facilities.	<p>Review all residential, commercial, and industrial plans submitted for City-issued permits for compliance with the City's Stormwater Management Design Standards and associated SRC provisions.</p> <p>Conduct inspections once construction is completed to ensure work was done in accordance with approved plans.</p>	<p>Maintain database of plans reviewed and final inspections conducted.</p>	<p>During this reporting period, all residential, commercial, and industrial plans submitted for City-issued permits continued to be reviewed by Public Works staff for compliance with Stormwater Management Design Standards. Construction of stormwater-related facilities are inspected by Plumbing Inspectors within Community Development and/or Public Works to ensure that work was done in accordance with approved plans. All plan reviews and inspections are tracked in AMANDA, the City's permit tracking database.</p>

Table 5. RC4—Operations and Maintenance

Task Description	Measurable Goals	Tracking Measures	FY 2016-17 Activities
RC 4-1: Continue with the existing street sweeping schedule for all areas, maintaining the record of observations, quantity, and quality of material collected in the daily log books. Collect and compile this information for making recommendations for modified methods, schedules, and for NPDES MS4 permit annual reporting and overall program evaluation.	<p>Review street sweeping program annually for effectiveness and any necessary revisions to sweeping schedule.</p> <p>Continue sweeping City streets on four zone schedule, sweeping heaviest zone 8 times per year and lightest zone 2-3 times per year.</p> <p>Continue sweeping City-owned parking lots as needed.</p>	<p>Record quantity of material collected during sweeping operations.</p> <p>Record number of curb-miles of streets swept.</p> <p>Track and report changes made to sweeping schedule, if any.</p>	<p>The City continued to utilize two regenerative air sweepers in FY 2016-17 to sweep residential and collector streets that have been categorized as having High, Medium, or Light debris accumulation. The Heavy debris accumulation zone contains 19 routes and is swept 13 times per year. The Medium debris accumulation zone contains 15 routes and is swept 8 times per year. The Light debris accumulation zone contains 8 routes and is swept 6 times a year. A fourth zone that encompasses the Central Business District (CBD) and Capitol Mall is swept at night on a weekly basis. Heavy debris areas within the CBD are also swept three times per week during summer and twice per week in fall through spring. Arterial streets are swept at night, approximately every four weeks. A third machine is operated during peak season leaf season or when one of the other machines is broken down. Two operators sweep residential and collector streets during the day and two operators sweep arterial streets during the night time. City-owned parking lots are swept on an as-needed basis. The City does not sweep any commercial parking lots. During this reporting year the City swept a total of 13,418 miles, collected approximately 1,570 tons of street sweeping debris and removed approximately 4,164 cubic yards of leaves.</p>
RC 4-2: The City will continue to perform de-icing operations in a way that minimizes stormwater pollution such as conducting annual inspections and training to ensure proper operation of the de-icing chemical storage facility, utilization of the expanded covered storage areas for de-icing materials, maintaining proper function of sediment traps and catch basins in the storage yard, and coordinating de-icing activities with Airport Operations and their 1200-Z permit. The City is also looking for ways to improve current operations by investigating and evaluating potential cost-effective recycling opportunities for used de-icing sand material.	<p>Continue current de-icing operations to prevent stormwater pollution.</p> <p>Investigate potential cost-effective recycling opportunities for de-icing sand material.</p>	<p>Document review of recycling opportunities.</p> <p>Document dates of activities for annual inspections and training.</p> <p>Document de-icing quantities applied annually.</p>	<p>Recycling opportunities for used deicing sand material have not been found. This material cannot be reused for sanding due to the loss of traction providing angular surfaces. Additionally, the sanding material recovered by street sweepers is mixed with additional debris and contaminants present from street surface (heavy metals, petro-chemicals, trash, etc.). At present, the used sand can only be utilized as fill material in approved sites depending on levels of intermingled debris or contaminants.</p> <p>Material usage is documented on time sheets and the liquid deicing storage facility log book. Lane miles treated annually are also documented in a units of accomplishment report. This past fiscal year we treated 4,382 lane miles with liquid deicer and sanding rock; which equates to approximately 17,530 gallons of deicer applied, and 2,800 tons of sanding rock applied. The sanding rock was recovered within 10 days of use through our sweeping program.</p> <p>The annual Snow/Ice Training was held on November 30, 2016.</p>
RC 4-3: Continue to review and update the O&M practices and activity schedules defined in the Drainage Program Evaluation Notebook (DPEN) (including updating GIS database). Utilize Hansen IMS data to develop and refine work programs. This review will serve as a basis for budgeting and allocating resources; scheduling work; and reporting on and evaluating the performance and costs for the overall O&M program and specific activities.	<p>Update DPEN and IMS database activities and schedules.</p> <p>Create line items in budget for specific O&M activities.</p> <p>Review and update O&M practices and activity schedules every 3 years.</p>	<p>Track revisions made to O&M practices and activity schedules.</p>	<p>During FY 2016-17, Stormwater Operations & Maintenance staff worked on developing a new repair and maintenance schedule that will be a part of the Granite NET program. Granite uses a national standard to rate sanitary and storm systems. Based on the rating system, needs can be identified much easier. This program will be implemented in FY2017-18. The maintenance of existing infrastructure is presently prioritized based on flooding issues, pipe size, area affected, and customer impact. Flood prevention is the primary focus.</p> <p>In addition, efforts continued this year to link the City's GIS and Hansen databases for improved efficiency and tracking. All inspection and maintenance activities will continue to be tracked and documented in Hansen and GIS, as well as the new IPS database. IPS allows staff to track work much easier, including the ability to open and close work orders in the field and send work orders to different work groups.</p>
RC 4-4: Continue to improve the O&M training program and activities especially with regards to safety and protection of water quality.	<p>Conduct O&M safety meetings twice per month.</p> <p>Attend ACWA committee meetings and workshops as scheduled.</p> <p>Conduct weekly tailgate meetings with Operations crews.</p>	<p>Document reviews and modifications to the O&M training program.</p> <p>Record O&M training activities completed.</p> <p>Document ACWA meetings and workshops attended.</p>	<p>City staff continued to provide education and training for O&M staff during this reporting period. This included weekly tailgate meetings as well as online trainings. All required training is logged in the City's Target Solutions database. In addition, 5 staff members received Certified Erosion and Sediment Control Lead (CESCL) Training in 2016-17.</p> <p>Public Works staff continued to participate in ACWA meetings and workshops in FY 2016-17 (see RC1 Task8).</p>
RC 4-5: Integrated Pest Management (IPM) Program: Salem Parks Operations Division will continue their program for careful monitoring and management of pesticides, herbicides and fertilizers, and will provide public information. Review and refine	<p>Review and refine IPM Program during the MS4 permit cycle.</p> <p>Routine inspections of storage facilities for proper storage of materials and chemicals.</p>	<p>Document revisions made to IPM Program.</p> <p>Document inspections of storage facilities.</p>	<p>In FY 15-16 City staff utilized contracted services to assist with an evaluation of the City's IPM Plan. The study concluded a need for a comprehensive, citywide database for the tracking of integrative pest management activities. An IPM team was created to address this data gap and focus on the development of a new GIS-</p>

Task Description	Measurable Goals	Tracking Measures	FY 2016-17 Activities
the IPM Program during the permit cycle, ensuring proper handling and storage of pesticides, herbicides, and fertilizers.			<p>based record-keeping system. This system will enable field crews and managers to electronically record and visually analyze pesticide application data.</p> <p>The new tracking tool was completed during FY 16-17. All records of pesticide use by City personnel and contractors employed on behalf of the City are kept on file.</p> <p>During this report period, Stormwater and Environmental Service staff continued to perform and document routine inspections of material/chemical storage facilities.</p>
RC 4-6: Continue the storm sewer cleaning and TV inspection program, concentrating on known areas of localized flooding complaints (this alerts the City to locations of debris build-up and minimizes erosion potential) and persistent operation and maintenance problems, and looking for potential illicit discharges and seepage from sanitary sewers, see ILL2. Also focus on significant industrial/commercial areas where potential illicit discharges may be of concern.	<p>Concentrate storm sewer cleaning and TV inspection on areas with historical problems and high potential for illicit discharges.</p> <p>Inspect 120,000 LF of conveyance system annually.</p>	<p>Track number of inspections; identify areas with persistent O&M problems.</p> <p>Track number of cross-connections found.</p> <p>Track length of conveyance system cleaned and inspected.</p>	<p>Cleaning activities included 285,043 LF of storm mainlines, and 26,375 LF of storm main root cutting/removal. 11,976 catch basins were cleaned. 952.5 cubic yards of material were removed from the storm system. CCTV Inspection activities included 182,651 LF of storm main inspected.</p>
RC 4-7: Continue supporting annual Stream Cleaning Program. More than one half of the stream miles in the City of Salem are inspected annually by walking each stream segment. Using summer interns the City inspects the riparian areas and streams, picks up litter and garbage, inspects for illicit discharges (ILL2), addresses potential conveyance concerns, and evaluates areas for stream restoration.	<p>Walk 50% of the waterways within the City each year for stream cleanup and enhancement.</p> <p>Complete one stream restoration project each year.</p>	<p>Track length of waterways walked each year.</p> <p>Document stream restoration projects completed each year.</p> <p>Document the amount of litter and garbage removed each year.</p>	<p>The Stream Cleaning Program continues to span two reporting periods (running annually June through October).</p> <p>The 2016 Stream Crew (as of September 20, 2016) cleaned and inspected 45.49 miles of Salem's waterways removing 10,657 pounds of trash, 432 pounds of recyclables, and 74 cubic yards of natural debris. This Crew completed one restoration project as well as several smaller service requests pertaining to invasive vegetation removal and streambank stabilization.</p> <p>The 2017 Stream Crew (as of October 5, 2017) cleaned and inspected 47.5 miles of Salem's Waterways, removing 6,753 lbs. of trash and clearing 120 debris jams totaling 65 yds³ of green waste. Currently the Stream Crew is working on completing its annual restoration project, involving the removal of Ludwigia (an invasive aquatic plant) and replanting native plants at a pond on Geren Island. This project will help boost the quality of the aquatic habitat, as well as allow for the pond to more successfully capture and retain excess water during large rain events.</p>
RC 4-8: Continue to regularly inspect and maintain public structural stormwater control facilities. Coordinate with RC4 Task 9.	Regularly inspect all public detention and water quality facilities.	<p>Track number of public facilities inspected and maintained.</p> <p>Track amount of sediment and debris removed from all facilities.</p>	<p>During the reporting period, staff conducted 1,132 public water quality facility inspections of water quality manholes, catch basins, tree boxes, planters, rain gardens, and bioswales. In addition, field crews inspected 332 detention basins as part of the FEMA Community Rating System program.</p> <p>As seen in RC 4-6, the total amount of sediment and debris removed from the entire stormwater system (including sediment and debris from all public treatment facilities) total 952.5 cubic yards.</p>
RC 4-9: Develop and implement a long-term maintenance strategy for public and private stormwater control facilities. This strategy will identify procedures and/or priorities for inventorying, mapping, inspecting, and maintaining facilities.	Document and implement a long-term maintenance strategy for public and private stormwater control facilities during the MS4 permit cycle.	<p>Track number of private facilities located, mapped, and inspected.</p> <p>Track progress toward developing a facility long-term maintenance strategy.</p>	<p>During the reporting period, the City continued implementation of its Stormwater Facility Inventory, Inspection, and Maintenance Program. This program outlines the City's process for mapping public and private stormwater facilities in GIS, as well as the asset tracking methodology used in the Hansen database.</p> <p>Since implementation, the City has inventoried, mapped, inspected, and maintained all of its 256 public vegetative (e.g. bioswales, rain gardens) and 216 public mechanical (e.g. water quality manholes, tree boxes) treatment facilities through a quarterly inspection process. The City has also inventoried, mapped, and inspected 284 private vegetative and 356 private mechanical treatment facilities.</p> <p>Stormwater and GIS technical staff have completed a full inventory of public and private water quality facilities, and continue to update the list as new plans are approved, old plans are reviewed, and field crews discover previously unknown facilities in the field.</p>

Task Description	Measurable Goals	Tracking Measures	FY 2016-17 Activities
RC 4-10: Ditch maintenance is performed to assure adequate conveyance, and consists of two components: (1) Ditch Cleaning – Cleaning consists of removal of sediment in the bottom of roadside ditches only as needed for proper conveyance, with limited vegetation disturbance and the use of straw wattles to reduce sedimentation and erosion within the ditch. (2) Ditch Mowing – Mowing is typically conducted by inmate crews using hand-held equipment. Vegetation cutting facilitates conveyance and reduces the risk of potential fires in summer months.	Regularly inspect and maintain 100% of City ditches using appropriate water quality BMPs.	Track length of ditch maintenance performed (cleaning and mowing). Track amount of sediment and debris removed.	<p>During this reporting period, the inspection of roadside ditches was completed during the mowing process. The mower operator does a visual inspection once the ditch is mowed to determine if the level of sediment is impeding the flow.</p> <p>Drainage ditches are mowed with the use of Depart of Corrections crews. All drainage ditches are mowed twice, once in the summer and then in the fall. This reduces the risk of flooding in the winter and fire hazard in the summer.</p> <p>During FY 16-17 City crews:</p> <ul style="list-style-type: none">• Inspected and mowed 13.98 miles of roadside ditches (ditches along roadways);• Inspected and cleaned 6.9 miles of roadside ditches;• Removed 300 cubic yards of accumulated sediment/debris from roadside ditches <p>During FY 16-17 City and Inmate crews:</p> <ul style="list-style-type: none">• Inspected and mowed 37 miles of drainage ditches (ditches nonadjacent to roadways and commonly located on private property);• Removed 570 cubic yards of grass and vegetative debris from drainage ditches.
RC 4-11: Public catch basins are cleaned on a regular basis with a Vactor truck. During catch basin cleaning activities, inspections are done and repairs are scheduled if needed.	Clean and inspect 75% of catch basins annually. Periodically analyze the material removed from the catch basins.	Track the number and percent of catch basins cleaned annually. Report on any analysis of removed material.	During FY 16-17, City crews inspected and cleaned 11,976 (77 %) of 15,553 public catch basins. Through this process, and estimated 360.25 cubic yards of sediment/debris was removed from these structures using a Vactor truck and/or hand tools. As resources allow, staff anticipate utilizing GIS to map debris accumulations throughout the city, so that a prioritization scheme may be developed for future inspections and cleanings.
RC 4-12: Continue to refine the maintenance program for public and private stormwater detention and water quality facilities. The City maintains an informational packet outlining ownership and maintenance responsibilities and compliance assurance procedures to encourage owners of private detention and water quality systems to perform maintenance. Coordinate with RC 4 Task 9.	Maintain informational package for ownership maintenance responsibilities for detention and water quality facilities. Implement maintenance activities and requirements identified in long-term maintenance strategy (RC4 Task 9).	Track number of information packets distributed regarding private stormwater control facilities. Track maintenance requirements of long-term maintenance strategy.	<p>Since the effective date of this permit, City staff have inventoried 597 private water quality facilities on 263 private property taxlots, and created a dynamic GIS database for tracking purposes. This database is updated with new public and private stormwater quality facilities as new construction plans are approved and as-builts are received.</p> <p>As adopted in the 2014 Stormwater Design Standards, owners of newly installed private water quality facilities are be required to enter into a Private Stormwater Facilities Agreement, which holds the property owner responsible for the maintenance, inspection, recordkeeping, and repair of each facility.</p> <p>Additionally, private facility owners are required, at a minimum, to inspect their facilities quarterly for the first two years, and two times per year thereafter, unless otherwise stated in the manufacturer’s maintenance specifications. This is to ensure proper functioning of the facility for maximum pollutant removal.</p> <p>As a result of implementing the Private Stormwater Facilities Agreement during the construction phase of development projects, the City has a more reliable way of inventorying all of its private stormwater quality facilities. During this reporting year, 20 private green stormwater facilities were approved and permitted, and a total of 16 facilities were successfully constructed.</p>

Table 6. RC5—Public Education and Participation

Task Description	Measurable Goals	Tracking Measures	FY 2016-17 Activities
RC 5-1: Develop and implement a public outreach and education strategy with goals, objectives, identified target audiences, partners, identified target contaminants, and messaging. Conduct a public education program effectiveness evaluation of outreach procedures/efforts. Adjust the program based on the results in year five. (See Table A.1 – Public Outreach Program Matrix, June 2008).	Create two (2) public education campaigns* from the Public Outreach Program Matrix. Support outreach and educational activities for other divisions**. Conduct an effectiveness evaluation of the outreach program before the end of year four of the MS4 permit cycle.	Document public outreach and involvement activities for two (2) education campaigns. Document outreach activities for other divisions. Document the results of the effectiveness evaluation and subsequent changes to the outreach procedures/efforts.	<u>Category: General Outreach</u> Since trees play a large role in helping to mitigate stormwater issues, our Tree City USA celebration was one of the campaigns for the 2016/17 year. The campaign continues on what began in April 2016. In April 2016 the City celebrated 40 years as a Tree City USA. Outreach to celebrate the Year of the Tree was conducted from April 2016 to April 2017. The Year of the Tree celebrations were combined with tree-planting events to help mitigate temperature. The city hosted the following events between July 2016 and April 2017; when the “Year of the Tree” concluded: July 11: Capitol Tree Walk July 15 - 17: Salem Art Fair July 30: The Lorax movie August 18: Tree Trivia at Taproot September 22: Oregon Heritage Tree Travelogue Presentation October 22: Friends of Trees Crew Lead Training October 27: Trees for Wildlife presentation November 5: Tree Planting at Royal Oaks Park November 19: Tree planting at Judson Middle School December 2: Tree Lighting Ceremony December 3: Tree Planting at Eola Ridge Park January 17: Tree Painting and Pinot Party January 20: Tree City USA presentations at Pringle Elementary February 1 - 28: Tree Photo Contest February 11: Tree Planting at Eola Ridge Park March 11: Tree Planting at Judson Middle School March 28: Tree story time reading at the library April 1: Arbor Day planting Total participants: 988 <u>Category: Erosion & Turbidity:</u> Audience: streamside landowners Staff continued to explore options for building an outreach program for streamside homeowners to help with erosion issues. With 90 miles of streams in Salem that are primarily privately owned, streamside erosion is a considerable issue. The first step to building this program was to develop pilot projects to address different erosion severities with different techniques. To that end, we have been working with landowners and contractors who are currently addressing streamside issues. Three project areas have been identified; with each at a different stage of stabilization. This includes a recently completed living wall, a compost sock installation plantings, and one project with a scope of work that is just being identified. The goal is to develop a workshop for streamside landowners to provide education and assistance with erosion issues. The development and implementation of this this campaign and program will span several years. Audience: Erosion-related businesses

Task Description	Measurable Goals	Tracking Measures	FY 2016-17 Activities
			<p>*On December 13 and 14, 2016, the City hosted a Certified Erosion and Sediment Control Lead Training taught by the Northwest Environmental Training Center.</p> <p>Attendance: 32</p> <p>* On January 24, 2017, the Mid-Willamette Valley Outreach Group hosted its annual Erosion Control and Stormwater Management Summit. This year, the event was combined with a Certified Erosion and Sediment Control Lead Training offered by Northwest Environmental Training Center.</p> <p>Event Attendance: Summit: 54, CESCL: 36, Total: 90</p> <p><u>Categories: Garbage/Trash & General Outreach</u></p> <p>Storm Drain Art Project:</p> <p>Since February 2017, staff have been researching a means for developing a storm drain art project. We have interested partners, and staff is currently in discussion with various facets of the City to learn how to implement the project within the guidelines of City code.</p>
RC 5-2: Coordinate activities of various groups within the Public Works Department and other City departments assigned responsibility for public outreach and citizen contacts on stormwater matters.	Quarterly meetings of various groups assigned responsibility for public outreach and citizen contacts on stormwater matters.	Document quarterly meetings and outcomes.	<p><u>Strategic Communications Group:</u></p> <p>This group continued to meet regularly to discuss communications issues (such as changes to the City newsletter, website, social media accounts, etc.), that influence how information is communicated both internally and externally.</p> <p>Topics included:</p> <ul style="list-style-type: none">* Tools and Tips: Improving Communications* Launch of new website <p>The stormwater web pages continued to be a work in progress with the relaunching and upgrading of the new website.</p> <p><u>Annual Streamside Mailer:</u></p> <p>Staff met to discuss the content for the annual streamside outreach mailer. Topics that were included were dry weather outfall surveys, stream blockages, permission to access streams to remove debris, knotweed, flood insurance, and an introduction to the stream crew. This document was mailed on May 15, 2017 to 2180 streamside residents.</p> <p><u>Stormwater messages:</u></p> <p>Staff coordinated with street sweeping crews to provide messaging regarding keeping leaves out of the storm drains, created a storm drain video, added an educational insert to water bills, and promoted messages on social media, radio, and print.</p> <p><u>Green Team:</u></p> <p>A “Green Team” was developed to help the Public Works Operations Complex become Earthwise Certified in December 2016. Earthwise certification verifies that businesses are meeting waste management and pollution prevention goals.</p> <p><u>Stormwater Retrofits:</u></p> <p>Staff held meetings to develop a tool that improves retrofit project prioritization. A consultant was hired in FY 2016-17 to assist with this project. Staff is currently working to develop a weighting criteria to rank projects.</p>
RC 5-3: Increase the use of community partnerships to carry out outreach goals.	Develop one new partnership per year to carry out outreach goals.	Document partnerships and outcomes of partnership activities.	<p>During this reporting year Salem partnered with the new environmental non-profit in town (Salem Environmental Education or SEE). SEE is dedicated to providing and supporting environmental education in the Salem community for citizens of all ages. Being receptive and responsive to the needs of the community through partnerships with agencies and organizations are central to the mission. SEE is a</p>

Task Description	Measurable Goals	Tracking Measures	FY 2016-17 Activities
			<p>“go to” environmental organization with quality programming from a cadre of expert educators.</p> <p>Salem provided the following assistance to SEE in order to help carry out mutual goals:</p> <ul style="list-style-type: none">* lecture space at the City's library for SEE lectures.* staff for neighborhood outreach regarding water conservation* staff for Environmental Science, Technology, Engineering, and Math (eSTEM) program* staff interviews on our local, community-based radio station (KMUZ) <p>Staff will continue to work with Salem Environmental Education to incorporate outreach messages into SEE programming in FY 2017-18.</p>
RC 5-4: Investigate the use of a stormwater utility to provide an adequate funding base to support expanded public outreach (see RC6-2).	<p>Develop a yearly public education budget.</p> <p>Document public education and outreach needs in the Stormwater Utility Implementation Plan.</p>	<p>Document public education budget and expenditures.</p> <p>Document Utility implementation plan showing public education and outreach needs.</p>	<p>The outreach budget in FY 2016-17 was \$35,200 and included the following:</p> <p><u>Supplies:</u> \$5500 (Stormwater) and \$800 (Youth Environmental Education Program)</p> <p><u>Advertising:</u> \$8400</p> <p><u>Mileage:</u> \$250 (Youth Environmental Education Program)</p> <p><u>Erosion Control Summit:</u> \$3500</p> <p><u>Invasive Species-- Knotweed treatment:</u> \$10,000</p> <p><u>Adopt-A-Stream Support:</u> \$1500</p> <p><u>Translation Services:</u> \$2000</p> <p><u>Memberships:</u> \$250</p> <p><u>Event Rentals:</u> \$3000</p> <p>Total: \$35,200</p> <p>A request to move two part-time staff to full-time will be submitted for the FY 2018-19 budget.</p>

Table 7. RC6—Stormwater Management Program Financing

Task Description	Measurable Goals	Tracking Measures	FY 2016-17 Activities
RC 6-1: In conjunction with the updated Stormwater Master Plan (RC1-1), review and update the Stormwater System Development Charge (SDC) methodology to address both stormwater quantity and quality.	Adopt updated Stormwater SDC methodology by the end of the MS4 permit cycle.	Report on update to Stormwater SDC methodology.	The review and update to the Stormwater System Development Charge (SDC) methodology is being conducted independent of the work plan for the Stormwater Master Plan. A consultant has been hired and a committee consisting of representatives of the development community, home builders, and residents has been formed and began meeting in early summer of 2017. Updates to the stormwater SDC methodology will be done in conjunction with updates to all five SDC methodologies -- water, wastewater, stormwater, transportation, and parks.
RC 6-2: Implement a new stormwater utility capable of generating stormwater fees historically paid for by water and/or sewer utility customers. The new utility will include incentives to encourage users to implement alternative stormwater management practices such as LID.	Adopt new stormwater utility by the end of the MS4 permit cycle.	Report on adoption of new stormwater utility.	The new Stormwater Utility was adopted by Salem City Council in December 2010 and the first of four phases implementing the stormwater fee took place in January 2013. The fee is now fully implemented. The fee structure includes credits that provide for reductions in the impervious surface-based portion of the utility fee for ratepayers who have stormwater treatment and/or flow control facilities on their property. Generally, the credit is higher for facilities that are categorized as green stormwater infrastructure than for more traditional stormwater facilities.
RC 6-3: Identify and pursue grant opportunities for stormwater quality projects, including potential retrofit and LID project opportunities.	Pursue grant opportunities as staff resources allow.	Track number of grants applied for each year. Track number of grants received each year.	<p>During this reporting year, the City of Salem worked with Willamette Riverkeeper on a pre-application to the Willamette Focused Investment Program to complete work at Minto-Brown Island Park to address invasive aquatic species (Ludwigia) growing in both Oxbow and Willamette Sloughs. After further inquiry, the City determined that baseline water quality testing and biological surveys are needed to ensure that any action does not negatively affect water quality and wildlife in this natural area. The City plans to complete this baseline monitoring and then apply for funding with Willamette Riverkeeper through the competitive grant cycle with the Focused Investment Program in 2018 for Minto-Brown Island Park.</p> <p>In this reporting year, the City submitted a letter of support for Willamette Riverkeeper’s Gail Achterman Wildlife Area Focused Investment Program Grant Application, which would dedicate funds for Willamette Riverkeeper staff to assist the City during fiscal year 2017/2018 with the development of a future grant.</p>

Table 8. RC7—Maintain and Update GIS System

Task Description	Measurable Goals	Tracking Measures	FY 2016-17 Activities
RC 7-1: Continue maintenance of the GIS database and Hansen IMS database. These on-going updates will also reflect completion of any stormwater Master Plan capital improvement projects, new facilities added to the system, potential “hot-spots” for illicit discharges, refinement of data for the existing system, updated information on wetlands, perennial streams, waterways, and floodplain/floodway designations, and information updated on a periodic basis for the City’s Urban Growth Boundary. The GIS database will be accessible by City departments for review purposes.	Continue performing database updates annually. Create record of GIS maintenance activities.	Record maintenance / updates made to database.	The GIS team worked on 84,222 linear feet of pipes in the sanitary sewer and storm system during the 2016-2017 fiscal year. This footage reflects both new line work created for permitted developments, capital improvement projects or City Operations projects, as well as updating existing line work to match as-built information for City owned and certain privately owned sewer and storm assets.
RC 7-2: Integrate the information in the GIS and IMS. The City plans to integrate the data from both the GIS and Hansen IMS databases so that information in the Hansen IMS database can be visualized using the GIS system.	Create an action plan for how the GIS and IMS system will be integrated and updated. Implement action plan to integrate GIS and IMS.	Track completion of action plan items. Track implementation status of database integration.	The City continued to use a phased approach during this reporting period in order to integrate the GIS and Asset management system (Infor Public Sector). Stormwater asset integration was finally implemented in June 2017.

Table 9. RC8—City Stormwater Grant Program

Task Description	Measurable Goals	Tracking Measures	FY 2016-17 Activities
RC 8-1: Expand matching grant program for watershed protection and preservation to allow for funding of stormwater-related activities, such as promoting water-wise landscaping, reduction of stormwater discharges, restoring riparian areas, stormwater quantity reduction, stormwater quality/treatment, etc.	Continue to fund \$50,000 grant program. Expand matching grant program for watershed protection. Promote the grant program in conjunction with RC5 outreach activities.	Maintain a list of grant awards tracking funding and projects.	<p>The City of Salem continued to provide \$50,000 for the grant program in FY 2016-17. Five grants were submitted and approved. However, one grant was retracted by the group that submitted the grant. The amount granted was \$18,100. There are currently three potential grants moving forward into FY 2017-18.</p> <p>This grant program was previously expanded to include a larger range of project types for which grants may be requested. This year's grant recipients received funding for the following types of projects: environmental education, streambank restoration, and project implementation.</p> <p>The grant is promoted via multiple outreach mechanisms, but is mostly effected by simple word of mouth.</p>

Table 10. RC9—Legal/Ordinances

Task Description	Measurable Goals	Tracking Measures	FY 2016-17 Activities
RC 9-1: In process of revising the Stormwater Management Design Standards (RC 3 Task 1) and developing a stormwater-dedicated chapter to the SRC (RC 9 Task 3), coordinate with Community Development’s effort to adopt a Unified Development Code (UDC). It is envisioned that the stormwater dedicated SRC would be integrated into the UDC framework.	Adopt the UDC and integrate stormwater-related revisions to the SRC by the end of the MS4 permit cycle.	Report on progress for adoption of UDC and integration of stormwater-related SRC.	<p>City staff incorporated selected chapters of the Salem Revised Code (SRC) into a single, Unified Development Code (UDC). Led by the Community Development Department, the effort involved grouping related sections and subsections of existing chapters of the SRC into the more cohesive UDC format.</p> <p>The new Unified Development Code went into effect May 14, 2015. Additional information and details are provided on the City's website at: http://www.cityofsalem.net</p> <p>This activity is complete.</p>
RC 9-2: Continue to enforce the SRC and review and revise it as necessary to reflect the updated Stormwater Management Design Standards that principally focus on requirements associated with on-site water quality facilities for new development or redevelopment (RC3).	Revise SRC (as needed).	Track any MS4 stormwater pertinent revisions made to the SRC.	<p>Salem Revised Code (SRC) Chapter 20J (Administrative Rule Making and Contested Case Procedures) contains provisions for enforcement proceedings and civil penalties.</p> <p>Subsections in SRC Chapter 70 (Utilities General) were adopted by City Council in December 2012 that clarify inspection procedures for enforcing the Utility Code and establishes operation and maintenance requirements for owners/operators of private stormwater facilities.</p> <p>This task will remain ongoing.</p>
RC 9-3: Develop a new SRC chapter dedicated solely to stormwater management. It is currently envisioned that this will be done after the City’s renewed MS4 Permit is issued, and in conjunction with implementation of the new stormwater utility and updated Stormwater SDC Methodology (RC6) and the updated Stormwater Master Plan (RC1).	Adopt the new SRC chapter for stormwater by the end of the MS4 permit cycle.	Report on adoption of the new SRC chapter for stormwater, and processes/milestones enroute to formal adoption of the SRC revisions.	<p>A new chapter of the Salem Revised Code (SRC) specific to stormwater was adopted in December 2013 and became effective January 1, 2014. An update to City’s Public Works Design Standards was completed in December 2013 and became effective January 1, 2014.</p> <p>This activity has been completed.</p>

Table 11. ILL1—Spill Prevention and Response Program

Task Description	Measurable Goals	Tracking Measures	FY 2016-17 Activities
ILL 1-1: Continue to review and refine the existing spill prevention and emergency response program to protect ground and surface water quality. New activities will be proposed and implemented as appropriate, and coordination and cooperation among other relevant agencies and ODOT will be maintained and improved. This review will be coordinated with the de-icing activities of the Airport Operations and their 1200-Z permit, and possibly the Oregon Air National Guard.	Continue to implement the spill prevention and emergency response program and review and revise as needed.	Document refinements to cleanup procedures for vehicular accidents and structural fires.	Salem Fire continued to respond to emergencies related to vehicular crashes, structural fires, and hazardous materials incidents utilizing Salem Fire Standard Operation Guideline (SOG) Tactical Guideline #4.16 – Minor Spill Response and Tactical Guideline #4.39-Sanitary Dump Stations. These Tactical Guidelines provide guidance on Best Management Practices (BMP) for preventing discharge into storm drains and how to appropriately identify and safely flush contaminants such as foam from engine company tanks into approved locations. Salem Fire will continue to respond to any spill or leak of de-icing material at the Salem Airport. Salem Fire continues to use Standard Operation Guideline (SOG) #2.6.3 – Live Fire Training, to incorporate best management practices related to the prevention and/or control of materials related to firefighter training. This guideline includes site surveys and procedures to eliminate runoff/discharge from firefighter training exercises into storm drain systems.
ILL 1-2: Continue to coordinate timely responses to, and clean-up of emergency response sites and structural fires among Fire, Building and Safety, Development Services, and Environmental Services staff. The Fire Department has the lead role for response at emergency response and structural fire sites and all major vehicular accidents. Environmental Services (ES) staff will provide assistance when requested by the on-scene incident commander. One of the ES responsibilities is to make sure that the cleanup activities are conducted in an environmentally sensitive manner.	Develop a review schedule with a checklist for the spill response plan.	Track the number and category of spill events responded to, including an estimate of the amount of spilled materials collected and any associated enforcement actions.	During this reporting period Salem Fire Department staff responded to the following spill events: Chemical leaks or spills = 31 Vehicle accidents = 1221 Fuel or oil spills =161 Salem Fire continues to respond hazardous/chemical spills as requested by our emergency dispatch center. If spills and/or leaks are beyond our capability or exceed the amount of equipment carried on our response vehicles, the Fire Department incident commander will request assistance from Environmental Services.
ILL 1-3: Continue to conduct daily City vehicle and equipment inspections for leaks and repairs as needed. Staff will review current procedures on an ongoing basis and implement improvements as necessary.	Continue to implement the daily equipment inspection program.	Report revisions to the daily inspection program.	City staff continued to conduct daily inspections of City vehicles and equipment in FY 2016-17. These inspections are documented on weekly inspection sheets that are routinely submitted to Section Supervisors. In the event that a leak/repair is identified the vehicle/equipment is promptly turned into Fleet for servicing.
ILL 1-4: Develop an updated Operations Pollution Prevention Plan; incorporating new/expanded/relocated Operations-oriented facilities.	Update the Operations Pollution Prevention Plan by the end of the MS4 permit cycle. Implement the updated Operations Prevention Plan upon completion.	Track progress toward updating the Operations Pollution Prevention Plan. Track implementation of the Operations Pollution Prevention Plan.	During this reporting period, Stormwater Quality staff continued to conduct monthly visual inspections of the Shops Complex. Stormwater staff also provided presentations to the various Public Works Operations work groups on the importance of good housekeeping practices, erosion control, and materials recycling. One of the resources used to educate staff is the Rain Check Employee Training Stormwater Pollution Prevention for MS4s video from Excal Visual, which covers BMPs applicable to municipal operations. The Stormwater Quality Supervisor continued to serve on the Shops Yardmaster Committee in FY16-17, and worked to design and implement the stormwater retrofit project in the East Yard. This committee is responsible for developing and implementing policies and programs, including the Shops Complex Stormwater Pollution Control Plan, which was completed in September 2012. On August 1, 2013, the Shops Complex was awarded an EarthWISE certification by the Marion County Public Works Department, which expired in May 2016. The Public Works Shops Complex received Earthwise re-certification in December 2016. In an effort to reduce waste and increase recycling in municipal operations, the City's Stormwater Quality Supervisor participated in the Marion County Master Recycler Program in the fall of 2016, and currently serves on the Marion County Solid Waste Management Advisory Council.

Table 12. ILL2—Illicit Discharge Elimination Program

Task Description	Measurable Goals	Tracking Measures	FY 2016-17 Activities
ILL 2-1: Continue to respond to reports of unusual discharges or suspicious water quality conditions within the stormwater system and urban streams. Where able, identify sources/causes and implement appropriate corrective actions. Utilize database to document associated activities.	Respond to reports of illicit discharges and suspicious water quality conditions. Maintain database to document unusual/suspicious discharges, sources found, and corrective actions taken.	Track calls and mitigation actions taken in database.	Environmental Services staff continued to respond, 24/7, to reports of unusual discharges or suspicious water quality conditions. During this reporting period, staff responded to 402 total incidents this year; 46 of which were directly related to water quality concerns. All responses and corrective measures are tracked in the Environmental Services database. A summary of enforcement actions and inspections is provided in Section 4 of this report.
ILL 2-2: Environmental Services staff will continue inspections of the City's wastewater users, through the pretreatment program, verifying the proper handling and disposal of both wastewater and stormwater.	Inspect City's wastewater users for proper management of wastewater and stormwater.	Track number of inspections and associated findings.	During this reporting year, Environmental Services staff continued to inspect wastewater users for proper handling and disposal of wastewater and stormwater. Staff completed the following inspections and business contacts during the reporting year: Business Inspections = 546 New Businesses Identified = 127
ILL 2-3: Work with Wastewater Collection Services to identify and correct cross-connections between the sanitary sewer and stormwater systems.	Review stormwater and ambient stream monitoring data to identify possible cross-connection discharges into the stormwater system. Maintain communications with Wastewater Collections and other City staff to identify any system cross connection problems.	Document number of cross-connections identified and corrective actions taken.	If stream water quality data from instream flow monitors indicate a rapid change in pH, conductivity, turbidity, etc. (particularly during dry weather), system alarms will trigger and personnel are dispatched to the location to determine the cause. Dry weather outfall screening may also show signs of possible cross connections. If evidence of cross connections is witnessed by any City staff, Environmental Services is notified. Environmental Services will investigate, log, and track the issue in their database. Wastewater Collections staff can provide smoke and dye inspection of lines to identify cross connections if needed. Corrective action is taken immediately to fix a cross connection. During the 2016/2017 reporting period, no cross connections were identified.
ILL 2-4: Develop and update a storm sewer outfall dry weather inspection and monitoring prioritization plan.	Prioritize outfalls for storm sewer outfall inspection and monitoring, and inspect annually. Coordinate prioritization process with ILL 2 Task 5.	Document review of outfall monitoring plan. Document priorities established for monitoring and inspection. Track dry weather inspections conducted and results of inspection.	The FY 2016-2017 dry weather outfall screening effort included a total of 37 outfall inspections (outfall structures or the first available upstream manhole); 21 of which received analytical sampling. A total of 15 pipesheds were investigated based on these outfall inspections, and 4 pipesheds were not investigated due to lack of time and resources. As part of the pipeshed investigations, a total of 5 additional manholes received analytical confirmation sampling to identify the origin of flow, and 1 outfall was revisited following water main repairs. Of the 37 outfalls inspected, 35 were identified in the City of Salem's Dry Weather Outfall and Illicit Discharge Screening Plan, 1 outfall was inspected based upon a Stream Crew observation of orange benthic growth at the outfall, and 1 outfall was inspected opportunistically due to its proximity to 2 existing priority outfalls. One priority outfall (D48486207) was determined to be a culvert structure above an existing priority outfall and will not be inspected in future years, but will be replaced by an additional outfall. For further information on the results of the inspections refer to Appendix B. In FY 2016-2017, a GIS-connected database was implemented for tracking Dry Weather Outfall Screening inspections, analytical results, and response activities. The use of this database will improve staff ability to track change in flowing outfalls over time, interpret long-term trends, and track interdepartmental response activities and pipeshed investigations. In FY 2016-2017, the Stormwater Services Department sent a mailer to all streamside residents describing the Dry Weather Outfall Screening Program and requesting that residents contact City of Salem Public Works Dispatch whenever stormwater outfalls are observed to be flowing after 72 hours or more without rain. No calls have yet been received as a result of this mailer.
ILL 2-5: Identify and map contaminated sites in the GIS system. With input from other City departments, identify a list of areas where there either has been a substantial spill or there is the potential for a spill or illicit discharge. These areas are identified based on activities on site, history of problems, or specific industry,	Continue to identify and map contaminated sites in the GIS system.	Track number of contaminated sites added to the GIS system.	No new contaminated sites were identified and/or added to the City GIS during this reporting period.

<u>Task Description</u>	<u>Measurable Goals</u>	<u>Tracking Measures</u>	<u>FY 2016-17 Activities</u>
for example. These areas will be mapped in the GIS system for use across City departments.			

Table 13. ILL3—Illegal Dumping Control Program

Task Description	Measurable Goals	Tracking Measures	FY 2016-17 Activities
ILL 3-1: Continue to sponsor the Adopt-a-Street Program. The program is an effective way to get residents involved in keeping the community’s streets clean and consequently preventing trash and debris from entering the storm drainage system.	Continue to support the Adopt-a-Street Program.	Record the miles of adopted streets, number of participating groups, and volume of litter collected through the Adopt-a-Street Program.	The City continued to sponsor the Adopt-a-Street Program during this last reporting year and utilized an internal database to track active/inactive volunteer group activity, dates of cleanup activities, total pounds of trash removed, and miles of street right-of-way maintained. During this reporting year, there were 90 different participating groups, 1,800 total volunteers, 180 street miles maintained, and 16,000 pounds of litter removed through this program.
ILL 3-2: Continue to provide the 24-hour Public Works Dispatch Reporting Center to receive and respond to calls regarding illegal dumping and other environmental complaints/problems and responses thereto. Continue to advertise hotline on City website, utility bill inserts, business cards, public brochures, and consumer confidence reports. As circumstances warrant, publicly report illicit discharges through use of various media outlets.	Continue to operate the 24-hour Public Works Dispatch Reporting Center. Assign reports to appropriate City staff for action, including actions taken under ILL2-1.	Record number and types of reported illegal dumping incidents. Track media outreach when a discharge warrants.	Environmental Services provides staff to respond, 24/7, to reports of illegal dumping and environmental complaints received through the Public Works Dispatch Center. Actions taken when responding to calls includes the completion of “Service Requests”, a computerized record of calls received and actions taken. This database is in the Public Works Dispatch Center. Staff responded to 402 incidents during this reporting period. Refer to Section 4 for additional information on MS4 related enforcement actions during the reporting year.
ILL 3-3: Continue to support the Adopt-a-Stream program, which involves teachers and students in gathering water quality data from streams, thereby providing water resource education to students through experience. The City supports the program by facilitating projects and providing technical assistance and resources.	Continue to support the Adopt-A-Stream Program.	Maintain a descriptive list of adopt a stream program projects, objectives, outcomes upon completion, and number of participants.	Staff continued to support the Adopt-A-Stream Program in FY 2016-17. Presentations and supplies were provided to interested teachers as well as project facilitation and technical assistance upon request. We also continued to budget expenses for field trips to local waterways, the drinking water treatment facility, or the wastewater treatment facility. Staff assisted three schools with Adopt-A-Stream studies this fiscal year: <u>North Salem High School:</u> <ul style="list-style-type: none">Staff provided four presentations for the riparian section of Salem Watch.Staff provided a presentation regarding the Mill Creek Watershed, its adjoining watershed, and ways to protect water quality.Provided AAS funding for a trip to the wastewater treatment facility. <u>South Salem High School:</u> <ul style="list-style-type: none">Assisted with macroinvertebrate comparative studies of two streamside locations (Bush Park and Gilmore Field).Assisted with field research at Opal Creek regarding water quality and macroinvertebrate studies. <u>Forest Ridge Elementary School:</u> <ul style="list-style-type: none">Provided macroinvertebrate sampling activity for the annual “Down by the Riverside” event.
ILL 3-4: Continue to support Marion County in their efforts to provide convenient alternatives for legal disposal of household hazardous wastes and other recyclable materials.	Continue to support Marion County in providing alternatives for household hazardous waste disposal.	Document frequency and type of support activities.	During this reporting period, six of 52 weeks (11.5%) of our aired radio spots discussed proper disposal of household hazardous waste (HHW) and recyclable materials. These items also align with our outreach pollutants of concern: household hazardous waste, mercury, and heavy metals. The dates of associated messaging are provided below: Sept 5 - 9: HHW disposal Oct 31 - Nov 4: Heavy metals (Battery recycling) Dec 12 - 16: Mercury (CFL Disposal) Dec 19- 23: E'cycling (Heavy metals) Mar 20 - 24: Poison Prevention (HHW disposal) Mar 6 - 10: Heavy metals (Battery recycling) Facebook posts: 12/16 Promotion of Earthwise Certification

Task Description	Measurable Goals	Tracking Measures	FY 2016-17 Activities
			12/17 Promotion of Green Awards 12/28 Promotion of Green Awards 3/21 Poison Prevention -- HHW 5/4 Polk County HHW Event
ILL 3-5: Continue to support the annual yard debris cleanup effort.	Support the annual yard debris cleanup effort.	Record amount of debris cleaned up and level of participation.	The City held its annual Fall Leaf Haul on the first Saturday of December (12/03/2016). The following was collected at the event. Cubic yards collected: 150 Parks Foundation funds collected: \$67 Food Share funds collected: \$308 Pounds of food collected: 150 Approximate number of volunteers: 35

Table 14. IND1—Industrial Stormwater Discharge Program

Task Description	Measurable Goals	Tracking Measures	FY 2016-17 Activities
IND 1-1: Environmental Services will inspect stormwater systems while conducting inspections of City-permitted industrial wastewater users, and work with DEQ to coordinate the permitting and compliance processes for industrial users in the Salem area, including DEQ-issued 1200-Z permitted sources, underground storage tank (UST) removal, and site remediation permits issued by DEQ for sources/sites within the City. Coordination options include: receiving information on proposed 1200-Z permits, commenting on proposed permits, and meeting periodically with DEQ on coordination efforts.	Inspect stormwater systems while conducting inspections of City-permitted wastewater users. Develop process to coordinate with DEQ on industrial permits within the City.	Track coordination efforts with DEQ. Include stormwater observations as appropriate on inspection reports and follow-up actions.	Environmental Services continued to inspect area stormwater systems as part of facility inspections performed under the industrial pretreatment program. Inspection records are maintained in the Environmental Services database. Salem is not a permitting agent for DEQ's 1200-Z program but has been developing a process (consistent with the MS4 permit) to notify the DEQ when a site in Salem is undergoing development which may be subject to State permitting. Environmental Services notified the facility owner or contact person by letter. Regional staff for the DEQ Western Region were contacted by email with a scanned copy of the letter that was sent to the facility. Refer to ILL2 Task 2 for a summary of facility inspections, and IND1 Task 2 for a summary of facility plans reviewed.
IND 1-2: During plan review, review industrial facilities for the potential of requiring pretreatment of stormwater prior to discharge based on the industrial activities of the specific facility. Conduct inspections of industrial facilities requiring stormwater pretreatment to ensure structural controls have been built according to approved plans.	Review industrial plans as necessary for additional stormwater treatment. Conduct inspections once construction is completed to ensure work was done in accordance with approved plans.	Maintain database of plans reviewed and final inspections conducted.	Environmental Services continued to participate in the plan review and inspection processes to help insure appropriate treatment is included during construction, or remodel, of industrial sites. All plans reviewed and inspections completed are tracked in the Environmental Services database and the AMANDA database. Staff reviewed 243 industrial and commercial plans during the reporting year.
IND 1-3: Surveys are sent to applicable business classes (restaurants, metal finishers/platers, radiator shops, dry cleaners, printing shops, photo processors, etc.) as part of the pretreatment business survey database, part of the industrial pretreatment program for wastewater. Customers will be surveyed on major on-site activities to identify potential locations for public education, future sampling, and tracking down illicit discharges. Illicit stormwater discharges from these business groups are address in ILL2.	Send surveys to new customers as accounts are opened. Enter survey results into database – on-going as surveys are returned.	Track number of surveys sent out. Track number of surveys returned and entered into database. Track targeted public education activities for specific industries.	Environmental Services continues to send or deliver surveys to newly identified targeted businesses. Businesses failing to return the survey were visited by an inspector to obtain the necessary information. 20 surveys were distributed and returned during this reporting year.
IND 1-4: Continue the semi-annual Technical Bulletin for the City's industrial users and produce other materials for these users. This activity is principally associated with the City's wastewater Pretreatment Program, but will be used as a vehicle to address stormwater related issues as well.	Produce two technical bulletins for industrial users each year.	Track published technical materials prepared for industrial users each year.	Targeted and individualized (email and/or direct phone call) communication with permitted industrial users continued during FY 2016-17 in order to better ensure compliance with pretreatment and stormwater regulations. This form of communication has proven more effective than continued production of technical bulletins.

Table 15. CON1—Construction Site Control Program

Task Description	Measurable Goals	Tracking Measures	FY 2016-17 Activities
CON 1-1: Continue implementation of the Erosion Prevention and Sediment Control program for developments that meet or exceed the threshold indicated in SRC Chapter 75, which includes the submission of erosion prevention and sediment control plans with structural and non-structural BMPs. Review program experiences annually and implement improvements as appropriate including Code amendments if needed.	Implement SRC 75. Conduct annual program reviews. Implement appropriate improvements and/or Code amendments. Perform plan reviews for erosion control requirements.	Track number of erosion control plans reviewed for compliance with SRC 75.	Salem Revised Code Chapter 75 (Erosion Prevention & Sediment Control) continued to be used as the basis for plan review, inspection procedures, and enforcement. No changes were implemented during this reporting year. A program review was completed and it was determined that dedicated staffing levels are providing for 100% plan review availability. During FY 2016-17, 146 EPSC plans were reviewed by City staff. In addition 692 single family applications were reviewed.
CON 1-2: Continue to train and educate City staff and private contractors about stormwater pollution at construction sites, with an emphasis on prevention and control BMPs. Provide notice to construction site operators concerning where education and training to meet erosion and sediment control requirements can be obtained.	Provide annual erosion control training to City staff and private contractors.	Track education and training programs conducted and number of staff/public trained.	The Mid-Willamette Erosion Control and Stormwater Management Summit (coordinated through MWOG – see RC 5-1) training took place on January 24, 2017. This annual event provides a training opportunity for regional area contractors and design consultants. In addition, staff prepared and uploaded EPSC Awareness Training for all City staff as initial training and annual refresher on the Target Solutions internal training system. 10 City Inspectors and one local area engineer completed CESCL training and received a 3 year certification from ECO-3 on October 19, 2017 in order to ensure continued compliance with 1200 series and MS4 permits.
CON 1-3: Document and streamline site plan review, inspection, and enforcement procedures for the construction site runoff control program.	Complete documentation of site plan review, inspection, and enforcement procedures before the end of year four of the MS4 permit cycle.	Track completion of documented procedures.	The measurable goal of this task was achieved previously. Site plan review and inspection procedures and checklists are in place and actively used. No checklist updates were proposed during this reporting period. Training and accountability on inspection documentation details and photo integration is ongoing. Enforcement procedures are adopted and implemented as needed. Training on procedures and practices is ongoing.
CON 1-4: Continue to review and update the Erosion Prevention and Sediment Control Technical Guidance Handbook.	Update Technical Guidance Handbook before the end of year four of the MS4 permit cycle.	Track updates made to the Technical Guidance Handbook.	City Design Standards, Standard Construction Specifications, and Standard Drawings for erosion prevention and sediment control were completed in the previous reporting years and continue to be followed for all design and construction activities. These three items implemented have systematically replaced the need for the Technical Guidance Handbook.
CON 1-5: Continue to coordinate with the City’s 1200-CA Permit for City construction projects subject to its program.	Requirements for 1200-CA compliance incorporated into City construction plans, specifications, and contract documents. Make erosion prevention and sediment control a key agenda item at all pre-construction conferences. Include inspection of all site erosion prevention and sediment control measures as part of City projects.	Track renewal of 1200-CA permit.	1200 CA Permits continued to be included in City contract documents. 1200 CA Permit and EPSC enforcement continued to be a key discussion point at pre-construction conferences. A designated EPSC Inspector inspects all City 1200 CA permitted projects. Staff contacted Oregon DEQ staff during this reporting period concerning renewal requirements for the City’s 1200-CA permit.

Table 16. MON1—Monitoring

Task Description	Measurable Goals	Tracking Measures	FY 2016-17 Activities
MON 1-1: Continue to install and maintain flow and water quality monitoring stations in City waterways to support selection of capital improvement projects, update the hydrologic-hydraulic computer model, and help direct policies to protect the health of these water bodies. The actual rate of installation and the total number of stations will be based on the maintenance requirements of the stations, available funding, and coordination with urban watershed assessments/plans.	Install additional monitoring stations. Monitor the station alarms in conjunction with the illicit discharge control program (ILL2, Task 1). Follow up on potential hotspots or problem areas as may be identified through data analyses.	Track number of additional monitoring stations implemented.	<p>During FY 2016-2017, the City did not install any new permanent continuous stream gaging or water quality monitoring stations. However, three temporary stage/flow stations were installed and data from these stations were used to aid in the calibration process of hydrologic-hydraulic models associated with the City's Stormwater Master Planning efforts. A permanent stream gaging station is planned for installation on Waln Creek during FY 2017-2018.</p> <p>City staff adjusted the response to and tracking of alarms during "storm conditions" this reporting year. After a thorough analysis of past alarm data collected during rain events, it was found that it was hard to identify illicit discharges during storm events, and that the alarms were just capturing the expected effects of urban runoff on a stream. Therefore no alarms were run on any stations when rain was forecast for FY 2016-2017. Of the alarms that occurred during dry conditions, none were due to an illicit discharge.</p> <p>One monitoring station (CLK12) appeared to have had recurrent spikes in specific conductivity during the summer months of this reporting period. To date, analysis has not identified specific trends in regards to the timing of the spikes, and field reconnaissance has not found anything that points to why the spikes are occurring. One working theory is that the large rainfall amounts experienced during the wet season elevated ground water levels thus causing sump pumps to run during the summer months when normally they wouldn't be running. If specific conductivity spikes again next summer a significantly more aggressive approached to identifying to source will occur. It should be noted that the spikes in specific conductivity were minor in nature and there is no reason to believe there is an immediate concern regarding any impact to stream health.</p>
MON 1-2: Continue the urban stream and Willamette River water quality sampling program, with emphasis on reviewing and evaluating sampling data to prioritize investigations and improvement/maintenance projects. This sampling augments the monitoring plan included in the City's 2008 NPDES MS4 Permit Renewal application.	Update database for collected data. Review collected data for purposes of trending and benchmarking by the end of the permit term. Follow-up on potential hotspots or problem areas as may be identified by the data review.	Document findings regarding trends.	<p>Staff input the data collected from the Monthly Instream Sampling Program on a monthly basis for field parameters, and as soon as possible upon receipt of laboratory results. Data are verified by at least 2 people, once before it is entered into the database, and again on a yearly basis when all data undergoes a thorough review before being included in the annual report.</p> <p>City staff completed an evaluation of monitoring data from 2001 to 2016 that included time series and spatial trends analyses, as well as summary statistics and boxplots of data and submitted it to the DEQ last year as part of the FY 2015-16 annual report. The City will continue to update and compute trends analyses as time allows and as it is needed.</p> <p>Every year staff produce an Appendix of Monitoring Data that is included in the Annual Report submission. This summarizes the data for the year and documents any water quality exceedances. This provides a visual comparison of stream health from year to year, and helps staff target where issues may be occurring. One example, data collected through this BMP has been used to help in the prioritization of outfalls to monitor as part of the IDDE dry weather sampling effort.</p>
MON 1-3: Continue to implement all components (MS4 outfall, instream, pesticide, and macro-invertebrate) of the City's "Surface Water and Stormwater Monitoring Plan."	Implement the City's Stormwater Monitoring Plan, including MS4 outfall, instream, pesticide, and macro-invertebrate monitoring components.	Provide summary statistics for sampling results from each wet-weather season. Track any modifications to the monitoring plan.	The City continues to collect data as part of the monitoring requirements listed in Table B-1 of the City's NPDES MS4 permit. Because this permit was administratively extended, the City will continue to implement the "Surface Water and Stormwater Monitoring Plan" and report all results as part of the Annual Report. Appendix A contains summary statistics for all sampling that was conducted during FY 2016-2017.

3 PROGRAM EXPENDITURES AND FUNDING SOURCES

Stormwater-related program costs in Salem have been historically funded through wastewater rates, which are comprised of a water consumption (flow) component and a fixed user charge. In December of 2010, Salem City Council approved the adoption of a separate stormwater service charge or utility. Implementation of the stormwater utility was initiated on January 1, 2013, and completed over a period of four rate cycles.

The stormwater utility was developed to provide an equitable way of paying for Salem's stormwater programs by more accurately and fairly linking the stormwater impacts of the ratepayer's property to the rate paid by each ratepayer. The stormwater service charge is based on each property's impervious surface and an assessment of stormwater programmatic costs that are shared equally among all ratepayers. Additionally, properties that take steps to reduce their impervious surface areas, or that have onsite facilities that reduce stormwater impacts, have an opportunity to reduce their stormwater service charge. There currently is no mechanism for residential ratepayers to reduce their stormwater service charge.

Table 17 provides a summary of the total stormwater program expenditures for the current reporting year, as well as those anticipated through the next (FY 17-18) as identified in the adopted budget.

Table 17. Stormwater Expenditures		
<u>Stormwater Operating Costs</u>	<u>FY 2016-17 Budget</u>	<u>FY 2017-18 Budget</u>
Stormwater Operations & Maintenance	\$2,946,460	\$3,758,970
Stormwater Quality	\$2,184,550	\$1,818,720
Cleaning	\$354,630	\$750,718
T.V. Inspection	\$398,300	\$265,022
Water and Environmental Resources*	\$0	\$0
Environmental Services	\$355,990	\$280,236
Planning & Development	\$1,025,373	\$989,313
Laboratory	\$26,323	\$39,752
Operations Administration	\$338,710	\$233,215
Utility Billing	\$601,480	\$689,298
Dispatch	\$94,700	\$115,791
Debt for Capital	\$692,478	\$631,129
Department Administration and Indirect Costs (Nondivisional)	\$1,440,187	\$1,329,619
Nondivisional (Street Sweeping, Watershed Grants, HazMat/Emergency Management)	\$1,283,210	\$1,566,190
Budgeted Capital Improvements	\$4,878,140	\$4,861,000
TOTAL:	\$16,620,530	\$17,328,975

*The Water and Environmental Resources Section was eliminated at the end of Fiscal Year 2013-14.

4 ENFORCEMENT ACTIONS, INSPECTIONS, AND OUTREACH

Environmental Services staff responded to 46 incidents directly related to water quality concerns and reported six prohibited/illicit discharge violations during this reporting period. Enforcement actions related to these violations included warnings, a notice of violation, and a citation.

Erosion control and 1200-CA Permit requirements are an integral part of all City-issued construction plans and specifications. The City of Salem continues to coordinate efforts with Department of Environmental Quality (DEQ) staff regarding 1200-C permitted sites. During the FY 16-17 reporting period 7,790 erosion control-related inspections were conducted by Public Works Inspectors, there were 236 erosion related enforcement actions, and a total of 838 erosion control permits issued (refer to CON 1 Task 1 through 5).

A description of outreach activities that occurred during this reporting year can be found in Section 2 of this report.

Table 18. MS4 Violations					
<u>Name</u>	<u>Date</u>	<u>Violation</u>	<u>Action</u>	<u>Discharge</u>	<u>SRC</u>
Oregon Fruit Products	7/01/2016	Prohibited Discharge to the Storm Sewer	Warning	Process Wastewater	73.160
CBI Remodel	11/14/2016	Prohibited Discharge to the Environment	Warning	Concrete Slurry	73.160
La Botana Food Cart	1/17/2017	Prohibited Discharge to the Storm Sewer	Warning	Dirty Water	73.160
Private Residence – Leaking Vehicle	1/13/17	Prohibited Discharge to the Environment	Warning	Car Leaking Oil	73.160
Capitol Recycling & Disposal Inc.	2/28/2017	Illicit Discharge Violation	Civil Penalty - DEQ	Wash Water/Leachate	73.160
Private Residence – Paint to Storm System	4/10/17	Prohibited Discharge to the Storm Sewer	Citation	Paint to Storm	73.160

5 PLANNING, LAND USE CHANGES, AND DEVELOPMENT

The City of Salem Public Works Department Stormwater Management Design Standards (Design Standards) were revised in FY 13-14 to reflect the post-construction requirements presented in the MS4 Permit. Before these updates were adopted via the City's relatively new administrative rule process, a new stand-alone stormwater chapter (SRC 71) was developed and approved. This new stormwater dedicated chapter was adopted by City Council in December 2013. SRC 71 and the updated Design Standards became effective on January 1, 2014. The Design Standards will continue to be revised as new information becomes available.

5.1 Land Use Changes

There were no annexations or significant land use changes to report on for FY 2016-17.

5.2 New Development

The City of Salem has continued to see a steady stream of new projects at all phases of development. During the FY 16-17 reporting period, there was an addition of 2,611,780 square feet (60 acres) of new or replaced impervious surface area related to development projects in Salem. The list below includes projects that were recently completed or are moving forward in the development process:

Under Construction/Recently Completed:

- Amazon Phase I – 4775 Depot Ct. SE. 1,018,020 SF Warehouse/Fulfillment Center for Amazon. Under construction.
- PacTrust Phase I – 3315 Aumsville Highway SE. Two new Industrial/Commercial Shell Bldgs. (67,000 SF and 49,000 SF). Under construction.
- Court Street – 245 Court St. NE. 5-Story Mixed Use Bldg. Under construction.
- Coastline Foot and Ankle – 868 Liberty St. SE. New outpatient medical building. Completed.
- Dutch Bros – 1330 Barnes. 1,500 SF drive-through. Building permit issued and under construction.
- Oregon State Sheriff's Association – 330 Hood St. NE. Building addition and parking. Completed.
- Starbucks/Retail – 3165 Commercial St. SE. Redevelopment including new 1,960 SF Starbucks and 6,340 SF retail shell. Building permit issued and under construction.
- Wilco – 3285 Commercial St. SE. Redevelopment of former grocery store with parking improvements. Completed.
- Roth's – 3045 Commercial St. SE. Building addition, removal/regrading of pavement, reconfiguration of parking. Completed.
- Henningsen Cold Storage – 4301 Henningsen Ct. SE. New 183,000 SF cold storage building. Completed.
- Marietta – 3311-3325 Marietta St. SE. Integrated phased development – five new buildings. Under construction.
- Turner Road Storage Units – 2150 Turner Rd. SE. Self-service storage facility (4.62 acres). Under construction.
- Cordon Road Storage Units – 1500-1700 Block Cordon Rd. SE. Self-service storage facility (3.1 acres). Under construction.
- Starbucks Drive-Through – 205 Church St. SE. Redevelopment of former Barricks Funeral Home Site. Completed.
- Boulder Creek Medical Office – 2500 12th St. SE. New 38,860 square foot medical office building. Under construction.
- Portland Road – 3200-3300 Block of Portland Rd. NE. 180-units multi-family residential. Under construction.
- Claxter Rd. – 2758 Claxter Rd. NE. 24-units multi-family residential. Under construction.
- Cordon Road Apartments (Hawks Ridge Phase 2) – 1500-1700 Block Cordon Rd. SE. 82-Units. Under construction.
- Pembroke Apartments – 4752 Liberty Rd. S. 88-Units. Under construction.
- Red Leaf Apartments – 5710 Red Leaf Dr. S. 127-Units. Under construction.
- River Bend Apartments – 642-750 River Valley Dr. NW. 60-unit multi-family development. Under construction.

- SAIF – 400 High St. Renovation, remodel, and addition of existing office campus. Under construction.
- Goodwill (West Salem) – 225 Wallace Rd. NW. Goodwill retail store/donation center plus two new commercial buildings. Completed.
- Home Builders Office – 2075 Madrona Ave. SE. New 7,000 square foot office building. Completed.
- Baggage Depot – 500 13th St. SE. Rehabilitation of historic building and site alterations for Greyhound bus terminal. Under construction.
- Fairway Apartments – 6161 Commercial St. SE. 201-Units. Under construction.
- Hyacinth Apartments – 3257-3297 Hyacinth St. NE. 56-Units. Under construction.

Estimate of Potential Future Development:

- Gas Station/Convenience Store – 5000 Block of Gaffin Rd. SE. New development. In review.
- Memory Care Facility – 901 Front St. NE. 48-unit Memory Care and 69-unit Assisted Living Facility. Land use approval received – building permits required.
- Assisted Living Facility – 2950 Boone Rd. SE. 90-unit assisted living and 32-unit memory facility. Land use approval received – building permits required.
- Memory Care Facility – 6100 Block of Commercial St. SE. 68-unit care facility. In review.
- The Pointe at Glenn Creek – Glenn Creek Rd. and Wallace Rd. Redevelopment at SW corner of intersection with 3 new buildings. In review.
- McDonald's Rebuild/Expansion – 1011 Lancaster Dr. SE. Rebuild/expansion of existing site. Building permits in review.
- Self-Storage Facility – 1107 Hawthorne Ave. NE. Development of new facility. In review.
- Office Building – 2332 Saginaw St. S. New 2,400 SF office building. In review.
- Home Improvement Store – 2505, 2575, and 2711 Mission St. 259,000 SF home improvement center and parking. Land use approved.
- Wiltsey Towing – 4350 Ridge Dr. NE. Towing company office and storage yard. Building permit in review.
- Hotel – 390 Hawthorne Ave. SE. 82-room hotel. Land use approved.
- Vehicle Storage – 1885 Fisher Rd. NE. Auto inventory storage lot. Waiting for land use decision.
- Corban Dormitories – 5000 Deer Park Dr. SE. 3 dorm buildings and 3 future dorm buildings. Site plan review decision pending.
- Marion County Sheriff's Office – Public Safety Building – 3610 Aumsville Hwy. SE. 30,980 SF addition, parking, and vehicle storage. Building permit issued.
- Restaurants – 3883 Commercial St. SE. 4,750 SF of restaurant space. Completed.
- Joint Force Headquarters of the Oregon Military Dept. – 230 Geer Dr. NE. 56,000 SF building with parking. Building permit issued.
- Walling Properties – 2685 Lancaster Dr. SE. 20,320 SF warehouse, future 12,000 SF office, 24,000 SF warehouse, and 12,000 SF office. First building permit issued.
- Meadow Creek – 1190 Oakhill Ave. SE. 20-unit memory care addition and parking lot expansion. Land use approved.
- Hyacinth/Claxter Storage Units – 1940 Claxter Rd. NE. Self-service storage facility (4.88 acres). In review.
- Retail – 1691 Lancaster Dr. SE. Two new retail buildings (6,000 SF and 2,375 SF). Land use approved.
- Fred Meyer Fuel Facility – 3415 Commercial St. SE. 9 pump fueling station. In review.
- Caplinger – 5200 Block of Caplinger Rd. SE. 108-units multi-family residential. In review.
- Greenway Development – 102 Pine St. NE. 8-lots, single family or duplex dwellings partially in Greenway. Land use approved.
- Boise Cascade North Block - 315 Commercial St. SE. Redevelopment. New care facility and office building. In review.
- Keizer Mist – 3139-3159 Broadway St. NE. New car wash and convenience store. In review.
- May's Trucking – 3940 Airway Dr. SE. New 24,000 metal building for hanger. In review.
- Corban College – 5000 Deer Park Dr. SE. Outdoor dining canopy and future plans for 5 new 2-story dormitory buildings. In review.
- May's Landing – 23rd & Mission St. SE. 96-Units. Land use approval received.

- Harold Drive Apartments – 3271 Lancaster Dr. NE. 84-Units. In review.
- Rushing Mixed Use – 5775 Commercial St. SE. 61,500 square foot mixed use building with 52-Units. Land use approval received.
- Market Street Terrace Phase II – 4072 Market St. SE. 25-units multi-family residential. Partition/Variance approved in 2016.
- Silverton at Lansing – 3010 Silverton Rd. NE. 96-units multi-family residential. In review.
- Capital Manor – 1955 Salem Dallas Highway NW. Demolition of existing dwellings/zone change, construction of multi-family residential. In review.
- Whispering Heights – 2960 Michigan City Ln. NW. 110-lot phased subdivision. Public construction plans in review.
- Trinity Estates – 2054 Mousebird Ave. NW. 9-lot subdivision. Public construction plans in review.
- Illahe Forest – 3800 Block of Illahe Hill Rd. S. 11-lot subdivision. Public construction plans in review.
- Rainier Ridge – 197 Rainier Dr. SE. 36-lot subdivision. Public construction plans in review.
- Sahalee Subdivision – 654 Sahalee Dr. SE. 4-lot subdivision. Final plat under review.
- 9th Court Addition – 5320 Sunnyside Rd. SE. 11-lot subdivision. Public construction plans in review.
- Crossler Meadow PUD – 5521 Liberty Rd. S. 11-lot subdivision. PUD final plan under review.

APPENDIX B. CITY OF SALEM CAPITAL IMPROVEMENT PLAN FY 2016-2021
(STORMWATER)

Stormwater

The City of Salem provides its residents with stormwater services within an area that comprises more than 48 square miles and 13 urban watersheds. The services include: stormwater system operation and maintenance, stormwater quality monitoring, public education and involvement, flood response, street sweeping, stream cleaning, spill response, municipal regulations, stormwater quality complaint response, facility inspections, and capital projects for growth, replacement, efficiency, and level of service compliance.

Salem's stormwater collection system consists of more than:

- 85 miles of open channels and ditches;
- 90 miles of waterways;
- 420 miles of pipes and culverts;
- 900 detention basins;
- 22,000 storm drainage structures;
- 5 controls, diversions, and fish passage structures; and
- 30 monitoring and water quality facilities.

The stormwater system has an estimated replacement value of approximately \$950,000,000.

Stormwater Projects by Funding Source

Funding Source	FY 2016-17	FY 2017-18	FY 2018-19	FY 2019-20	FY 2020-21	Total
FEMA	1,100,000	-	-	-	-	1,100,000
Utility Rates	2,231,000	345,000	1,205,000	1,595,000	4,316,000	9,692,000
Total:	\$ 3,331,000	\$ 345,000	\$ 1,205,000	\$ 1,595,000	\$ 4,316,000	\$ 10,792,000

Stormwater Project Details

Project Number:	0000121				Score:	62.750
Category:	Stormwater				Ward:	1
Neighborhood:	Central Area Neighborhood (CAN-DO), West Salem Neighborhood Association					
Title:	Wallace Marine Park Boat Ramp and Parking Area Repairs					
Funding Source	FY 2016-17	FY 2017-18	FY 2018-19	FY 2019-20	FY 2020-21	Total
FEMA	600,000	-	-	-	-	600,000
Current CIP Total:	\$ 600,000	\$ -	\$ -	\$ -	\$ -	\$ 600,000
Amount Funded in Prior Years:						124,281
Total Estimated Project Cost:						\$ 724,281

Design and construction to repair damages to the Willamette River bank sustained during the January 2012 flood event. An application for Federal Emergency Management Agency (FEMA) funding has been submitted.

City of Salem**Capital Improvement Plan - Fiscal Years 2016-17 through 2020-21**

Project Number: 0000126 Score: 43.000
 Category: Stormwater Ward: 3
 Neighborhood: Southeast Mill Creek Association (SEMCA)
 Title: Pipe Replacement - Campbell Dr / Cranston St Package

Funding Source	FY 2016-17	FY 2017-18	FY 2018-19	FY 2019-20	FY 2020-21	Total
Utility Rates	675,000	-	-	-	-	675,000
Current CIP Total:	\$ 675,000	\$ -	\$ -	\$ -	\$ -	\$ 675,000
Amount Funded in Prior Years:						35,005
Total Estimated Project Cost:						\$ 710,005

Design and construction for the replacement of approximately 1,300 linear feet of 12-inch pipe in the vicinity of Campbell Dr SE at 42nd Ave SE and Cranston St SE from Carson Dr SE to Campbell Dr SE.

Project Number: 0000180 Score: 55.000
 Category: Stormwater Ward: 5
 Neighborhood: Northgate Neighborhood Association
 Title: Salem Industrial Park, East of Tandem Avenue NE to Bill Frey Drive NE - Stormwater Improvements

Funding Source	FY 2016-17	FY 2017-18	FY 2018-19	FY 2019-20	FY 2020-21	Total
Utility Rates	250,000	-	-	-	-	250,000
Current CIP Total:	\$ 250,000	\$ -	\$ -	\$ -	\$ -	\$ 250,000
Amount Funded in Prior Years:						1,100,000
Total Estimated Project Cost:						\$ 1,350,000

Construction of approximately 2,100 linear feet of new 18-inch and 30-inch pipe required to abandon an existing underground injection control facility at Salem Industrial Park. This project provides additional funding for a project in the North Gateway Urban Renewal Area.

Project Number: 0000183 Score: 49.250
 Category: Stormwater Ward: 1
 Neighborhood: Highland Neighborhood Association
 Title: Broadway Street NE - Stormwater Improvements

Funding Source	FY 2016-17	FY 2017-18	FY 2018-19	FY 2019-20	FY 2020-21	Total
Utility Rates	100,000	-	-	-	-	100,000
Current CIP Total:	\$ 100,000	\$ -	\$ -	\$ -	\$ -	\$ 100,000
Amount Funded in Prior Years:						219,999
Total Estimated Project Cost:						\$ 319,999

Design and construction for the replacement of 465 feet of undersized 8-inch pipe with 10-inch pipe on Broadway St NE from Academy St NE to Columbia Ave NE.

City of Salem**Capital Improvement Plan - Fiscal Years 2016-17 through 2020-21**

Project Number: 0000217 Score: 48.250
 Category: Stormwater Ward: 2
 Neighborhood: Northeast Neighbors (NEN)

Title: Center Street Pipe Relocation Phase A and B

Funding Source	FY 2016-17	FY 2017-18	FY 2018-19	FY 2019-20	FY 2020-21	Total
Utility Rates	-	-	505,000	1,095,000	-	1,600,000
Current CIP Total:	\$ -	\$ -	\$ 505,000	\$ 1,095,000	\$ -	\$ 1,600,000
Amount Funded in Prior Years:						-
Total Estimated Project Cost:						\$ 1,600,000

Design and construction to abandon existing 24-inch and 30-inch stormwater pipe that is located in back lots between B St NE and Breyman Ave NE and reinstall new 12-inch to 24-inch stormwater main within the street right-of-way.

Project Number: 0000218 Score: 44.250
 Category: Stormwater Ward: 2
 Neighborhood: South Central Association of Neighbors (SCAN)

Title: Cedar Way SE: Fairview Avenue to Summer Street

Funding Source	FY 2016-17	FY 2017-18	FY 2018-19	FY 2019-20	FY 2020-21	Total
Utility Rates	-	100,000	-	-	-	100,000
Current CIP Total:	\$ -	\$ 100,000	\$ -	\$ -	\$ -	\$ 100,000
Amount Funded in Prior Years:						-
Total Estimated Project Cost:						\$ 100,000

Design and construction of stormwater infiltration facilities and associated improvements to address neighborhood drainage problems.

Project Number: 0000219 Score: 62.750
 Category: Stormwater Ward: 7
 Neighborhood: Sunnyslope Neighborhood Association

Title: McKay Drive S: North of Leona to Dwight Drive Pipe Relocation

Funding Source	FY 2016-17	FY 2017-18	FY 2018-19	FY 2019-20	FY 2020-21	Total
Utility Rates	-	245,000	-	-	-	245,000
Current CIP Total:	\$ -	\$ 245,000	\$ -	\$ -	\$ -	\$ 245,000
Amount Funded in Prior Years:						-
Total Estimated Project Cost:						\$ 245,000

Design and construction to relocate/replace existing 10-inch clay pipe on McKay Dr S between Leona Ln S and Dwight Dr S.

City of Salem**Capital Improvement Plan - Fiscal Years 2016-17 through 2020-21**

Project Number:	0000271				Score:	45.875
Category:	Stormwater				Ward:	5
Neighborhood:	Highland Neighborhood Association					
Title:	Highland Avenue NE, Church Street NE to Laurel Avenue NE Pipe Replacement					
Funding Source	FY 2016-17	FY 2017-18	FY 2018-19	FY 2019-20	FY 2020-21	Total
Utility Rates	-	-	-	-	416,000	416,000
Current CIP Total:	\$ -	\$ -	\$ -	\$ -	\$ 416,000	\$ 416,000
Amount Funded in Prior Years:						-
Total Estimated Project Cost:						\$ 416,000
Design and construction to replace 932 linear feet of 15-inch and 18-inch pipe from Laurel Ave NE to Church St NE.						

Project Number:	0000272	Score:	47.625			
Category:	Stormwater	Ward:	1			
Neighborhood:	Highland Neighborhood Association, Northeast Neighbors (NEN)					
Title:	Woodrow Street Storm Pipeline Replacement					
Funding Source	FY 2016-17	FY 2017-18	FY 2018-19	FY 2019-20	FY 2020-21	Total
Utility Rates	-	-	-	-	200,000	200,000
Current CIP Total:	\$ -	\$ -	\$ -	\$ -	\$ 200,000	\$ 200,000
Amount Funded in Prior Years:						-
Total Estimated Project Cost:						\$ 200,000
Design and construction to replace approximately 500 linear feet of failing 24-inch concrete pipe with 24-inch PVC on Woodrow St NE between the UPRR railroad track and Fairgrounds Rd NE.						

Project Number:	0000506					Score:	66.750	
Category:	Stormwater					Ward:	All	
Neighborhood:	All							
Title:	Implementation of DEQ Retrofit Plan							
Funding Source	FY 2016-17	FY 2017-18	FY 2018-19	FY 2019-20	FY 2020-21	Total		
Utility Rates	200,000	-	-	-	-	200,000		
Current CIP Total:	\$ 200,000	\$ -	\$ -	\$ -	\$ -	\$ 200,000		
Amount Funded in Prior Years:						-		
Total Estimated Project Cost:						\$ 200,000		
Design and construction of stormwater system improvements identified in the Stormwater Retrofit Plan submitted to Oregon Department of Environmental Quality in November 2014 per the requirements of Salem's Municipal Separate Stormwater System Discharge Permit.								

City of Salem**Capital Improvement Plan - Fiscal Years 2016-17 through 2020-21**

Project Number: 0000507 Score: 66.750
 Category: Stormwater Ward: 3
 Neighborhood: Faye Wright Neighborhood Association

Title: Total Maximum Daily Load (TMDL) Implementation Plan Projects

Funding Source	FY 2016-17	FY 2017-18	FY 2018-19	FY 2019-20	FY 2020-21	Total
Utility Rates	100,000	-	-	-	-	100,000
Current CIP Total:	\$ 100,000	\$ -	\$ -	\$ -	\$ -	\$ 100,000
Amount Funded in Prior Years:						-
Total Estimated Project Cost:						\$ 100,000

Design and construction of long-term stream bank stabilization and riparian restoration in the section of Pringle Creek flowing from Jones Rd SE to Idylwood Dr SE. The project will address multiple regulatory requirements including those in the Total Maximum Daily Load (TMDL) Implementation Plan for controlling temperature in the Salem watershed.

Project Number: 0000531
 Category: Stormwater Ward: All
 Neighborhood: City-Wide
 Title: Stream Bank Restoration Mitigation for Various Projects

Funding Source	FY 2016-17	FY 2017-18	FY 2018-19	FY 2019-20	FY 2020-21	Total
Utility Rates	100,000	-	-	-	-	100,000
Current CIP Total:	\$ 100,000	\$ -	\$ -	\$ -	\$ -	\$ 100,000
Amount Funded in Prior Years:						-
Total Estimated Project Cost:						\$ 100,000

Plant establishment, long term monitoring, and maintenance of mitigation sites as required by state and federal environmental permits issued for capital improvement projects. Funding will be transferred to this project from other projects within the construction budget to cover the respective responsibility for each project.

Project Number: 0000532
 Category: Stormwater Ward: 1,2
 Neighborhood: Northeast Neighbors (NEN)
 Title: 13th Street NE and Mill Creek Rain Garden

Funding Source	FY 2016-17	FY 2017-18	FY 2018-19	FY 2019-20	FY 2020-21	Total
Utility Rates	56,000	-	-	-	-	56,000
Current CIP Total:	\$ 56,000	\$ -	\$ -	\$ -	\$ -	\$ 56,000
Amount Funded in Prior Years:						-
Total Estimated Project Cost:						\$ 56,000

Design and construction of a bio swale located at the end of the 13th St NE across Mill Creek from the Olinger Pool. The total impervious surface served by this facility is approximately 37,000 square feet.

City of Salem

Capital Improvement Plan - Fiscal Years 2016-17 through 2020-21

Project Number: 0000544
 Category: Stormwater Ward: All
 Neighborhood: City-Wide
 Title: Battle Creek Stormwater Master Plan Improvements

Funding Source	FY 2016-17	FY 2017-18	FY 2018-19	FY 2019-20	FY 2020-21	Total
Utility Rates	-	-	-	500,000	2,200,000	2,700,000
Current CIP Total:	\$ -	\$ -	\$ -	\$ 500,000	\$ 2,200,000	\$ 2,700,000
Amount Funded in Prior Years:						-
Total Estimated Project Cost:						\$ 2,700,000

Preliminary estimates for design and construction of stormwater improvement projects as identified in the Stormwater Master Plan for the Battle Creek basin. Projects may include flood mitigation, open channel/creek improvements, pipe capacity expansion and/or implementation of stormwater infiltration, flow control and treatment.

Project Number: 0000545
 Category: Stormwater Ward: All
 Neighborhood: City-Wide
 Title: Mill and Pringle Creeks Stormwater Master Plan Improvements

Funding Source	FY 2016-17	FY 2017-18	FY 2018-19	FY 2019-20	FY 2020-21	Total
Utility Rates	-	-	-	-	1,500,000	1,500,000
Current CIP Total:	\$ -	\$ -	\$ -	\$ -	\$ 1,500,000	\$ 1,500,000
Amount Funded in Prior Years:						-
Total Estimated Project Cost:						\$ 1,500,000

Preliminary estimates for design and construction of stormwater improvement projects as identified in the Stormwater Master Plan for the Mill and Pringle Creek basins. Projects may include flood mitigation, open channel/creek improvements, pipe capacity expansion and/or implementation of stormwater infiltration, flow control and treatment.

Project Number: 0000553
 Category: Stormwater Ward: 2
 Neighborhood: South East Salem Neighborhood Association (SESNA)
 Title: 25th Street SE at Madrona Avenue SE Stormwater Improvements

Funding Source	FY 2016-17	FY 2017-18	FY 2018-19	FY 2019-20	FY 2020-21	Total
Utility Rates	750,000	-	-	-	-	750,000
Current CIP Total:	\$ 750,000	\$ -	\$ -	\$ -	\$ -	\$ 750,000
Amount Funded in Prior Years:						-
Total Estimated Project Cost:						\$ 750,000

Design and construction of a new box culvert and associated channel, wall, and embankment improvements for the east fork of Pringle Creek at the intersection of 25th Street SE / Madrona Avenue SE.

City of Salem**Capital Improvement Plan - Fiscal Years 2016-17 through 2020-21**

Project Number: 0000140
Category: Stormwater Ward: 2
Neighborhood: South Central Association of Neighbors (SCAN)
Title: Summer Street at Clark Creek Stormwater Improvements

Funding Source	FY 2016-17	FY 2017-18	FY 2018-19	FY 2019-20	FY 2020-21	Total
FEMA	500,000	-	-	-	-	500,000
Current CIP Total:	\$ 500,000	\$ -	\$ -	\$ -	\$ -	\$ 500,000
Amount Funded in Prior Years:						-
Total Estimated Project Cost:						\$ 500,000

Repair of roadway and culvert replacement at Clark Creek due to the January 2012 flood event. Primary funding provided by the Federal Emergency Management Agency (FEMA).

Project Number: 0000557
Category: Stormwater Ward: 2
Neighborhood: South East Salem Neighborhood Association (SESNA)
Title: McGilchrist Street SE Stormwater Improvements

Funding Source	FY 2016-17	FY 2017-18	FY 2018-19	FY 2019-20	FY 2020-21	Total
Utility Rates	-	-	700,000	-	-	700,000
Current CIP Total:	\$ -	\$ -	\$ 700,000	\$ -	\$ -	\$ 700,000
Amount Funded in Prior Years:						-
Total Estimated Project Cost:						\$ 700,000

Work includes replacing stream crossing structures at the East and West Forks of Pringle Creek to coincide with Streets companion project (CIP 554). Funding for project represents partial match funding to support Transportation Investment Generating Economic Recovery (TIGER) Grant application.

APPENDIX A. SUMMARY OF WATER QUALITY DATA

**City of Salem
National Pollutant Discharge Elimination System (NPDES)
Municipal Separate Storm Sewer System (MS4)**

**Summary of Water Quality Data
For Reporting Year 2016/2017**

Prepared by:
City Salem Public Works Department
Stormwater Services
Stormwater Monitoring Staff

November 1, 2017

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1.0 Introduction

This document provides all monitoring data collected for the reporting year of July 1, 2016, to June 30, 2017 (RY 2016/17), in accordance with the City of Salem's NPDES MS4 permit requirements listed in Schedule B(5)(f)&(g). A background narrative for each monitoring element for which data were collected and a brief summary of results for RY 2016/17 is provided below, and all collected data are provided in the attached tables and figures.

2.0 Monitoring Elements

Specific details for each monitoring element can be found in the City's *Stormwater and Surface Water Monitoring Plan*. Progress toward meeting the monitoring requirements defined in Table B-1 of the City's MS4 Permit are summarized in Table 1. Monitoring site locations are described in Table 2 and denoted in Figure 1, and the parameters analyzed for each monitoring element are listed in Table 3.

2.1 Monthly Instream Monitoring

Sampling of designated urban streams for the Monthly Instream¹ monitoring element is conducted on a predetermined monthly schedule at 24 different locations. This monitoring element includes the collection of grab samples and field measurements on 11 of Salem's MS4 stormwater runoff receiving streams and the Willamette River. Ten of these streams are paired with upstream (at or near where the stream enters the City's jurisdiction) and downstream (at or near where the stream exits the City's jurisdiction or enters a receiving stream) site locations. The eleventh stream, the West Fork Little Pudding River, only has a downstream site location, because the West Fork Little Pudding River starts in the greater Salem area and runs dry during the summer months. The Willamette River has three sites located upstream, mid-way, and downstream of city limits.

The general locations of all sites are provided in Table 2 and Figure 1.

A general suite of water quality parameters are collected for each site, with additional water quality parameters analyzed for the sites within the Pringle Creek Watershed (PRI1, PRI5, CLA1, and CLA10), West Fork Little Pudding River (LPW1), and the Willamette River (WR1, WR5, and WR10); these additional parameters are denoted with parentheses in the list below.

Water quality parameters collected include:

- Temperature
- Turbidity
- Specific Conductivity
- pH
- Dissolved Oxygen (DO)
- Nitrate + Nitrite as Nitrogen (NO₃+NO₂-N)
- *Escherichia coli* (*E. coli*)
- Biochemical Oxygen Demand (BOD_{stream})

¹ Identified as "Urban Streams monitoring" in the City of Salem Stormwater Management Plan 2010.

- Zinc -total recoverable and dissolved (CLA1, CLA10, PRI1, PRI5 only)
- Copper -total recoverable and dissolved (CLA1, CLA10, PRI1, PRI5 only)
- Lead -total recoverable and dissolved (CLA1, CLA10, PRI1, PRI5 only)
- Hardness (CLA1, CLA10, PRI1, PRI5 only)
- Total Suspended Solids (TSS) (LPW1, WR1, WR5, WR10 only)
- Alkalinity (WR1, WR5, WR10 only)
- Ammonia (WR1, WR5, WR10 only)
- Total Phosphorus (TP) (WR1, WR5, WR10 only)
- Total Solids (TS) (WR1, WR5, WR10 only)
- Total Dissolved Solids (TDS) (WR1, WR5, WR10 only)

Data for this monitoring element are provided in Tables 5 through 8, and Figures 2 and 3. Some general observations from this reporting period compared to the last reporting period include:

- **E. coli** – this year saw a higher number of exceedances of the 406 MPN/100mL single sample criterion
- **Dissolved Oxygen** – most dissolved oxygen medians were higher than the previous year
- **Copper** – greater exceedances than last year
- **Lead** – no exceedances of Lead occurred this reporting year
- **Zinc** – greater exceedances than last year
- **Nitrate & Nitrite** – results were a bit higher than last year
- **BOD** – about half of the results were higher than last year, and the other half were lower than last reporting year
- **Specific Conductivity** – results were lower than last year
- **pH** – results were similar to last reporting year
- **Turbidity** – significant decrease in turbidity results overall
- **Rainfall** – this reporting year saw more rainfall observed in the 24 hours prior to sample collection than last year, as well as the majority of the sampling days had seen measurable rainfall in the preceding 24 hours. This also resulted in a greater N of samples collected at CGT1 and 5, GLE10, and LPW1.

2.2 Continuous Instream Monitoring

The City maintains a network of Continuous Instream water quality monitoring sites and stream gauging sites on seven different urban streams within the city. There are currently 10 water quality and stream gauging sites and three stream gauge-only sites (SHE3, PRI4 and LPW1) within city limits. The City also maintains three stream gauge-only sites as part of a flood warning system for the Mill Creek Watershed, all of which reside outside of Salem city limits and therefore are not included in this document. Figure 1 denotes the locations of each site that resides within city limits.

The Continuous Instream water quality and stream gaging site on Shelton Ditch was non-operational for the entire 2015/16 reporting year, while construction work to replace the historic Winter Street Bridge was performed. After the station was re-installed, it was decided to use it as a stream gauge-only site. This is a newer site and is not included in Table B-1 of the City's MS4 permit, therefore all requirements for Continuous Instream monitoring are still being met.

The monitoring sites for this monitoring element are positioned in an upstream/downstream configuration. The upstream sites are adjacent to where the stream enters the City and the downstream sites are either above the confluence with another stream or where the stream exits the City's jurisdictional boundary.

Continuous data collected includes:

- Turbidity
- Specific Conductivity
- Temperature
- pH
- DO
- Stage

All data are recorded in 15-minute intervals. All continuous statistical data summaries presented in the various tables and figures were computed using grade A and/or grade B data.

Qualifications for what constitutes grade A and grade B data are provided in Table 9, and monthly medians for collected data are summarized in Table 10. Plots of continuous data are provided in Figures 4 through 6.

Overall, for reporting year 2016/2017 there were less data gaps in the figures, most likely due to higher quality data being available. There were no significant changes in data trends or exceedances from last year.

The Continuous Instream monitoring element incorporates an alarm system that supports the City's Illicit Discharge Detection and Elimination (IDDE) program. The alarm system is used to record, notify, and prompt investigation of water quality abnormalities that may be indicative of illicit discharges. It serves as an important tool to aid in the elimination of periodic illicit discharges, helps to prioritize dry weather outfall screening activities (see section 2.5), and serves as an outreach/education opportunity for residents.

2.3 Instream Storm Monitoring

Instream Storm refers to the monitoring of MS4 receiving streams during defined storm events. Sampling occurs at three sites in the Pringle Creek Watershed (continuous instream monitoring sites PRI12, PRI3, and CLK1). Data collected are used to increase understanding of receiving waters within the Pringle Creek Watershed and help guide Salem's stormwater management strategies in watersheds throughout the city. This monitoring element was initiated this permit cycle and is expected to continue beyond the current MS4 permit; ultimately providing a dataset for long-term trending and spatial analyses.

Sampling consists of flow weighted composite samples, grab samples, and field measurements. Parameters include:

- *E. coli*
- Dissolved Oxygen
- pH
- Temperature

- Specific Conductivity
- Copper (Total Recoverable and Dissolved)
- Zinc (Total Recoverable and Dissolved)
- Lead (Total Recoverable and Dissolved)
- Hardness
- Ammonia Nitrogen (NH₃)
- NO₃+NO₂-N
- Ortho Phosphorus
- Total Phosphorus (TP)
- BOD_{stream}
- TSS

Data for this monitoring element are provided in Table 11. For reporting year 2016/2017, staff captured one storm event.

2.4 Stormwater Monitoring

The City has collected water quality samples from a number of sites throughout the piped MS4 system since 1995. Three monitoring sites are identified in the current monitoring plan, one each for residential, commercial, and industrial land use. The commercial and industrial sites are new sites for this permit cycle, but the residential site had been sampled previously during the last MS4 Permit and continued to be sampled through this permit cycle. Data from this monitoring element will be aggregated with previous data collected from similar land use types. The aggregated datasets will be used to characterize Salem's MS4 stormwater runoff pollutant concentrations by land use and compare them with the ACWA characterized land use concentrations.

Sampling consists of flow weighted² composite samples, grab samples, and field measurements.

Parameters include:

- *E. coli*
- Dissolved Oxygen
- pH
- Temperature
- Specific Conductivity
- Copper (Total Recoverable and Dissolved)
- Zinc (Total Recoverable and Dissolved)
- Lead (Total Recoverable and Dissolved)
- Hardness
- Ammonia Nitrogen (NH₃)
- NO₃+NO₂-N
- Ortho Phosphorus
- Total Phosphorus (TP)

² Due to hydraulic conditions, accurate flow pace sampling is not achievable at the residential land use site (Electric), therefore the City has employed a time paced sampling protocol for this site.

- BOD_{5-day}
- TSS

Data for this monitoring element are provided in Table 12. For reporting year 2016/2017, staff captured one storm event.

2.5 Priority Dry Weather Outfall/Manhole Screening

The RY 2016/2017, dry weather outfall screening effort included a total of 37 outfall inspections (outfall structures or the first available upstream manhole), 21 of which received analytical sampling. A total of 15 pipesheds were investigated based on these outfall inspections; 4 pipesheds were not investigated due to lack of time and resources. As part of the pipeshed investigations, a total of 5 additional manholes received analytical confirmation sampling to identify the origin of flow and 1 outfall was revisited after water main repairs. Of the 37 outfalls inspected, 35 were identified in the City of Salem's *Dry Weather Outfall and Illicit Discharge Screening Plan*, 1 outfall was inspected based upon a Stream Crew observation of orange benthic growth at the outfall, and 1 outfall was inspected opportunistically due to its proximity to 2 existing priority outfalls. One priority outfall (D48486207) was determined to be a culvert structure above an existing priority outfall and will not be inspected in future years, but will be replaced by an additional outfall.

Observational data collected at outfalls did not produce any direct indication of an illicit discharge at any of the inspected outfalls. One outfall (D39460252) appeared to have suds in the pool upon arrival at the location, however, a detergents/surfactants test did not indicate the presence of those analytes above the limits of detection (0.25 mg/L). Pipeshed investigations for flowing outfalls resulted in the discovery and repair of 4 municipal drinking water leaks. For RY 2016/2017, in order to characterize all flowing priority outfalls, pipeshed investigations were again performed based on the presence of flow as opposed to the exceedance of screening parameters unless the pipesheds were sufficiently characterized during the previous rain year (RY 2015/2016). Once the origins of flow were isolated to single pipe section or location, confirmation sampling, TV inspections, leak detection by the City's Water Distribution Department, and/or investigation by Environmental Services were performed. Due to the additional time and effort required for this increased source tracking, the source(s) of all flowing outfalls were not able to be completely resolved in RY 2016/2017 and will need to be investigated in subsequent years.

Field screening parameters for RY 2016/2017 include temperature, pH, specific conductivity, turbidity, chlorine, fluoride, detergents/surfactants, and ammonia and were analyzed using a multi-parameter colorimeter and multi-parameter data sonde. Laboratory parameters include Potassium, Sodium, and E. coli and were analyzed by the City's laboratory at the Willow Lake Waste Water Treatment Plant. In total:

- 20 of the structures investigated (outfalls and manholes) had concentrations of chlorine above the action level (> 0 mg/L),
- 9 had concentrations of fluoride exceeding the action level (0.1 mg/L),
- 3 had a specific conductivity exceeding the action limit (250 µS/cm),
- 1 had a temperature exceeding the action level (> 3°C above receiving stream),
- 1 had a turbidity reading exceeding the action level (> 15 NTU) (likely due to sediment from pipe as sample was collected from a very small trickle of water), and

- 1 had an E. coli concentration exceeding the action limit (406 MPN/100mL).

In general, if Chlorine results were below 0.05 mg/L, fluoride, detergents/surfactants, ammonia, potassium, sodium, and E. coli parameters were not analyzed unless there was additional reason to suspect an illicit discharge. Fluoride was not collected at all locations where chlorine was detected because the City's drinking water treatment plant was not fluorinating water at the time of the inspection.

Data for this monitoring element are provided as an Attachment.

3.0 Conclusion

The City continues to meet all monitoring requirements of its administratively extended MS4 Permit. Cumulatively, data collected throughout this MS4 Permit cycle will be used to meet monitoring objectives identified in the City's monitoring plan, while also supporting data analyses.

Figure 1
Monitoring Sites Map
RY 2016/17

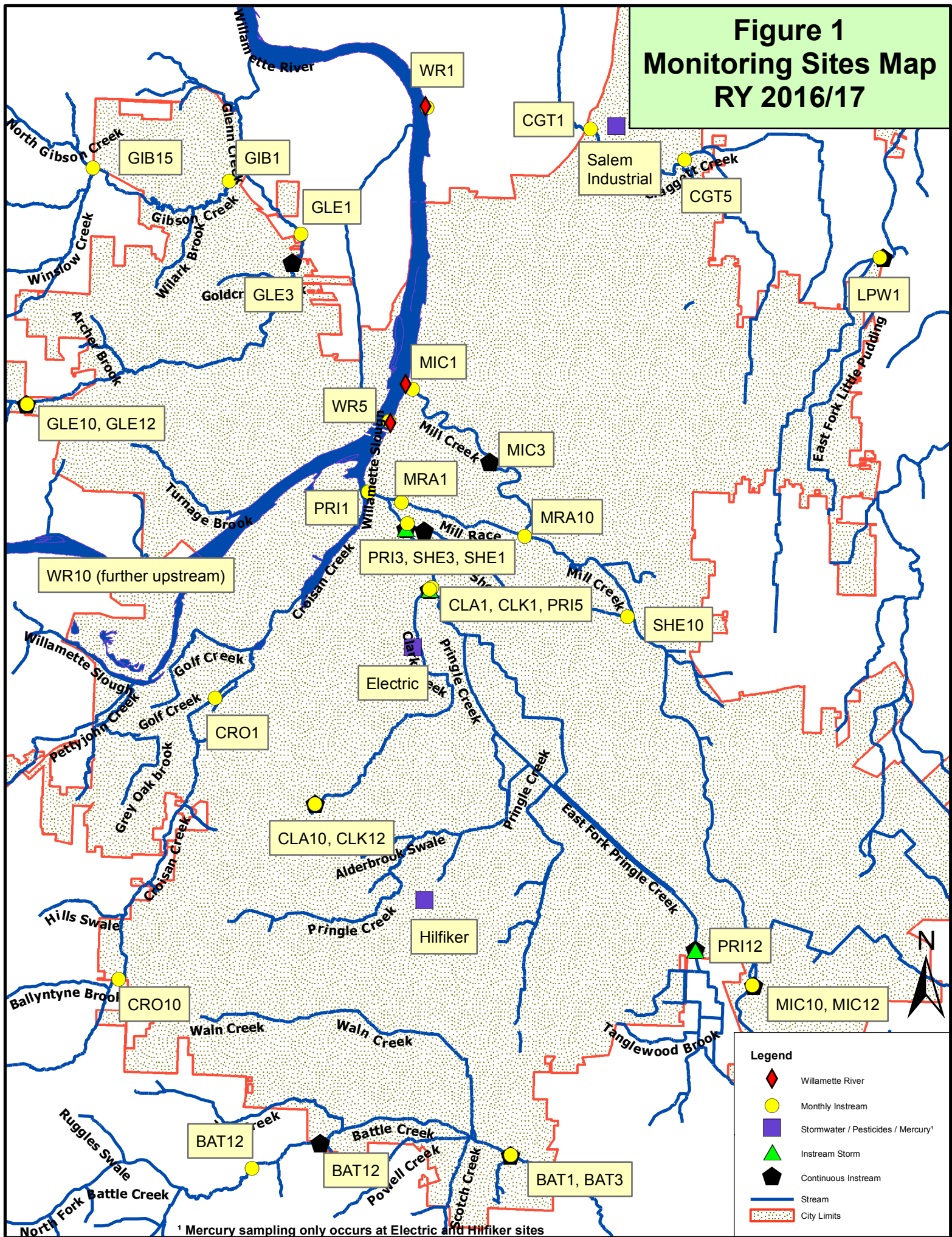
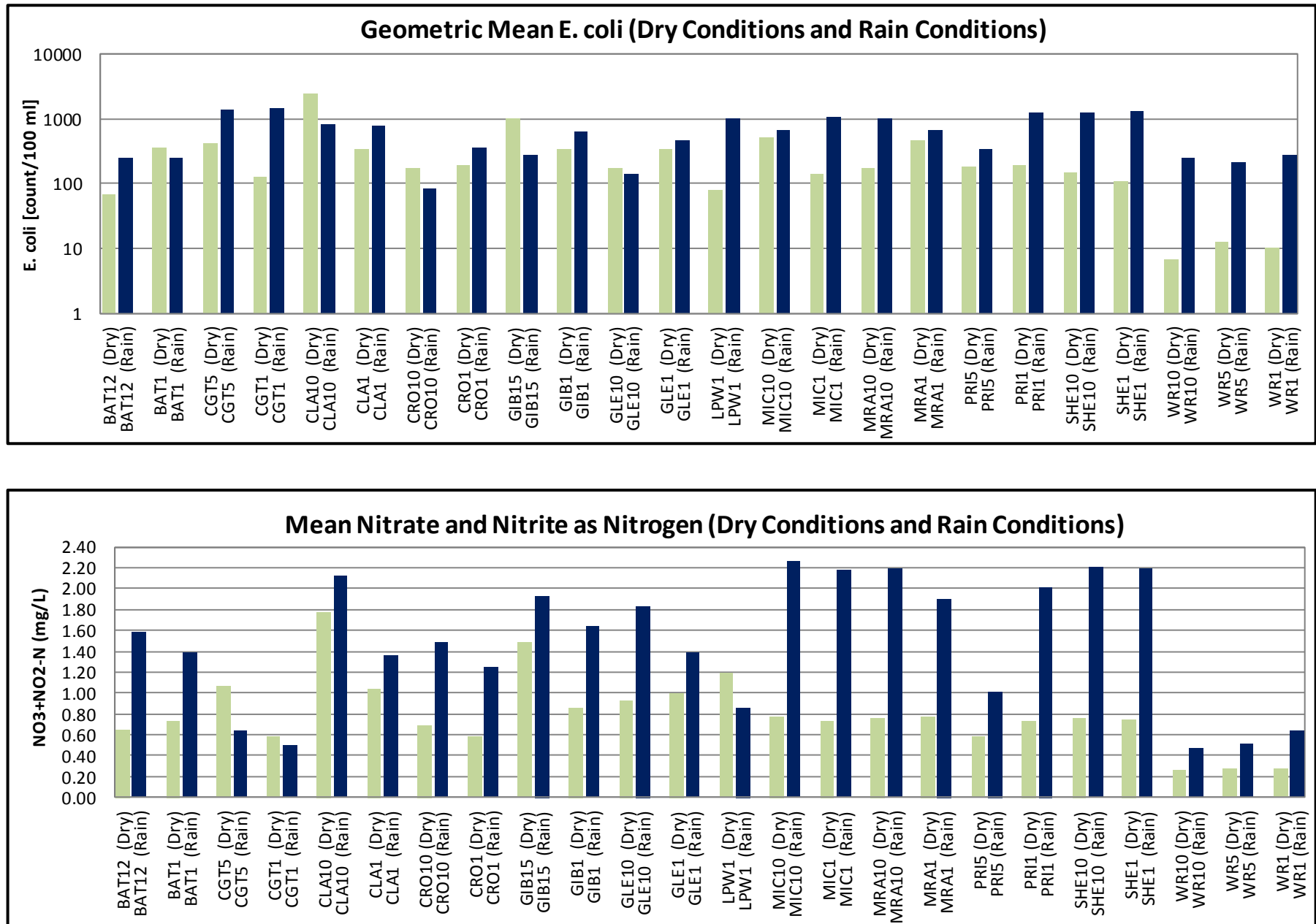
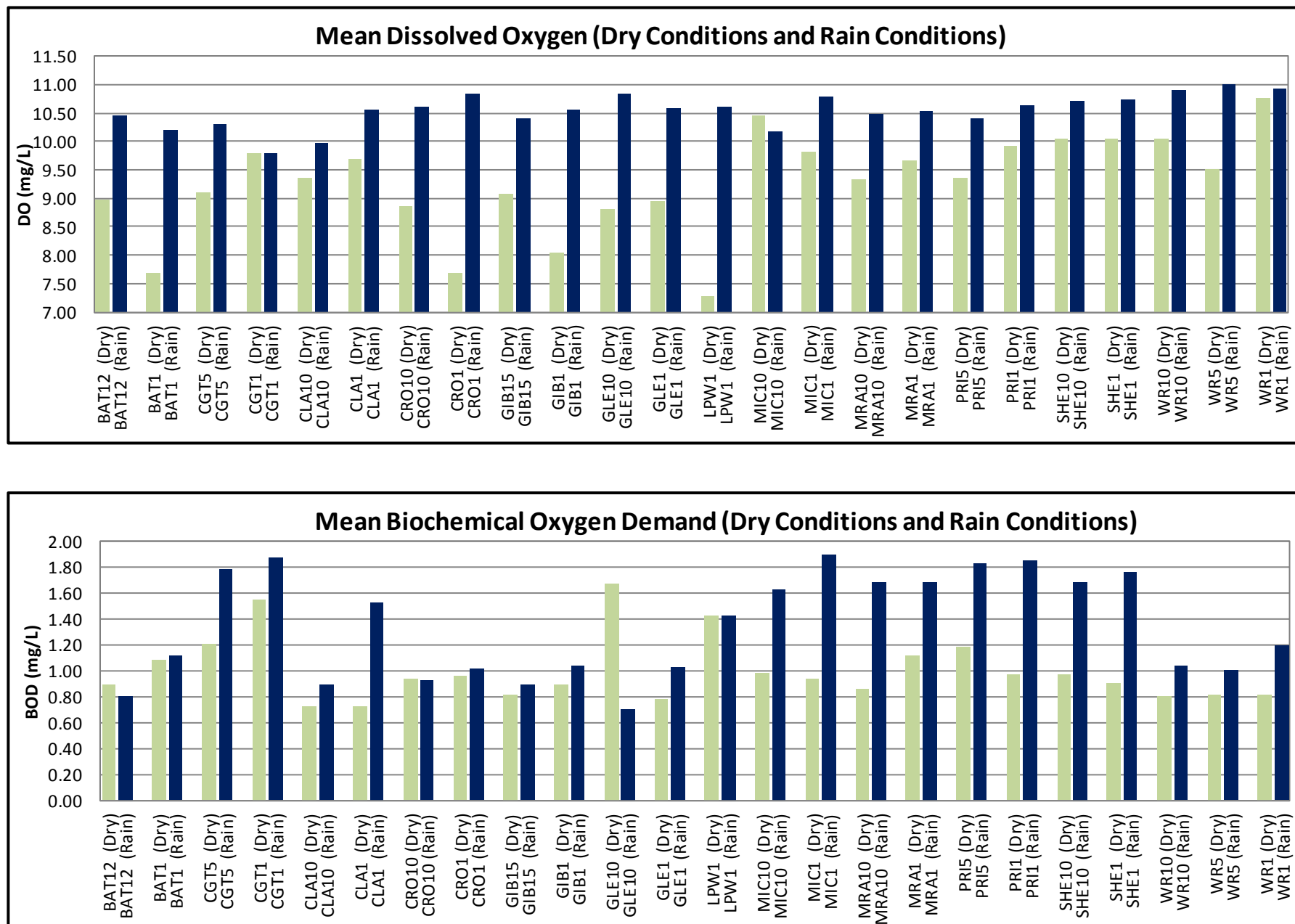


Figure 2
Monthly Instream Mean Value Comparison for Dry and Rain Conditions (Reporting Year 2016/2017)



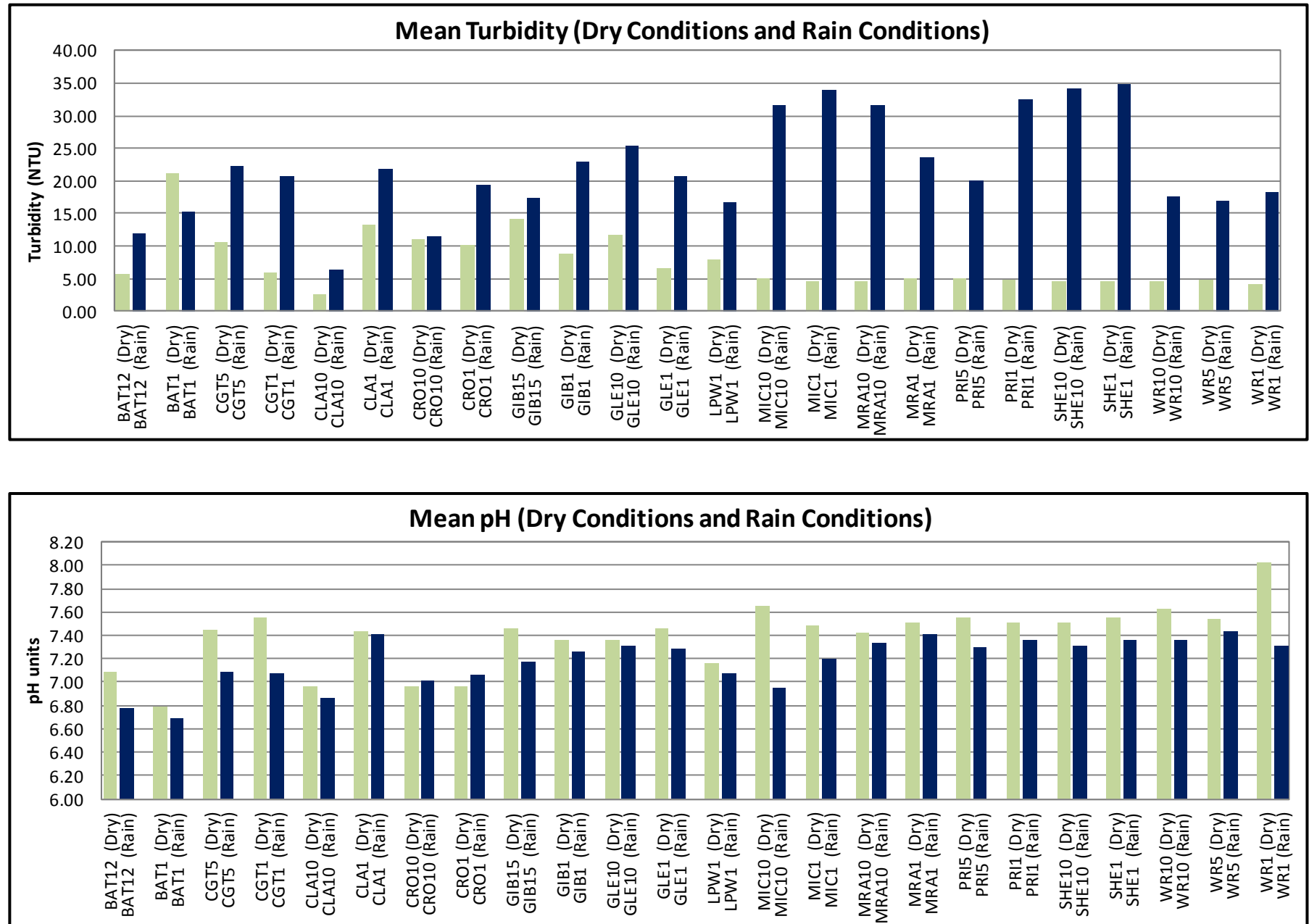
Dry conditions defined as less than 0.05 inches of rainfall in the 24 hours prior to sample collection; rain conditions defined as greater than or equal to 0.05 inches of rainfall in the 24 hours prior to sample collection.

Figure 2
Monthly Instream Mean Value Comparison for Dry and Rain Conditions (Reporting Year 2016/2017)



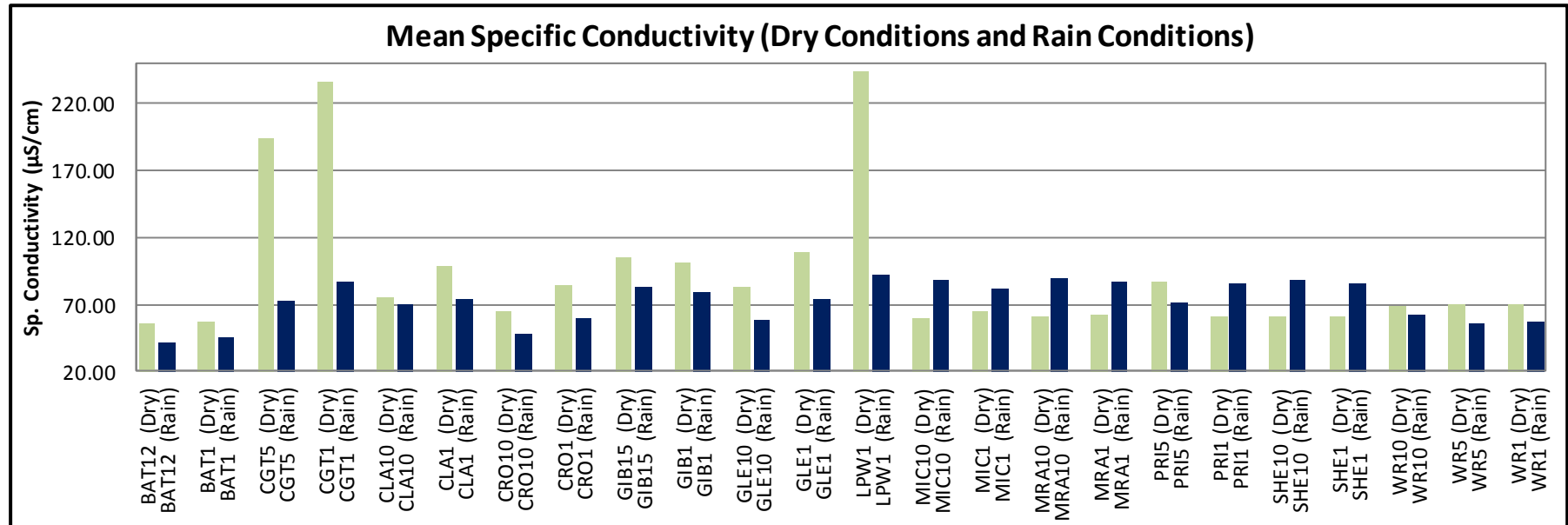
Dry conditions defined as less than 0.05 inches of rainfall in the 24 hours prior to sample collection; rain conditions defined as greater than or equal to 0.05 inches of rainfall in the 24 hours prior to sample collection.

Figure 2
Monthly Instream Mean Value Comparison for Dry and Rain Conditions (Reporting Year 2016/2017)



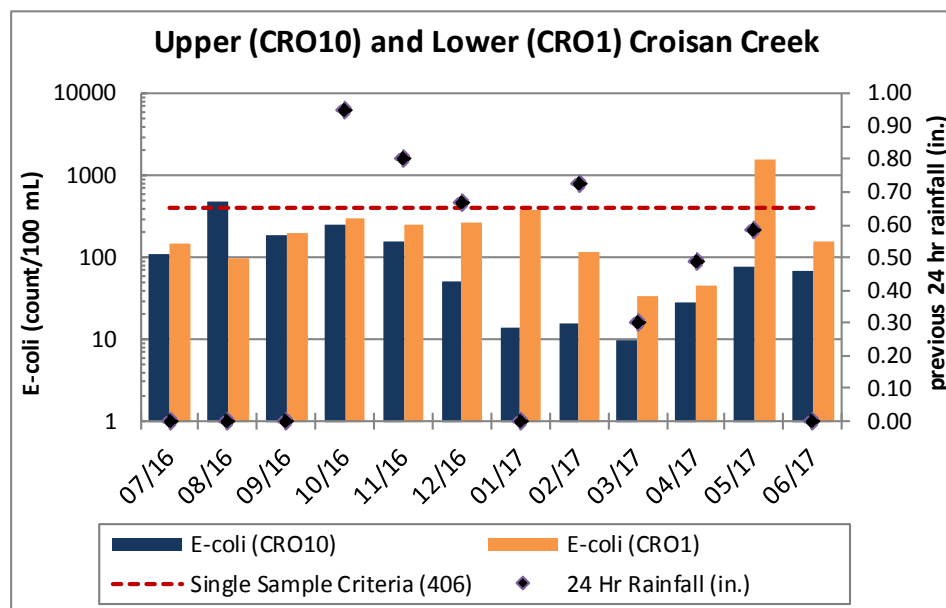
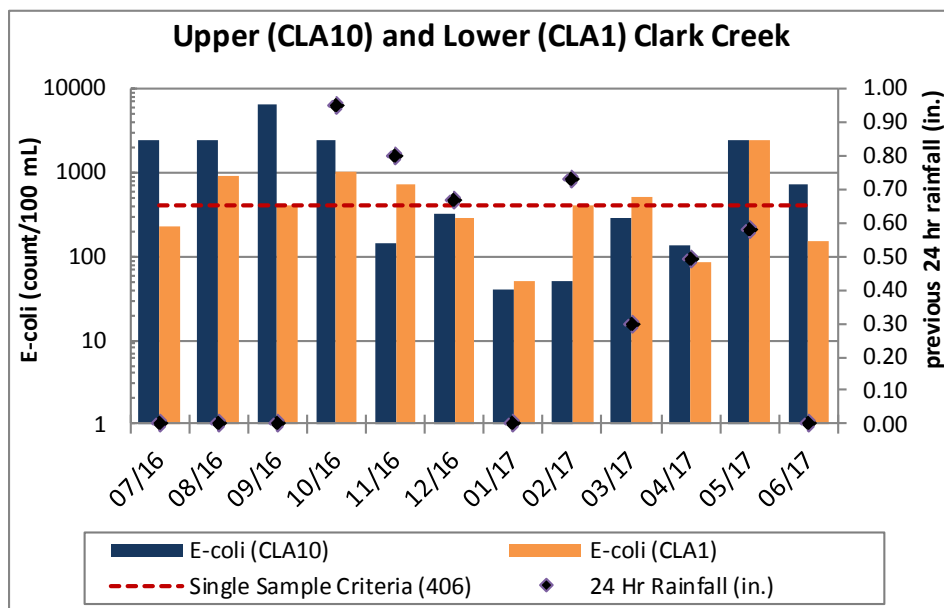
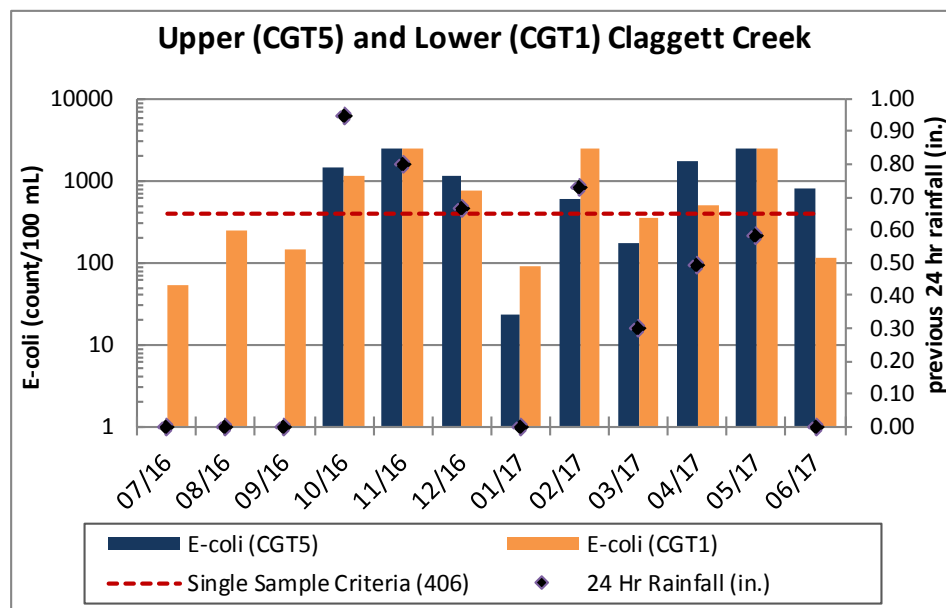
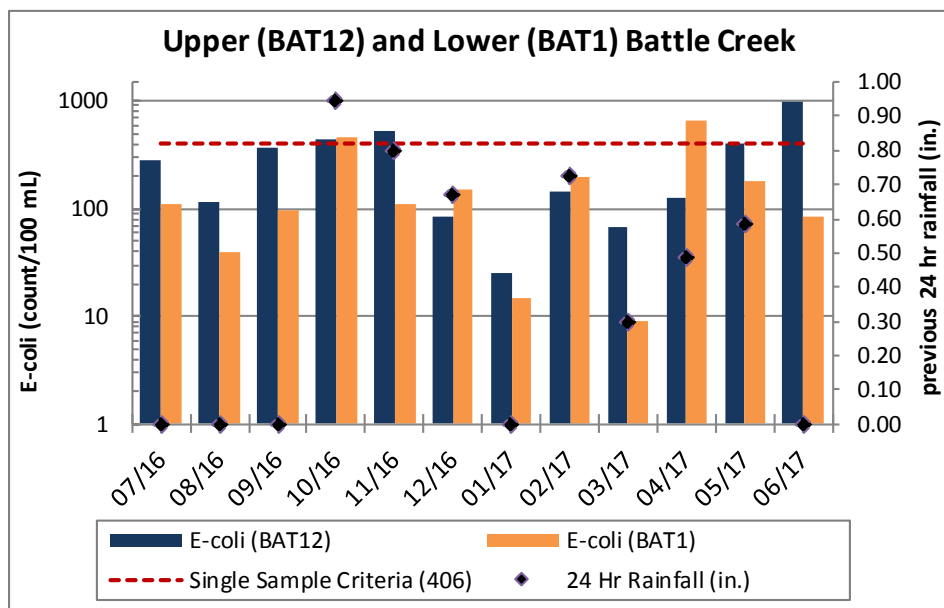
Dry conditions defined as less than 0.05 inches of rainfall in the 24 hours prior to sample collection; **rain** conditions defined as greater than or equal to 0.05 inches of rainfall in the 24 hours prior to sample collection.

Figure 2
Monthly Instream Mean Value Comparison for Dry and Rain Conditions (Reporting Year 2016/2017)



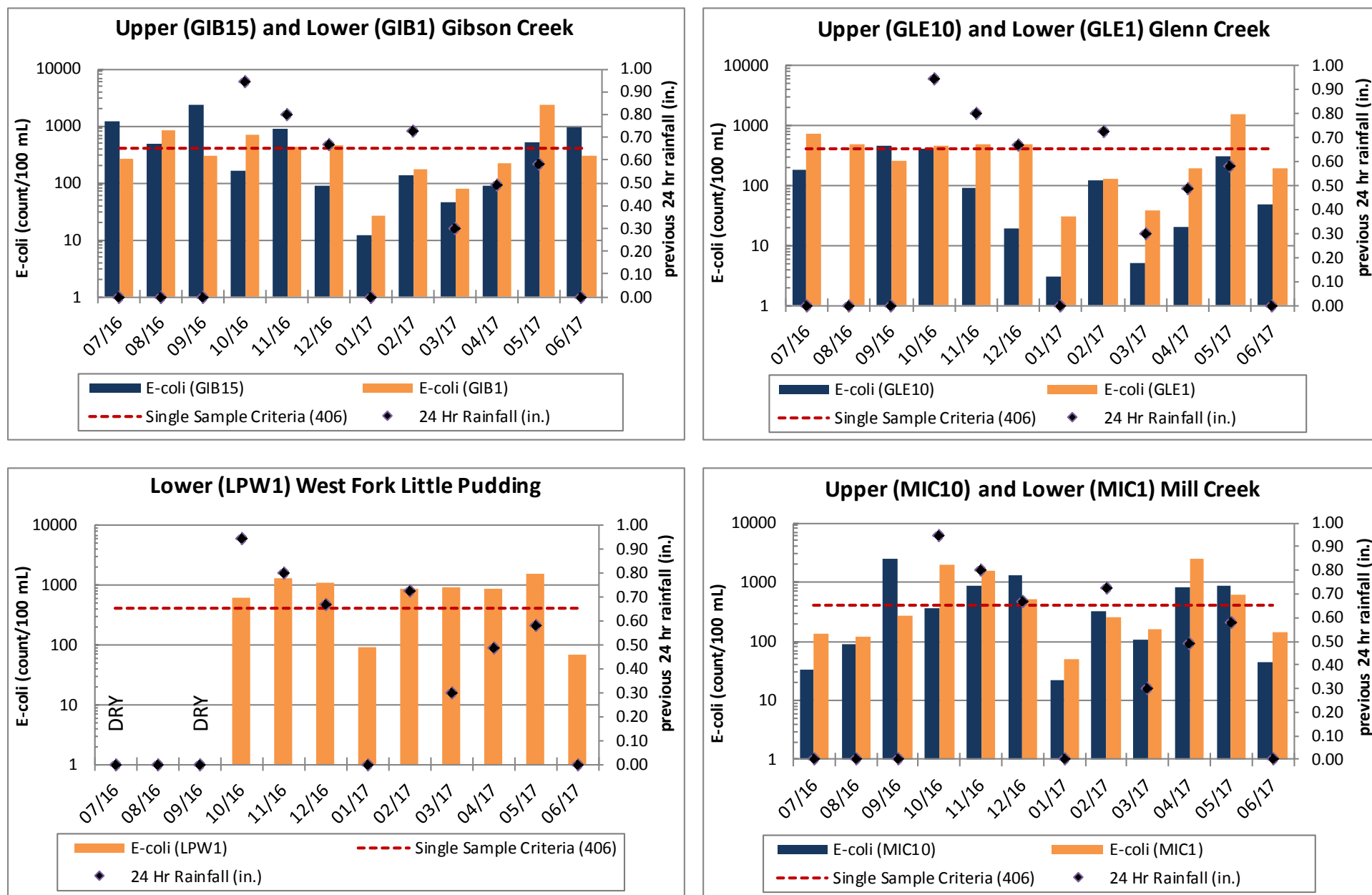
Dry conditions defined as less than 0.05 inches of rainfall in the 24 hours prior to sample collection; rain conditions defined as greater than or equal to 0.05 inches of rainfall in the 24 hours prior to sample collection.

Figure 3
Monthly Instream E. Coli Upstream / Downstream Site Comparison (Reporting Year 2016/2017)



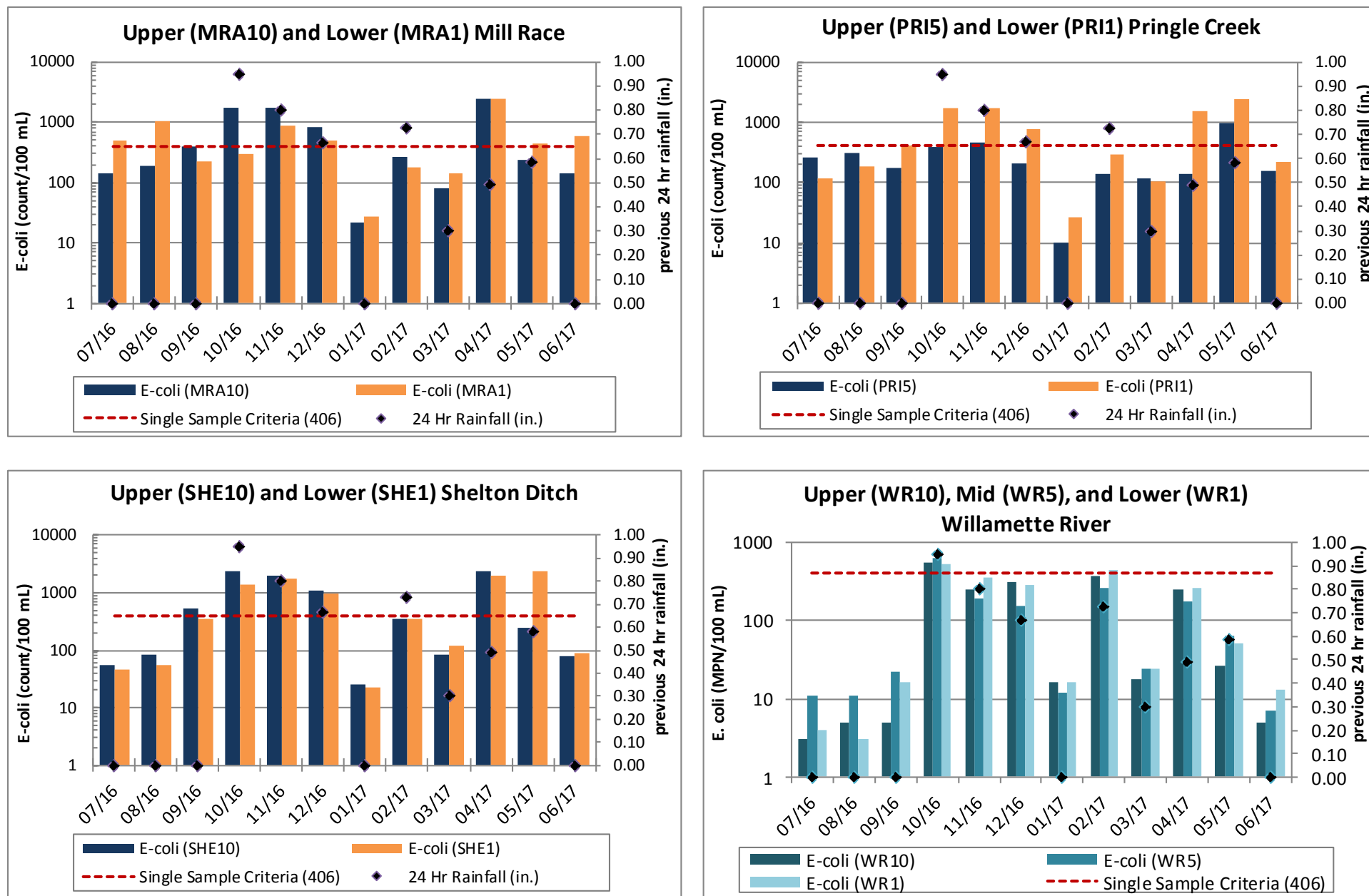
If 24 hour rainfall depth prior to sample collection differed between upstream and downstream sites, the average rainfall of the two sites was used.

Figure 3
Monthly Instream E. Coli Upstream / Downstream Site Comparison (Reporting Year 2016/2017)



If 24 hour rainfall depth prior to sample collection differed between upstream and downstream sites, the average rainfall of the two sites was used.

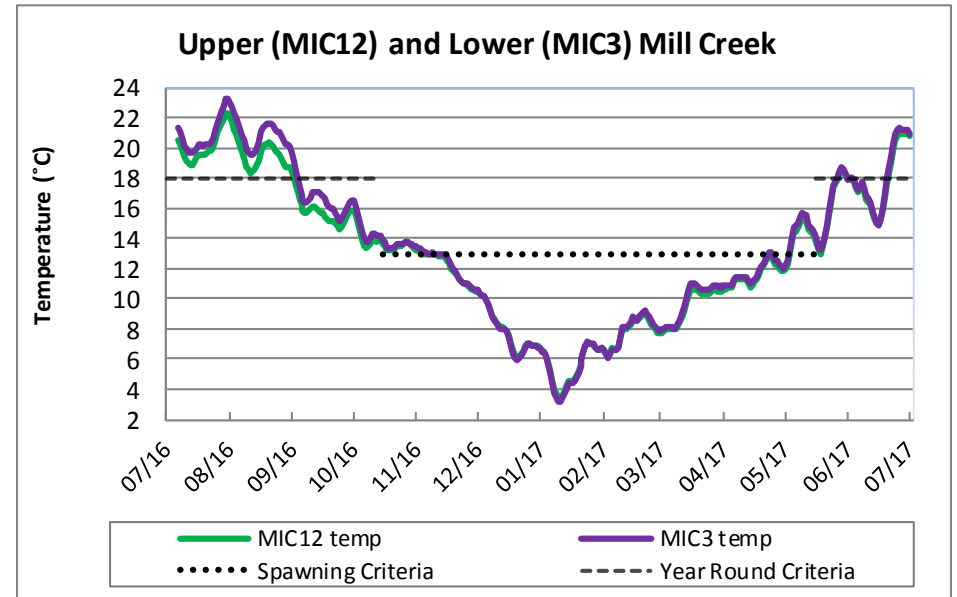
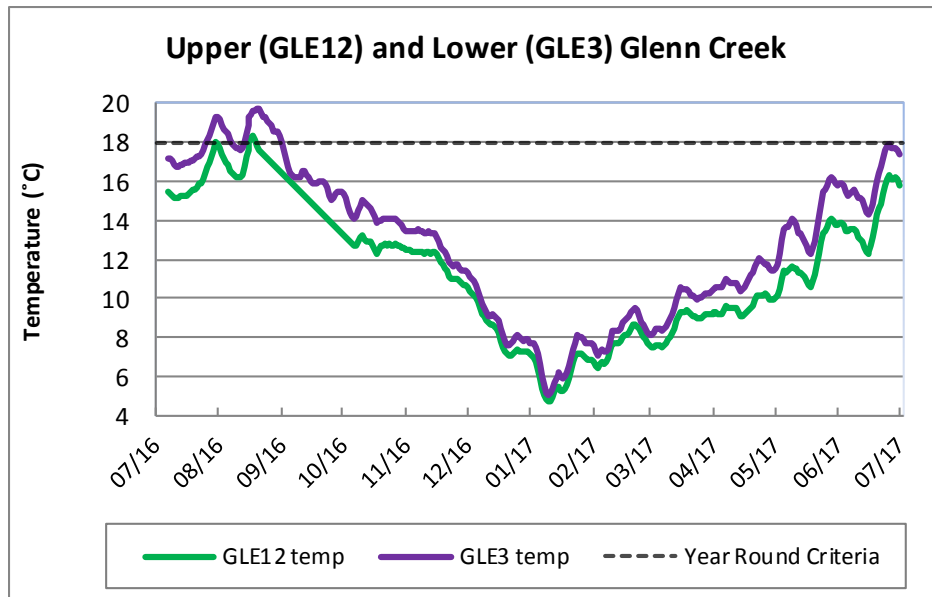
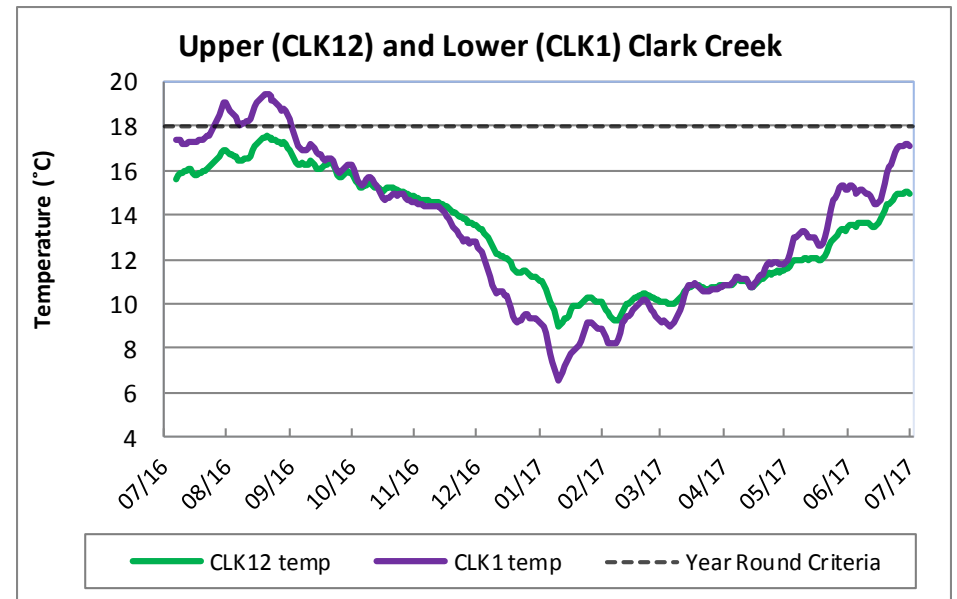
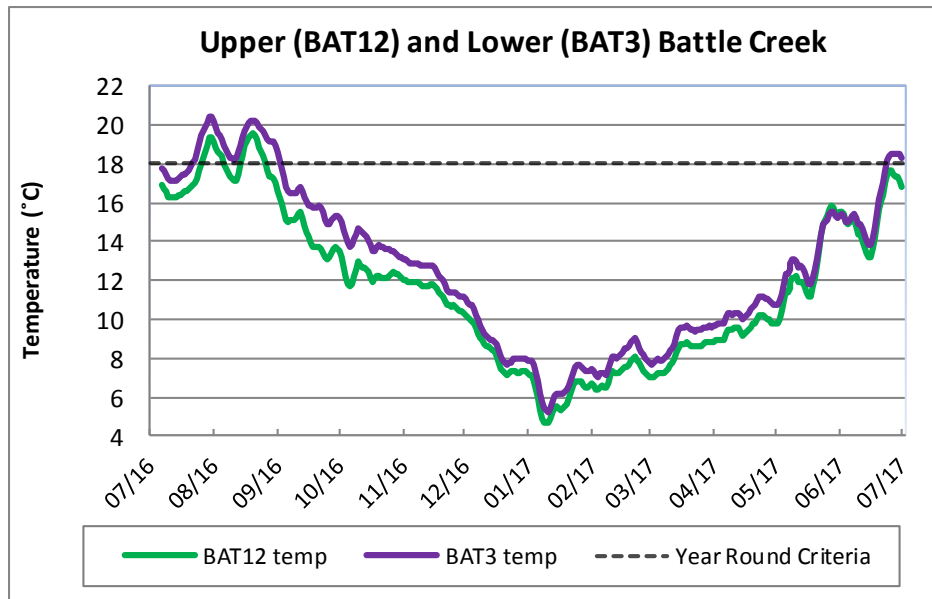
Figure 3
Monthly Instream E. Coli Upstream / Downstream Site Comparison (Reporting Year 2016/2017)



If 24 hour rainfall depth prior to sample collection differed between upstream and downstream sites, the average rainfall of the two sites was used.

Figure 4

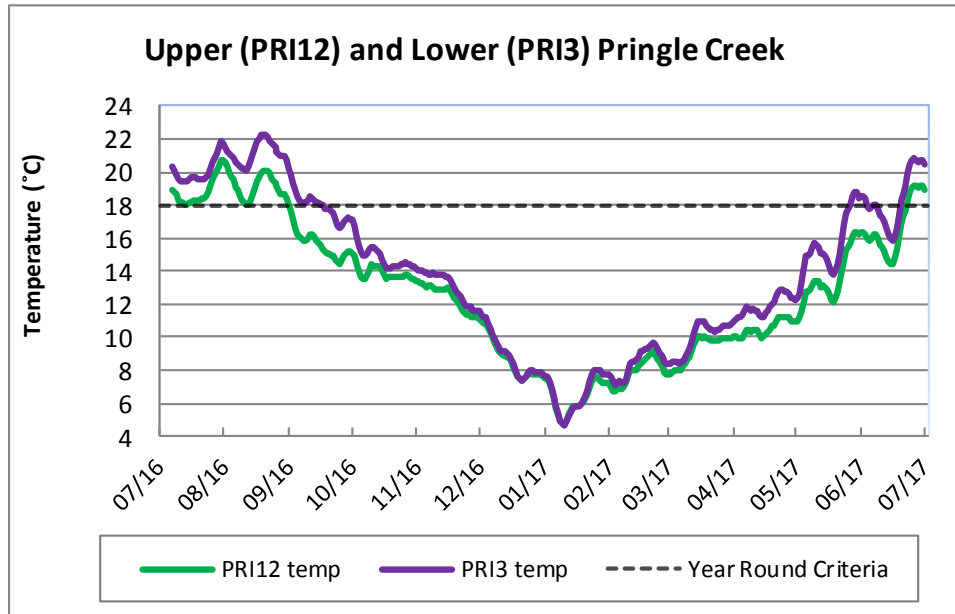
Continuous Instream Temperature 7-Day Moving Average Maximum (Reporting Year 2016/2017)



Presented temperature data consists of A grade data with greater than 80% of data points collected per day. Temperature criteria is defined in OAR 340--04100028 and OAR 340-0340, Tables 340A & B.

- Spawning Minimum Criteria for applicable streams may not exceed 7-day average maximum of 13 degrees C.
- Year Round Minimum Criteria may not exceed 7-day average maximum of 18 degrees C.

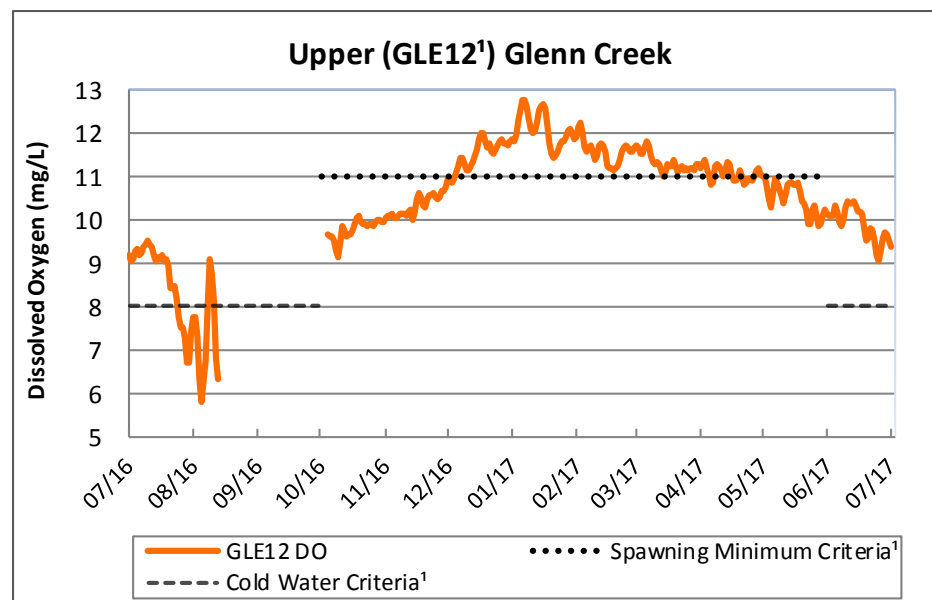
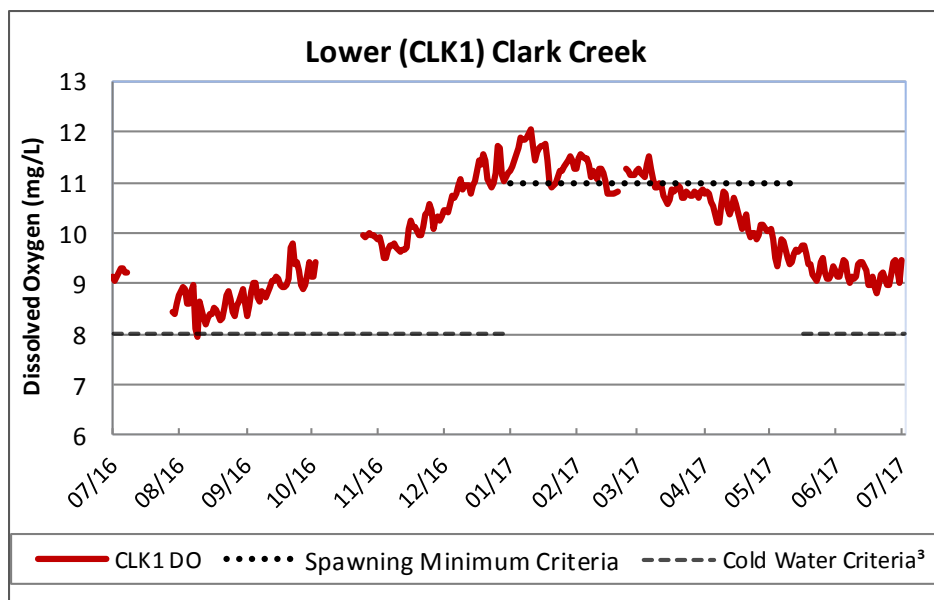
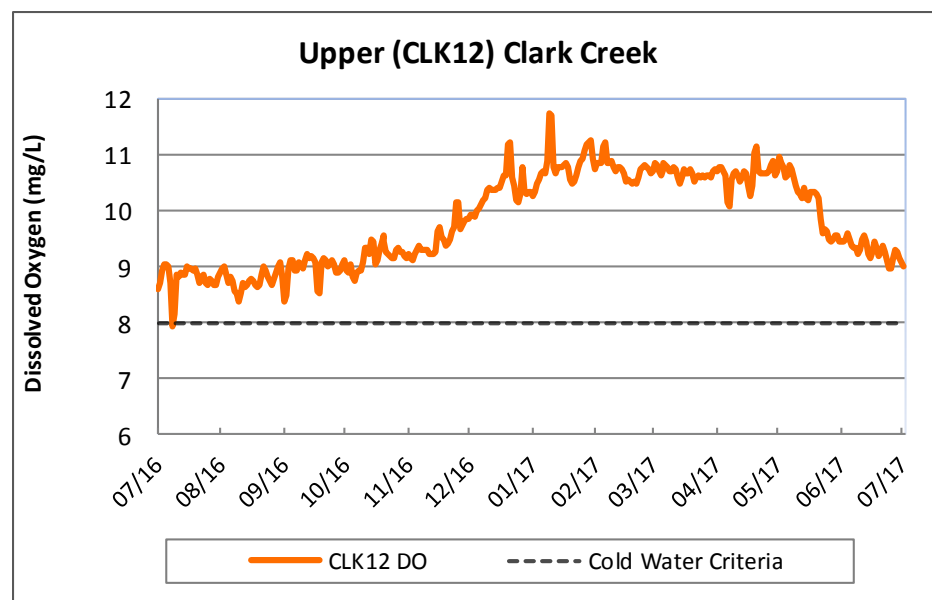
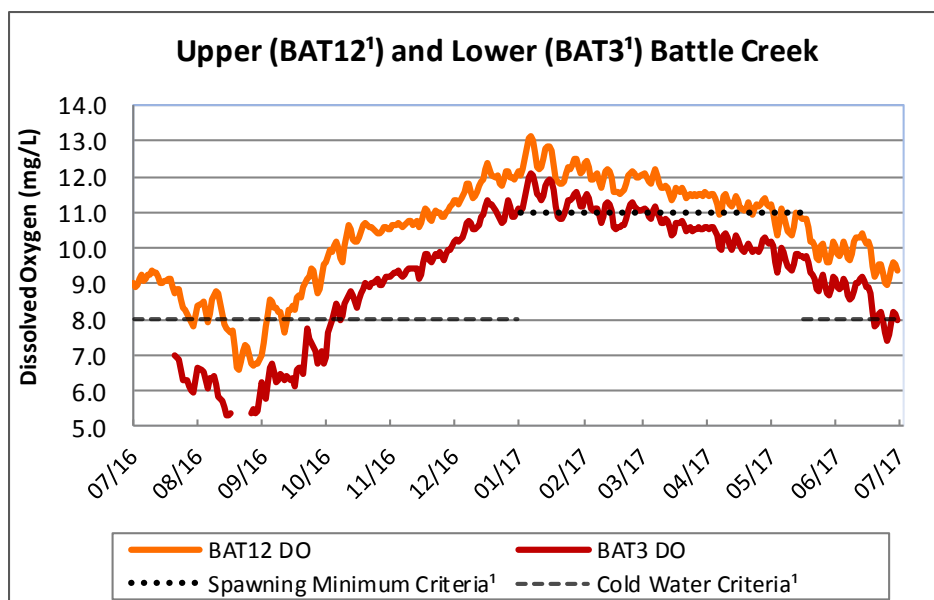
Figure 4
Continuous Instream Temperature 7-Day Moving Average Maximum (Reporting Year 2016/2017)



Presented temperature data consists of A grade data with greater than 80% of data points collected per day. Temperature criteria is defined in OAR 340--04100028 and OAR 340-0340, Tables 340A & B.

- Spawning Minimum Criteria for applicable streams may not exceed 7-day average maximum of 13 degrees C.
- Year Round Minimum Criteria may not exceed 7-day average maximum of 18 degrees C.

Figure 5
Continuous Instream Dissolved Oxygen Daily Mean (Reporting Year 2016/2017)

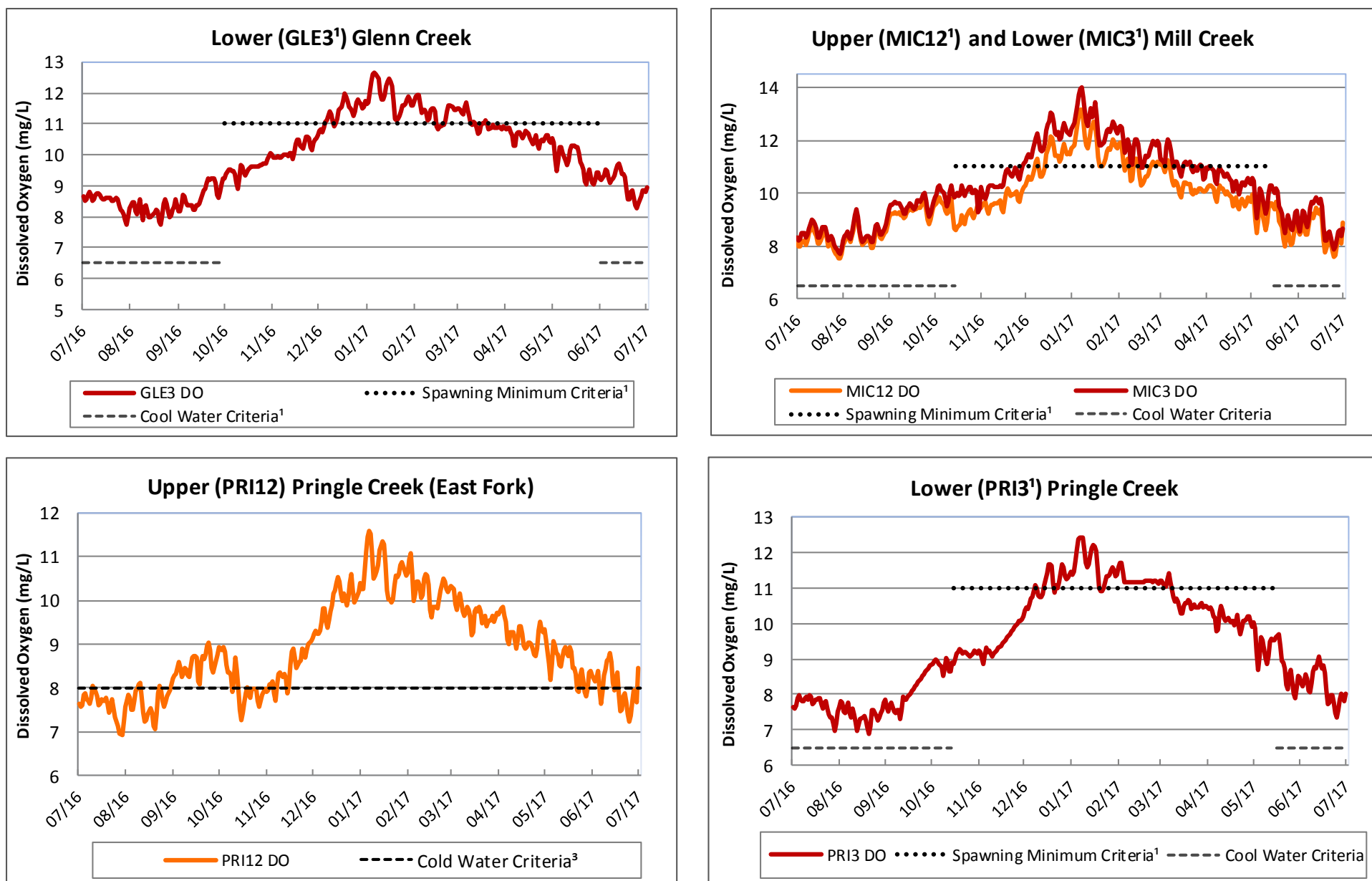


Presented DO data consists of A and B grade data with greater than or equal to 80% of data points collected per day. DO Criteria as defined in OAR 340-041-0016 and OAR 340-0340, Tables 340 A & B.

- Spawning Minimum Criteria for applicable streams may not be less than 11 mg/L.
- Oregon Cold Water Criteria for applicable streams may not be less than 8 mg/L.

¹ Oregon's 2012 Integrated Report Section 303(d) listed.

Figure 5
Continuous Instream Dissolved Oxygen Daily Mean (Reporting Year 2016/2017)

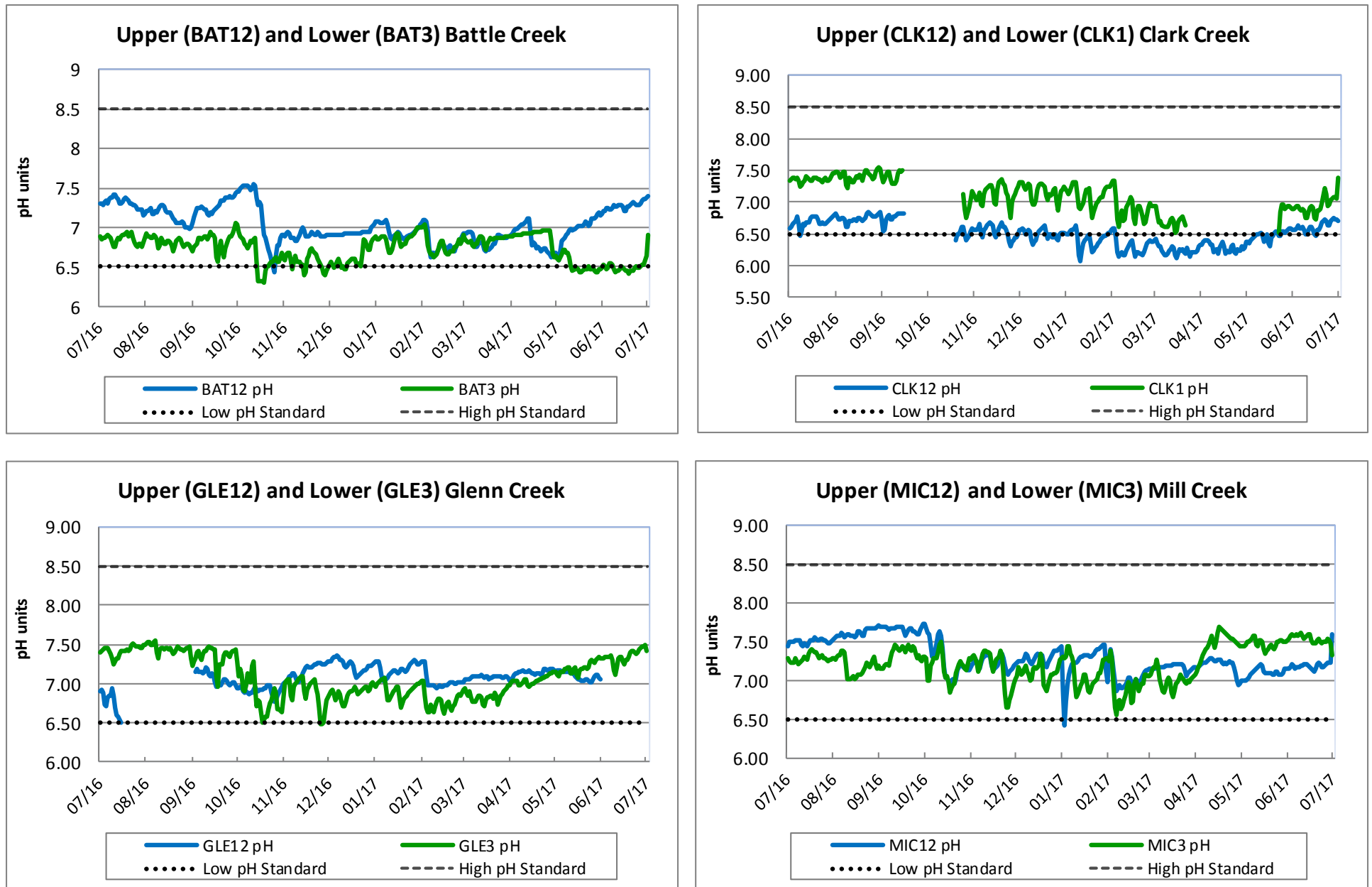


Presented DO data consists of A and B grade data with greater than or equal to 80% of data points collected per day. DO Criteria as defined in OAR 340-041-0016 and OAR 340-0340, Tables 340 A & B.

- Spawning Minimum Criteria for applicable streams may not be less than 11 mg/L.
- Oregon Cold Water Criteria for applicable streams may not be less than 8 mg/L.

¹ Oregon's 2012 Integrated Report Section 303(d) listed.

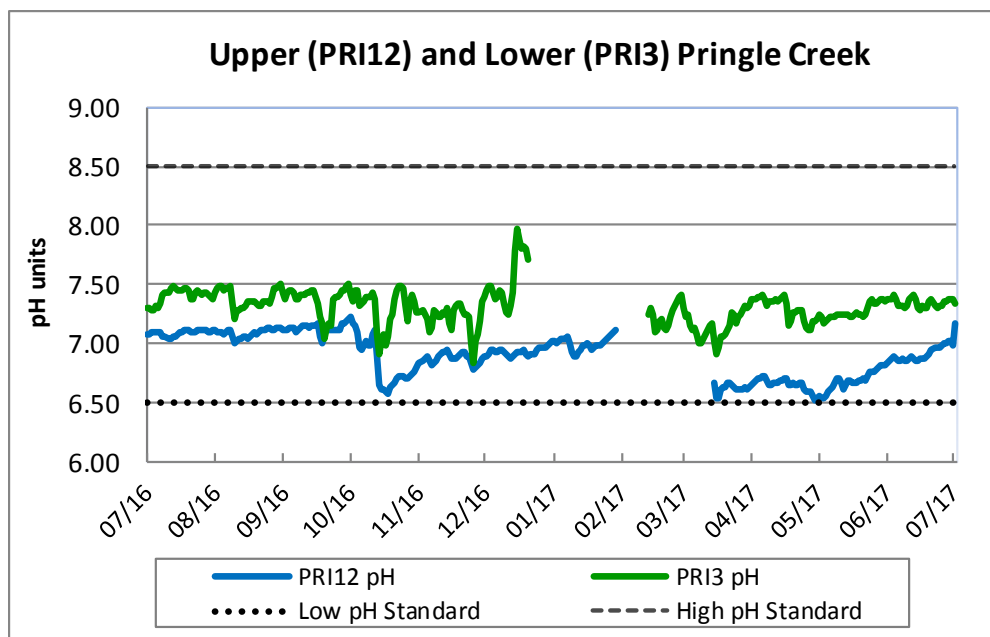
Figure 6
Continuous Instream pH Daily Mean (Reporting Year 2016/2017)



Presented pH data consist of A and B grade data with greater than or equal to 80% of data points collected per day.

As defined in OAR 341-041-0035 Water Quality Standards for the Willamette Basin, pH should not fall outside the ranges of 6.5 to 8.5 pH units.

Figure 6
Continuous Instream pH Daily Mean (Reporting Year 2016/2017)



Presented pH data consist of A and B grade data with greater than or equal to 80% of data points collected per day.

As defined in OAR 341-041-0035 Water Quality Standards for the Willamette Basin, pH should not fall outside the ranges of 6.5 to 8.5 pH units.

Figure 7
Total Rainfall by Month across Salem 7/2016 to 6/2017

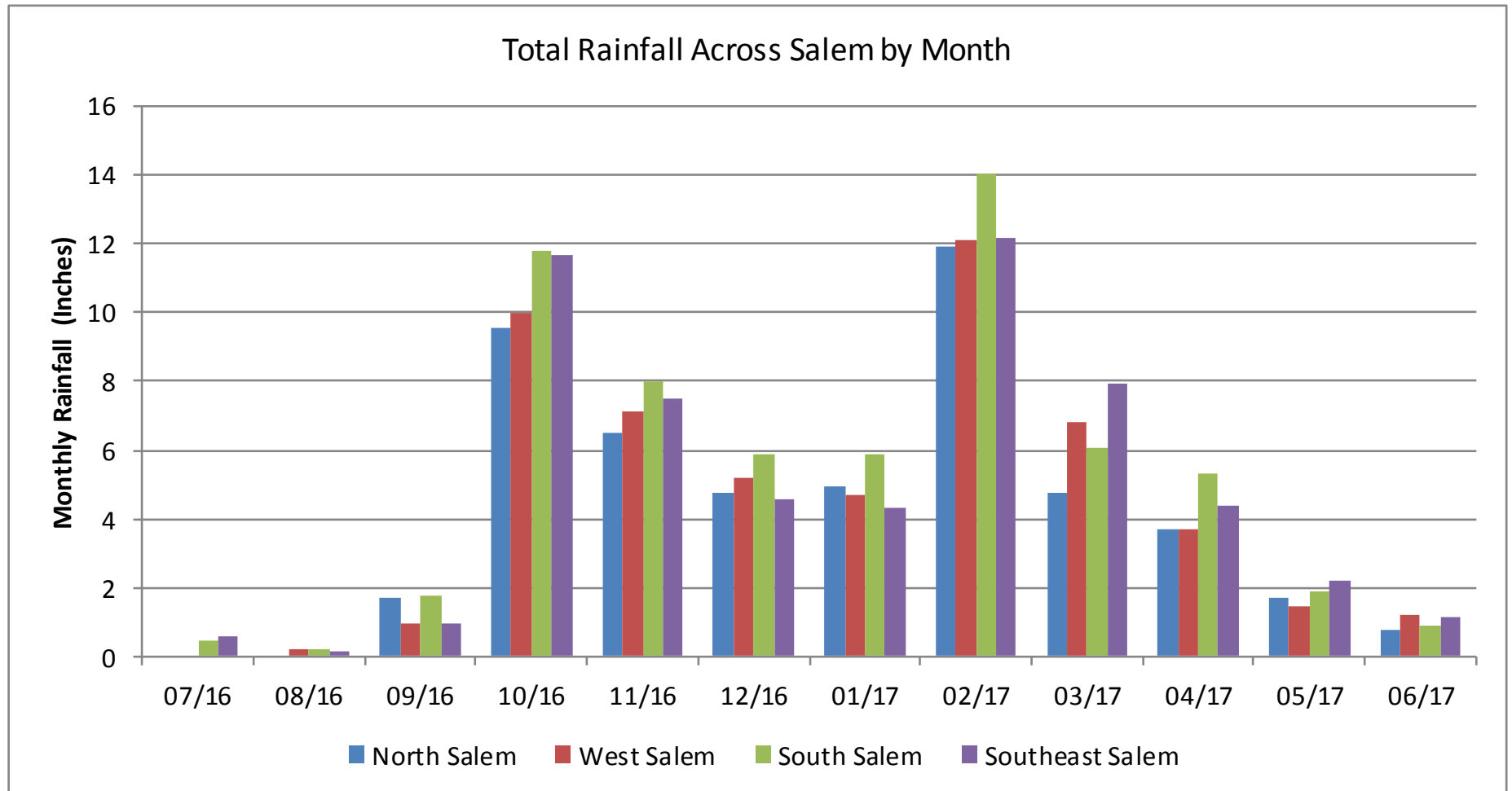


Table 1.
Completion of Table B-1 Environmental Monitoring Elements

Monitoring Type	# of sites	Total “Events” Needed	Completed 2011/2012	Completed 2012/2013	Completed 2013/2014	Completed 2014/2015	Completed 2014/2015	Completed 2015/2016	Remaining "Events" Needed
Monthly Instream	21	48 / site	12¹	12¹	12¹	12¹	12¹	12¹	COMPLETE
Continuous Instream	10	On going	NA	NA	NA	NA	NA	NA	COMPLETE
Instream Storm	3	25 / site	6	6	5	4	4	1	COMPLETE
Stormwater (MS4)	3	15 / site	4	4	4	1	2	1	COMPLETE
Pesticides	3	4 / site	1	2	0	1	COMPLETE		
Mercury	2	2 / site / year	2	1	1	COMPLETE³			
Macroinvertebrates	3	2 / site	1	1	COMPLETE				

¹ Due to no flow or access issues, several of the sites had less than 12 data collection events; however, all sites are on track to meet the minimum permit requirements.

² The City's monitoring plan was not approved by the Department until June 29th, 2011; therefore, no sampling was conducted during this year for this element.

³ Following Table B-1 Special Condition #6 of the City's NPDES MS4 permit, the City requested and received approval from Department to eliminate the mercury and methyl mercury monitoring requirement after completing the required two years of monitoring.

Table 2.
Site Locations for Each Monitoring Element

Monthly Instream	
Site ID	Site Location
BAT 1	Commercial St SE
BAT 12	Rees Hill Rd SE
CGT 1	Mainline Dr NE
CGT 5	Hawthorne St NE @ Hyacinth St NE
CLA 1	Bush Park
CLA 10	Ewald St SE
CRO 1	Courthouse Athletic Club
CRO 10	Ballantyne Rd S
GIB 1	Wallace Rd NW
GIB 15	Brush College Rd NW
GLE 1	River Bend Rd NW
GLE 10	Hidden Valley Dr NW
LPW 1	Cordon Rd NE
MIC 1	Front St Bridge
MIC 10	Turner Rd SE
MRA 1	High St SE
MRA 10	Mill Race Park
PRI 1	Riverfront Park
PRI 5	Bush Park
SHE 1	Church St SE
SHE 10	State Printing Office
WR1	Sunset Park (Keizer)
WR5	Union St. Railroad Bridge
WR10	Halls Ferry Road (Independence)

Continuous Instream	
Site ID	Site Location
BAT3	Commercial St SE
BAT12	Lone Oak Rd SE
CLK1 ¹	Bush Park
CLK12	Ewald St SE
GLE3	Wallace Rd NW
GLE12	Hidden Valley Dr NW
LPW1 ²	Cordon Rd
MIC3	North Salem High School
MIC12	Turner Rd SE
PRI3 ¹	Pringle Park
PRI4 ²	Salem Hospital Footbridge
PRI12 ¹	Trelstad Ave SE
SHE3	Winter St. Bridge

Stormwater / Pesticides / Mercury	
Site Id	Site Location
Electric ³	Electric St. SE and Summer St. SE
Hilfiker ³	Hilfiker Ln. SE and Commercial St. SE
Salem Industrial	Salem Industrial Dr. NE and Hyacinth St. NE

¹ Instream Storm sampling done at these sites. ² Stage-only gauging station. ³ Mercury monitoring conducted at these sites.

BAT = Battle Creek, CGT = Claggett Creek, CLA / CLK = Clark Creek, CRO = Croisan Creek, GIB = Gibson Creek, GLE = Glenn Creek, MIC = Mill Creek, MRA = Mill Race, PRI = Pringle Creek, SHE = Shelton Ditch, LPW = West Fork Little Pudding River, WR = Willamette River

Table 3.
Parameters for Each Monitoring Element

Parameter	Units	Monitoring Element			
		Instream Storm	Stormwater	Monthly Instream	Continuous Instream
Alkalinity	mg/L			x ¹	
Biological Oxygen Demand (BOD _{stream})	mg/L	x		x	
Biological Oxygen Demand (BOD _{5day})	mg/L		x		
Specific Conductivity (Sp. Cond)	µS/cm	x	x	x	x
Copper (Total Recoverable and Dissolved)	mg/L	x	x	x ²	
Dissolved Oxygen (DO)	mg/L	x	x	x	x
<i>E. coli</i>	MPN/100 mL	x	x	x	
Hardness	mg/L	x	x	x ²	
Lead (Total Recoverable and Dissolved)	mg/L	x	x	x ²	
Ammonia Nitrogen (NH ₃ -N)	mg/L	x	x	x ¹	
Nitrate and Nitrite (NO ₃ -NO ₂)	mg/L	x	x	x	
pH	S.U.	x	x	x	x
Total Dissolved Solids (TDS)	mg/L			x ¹	
Temperature	°C	x	x	x	x
Total Phosphorus (TP)	mg/L	x	x	x ¹	
Ortho Phosphorus	mg/L	x	x		
Total Solids (TS)	mg/L			x ¹	
Total Suspended Solids (TSS)	mg/L	x	x	x ^{1, 3}	
Turbidity	NTU			x	x
Zinc (Total Recoverable and Dissolved)	mg/L	x	x	x ²	

¹ Willamette River sites only (WR1, WR5, and WR10).

² Pringle Creek Watershed sites only (PRI1, PRI5, CLA1, and CLA10).

³ West Fork of Little Pudding River site only (LPW 1).

Table 4.
Water Quality Criteria for Monitored Streams

Parameter	Season	Criteria	Applicable Waterbody
Dissolved Oxygen	January 1-May 15	Spawning: Not less than 11.0 mg/L or 95% saturation	Battle Creek*, Claggett Creek*, Clark Creek** ³ , Croisan Creek*, Glenn Creek*, West Fork Little Pudding River*
	October 1- May 31	Spawning: Not less than 11.0 mg/L or 95% saturation	Gibson Creek* [□]
	October 15 - May 15	Spawning: Not less than 11.0 mg/L or 95% saturation	Mill Creek*, Pringle Creek* ¹ , Shelton Ditch*, Willamette River* ⁵
	Year Around (Non-spawning)	Cold water: Not less than 8.0 mg/L or 90% saturation	Battle Creek*, Croisan Creek*, Clark Creek, Glenn Creek* ⁴ , Pringle Creek ²
		Cool water: Not less than 6.5 mg/L	Claggett Creek*, Glenn Creek*, Mill Creek, Pringle Creek ¹ , Shelton Ditch, West Fork Little Pudding River, Willamette River* ⁶
pH	Year Around	Must be within the range of 6.5 to 8.5 pH units	All Monitoring Streams
Temperature	October 15 - May 15	Salmon and steelhead spawning: 13°C 7-day average maximum	Mill Creek, Shelton Ditch
	October 1- May 31	Salmon and steelhead spawning: 13°C 7-day average maximum	Gibson Creek [□]
	Year Around (Non-spawning)	Salmon and trout rearing and migration: 18°C 7-day average maximum	
			All Monitoring Streams
E. coli	Fall-Winter-Spring	30 day log mean of 126 E. coli organisms per 100 ml (or) no single sample > 406 organisms per 100 ml	All Monitoring Streams
	Summer	30 day log mean of 126 E. coli organisms per 100 ml (or) no single sample > 406 organisms per 100 ml	All Monitoring Streams
Biological Criteria	Year Around	Waters of the state must be of sufficient quality to support aquatic species without detrimental changes in the resident biological communities.	Claggett Creek*, Clark Creek** ³ , Croisan Creek*, Glenn Creek*, Pringle Creek Trib*, Willamette River*
Copper	Year Around	Freshwater Acute and Chronic Criteria: 18 and 12 µg/L respectively with values calculated for a hardness of 100 mg/L	Pringle Creek*
Lead	Year Around	Freshwater Acute and Chronic Criteria: 82 and 3.2 µg/L respectively with values calculated for a hardness of 100 mg/L	Pringle Creek*, Willamette River*
Zinc	Year Around	Freshwater Acute and Chronic Criteria: 120 and 110 µg/L respectively with values calculated for a hardness of 100 mg/L	Pringle Creek*

Note: All waterbodies in this table are included under the Willamette Basin or Molalla-Pudding Subbasin TMDL for Temperature and E. coli.

* Oregon's 2012 Integrated Report Section 303(d) listed.

¹ Applies to Pringle Creek from river mile 0 to 2.6.

³ Applies to Clark Creek from river mile 0 to 1.9.

⁵ Applies to Willamette River from river mile 54.8 to 186.5

□ Gibson Creek is referred as Gibson Gulch in Oregon's 2012 Integrated Report.

² Applies to Pringle Creek from river mile 2.6 to 6.2.

⁴ Applies to Glenn Creek from river mile 4.1 to 7.

⁶ Applies to Willamette River from river mile 50.6 to 186.5

Table 5.
Median Values for Monthly Instream Sites (RY 2016/17)

Site ID	Number of Samples	Temperature (C)	DO (mg/L)	Sp. Cond (µS/cm)	Turbidity (NTUs)	pH (S.U.)	E. Coli (MPN/100 mL)	NO ₃ -NO ₂ (mg/L)	BOD _{stream} (mg/L)
BAT 1	12	12.0	9.7	48.1	14.0	6.7	213.0	1.23	1.10
BAT 12	12	11.3	10.1	43.5	6.4	6.9	111.0	1.32	0.83
CGT 1	12	13.6	10.4	120.0	12.8	7.2	424.5	0.39	1.68
CGT 5	9	12.9	10.7	73.1	20.5	7.2	1120.0	0.61	1.56
CLA 1	12	13.1	10.1	91.0	10.2	7.4	411.0	1.22	0.91
CLA 10	12	13.2	9.6	74.0	3.3	6.9	526.5	2.13	0.67
CRO 1	12	11.8	10.3	63.9	12.4	7.0	177.5	1.07	0.96
CRO 10	12	11.4	10.2	50.5	9.4	7.0	74.5	1.24	0.93
GIB 1	12	12.3	10.1	83.4	12.4	7.3	291.0	1.38	0.97
GIB 15	12	12.3	9.9	88.2	14.0	7.3	327.0	1.86	0.87
GLE 1	12	12.3	10.1	85.5	11.4	7.4	361.0	1.22	0.86
GLE 10	11	11.1	10.7	57.0	17.5	7.4	91.0	1.60	0.64
LPW 1	9	12.4	10.8	101.5	11.8	7.1	866.0	0.97	1.39
MIC 1	12	12.3	10.3	70.2	9.3	7.4	268.5	1.62	1.40
MIC 10	12	12.0	10.4	81.6	17.9	7.1	345.5	1.56	1.39
MRA 1	12	12.2	9.9	75.3	9.5	7.5	461.5	1.18	1.36
MRA 10	12	12.1	10.1	80.3	8.6	7.4	249.5	1.57	1.26
PRI 1	12	12.2	10.2	76.7	12.2	7.4	351.0	1.47	1.34
PRI 5	12	12.8	9.9	81.8	9.9	7.4	196.0	0.83	1.33
SHE 1	12	12.2	10.4	77.9	10.0	7.5	345.0	1.59	1.34
SHE 10	12	12.0	10.4	79.7	10.9	7.4	291.5	1.62	1.36
WR1	12	11.8	11.0	67.7	11.8	7.5	37.0	0.43	0.95
WR5	12	11.7	10.5	65.5	10.3	7.5	44.0	0.39	0.90
WR10	12	11.7	10.5	65.6	10.6	7.4	22.0	0.45	0.88

Table 6.
Number of Water Quality Criteria Exceedances for Monthly Instream Sites (RY 2016/17)

Site ID	Number of Samples	Dissolved Oxygen	pH	E. Coli ⁵			Copper ⁶		Lead ⁶		Zinc ⁶	
				Total #	Dry ²	Rain ³	Total	Dissolved	Total	Dissolved	Total	Dissolved
BAT 1	12	5	2	3	2	1						
BAT 12	12	3	0	2	2	0						
CGT 1	12	4	0	6	6	0						
CGT 5 ⁴	9	2	0	7	6	1						
CLA 1	12	2	0	7	5	2	1	1	0	0	1	0
CLA 10	12	0	0	6	2	4	1	1	0	0	1	0
CRO 1	12	3	0	1	1	0						
CRO 10	12	3	0	1	0	1						
GIB 1	12	5 ¹	0	5	4	1						
GIB 15	12	5 ¹	0	6	2	4						
GLE 1	12	1	0	6	4	2						
GLE 10 ⁴	11	2	0	2	1	1						
LPW 1 ⁴	9	2	0	7	7	0						
MIC 1	12	3	0	5	5	0						
MIC 10	12	6	0	5	4	1						
MRA 1	12	NA	0	7	4	3						
MRA 10	12	NA	0	4	4	0						
PRI 1	12	3	0	6	5	1	0	0	0	0	0	0
PRI 5	12	4	0	2	2	0	1	0	0	0	1	0
SHE 1	12	3	0	5	5	0						
SHE 10	12	3	0	5	4	1						
WR1	12	2	1	2	2	0						
WR5	12	3	0	1	1	0						
WR10	12	4	0	1	1	0						

Note: Copper, lead, and zinc collected at Pringle Creek Watershed sites only (PRI1, PRI5, CLA1, and CLA10).

NA = Not available (No dissolved oxygen water quality criteria associated with this waterbody).

¹ No year-round dissolved oxygen water quality criteria associated with this waterbody

³ Rain is ≥ 0.05 inches of rainfall in previous 24 hours.

⁵ Single sample criterion of > 406 organisms per 100 mL used.

² Dry is < 0.05 inches of rainfall in previous 24 hours.

⁴ Unable to sample all 12 due to lack of flow/too high of flow.

⁶ Exceedences calculated based on hardness concentration for each event.

Table 7.
Monthly Instream Data - Battle Creek (RY 2016/17)

Site Name:		BAT1							
Site Description:		Commercial St							
Collection Date/Time	Temp (°C)	DO (mg/L)	Sp Cond (µS/cm)	Turb (NTU)	pH (S.U.)	E-Coli (#/ 100 mL)	NO₃-NO₂ (mg/L)	BOD (mg/L)	Rainfall previous 24 hrs
7/26/2016 12:55	19.6	6.18	63	29	6.63	281	0.48	1.01	0.00
8/16/2016 11:50	18.8	5.85	66.8	23.9	6.66	117	0.34	1.27	0.00
9/13/2016 10:55	14.1	6.15	61.7	43	6.74	365	0.33	1.32	0.00
10/18/2016 10:55	13.1	9.01	56	20.3	6.46	435	1.88	1.11	0.95
11/15/2016 11:25	12.7	9.39	47.8	12.8	6.49	517	1.24	1.16	0.80
12/20/2016 11:00	8.8	10.78	48.2	15.2	6.75	84	1.58	1.02	0.67
1/24/2017 10:43	6.2	11.7	48	3.59	6.91	25	1.9	0.81	0.00
2/21/2017 10:54	8.3	11.00	40	29.2	6.57	145	1.56	1.16	0.73
3/21/2017 11:08	8.9	10.78	42.1	8.18	6.85	67	1.48	0.81	0.30
4/18/2017 11:30	10.8	10.36	43.9	8.56	6.78	126	1.21	1.08	0.49
5/16/2017 11:35	11.2	10.02	37.7	12.4	6.93	403	0.73	1.46	0.58
6/20/2017 11:40	17.1	8.58	49.1	6.89	7.02	980	0.62	1.02	0.00
Median	11.95	9.71	48.10	14.00	6.75	213	1.23	1.10	

Site Name:		BAT12							
Site Description:		Rees Hill Rd.							
Collection Date/Time	Temp (°C)	DO (mg/L)	Sp Cond (µS/cm)	Turb (NTU)	pH (S.U.)	E-Coli (#/ 100 mL)	NO₃-NO₂ (mg/L)	BOD (mg/L)	Rainfall previous 24 hrs
7/26/2016 11:45	18.8	8.22	57.5	8.82	7.14	111	0.21	0.9	0.00
8/16/2016 11:35	17.8	7.48	65.8	5.8	7.13	40	0.25	0.79	0.00
9/13/2016 10:40	12.3	8.26	69.6	4.52	7.22	96	0.32	1.05	0.00
10/18/2016 10:33	12.3	9.47	49.7	13.7	6.65	461	2.19	0.97	0.95
11/15/2016 10:45	12.2	9.76	43.7	8.46	6.62	111	1.34	0.73	0.80
12/20/2016 10:30	8.4	10.94	43.2	9.78	6.68	152	1.77	0.85	0.67
1/24/2017 10:28	5.6	11.87	44	3.59	6.91	15	2.03	0.98	0.00
2/21/2017 10:38	8	11.04	37.7	34.5	6.66	194	1.86	0.88	0.73
3/21/2017 10:55	8.5	10.85	39.5	5.32	6.9	9	1.6	0.62	0.30
4/18/2017 11:20	10.4	10.63	39.4	6.76	6.89	649	1.3	0.74	0.49
5/16/2017 11:15	10.3	10.53	40.3	4.87	7.04	178	0.99	0.81	0.58
6/20/2017 11:00	17.4	9.13	43.3	5.96	7.06	84	0.41	0.72	0.00
Median	11.30	10.15	43.50	6.36	6.91	111	1.32	0.83	

Note: Data in red exceed applicable water quality criteria (see Table 4). Single sample criterion (406 organisms/100 mL) used for E. Coli.

Table 7.
Monthly Instream Data - Claggett Creek (RY 2016/17)

Site Name:		CGT1							
Site Description:		Mainline Dr S							
Collection Date/Time	Temp (°C)	DO (mg/L)	Sp Cond (µS/cm)	Turb (NTU)	pH (S.U.)	E-Coli (#/ 100 mL)	NO ₃ -NO ₂ (mg/L)	BOD (mg/L)	Rainfall previous 24 hrs
7/26/2016 14:35	24.4	10.43	242.7	4.01	7.7	52	0.06	1.58	0.00
8/16/2016 13:15	23.7	9.33	236.9	3.75	7.72	240	< 0.05	1.55	0.00
9/13/2016 12:30	18.6	7.55	239.2	4.94	7.49	147	< 0.05	1.66	0.00
10/18/2016 12:55	12.7	8.42	74.2	10.9	6.98	1120	0.58	1.44	0.95
11/15/2016 13:35	13.2	8.83	74.3	25.9	7.11	2420	0.63	1.95	0.80
12/20/2016 13:00	8.1	10.36	100.8	25.7	7.09	770	0.69	1.86	0.67
1/24/2017 12:31	6.2	10.57	212.5	11.4	7.35	88	1.36	1.25	0.00
2/21/2017 12:25	8.1	10.83	57.8	30.8	7.02	2420	0.44	1.91	0.73
3/21/2017 12:56	10.7	10.34	129.4	14.2	7.15	361	0.6	1.63	0.30
4/18/2017 13:10	15.2	10.52	110.6	15	7.15	488	0.33	2.01	0.49
5/16/2017 13:27	14	9.27	59.7	23.4	7.03	>2420	0.25	2.31	0.58
6/20/2017 14:20	22.8	11.1	254.5	4.93	7.49	115	0.34	1.7	0.00
Median	13.60	10.35	120.00	12.80	7.15	361	0.51	1.68	

Site Name:		CGT5							
Site Description:		Hawthorne Ave							
Collection Date/Time	Temp (°C)	DO (mg/L)	Sp Cond (µS/cm)	Turb (NTU)	pH (S.U.)	E-Coli (#/ 100 mL)	NO ₃ -NO ₂ (mg/L)	BOD (mg/L)	Rainfall previous 24 hrs
7/26/2016 12:00	No Flow								0.00
8/16/2016 12:00	No Flow								0.00
9/13/2016 12:00	No Flow								0.00
10/18/2016 12:35	12.9	9.28	71.1	14.3	6.96	1414	1.12	1.89	0.95
11/15/2016 13:15	13	9.44	67.8	23.4	7.01	2420	0.61	2.33	0.80
12/20/2016 12:35	8.3	10.91	105	26	6.9	1120	0.96	1.56	0.67
1/24/2017 12:17	5.9	11.7	206.3	11.1	7.38	23	1.79	1.12	0.00
2/21/2017 12:15	8.3	11.04	47.7	35	6.85	613	0.5	1.88	0.73
3/21/2017 12:43	10.1	10.95	102.1	16.1	7.21	178	0.71	1.32	0.30
4/18/2017 12:55	14.2	10.71	73.1	20.5	7.26	1733	0.31	1.46	0.49
5/16/2017 13:15	13	9.77	46.4	20.7	7.44	>2420	0.24	2.02	0.58
6/20/2017 14:00	19.9	6.51	181.3	9.97	7.52	816	0.34	1.28	0.00
Median	12.90	10.71	73.10	20.50	7.21	668	0.61	1.56	

Note: Data in red exceed applicable water quality criteria (see Table 4). Single sample criterion (406 organisms/100 mL) used for E. Coli.

Table 7.
Monthly Instream Data - Clark Creek (RY 2016/17)

Site Name: CLA1									
Site Description: Bush Park									
Collection Date/Time	Temp (°C)	DO (mg/L)	Sp Cond (µS/cm)	Turb (NTU)	pH (S.U.)	E-Coli (#/ 100 mL)	NO ₃ -NO ₂ (mg/L)	BOD (mg/L)	Rainfall previous 24 hrs
7/26/2016 10:30	17.5	9.04	100.2	2.71	7.41	225	0.82	0.75	0.00
8/16/2016 10:15	17.7	8.94	103.8	3.75	7.47	921	0.92	0.69	0.00
9/13/2016 11:35	15.1	9.44	97.3	52.5	7.53	411	0.68	0.68	0.00
10/18/2016 10:25	14.3	9.77	94.6	11.9	7.18	1046	2.33	0.84	0.95
11/15/2016 10:00	14.1	9.81	90.9	10.4	7.57	727	1.69	0.99	0.80
12/20/2016 9:40	9.5	11.08	91	19.5	7.43	291	1.49	1.16	0.67
1/24/2017 10:04	8	11.67	100	4.39	7.38	52	1.9	0.9	0.00
2/21/2017 10:20	9	11.28	60.2	31.3	7.17	411	1.14	1.33	0.73
3/21/2017 11:00	10.1	10.88	77.3	7.96	7.34	517	1.34	0.92	0.30
4/18/2017 10:35	11.5	10.55	83.3	9.92	7.46	86	1.29	0.99	0.49
5/16/2017 10:25	12.1	10.43	24.2	61.4	7.73	> 2420	0.22	4.47	0.58
6/20/2017 10:40	16.2	9.37	89.1	3.25	7.4	150	0.86	0.62	0.00
Median	13.10	10.12	90.95	10.16	7.42	366	1.22	0.91	

Site Name: CLA1							
Site Description: Bush Park							
Collection Date/Time	Total Copper (mg/L)	Dissolved Copper (mg/L)	Total Lead (mg/L)	Dissolved Lead (mg/L)	Total Zinc (mg/L)	Dissolved Zinc (mg/L)	Hardness
7/26/2016 10:30	< 0.0025	< 0.0025	< 0.0005	< 0.0005	0.0042	0.0034	31
8/16/2016 10:15	< 0.0025	< 0.0025	< 0.0005	< 0.0005	0.0059	0.0035	31
9/13/2016 11:35	0.0033	< 0.0025	0.0011	< 0.0005	0.0158	0.0046	32
10/18/2016 10:25	< 0.0025	< 0.0025	0.0007	< 0.0005	0.018	0.0131	30
11/15/2016 10:00	< 0.0025	< 0.0025	< 0.0005	< 0.0005	0.0155	0.01	33
12/20/2016 9:40	< 0.0025	< 0.0025	0.001	< 0.0005	0.0225	0.0135	28
1/24/2017 10:04	< 0.0025	< 0.0025	< 0.0005	< 0.0005	0.0107	0.0091	37
2/21/2017 10:20	0.0029	< 0.0025	0.0014	< 0.0005	0.0251	0.016	22
3/21/2017 11:00	< 0.0025	< 0.0025	< 0.0005	< 0.0005	0.0104	0.0059	29
4/18/2017 10:35	< 0.0025	< 0.0025	< 0.0005	< 0.0005	0.0132	0.0102	29
5/16/2017 10:25	0.0127	0.0026	0.0087	< 0.0005	0.0846	0.0171	13
6/20/2017 10:40	< 0.0025	< 0.0025	< 0.0005	< 0.0005	0.0061	0.0034	30
Median	NA	NA	NA	NA	0.0144	0.0096	30

Note: Data in red exceed applicable water quality criteria (see Table 4). Single sample criterion (406 organisms/100 mL) used for E. Coli.

NA= Medians not calculated for copper and lead due to the large number of censored values.

Table 7.
Monthly Instream Data - Clark Creek (RY 2016/17)

Site Name: CLA10 Site Description: Ewald Ave									
Collection Date/Time	Temp (°C)	DO (mg/L)	Sp Cond (µS/cm)	Turb (NTU)	pH (S.U.)	E-Coli (#/ 100 mL)	NO ₃ -NO ₂ (mg/L)	BOD (mg/L)	Rainfall previous 24 hrs
7/26/2016 10:38	16.4	8.98	73.2	2.26	7.07	> 2420	1.55	0.58	0.00
8/16/2016 10:20	16.9	8.76	73.5	2.72	7.12	> 2420	1.38	0.72	0.00
9/13/2016 9:33	14.8	9.22	75.7	2.75	7.2	6488	1.46	0.69	0.00
10/18/2016 9:50	15	9.26	82.7	5.62	6.78	2420	2.84	0.54	0.95
11/15/2016 9:45	14.4	9.37	79	5.48	6.65	147	2.38	< 0.5	0.80
12/20/2016 9:30	11.6	10.18	89.4	5.86	6.98	326	2.55	0.51	0.67
1/24/2017 9:45	9.8	10.64	81.5	2.34	6.86	40	2.66	0.89	0.00
2/21/2017 10:00	9.8	10.66	66.7	9.67	6.74	50	2.18	1.25	0.73
3/21/2017 10:15	10.5	10.34	74.5	2.67	7.06	285	2.28	0.64	0.30
4/18/2017 10:15	11.3	10.13	71.7	3.77	6.84	133	2.08	0.52	0.49
5/16/2017 10:05	12	9.9	28.5	11.19	7	> 2420	0.54	1.88	0.58
6/20/2017 10:00	14.7	9.21	72.5	2.53	6.55	727	1.84	0.75	0.00
Median	13.20	9.64	74.00	3.26	6.92	527	2.13	0.69	

Site Name: CLA10 Site Description: Ewald Ave							
Collection Date/Time	Total Copper (mg/L)	Dissolved Copper (mg/L)	Total Lead (mg/L)	Dissolved Lead (mg/L)	Total Zinc (mg/L)	Dissolved Zinc (mg/L)	Hardness
7/26/2016 10:38	<0.0025	<0.0025	<0.0005	<0.0005	0.0055	0.0049	20
8/16/2016 10:20	<0.0025	<0.0025	<0.0005	<0.0005	0.0056	0.0044	19
9/13/2016 9:33	<0.0025	<0.0025	<0.0005	<0.0005	0.0057	0.0042	20
10/18/2016 9:50	<0.0025	<0.0025	<0.0005	<0.0005	0.014	0.0123	25
11/15/2016 9:45	<0.0025	<0.0025	<0.0005	<0.0005	0.0142	0.0116	24
12/20/2016 9:30	<0.0025	<0.0025	<0.0005	<0.0005	0.0154	0.013	23
1/24/2017 9:45	<0.0025	<0.0025	<0.0005	<0.0005	0.0067	0.0065	22
2/21/2017 10:00	<0.0025	<0.0025	<0.0005	<0.0005	0.0117	0.0089	20
3/21/2017 10:15	<0.0025	<0.0025	<0.0005	<0.0005	0.0164	0.0155	25
4/18/2017 10:15	<0.0025	<0.0025	<0.0005	<0.0005	0.0101	0.01	23
5/16/2017 10:05	0.0031	<0.0025	<0.0005	<0.0005	0.0158	0.0122	8
6/20/2017 10:00	<0.0025	<0.0025	<0.0005	0.0005	0.0058	0.0044	21
Median	NA	NA	NA	NA	0.0109	0.0095	21.50

Note: Data in red exceed applicable water quality criteria (see Table 4). Single sample criterion (406 organisms/100 mL) used for E. Coli.

NA= Medians not calculated for copper and lead due to the large number of censored values.

Table 7.
Monthly Instream Data - Croisan Creek (RY 2016/17)

Site Name: CRO1 Site Description: River Rd S									
Collection Date/Time	Temp (°C)	DO (mg/L)	Sp Cond (µS/cm)	Turb (NTU)	pH (S.U.)	E-Coli (#/ 100 mL)	NO ₃ -NO ₂ (mg/L)	BOD (mg/L)	Rainfall previous 24 hrs
7/26/2016 10:57	17.8	6.6	89.1	9.73	7.06	147	0.27	1	0.00
8/16/2016 11:15	16.7	6.61	74.5	19.5	6.82	96	0.21	1	0.00
9/13/2016 9:50	14.3	4.08	119.2	10.6	6.82	194	0.2	0.94	0.00
10/18/2016 10:05	12.6	9.9	68.7	18.7	7.03	308	2.1	0.96	0.95
11/15/2016 10:00	12.4	10.09	65	14	7.11	248	1.18	0.79	0.80
12/20/2016 9:50	8.1	11.58	62.7	14.2	7.26	270	1.38	1.06	0.67
1/24/2017 9:58	5.7	12.29	62.6	6.13	7.07	387	1.69	1.14	0.00
2/21/2017 10:10	8.6	11.4	53.3	27.5	6.92	115	1.31	0.92	0.73
3/21/2017 10:30	9	11.23	57.7	7.44	7.19	33	1.25	0.6	0.30
4/18/2017 10:35	10.5	11.05	60.2	10.7	6.94	46	0.96	0.95	0.49
5/16/2017 10:35	11.1	10.6	52.3	43.9	7.02	1553	0.55	1.83	0.58
6/20/2017 10:15	16.1	8.86	75.9	5.05	7.07	161	0.53	0.72	0.00
Median	11.75	10.35	63.85	12.35	7.05	178	1.07	0.96	

Site Name: CRO10 Site Description: Ballantyne Rd.									
Collection Date/Time	Temp (°C)	DO (mg/L)	Sp Cond (µS/cm)	Turb (NTU)	pH (S.U.)	E-Coli (#/ 100 mL)	NO ₃ -NO ₂ (mg/L)	BOD (mg/L)	Rainfall previous 24 hrs
7/26/2016 11:17	17.8	7.98	73.5	9.3	7.05	110	0.24	0.96	0.00
8/16/2016 11:15	16.7	6.61	74.5	19.5	6.82	488	0.36	1.02	0.00
9/13/2016 10:10	12.5	8.77	73.3	14.3	7.1	192	0.31	1.01	0.00
10/18/2016 10:20	12.3	9.73	55.6	12.6	6.87	248	2.25	0.95	0.95
11/15/2016 10:25	12.1	9.97	50.4	9.4	6.85	161	1.31	0.77	0.80
12/20/2016 10:05	7.8	11.28	50.3	9.87	7.2	51	1.73	0.82	0.67
1/24/2017 10:12	5.9	11.93	50.5	4.75	7.03	14	1.97	0.9	0.00
2/21/2017 10:24	8.2	11.16	44.8	25.3	6.83	16	1.7	1.3	0.73
3/21/2017 10:42	8.7	11.07	45.6	5.88	7.3	10	1.47	0.75	0.30
4/18/2017 11:00	10.4	10.69	45.5	8.78	6.95	28	1.16	0.99	0.49
5/16/2017 10:52	10.6	10.36	47.3	8.34	7.1	79	0.78	0.88	0.58
6/20/2017 10:40	15.1	8.92	53.8	7	6.81	70	0.6	0.82	0.00
Median	11.35	10.17	50.45	9.35	6.99	75	1.24	0.93	

Note: Data in red exceed applicable water quality criteria (see Table 4). Single sample criterion (406 organisms/100 mL) used for E. Coli.

Table 7.
Monthly Instream Data - Gibson Creek (RY 2016/17)

Site Name: GIB1		Site Description: Wallace Rd.							
Collection Date/Time	Temp (°C)	DO (mg/L)	Sp Cond (µS/cm)	Turb (NTU)	pH (S.U.)	E-Coli (#/ 100 mL)	NO ₃ -NO ₂ (mg/L)	BOD (mg/L)	Rainfall previous 24 hrs
7/26/2016 12:05	19.1	6.6	110.4	6.81	7.28	260	0.36	0.98	0.00
8/16/2016 10:55	19.3	6.01	114.7	8.2	7.21	816	0.28	0.95	0.00
9/13/2016 13:30	15.9	7.01	111.9	8.09	7.4	291	0.36	1.03	0.00
10/18/2016 11:15	12.7	9.67	97	23.2	7.1	687	2.26	1.12	0.95
11/15/2016 10:45	12.3	9.9	84.3	31.2	7.43	435	1.36	1.28	0.80
12/20/2016 10:40	8.3	11.32	82.5	21.6	7.34	461	1.88	1.01	0.67
1/24/2017 11:00	6.5	12.16	76.1	13.6	7.4	26	2.44	0.76	0.00
2/21/2017 11:25	8.9	11.17	65.1	40.1	7.14	172	1.72	0.74	0.73
3/21/2017 12:00	9.8	10.99	73.4	11	7.26	81	1.84	0.67	0.30
4/18/2017 11:55	12	10.54	78.8	11.1	7.27	225	1.39	0.95	0.49
5/16/2017 11:45	12.2	10.21	75.8	21.8	7.26	> 2420	1.03	1.5	0.58
6/20/2017 12:08	19.8	8.49	91.8	6.86	7.48	291	0.84	0.72	0.00
Median	12.25	10.06	83.40	12.35	7.28	291	1.38	0.97	

Site Name: GIB15		Site Description: Brush College Rd.							
Collection Date/Time	Temp (°C)	DO (mg/L)	Sp Cond (µS/cm)	Turb (NTU)	pH (S.U.)	E-Coli (#/ 100 mL)	NO ₃ -NO ₂ (mg/L)	BOD (mg/L)	Rainfall previous 24 hrs
7/26/2016 12:15	19.1	8.06	116.6	8.22	7.46	1203	0.84	0.67	0.00
8/16/2016 11:10	18.1	8.2	120	6.05	7.42	488	1.04	0.9	0.00
9/13/2016 13:40	15.3	8.67	116.1	24.7	7.61	> 2420	1.3	1.19	0.00
10/18/2016 11:30	12.5	9.38	99.2	16.5	7.01	166	2	1.02	0.95
11/15/2016 11:20	12.4	9.63	87.2	25.1	7.22	866	1.56	1.09	0.80
12/20/2016 10:55	8.6	11.05	82.5	15.4	7.28	91	2.21	0.84	0.67
1/24/2017 11:16	6.9	11.94	80.1	12.6	7.4	12	2.71	0.64	0.00
2/21/2017 11:45	9.2	11.09	69.8	32.4	7.16	140	1.86	0.67	0.73
3/21/2017 12:12	9.8	10.99	76.6	9.75	7.2	46	2.12	0.74	0.30
4/18/2017 12:08	11.3	10.47	81.4	10.5	7.24	88	1.86	0.9	0.49
5/16/2017 11:55	12.1	10.22	89.1	11.8	7.14	517	1.92	0.98	0.58
6/20/2017 12:20	19.1	8.53	93.8	18.9	7.37	921	1.56	0.65	0.00
Median	12.25	9.93	88.15	14.00	7.26	345	1.86	0.87	

Note: Data in red exceed applicable water quality criteria (see Table 4). Single sample criterion (406 organisms/100 mL) used for E. Coli.

Table 7.
Monthly Instream Data - Glenn Creek (RY 2016/17)

Site Name:		GLE1							
Site Description:		River Bend Rd.							
Collection Date/Time	Temp (°C)	DO (mg/L)	Sp Cond (µS/cm)	Turb (NTU)	pH (S.U.)	E-Coli (#/ 100 mL)	NO ₃ -NO ₂ (mg/L)	BOD (mg/L)	Rainfall previous 24 hrs
7/26/2016 11:50	17.8	7.43	118.9	5.7	7.44	727	0.62	0.68	0.00
8/16/2016 10:45	17.3	7.51	122.7	7.61	7.39	488	0.59	0.77	0.00
9/13/2016 13:04	14.3	8.73	120	5.51	7.56	261	0.52	0.86	0.00
10/18/2016 10:55	13	9.77	88.2	18.1	7.08	461	1.98	0.85	0.95
11/15/2016 10:30	13.3	9.7	88.5	13.8	7.4	488	1.32	0.88	0.80
12/20/2016 10:25	8.5	11.24	75.7	19.7	7.43	488	1.43	1.04	0.67
1/24/2017 10:48	6.3	12.17	82.7	9.03	7.45	30	2.38	0.93	0.00
2/21/2017 11:00	8.9	11.17	66.7	34.1	7.16	129	1.67	0.81	0.73
3/21/2017 11:55	9.6	11.08	78.1	8.91	7.27	39	1.76	0.8	0.30
4/18/2017 11:45	11.4	10.66	79.9	14	7.26	192	1.12	0.93	0.49
5/16/2017 11:30	11.6	10.45	44.7	36.4	7.41	1553	0.46	1.87	0.58
6/20/2017 11:48	17.5	9	103.1	5.38	7.47	194	0.89	0.68	0.00

Median	12.30	10.11	85.45	11.42	7.41	361	1.22	0.86	
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Site Name:		GLE10							
Site Description:		Hidden Valley Dr.							
Collection Date/Time	Temp (°C)	DO (mg/L)	Sp Cond (µS/cm)	Turb (NTU)	pH (S.U.)	E-Coli (#/ 100 mL)	NO ₃ -NO ₂ (mg/L)	BOD (mg/L)	Rainfall previous 24 hrs
7/26/2016 12:30	16.4	8.76	83.8	5.65	7.42	184	0.37	< 0.5	0.00
8/16/2016 11:25	No Flow								0.00
9/13/2016 14:00	13.6	4.84	128.7	17.5	7.11	461	0.2	2.62	0.00
10/18/2016 11:45	12.7	10.07	81.1	21.5	7.07	411	3.4	0.73	0.95
11/15/2016 11:40	12.2	10.21	61.5	33.4	7.33	91	1.6	1.04	0.80
12/20/2016 11:10	8.3	11.49	56.7	17.9	7.44	19	2.03	0.55	0.67
1/24/2017 11:30	6.6	12.09	56.9	13.1	7.43	3	2.38	0.72	0.00
2/21/2017 12:00	8.5	11.4	48.6	45.8	7.36	121	1.86	0.51	0.73
3/21/2017 12:25	9.4	11.12	52.4	11	7.26	5	1.69	0.6	0.30
4/18/2017 12:30	11.1	10.73	53.8	12.8	7.43	20	1.28	0.64	0.49
5/16/2017 12:10	10.7	10.77	57	34.5	7.25	313	0.98	0.83	0.58
6/20/2017 12:32	15.9	9.56	64.6	10.1	7.46	48	0.76	< 0.5	0.00

Median	10.70	10.73	57.00	17.50	7.36	91	1.60	0.72	
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Note: Data in red exceed applicable water quality criteria (see Table 4). Single sample criterion (406 organisms/100 mL) used for E. Coli.

Table 7.
Monthly Instream Data - West Fork Little Pudding River (RY 2016/17)

Site Name:		LPW1								
Site Description:		Cordon Rd.								
Collection Date/Time	Temp (°C)	DO (mg/L)	Sp Cond (µS/cm)	Turb (NTU)	pH (S.U.)	E-Coli (#/ 100 mL)	NO ₃ -NO ₂ (mg/L)	BOD (mg/L)	Rainfall previous 24 hrs	TSS
7/26/2016 14:35	No Flow									
8/16/2016 0:00	No Flow									
9/13/2016 0:00	No Flow									
10/18/2016 11:45	12.4	9.39	75.7	9.44	6.91	613	1.36	1.39	0.95	2.4
11/15/2016 13:00	13.3	9.88	112	16.1	7.1	1300	1.37	1.33	0.80	9.00
12/20/2016 11:50	8	11.04	101.5	23.2	6.78	1120	1.18	1.44	0.67	10.40
1/24/2017 11:24	4.2	11.88	208.3	10.3	7.1	90	2.3	0.96	0.00	8.40
2/21/2017 11:28	8.1	10.75	68.2	29.9	6.76	866	0.78	1.35	0.73	20.30
3/21/2017 11:50	9.5	11.3	127.2	11.8	7.04	921	0.97	0.99	0.30	5.00
4/18/2017 12:40	13.9	11.65	74.9	14.8	7.2	866	0.15	1.81	0.49	8.00
5/16/2017 13:00	12.7	10.24	83.1	11.5	7.71	1553	0.15	1.7	0.58	5.00
6/20/2017 13:45	20.1	2.66	279.6	5.34	7.22	68	0.08	1.9	0.00	5.8
Median	12.40	10.75	101.50	11.80	7.10	866	0.97	1.39		8.0

Note: Data in red exceed applicable water quality criteria (see Table 4). Single sample criterion (406 organisms/100 mL) used for E. Coli.

Table 7.
Monthly Instream Data - Mill Creek (RY 2016/17)

Site Name: MIC1		Site Description: Front St.							
Collection Date/Time	Temp (°C)	DO (mg/L)	Sp Cond (µS/cm)	Turb (NTU)	pH (S.U.)	E-Coli (#/ 100 mL)	NO ₃ -NO ₂ (mg/L)	BOD (mg/L)	Rainfall previous 24 hrs
7/26/2016 9:15	20.2	8.84	63.7	4.06	7.57	131	0.26	0.84	0.00
8/16/2016 9:40	18.9	8.99	53.7	2.91	7.54	122	0.11	0.78	0.00
9/13/2016 8:50	14.5	9.85	56.3	3.52	7.59	276	0.08	0.82	0.00
10/18/2016 9:10	12.2	10.06	106.4	42.4	7.19	1986	4.12	1.83	0.95
11/15/2016 8:50	12.9	10.13	108.6	36.7	6.99	1553	2.39	2.06	0.80
12/20/2016 8:30	7	11.99	46.7	56.6	7.52	517	2.28	2.08	0.67
1/24/2017 8:55	5.3	12.54	90	7.9	7.04	50	2.75	1.14	0.00
2/21/2017 8:53	8.2	11.33	58	33.3	6.83	261	1.9	1.25	0.73
3/21/2017 9:05	9.1	11.06	85.2	10.4	7.28	161	2.08	1.56	0.30
4/18/2017 9:20	11.1	10.55	89.7	51.1	7.43	>2420	1.34	2.98	0.49
5/16/2017 9:15	12.3	10.4	76.6	8.17	7.13	613	1.13	1.54	0.58
6/20/2017 9:00	19.9	8.83	63.2	4.74	7.67	140	0.49	1.09	0.00
Median	12.25	10.27	70.15	9.29	7.36	261	1.62	1.40	

Site Name: MIC10		Site Description: Turner Rd							
Collection Date/Time	Temp (°C)	DO (mg/L)	Sp Cond (µS/cm)	Turb (NTU)	pH (S.U.)	E-Coli (#/ 100 mL)	NO ₃ -NO ₂ (mg/L)	BOD (mg/L)	Rainfall previous 24 hrs
7/26/2016 14:00	21.6	9.73	56	4.31	7.88	33	0.23	0.84	0.00
8/16/2016 12:45	18.7	10.14	49.5	3.96	7.89	88	0.1	0.88	0.00
9/13/2016 11:15	13.7	10.44	52.9	4.03	7.73	> 2420	0.15	1.05	0.00
10/18/2016 11:25	12	8.93	112.9	24.2	6.75	365	4.49	1.42	0.95
11/15/2016 12:35	12.6	9.22	105	25.9	6.98	866	2.86	1.49	0.80
12/20/2016 11:25	7.2	10.97	84.2	62.5	6.84	1300	2.22	1.75	0.67
1/24/2017 11:01	4.9	12.3	84.6	7.18	7.18	22	2.96	1.1	0.00
2/21/2017 11:10	7.9	10.73	70	43.8	6.77	326	1.67	1.37	0.73
3/21/2017 11:30	8.9	10.47	84	13.5	7	105	2.03	1.41	0.30
4/18/2017 11:50	11.1	10.34	85	28.6	7.08	816	1.44	1.96	0.49
5/16/2017 12:24	11.9	10.55	79.2	22.3	7.2	866	1.13	1.98	0.58
6/20/2017 13:20	19.7	9.71	55.9	6	7.61	43	0.4	1.02	0.00
Median	11.95	10.39	81.60	17.90	7.13	326	1.56	1.39	

Note: Data in red exceed applicable water quality criteria (see Table 4). Single sample criterion (406 organisms/100 mL) used for E. Coli.

Table 7.
Monthly Instream Data - Mill Race (RY 2016/17)

Site Name:		MRA1							
Site Description:		High St.							
Collection Date/Time	Temp (°C)	DO (mg/L)	Sp Cond (µS/cm)	Turb (NTU)	pH (S.U.)	E-Coli (#/ 100 mL)	NO ₃ -NO ₂ (mg/L)	BOD (mg/L)	Rainfall previous 24 hrs
7/26/2016 9:55	20.4	8.94	56.7	3.26	7.64	488	0.22	0.89	0.00
8/16/2016 9:40	19	9.2	49.5	4.35	7.5	1046	0.09	0.73	0.00
9/13/2016 10:30	14.5	8.63	58	2.51	7.37	228	0.12	1.61	0.00
10/18/2016 9:50	11.8	9.54	99.1	17	7.18	291	3.46	1.5	0.95
11/15/2016 9:35	12.6	9.97	110.7	23.3	7.49	866	2.34	1.5	0.80
12/20/2016 9:20	6.5	12.1	96	44.8	7.43	488	2.32	2.07	0.67
1/24/2017 9:38	4.3	12.63	91.2	10.7	7.46	27	2.99	1.29	0.00
2/21/2017 9:50	8.1	10.68	66.8	19	7.32	179	1.03	1.35	0.73
3/21/2017 10:30	8.7	9.82	79.8	8.23	7.44	145	1.84	1.08	0.30
4/18/2017 9:55	11.6	10.9	88.6	47.8	7.47	> 2420	1.32	2.95	0.49
5/16/2017 10:00	12.5	10.76	70.8	4.55	7.54	435	1.02	1.37	0.58
6/20/2017 10:15	20.1	8.95	59.2	3.92	7.55	579	0.45	1.04	0.00
Median	12.15	9.90	75.30	9.47	7.47	435	1.18	1.36	

Site Name:		MRA10							
Site Description:		19th St.							
Collection Date/Time	Temp (°C)	DO (mg/L)	Sp Cond (µS/cm)	Turb (NTU)	pH (S.U.)	E-Coli (#/ 100 mL)	NO ₃ -NO ₂ (mg/L)	BOD (mg/L)	Rainfall previous 24 hrs
7/26/2016 9:15	20.3	7.95	57	3.21	7.34	145	0.22	0.74	0.00
8/16/2016 9:05	18.7	8.51	49.4	3.02	7.42	194	0.08	0.65	0.00
9/13/2016 9:37	14.3	9.29	53.3	4.08	7.5	387	0.1	0.88	0.00
10/18/2016 9:15	12.1	9.54	108.4	31.9	7.15	1733	4.24	1.6	0.95
11/15/2016 9:00	12.8	9.7	106.7	35.8	7.27	1733	2.43	1.68	0.80
12/20/2016 8:50	6.7	11.65	90.1	61.5	7.42	816	2.22	2.05	0.67
1/24/2017 9:05	5.1	12.45	87.6	7.38	7.33	22	2.96	1.16	0.00
2/21/2017 9:05	8.1	10.94	73.7	28.3	7.34	261	1.78	1.19	0.73
3/21/2017 9:10	9	10.67	85.3	9.79	7.38	82	2.17	1.34	0.30
4/18/2017 9:30	11.3	10.45	88.5	46.9	7.41	>2420	1.35	2.63	0.49
5/16/2017 9:30	12.1	10.44	75.3	7.18	7.35	238	1.12	1.33	0.58
6/20/2017 9:10	19.7	8.49	59.9	4.96	7.49	140	0.43	0.88	0.00
Median	12.10	10.07	80.30	8.59	7.37	238	1.57	1.26	

Note: Data in red exceed applicable water quality criteria (see Table 4). Single sample criterion (406 organisms/100 mL) used for E. Coli.

Table 7.
Monthly Instream Data - Pringle Creek (RY 2016/17)

Site Name: PR1 Site Description: Waterfront Park									
Collection Date/Time	Temp (°C)	DO (mg/L)	Sp Cond (µS/cm)	Turb (NTU)	pH (S.U.)	E-Coli (#/ 100 mL)	NO ₃ -NO ₂ (mg/L)	BOD (mg/L)	Rainfall previous 24 hrs
7/26/2016 9:35	20.4	8.89	59	3.7	7.62	120	0.21	0.9	0.00
8/16/2016 9:25	18.6	9.08	52	3.21	7.45	186	0.11	0.84	0.00
9/13/2016 10:00	14	10.09	54.6	3.8	7.6	411	0.12	0.95	0.00
10/18/2016 9:30	12.3	9.75	104.8	32.2	7.11	1733	4.01	1.65	0.95
11/15/2016 9:15	13	9.8	102.4	38	7.31	1733	2.31	1.73	0.80
12/20/2016 9:05	6.9	11.64	87.7	60.6	7.38	770	1.96	2.26	0.67
1/24/2017 9:17	5.2	12.58	88.3	8.13	7.33	26	2.78	1.16	0.00
2/21/2017 9:30	8.2	11.26	70.3	34	7.36	291	1.64	1.41	0.73
3/21/2017 10:05	9.1	11.03	83.1	10.4	7.41	105	2.04	1.26	0.30
4/18/2017 9:45	11.1	10.51	84.7	38	7.43	1553	1.29	2.51	0.49
5/16/2017 9:50	12.1	10.38	64.5	13.9	7.47	>2420	0.86	2.13	0.58
6/20/2017 10:00	19.7	9.02	52.7	4.98	7.54	222	0.44	1.03	0.00
Median	12.20	10.24	76.70	12.15	7.42	291	1.47	1.34	

Site Name: PR1 Site Description: Waterfront Park							
Collection Date/Time	Total Copper (mg/L)	Dissolved Copper (mg/L)	Total Lead (mg/L)	Dissolved Lead (mg/L)	Total Zinc (mg/L)	Dissolved Zinc (mg/L)	Hardness
7/26/2016 9:35	< 0.0025	< 0.0025	< 0.0005	< 0.0005	< 0.0025	< 0.0025	18
8/16/2016 9:25	< 0.0025	< 0.0025	< 0.0005	< 0.0005	< 0.0025	< 0.0025	16
9/13/2016 10:00	< 0.0025	< 0.0025	< 0.0005	< 0.0005	< 0.0025	< 0.0025	19
10/18/2016 9:30	0.0031	< 0.0025	< 0.0005	< 0.0005	0.0088	0.0034	40
11/15/2016 9:15	0.004	< 0.0025	< 0.0005	< 0.0005	0.0086	< 0.0025	39
12/20/2016 9:05	0.0035	< 0.0025	0.0008	< 0.0005	0.0125	< 0.0025	33
1/24/2017 9:17	< 0.0025	< 0.0025	< 0.0005	< 0.0005	0.0048	0.0028	31
2/21/2017 9:30	0.0025	< 0.0025	0.0007	< 0.0005	0.0102	0.0091	27
3/21/2017 10:05	0.004	0.0026	< 0.0005	< 0.0005	0.0046	< 0.0025	35
4/18/2017 9:45	0.0027	< 0.0025	< 0.0005	< 0.0005	0.0071	< 0.0025	35
5/16/2017 9:50	0.0036	< 0.0025	0.0008	< 0.0005	0.0188	0.0081	27
6/20/2017 10:00	< 0.0025	< 0.0025	< 0.0005	< 0.0005	< 0.0025	< 0.0025	22
Median	NA	NA	NA	NA	NA	NA	29

Note: Data in red exceed applicable water quality criteria (see Table 4). Single sample criterion (406 organisms/100 mL) used for E. Coli.

NA= Medians not calculated for copper and lead due to the large number of censored values.

Table 7.
Monthly Instream Data - Pringle Creek (RY 2016/17)

Site Name:		PRI5							
Site Description:		Bush Park							
Collection Date/Time	Temp (°C)	DO (mg/L)	Sp Cond (µS/cm)	Turb (NTU)	pH (S.U.)	E-Coli (#/ 100 mL)	NO ₃ -NO ₂ (mg/L)	BOD (mg/L)	Rainfall previous 24 hrs
7/26/2016 10:40	20.5	8.52	89.6	4.96	7.64	260	0.18	1.15	0.00
8/16/2016 10:20	20.7	8.32	88.4	4.36	7.59	308	0.18	1.02	0.00
9/13/2016 12:15	17.5	9.14	84.7	2.48	7.67	178	0.19	1.47	0.00
10/18/2016 10:30	13.4	9.07	80	18.5	7.07	397	1.6	1.25	0.95
11/15/2016 10:10	13.4	9.43	74.9	17.5	7.4	479	0.97	1.41	0.80
12/20/2016 9:45	7.6	11.28	81.5	19.5	7.41	214	1.12	1.43	0.67
1/24/2017 10:12	6.5	12.05	89.6	8.64	7.39	10	1.82	1.12	0.00
2/21/2017 10:30	8.6	11.02	58.7	25.1	7.17	142	1.02	1.11	0.73
3/21/2017 11:05	9.6	10.83	82.1	9.77	7.31	116	1.17	3.94	0.30
4/18/2017 10:40	11.8	10.88	71.9	10	7.5	138	0.69	1.49	0.49
5/16/2017 10:45	12.2	10.29	51.2	39.5	7.24	961	0.47	2.19	0.58
6/20/2017 10:52	20.4	8.72	85.6	5.05	7.51	161	0.56	1.13	0.00
Median	12.80	9.86	81.80	9.89	7.41	196	0.83	1.33	

Site Name:		PRI5					
Site Description:		Bush Park					
Collection Date/Time	Total Copper (mg/L)	Dissolved Copper (mg/L)	Total Lead (mg/L)	Dissolved Lead (mg/L)	Total Zinc (mg/L)	Dissolved Zinc (mg/L)	Hardness
7/26/2016 10:40	< 0.0025	< 0.0025	< 0.0005	< 0.0005	0.0028	< 0.0025	34
8/16/2016 10:20	< 0.0025	< 0.0025	< 0.0005	< 0.0005	0.0032	< 0.0025	32
9/13/2016 12:15	< 0.0025	< 0.0025	< 0.0005	< 0.0005	< 0.0025	< 0.0025	30
10/18/2016 10:30	< 0.0025	< 0.0025	< 0.0005	< 0.0005	0.0148	0.0074	30
11/15/2016 10:10	< 0.0025	< 0.0025	< 0.0005	< 0.0005	0.013	0.0054	32
12/20/2016 9:45	< 0.0025	< 0.0025	0.0005	< 0.0005	0.0162	0.0065	26
1/24/2017 10:12	< 0.0025	< 0.0025	< 0.0005	< 0.0005	0.0121	0.0085	32
2/21/2017 10:30	< 0.0025	< 0.0025	0.0011	< 0.0005	0.0193	0.0091	22
3/21/2017 11:05	0.0025	< 0.0025	< 0.0005	< 0.0005	0.016	0.0122	27
4/18/2017 10:40	< 0.0025	< 0.0025	< 0.0005	< 0.0005	0.0119	0.0065	28
5/16/2017 10:45	0.0046	< 0.0025	0.0018	< 0.0005	0.0387	0.013	21
6/20/2017 10:52	< 0.0025	< 0.0025	< 0.0005	< 0.0005	0.0049	0.0025	28
Median	NA	NA	NA	NA	0.0130	0.0074	29.00

Note: Data in red exceed applicable water quality criteria (see Table 4). Single sample criterion (406 organisms/100 mL) used for E. Coli.

NA= Medians not calculated for copper and lead due to the large number of censored values.

Table 7.
Monthly Instream Data - Shelton Ditch (RY 2016/17)

Site Name: SHE1		Site Description: Church St.							
Collection Date/Time	Temp (°C)	DO (mg/L)	Sp Cond (µS/cm)	Turb (NTU)	pH (S.U.)	E-Coli (#/ 100 mL)	NO ₃ -NO ₂ (mg/L)	BOD (mg/L)	Rainfall previous 24 hrs
7/26/2016 10:15	20.2	9	57.2	3.39	7.69	46	0.22	0.82	0.00
8/16/2016 9:55	18.5	9.2	49.8	2.98	7.53	55	0.1	0.78	0.00
9/13/2016 11:00	14	10.21	52.8	3.78	7.61	345	0.11	0.91	0.00
10/18/2016 10:00	12.1	9.84	99	33.3	7	1414	4.34	1.57	0.95
11/15/2016 9:45	12.9	10.07	108.3	35.5	7.49	1733	2.52	1.74	0.80
12/20/2016 9:25	6.9	11.78	88	71.3	7.45	980	2.19	2.14	0.67
1/24/2017 9:45	5.1	12.76	86.7	7.57	7.44	22	2.87	1.14	0.00
2/21/2017 10:00	8.4	11.22	65.9	44.4	7.29	345	1.81	1.34	0.73
3/21/2017 10:45	9	11.04	84.6	11.3	7.35	120	2.07	1.34	0.30
4/18/2017 10:07	11	10.5	86.5	40.3	7.44	1986	1.36	2.59	0.49
5/16/2017 10:10	12.2	10.71	71.1	8.78	7.52	>2420	1.04	1.63	0.58
6/20/2017 10:25	19.4	9.07	59.7	4.77	7.53	91	0.45	0.88	0.00
Median	12.15	10.36	77.85	10.04	7.47	345	1.59	1.34	

Site Name: SHE10		Site Description: Airport Road							
Collection Date/Time	Temp (°C)	DO (mg/L)	Sp Cond (µS/cm)	Turb (NTU)	pH (S.U.)	E-Coli (#/ 100 mL)	NO ₃ -NO ₂ (mg/L)	BOD (mg/L)	Rainfall previous 24 hrs
7/26/2016 9:05	20.2	8.97	56.5	3.61	7.5	56	0.23	1.03	0.00
8/16/2016 8:50	18.2	9.25	49.1	3.07	7.67	82	0.09	0.82	0.00
9/13/2016 9:00	13.6	10.26	52.4	3.94	7.54	517	0.11	1.2	0.00
10/18/2016 9:00	12	9.79	109.7	35.3	7.22	2420	4.24	1.71	0.95
11/15/2016 8:42	12.9	9.97	105.8	35.3	7.09	1986	2.54	1.64	0.80
12/20/2016 8:40	6.8	11.75	87.3	67.9	7.53	1120	2.18	1.99	0.67
1/24/2017 8:42	5	12.66	86.1	7.64	7.24	25	2.9	1.02	0.00
2/21/2017 8:50	8.1	11.26	74.3	36.4	7.23	345	1.85	1.41	0.73
3/21/2017 8:50	9	11.06	84.2	13.8	7.43	84	2.12	1.44	0.30
4/18/2017 9:07	10.8	10.54	86.2	42.7	7.4	2420	1.38	2.33	0.49
5/16/2017 9:20	11.9	10.63	75.1	7.98	7.3	238	1.14	1.3	0.58
6/20/2017 8:55	19.1	9.16	59.2	5.19	7.55	78	0.46	0.81	0.00
Median	11.95	10.40	79.65	10.89	7.42	291.5	1.62	1.36	

Note: Data in red exceed applicable water quality criteria (see Table 4). Single sample criterion (406 organisms/100 mL) used for E. Coli.

Table 7.
Monthly Instream Data - Willamette River (RY 2016/17)

Site Name:		WR1							
Site Description:		Sunset Park (Keizer)							
Collection Date/Time	Temp (°C)	DO (mg/L)	Sp Cond (µS/cm)	Turb (NTU)	pH (S.U.)	E-Coli (#/ 100 mL)	NO ₃ -NO ₂ (mg/L)	BOD (mg/L)	Rainfall previous 24 hrs
7/26/2016 15:00	23.8	9.94	74.8	2.14	7.85	4	0.16	0.67	0.00
8/16/2016 13:35	23	11.19	71.9	1.96	8.78	3	0.11	0.78	0.00
9/13/2016 12:50	17.7	10.05	71.1	2.24	7.78	16	0.11	0.85	0.00
10/18/2016 13:10	11.9	9.98	11.8	26.2	7.22	525	1.29	1.18	0.95
11/15/2016 14:00	12.4	10.02	77.9	14.6	7.37	345	0.78	1.08	0.80
12/20/2016 13:30	6	12	66.1	23.3	7.3	285	0.68	1.43	0.67
1/24/2017 13:04	5.9	11.81	72.5	12.2	7.61	16	0.88	0.77	0.00
2/21/2017 12:45	8	11.08	64.4	33.8	7.03	435	0.66	1.83	0.73
3/21/2017 13:20	9.2	11.41	56.2	13.9	7.45	24	0.39	0.88	0.30
4/18/2017 13:30	10.8	11.01	69.2	11.4	7.5	261	0.47	1.16	0.49
5/16/2017 13:45	11.7	11.06	54.2	5.12	7.3	50	0.22	0.8	0.58
6/20/2017 14:50	20.7	10.85	63.5	2.25	8.12	13	0.14	1.01	0.00
Median	11.80	11.04	67.65	11.80	7.48	37	0.43	0.95	

Site Name:		WR1			
Site Description:		Sunset Park (Keizer)			
Alkalinity (mg/L)	Ammonia (mg/L)	TP (mg/L)	TDS (mg/L)	TS (mg/L)	TSS (mg/L)
32	<0.05	0.036	67	72	4.8
31	<0.05	0.035	69	71	2
31	<0.05	0.04	63	67	4.4
22	<0.05	0.127	77	110	33.2
27	<0.05	0.085	78	90	12.4
29	<0.05	0.093	70	89	19.2
28	<0.05	0.057	75	85	10
26	0.076	0.174	64	98	33.6
26	<0.05	0.06	53	70	17
28	<0.05	0.052	55	63	8
25	<0.05	0.027	56	62	5.5
30	<0.05	0.035	50	54	4.2
28	NA	0.0545	65.5	71.5	9

Note: Data in red exceed applicable water quality criteria (see Table 4). Single sample criterion (406 organisms/100 mL) used for E. Coli.

Table 7.
Monthly Instream Data - Willamette River (RY 2016/17)

Site Name: WR5									
Site Description: Union Street Railroad Bridge									
Collection Date/Time	Temp (°C)	DO (mg/L)	Sp Cond (µS/cm)	Turb (NTU)	pH (S.U.)	E-Coli (#/ 100 mL)	NO ₃ -NO ₂ (mg/L)	BOD (mg/L)	Rainfall previous 24 hrs
7/26/2016 9:45	21	8.35	73.7	2.32	7.51	11	0.16	0.75	0.00
8/16/2016 9:55	21.3	8.52	71.8	2.52	7.66	11	0.12	0.71	0.00
9/13/2016 9:05	16.5	9.27	71	4.02	7.81	22	0.12	0.74	0.00
10/18/2016 9:30	11.8	10.15	13.3	26.6	7.82	613	1	1.11	0.95
11/15/2016 9:15	12.2	10.22	77.4	12	6.98	187	0.57	0.86	0.80
12/20/2016 9:00	5.9	12.2	64.5	17.7	7.5	154	0.54	1.03	0.67
1/24/2017 9:15	5.2	12.05	72.6	12.5	7.28	12	0.82	0.97	0.00
2/21/2017 9:25	7.9	11.33	63.4	36.7	7.19	261	0.54	1.24	0.73
3/21/2017 9:30	8	11.39	53.1	10.8	7.55	24	0.35	0.82	0.30
4/18/2017 10:00	10.4	10.85	66.5	9.82	7.63	172	0.43	1.1	0.49
5/16/2017 9:35	11.6	11	52.9	5.27	7.39	64	0.16	0.87	0.58
6/20/2017 9:30	18.9	9.42	60.3	3.22	7.44	7	0.12	0.93	0.00
Median	11.70	10.54	65.50	10.31	7.51	44	0.39	0.90	

Site Name: WR5					
Site Description: Union Street Railroad Bridge					
Alkalinity (mg/L)	Ammonia (mg/L)	TP (mg/L)	TDS (mg/L)	TS (mg/L)	TSS (mg/L)
33	<0.05	0.04	65	70	4.8
32	<0.05	0.037	68	72	3.6
30	<0.05	0.043	66	70	4.4
22	<0.05	0.112	80	110	30.4
27	<0.05	0.067	71	81	10
29	<0.05	0.077	67	84	16.8
28	<0.05	0.053	65	77	12.4
26	0.052	0.1	69	95	26.4
27	<0.05	0.057	59	71	11.7
28	<0.05	0.047	50	57	6.8
24	0.084	0.028	54	60	5.8
29	<0.05	0.029	52	56	4
28	NA	0.05	65.5	71.5	8.4

Note: Data in red exceed applicable water quality criteria (see Table 4). Single sample criterion (406 organisms/100 mL) used for E. Coli.

Table 7.
Monthly Instream Data - Willamette River (RY 2016/17)

Site Name: WR10 Site Description: Halls Ferry Road (Independence)									
Collection Date/Time	Temp (°C)	DO (mg/L)	Sp Cond (µS/cm)	Turb (NTU)	pH (S.U.)	E-Coli (#/ 100 mL)	NO ₃ -NO ₂ (mg/L)	BOD (mg/L)	Rainfall previous 24 hrs
7/26/2016 12:55	22.3	8.87	72.3	3.03	7.62	3	0.16	0.76	0.00
8/16/2016 12:30	22	9.37	72.9	1.69	7.74	5	0.16	0.71	0.00
9/13/2016 14:30	18.2	9.86	71.1	2.53	7.86	5	0.12	0.85	0.00
10/18/2016 12:45	11.7	10.06	57	31.3	7.3	548	0.69	1.19	0.95
11/15/2016 12:40	12.2	10.06	70.9	14.3	7.5	248	0.47	0.88	0.80
12/20/2016 12:00	5.9	11.94	63	19	7.44	308	0.52	1.05	0.67
1/24/2017 11:47	5.8	11.96	70.5	13.1	7.33	16	0.7	0.83	0.00
2/21/2017 12:30	7.9	11.17	61.2	32.9	7.31	365	0.51	1.1	0.73
3/21/2017 12:45	8.1	11.39	61.2	11.6	7.25	18	0.5	0.9	0.30
4/18/2017 12:55	10.4	10.85	68.2	9.62	7.4	248	0.43	1.34	0.49
5/16/2017 12:30	11.6	10.93	52	5.09	7.33	26	0.14	0.81	0.58
6/20/2017 12:55	18.7	10.2	61	2.59	7.62	5	0.17	0.87	0.00
Median	11.65	10.53	65.60	10.61	7.42	22	0.45	0.88	

Site Name: WR10 Site Description: Halls Ferry Road (Independence)					
Alkalinity (mg/L)	Ammonia (mg/L)	TP (mg/L)	TDS (mg/L)	TS (mg/L)	TSS (mg/L)
32	< 0.05	0.04	72	77	4.8
31	< 0.05	0.032	65	68	2.8
31	< 0.05	0.035	66	70	3.6
21	< 0.05	0.11	74	113	39.2
28	< 0.05	0.067	71	84	13.2
28	< 0.05	0.072	69	83	14.4
27	< 0.05	0.056	56	67	10.8
27	0.056	0.114	66	95	29.2
29	< 0.05	0.057	56	68	12.3
28	0.06	0.059	52	59	7.4
25	< 0.05	0.029	58	64	6.4
27	< 0.05	0.029	54	59	4.6
28	NA	0.0565	65.5	69	9.1

Note: Data in red exceed applicable water quality criteria (see Table 4). Single sample criterion (406 organisms/100 mL) used for E. Coli.

Table 8.
Monthly Instream Data - Duplicates (RY 2016/17)

Site ID	Collection Date/Time	Temp (C)	DO (mg/L)	Sp Cond (µS/cm)	Turb (NTUs)	pH (S.U.)	E-Coli (#/ 100 mL)	NO ₃ -NO ₂ (mg/L)	BOD (mg/L)	TSS	Total Copper (mg/L)	Dissolved Copper (mg/L)	Total Lead (mg/L)	Dissolved Lead (mg/L)	Total Zinc (mg/L)	Dissolved Zinc (mg/L)	Hardness
PRI1	07/26/2016 09:40	20.4	8.88	58.9	4.57	7.62	125	0.2	0.86		< 0.0025	< 0.0025	< 0.0005	< 0.0005	< 0.0025	< 0.0025	21
MRA1	07/26/2016 10:00	20.4	8.94	56.8	3.41	7.57	548	0.21	0.75								
SHE1	08/16/2016 10:00	18.5	9.2	49.8	5.05	7.51	59	0.11	0.62								
CLA10	08/16/2016 10:25	17	8.75	73.4	2.48	7.07	>2420	1.44	0.72		< 0.0025	< 0.0025	< 0.0005	< 0.0005	0.0055	0.0046	19
CRO1	08/16/2016 10:53	18.7	3.72	106.9	5.79	6.73	105	0.24	0.78								
CLA1	09/13/2016 11:45	15.1	9.44	97.3	52.8	7.52	317	0.73	0.52		0.0027	< 0.0025	0.0007	< 0.0005	0.0109	0.0031	32
PRI5	09/13/2016 12:19	17.16	9.14	84.7	2.57	7.68	162	0.25	1.17		< 0.0025	< 0.0025	< 0.0005	< 0.0005	< 0.0025	< 0.0025	29
CRO10	09/13/2016 10:15	12.5	8.75	73.1	11.5	7.08	179	0.29	0.81								
GLE1	10/18/2016 11:00	13.1	9.83	89.2	17.4	7.09	517	2.01	0.64								
BAT12	10/18/2016 10:40	12.3	9.47	49.7	14	6.55	308	2.1	0.77								
BAT1	10/18/2016 11:00	13.2	9.01	55.9	29.2	6.43	488	2.2	0.8								
MIC10	11/15/2016 12:40	12.6	9.22	104.9	25.9	7	659	2.83	1.49								
GIB1	11/15/2016 11:00	12.5	9.86	83.4	27.8	7.38	1203	1.51	1.07								
GIB15	11/15/2016 11:25	12.4	9.63	87.1	24.5	7.17	866	1.63	1.2								
GLE10	12/20/2016 11:15	8.3	11.49	56.7	17.5	7.42	21	2.07	0.71								
LPW1	12/20/2016 12:00	8.1	11.21	104.5	22.9	6.8	1120	1.19	1.75	12.4							
CGT5	12/20/2016 12:40	8.3	10.88	105.6	26.2	6.89	687	1	1.32								
SHE10	01/24/2017 08:42	5	12.66	86.1	7.64	7.24	21	2.96	1.16								
CGT1	01/24/2017 12:38	6.3	10.55	212.6	11.9	7.27	73	1.31	1.09								
MIC1	02/21/2017 08:53	8.2	11.33	58	33.3	6.83	261	1.87	1.5								
MRA10	02/21/2017 09:07	8.1	10.93	73.7	27.9	7.31	276	1.79	1.05								
PRI1	03/21/2017 10:10	9.1	11.03	83.1	11.3	7.37	99	1.94	1.45		0.0042	0.0025	< 0.0005	< 0.0005	0.0054	< 0.0025	34
MRA1	03/21/2017 10:35	8.7	9.8	79.6	8.22	7.36	133	1.72	1.03								
CLA10	04/18/2017 10:18	11.3	10.13	71.7	3.66	6.8	126	2.1	0.59		< 0.0025	< 0.0025	< 0.0005	< 0.0005	0.0101	0.0098	22
CRO1	04/18/2017 10:40	10.5	11.06	60.2	10.5	7	75	0.89	0.67								
SHE1	04/18/2017 10:12	11	10.49	86.5	32.3	7.41	1986	1.36	2.56								
CLA1	05/16/2017 10:30	12	10.47	23.6	75.6	7.6	> 2420	0.22	4.22		0.0127	0.0028	0.0079	< 0.0005	0.0897	0.0261	12
PRI5	05/16/2017 10:50	12.2	10.28	51.7	28.9	7.25	1120	0.48	2.2		0.0043	< 0.0025	0.0016	< 0.0005	< 0.0025	< 0.0025	21
CRO10	05/16/2017 10:53	10.6	10.33	47.4	8.48	7.05	110	0.8	0.67								
GLE1	06/20/2017 11:52	17.5	8.99	103.1	5.43	7.46	185	0.89	0.66								
BAT12	06/20/2017 11:05	17.4	9.13	43.3	5.87	7.05	80	0.4	0.65								
BAT1	06/20/2017 11:45	17.1	8.58	49.1	6.98	6.79	921	0.62	0.73								

Note: Duplicate field measurements and duplicate grab samples are taken at a minimum of 10 percent of the sites each month. These sites are selected prior to sampling.

Table 8.
Monthly Instream Data - Willamette River Duplicates (RY 2016/17)

Site ID	Collection Date/Time	Temp (C)	DO (mg/L)	Sp Cond (μS/cm)	Turb (NTUs)	pH (S.U.)	E-Coli (#/ 100 mL)	NO ₃ -NO ₂ (mg/L)	BOD (mg/L)	Alkalinity (mg/L)	Ammonia (mg/L)	TP (mg/L)	TDS (mg/L)	TS (mg/L)	TSS (mg/L)
WR5	07/26/2016 09:56	21.4	8.42	72.8	2.38	7.51	8	0.16	0.64	33	< 0.05	0.044	61	66	5.2
WR10	01/24/2017 11:51	5.8	11.95	70.3	13.2	7.28	16	0.72	1.08	27	< 0.050	0.05	61	72	10.8
WR1	02/21/2017 12:45	8	11.08	64.4	33.8	7.03	435	0.66	1.87	27	0.076	0.102	69	101	32.4
WR5	03/21/2017 09:35	8	11.44	53.2	10.9	7.5	15	0.34	0.96	27	< 0.05	0.057	57	68	11

Note: Duplicate field measurements and duplicate grab samples are taken at a minimum of 10 percent of the sites each month. These sites are selected prior to sampling.

Table 9.
Continuous Instream Grade A and Grade B Data Qualifications

Grade Values	Temperature (°C)	pH	Specific Conductivity (µS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)
A	$\pm < 0.5$	$\pm \leq 0.30$	$\leq 10\%$	$\pm \leq 3$ or 5% (whichever is greater)	$\pm \leq 0.3$
B	± 0.51 to 2.00	$\pm > 0.3$ to 0.50	$> 10\%$ to $\leq 15\%$	$\pm \leq 5$ or 30% (whichever is greater)	$\pm > 0.3$ to $\pm \leq 1.0$

Note: As stated in the "Continuous Water Quality Monitoring Program Quality Assurance Project Plan", data grades are a result of the absolute difference (value or percent) of station instrument reading and audit instrument reading at the time of site audit.

Table 10.
Monthly Median Values for Continuous Instream Data (RY 2016/17)

Monthly Medians for Turbidity at Continuous Instream Sites												
	Jul 2016	Aug 2016	Sep 2016	Oct 2016	Nov 2016	Dec 2016	Jan 2017	Feb 2017	Mar 2017	Apr 2017	May 2017	Jun 2017
Station Name	Turbidity (NTU)	Turbidity (NTU)	Turbidity (NTU)	Turbidity (NTU)	Turbidity (NTU)	Turbidity (NTU)	Turbidity (NTU)	Turbidity (NTU)	Turbidity (NTU)	Turbidity (NTU)	Turbidity (NTU)	Turbidity (NTU)
BAT3	13.84	14.71	23.12	15.70	9.52	8.49	9.00	17.91	9.52	7.87	6.60	7.33
BAT12	3.72	0.47	0.50	5.02	5.26	4.56	2.84	10.37	4.58	3.55	3.72	4.51
CLK1	2.70	2.20	2.10	2.09	3.25	3.75	5.10	7.95	7.10	4.60	2.43	2.50
CLK12	2.41	2.17	2.60	3.10	2.40	2.45	2.90	4.40	2.55	1.50	1.00	1.30
GLE3	4.30	5.10	4.75	10.26	6.30	7.25	8.00	19.02	12.10	8.75	6.00	6.10
GLE12	7.00	5.90	4.31	6.65	11.30	11.05	9.05	18.40	10.60	9.20	7.90	7.30
MIC3	2.99	2.31	2.93	7.33	7.54	6.46	5.99	14.65	11.46	6.56	4.32	3.97
MIC12	4.61	3.30	3.66	9.30	6.85	6.30	6.09	18.67	12.93	7.12	5.26	5.52
PRI3	2.52	3.09	2.45	11.12	7.55	7.79	6.64	9.73	8.03	5.94	3.09	3.16
PRI12	3.44	3.36	4.30	10.61	5.79	5.18	6.21	11.07	8.10	5.60	4.66	4.85

Monthly Medians for Specific Conductivity at Continuous Instream Sites												
	Jul 2016	Aug 2016	Sep 2016	Oct 2016	Nov 2016	Dec 2016	Jan 2017	Feb 2017	Mar 2017	Apr 2017	May 2017	Jun 2017
Station Name	Specific Conductivity (µS/cm)	Specific Conductivity (µS/cm)	Specific Conductivity (µS/cm)	Specific Conductivity (µS/cm)	Specific Conductivity (µS/cm)	Specific Conductivity (µS/cm)	Specific Conductivity (µS/cm)	Specific Conductivity (µS/cm)	Specific Conductivity (µS/cm)	Specific Conductivity (µS/cm)	Specific Conductivity (µS/cm)	Specific Conductivity (µS/cm)
BAT3	58.04	62.64	61.21	54.47	49.29	45.60	47.39	50.24	44.31	44.43	47.34	52.39
BAT12	54.62	60.86	62.86	55.08	47.35	44.73	43.68	42.42	41.61	41.95	44.03	46.44
CLK1	97.00	97.00	108.37	107.38	105.80	104.00	102.00	94.00	82.00	66.50	84.50	91.00
CLK12	72.00	73.00	75.00	80.50	77.50	80.50	77.00	74.00	75.00	75.00	75.00	74.00
GLE3	118.50	123.00	120.00	92.00	89.58	91.00	86.00	78.00	82.00	88.00	93.50	107.00
GLE12	81.00	112.16	103.02	87.50	65.00	62.00	58.11	54.97	57.00	57.00	61.00	68.00
MIC3	58.40	54.03	54.94	105.68	101.59	92.88	88.00	79.55	78.86	83.83	77.36	64.54
MIC12	57.78	55.42	53.40	107.73	96.28	91.39	85.15	75.41	79.62	83.23	73.46	59.07
PRI3	98.52	97.69	98.36	91.26	98.37	100.96	98.09	89.59	89.42	88.80	98.54	101.70
PRI12	61.63	60.33	61.42	93.48	95.36	90.29	87.12	79.50	79.11	82.02	88.13	NA

Presented median values consist of A and B grade data only.

NA = 60% of the continuous record for a given month is not represented by A and B grade data.

Table 10.
Monthly Median Values for Continuous Instream Data (RY 2016/17)

Monthly Medians for Temperature at Continuous Instream Sites												
	Jul 2016	Aug 2016	Sep 2016	Oct 2016	Nov 2016	Dec 2016	Jan 2017	Feb 2017	Mar 2017	Apr 2017	May 2017	Jun 2017
Station Name	Temperature (°C)	Temperature (°C)	Temperature (°C)	Temperature (°C)	Temperature (°C)	Temperature (°C)	Temperature (°C)	Temperature (°C)	Temperature (°C)	Temperature (°C)	Temperature (°C)	Temperature (°C)
BAT3	17.65	18.93	15.59	13.27	11.86	8.20	6.67	7.66	9.27	10.21	13.30	15.64
BAT12	16.71	17.43	13.94	11.86	11.04	7.49	5.96	6.91	8.44	9.32	12.68	15.26
CLK1	17.40	18.46	16.33	14.64	13.31	9.48	8.09	9.22	10.28	11.08	13.33	15.38
CLK12	15.90	16.85	15.87	14.92	13.87	11.53	9.88	10.08	10.53	10.99	12.29	13.91
GLE3	17.14	18.22	15.45	13.85	12.25	8.18	6.74	7.95	9.78	10.84	13.89	15.75
GLE12	15.54	16.19	14.49	12.53	11.38	7.47	6.01	7.45	8.81	9.36	11.86	13.74
MIC3	20.74	20.44	15.98	13.43	11.90	6.80	5.25	7.77	10.36	11.32	15.47	17.46
MIC12	20.07	19.04	15.29	13.15	11.57	7.04	5.51	7.53	10.08	11.20	15.11	17.21
PRI3	19.74	20.43	17.61	14.33	12.74	8.20	6.62	8.32	10.30	11.62	15.71	18.24
PRI12	18.59	18.60	15.21	13.51	11.87	7.97	6.25	7.65	9.53	10.32	13.69	16.18

Monthly Medians for pH at Continuous Instream Sites												
	Jul 2016	Aug 2016	Sep 2016	Oct 2016	Nov 2016	Dec 2016	Jan 2017	Feb 2017	Mar 2017	Apr 2017	May 2017	Jun 2017
Station Name	pH (S.U)	pH (S.U)	pH (S.U)	pH (S.U)	pH (S.U)	pH (S.U)	pH (S.U)	pH (S.U)	pH (S.U)	pH (S.U)	pH (S.U)	pH (S.U)
BAT3	6.85	6.82	6.86	6.62	6.59	6.57	6.88	6.73	6.86	6.94	6.47	6.50
BAT12	7.31	7.18	7.26	7.25	6.90	6.93	6.95	6.77	6.86	6.78	7.01	7.27
CLK1	7.37	7.42	7.40	7.13	7.17	7.19	7.17	6.91	6.66	6.49	6.38	6.91
CLK12	6.67	6.74	6.79	6.50	6.56	6.51	6.45	6.24	6.24	6.30	6.49	6.60
GLE3	7.45	7.46	7.40	6.79	6.99	6.90	6.94	6.75	6.83	7.02	7.20	7.35
GLE12	7.05	6.69	6.88	7.06	6.93	7.19	7.24	7.17	7.00	7.08	7.15	7.11
MIC3	7.27	7.16	7.36	7.17	7.27	7.10	7.08	6.91	7.01	7.45	7.49	7.54
MIC12	7.51	7.61	7.68	7.19	7.21	7.30	7.31	7.01	7.21	7.23	7.09	7.19
PRI3	7.43	7.35	7.40	7.34	7.26	7.57	7.47	7.26	7.15	7.32	7.24	7.34
PRI12	7.10	7.09	7.13	6.73	6.87	6.93	7.00	7.02	6.66	6.66	6.68	6.88

Presented median values consist of A and B grade data only.

NA = 60% of the continuous record for a given month is not represented by A and B grade data.

Table 10.
Monthly Median Values for Continuous Instream Data (RY 2016/17)

Monthly Medians for Dissolved Oxygen at Continuous Instream Sites												
	Jul 2016	Aug 2016	Sep 2016	Oct 2016	Nov 2016	Dec 2016	Jan 2017	Feb 2017	Mar 2017	Apr 2017	May 2017	Jun 2017
Station Name	Dissolved Oxygen (mg/L)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (mg/L)
BAT3	7.19	5.56	6.52	8.76	9.55	10.82	11.47	11.11	10.70	10.16	9.39	8.60
BAT12	9.02	7.69	8.45	10.39	10.80	11.84	12.32	12.01	11.63	11.26	10.37	9.69
CLK1	9.05	8.62	9.01	9.90	9.99	11.04	11.50	11.19	10.89	10.34	9.45	9.19
CLK12	8.85	8.74	9.05	9.19	9.41	10.35	10.75	10.76	10.71	10.69	10.34	9.33
GLE3	8.59	8.24	8.65	9.59	10.16	11.44	11.86	11.44	10.97	10.58	9.73	9.12
GLE12	9.06	7.43	8.70	9.83	10.32	11.56	12.05	11.62	11.30	11.08	10.44	9.96
MIC3	8.36	8.48	9.56	10.05	10.42	12.19	12.62	11.73	11.04	10.51	9.50	8.69
MIC12	8.13	8.35	9.32	9.31	9.69	11.30	11.85	11.00	10.32	9.88	8.98	8.53
PRI3	7.76	7.45	7.85	9.06	9.24	11.11	11.62	11.17	10.61	10.14	8.93	8.14
PRI12	7.66	7.66	8.56	8.02	8.37	9.93	10.62	10.22	9.71	9.23	8.56	7.98

Monthly Medians for Stage at Continuous Instream Sites												
	Jul 2016	Aug 2016	Sep 2016	Oct 2016	Nov 2016	Dec 2016	Jan 2017	Feb 2017	Mar 2017	Apr 2017	May 2017	Jun 2017
Station Name	Stage (ft)	Stage (ft)	Stage (ft)	Stage (ft)	Stage (ft)	Stage (ft)	Stage (ft)	Stage (ft)	Stage (ft)	Stage (ft)	Stage (ft)	Stage (ft)
BAT3	4.00	3.93	3.95	5.13	5.27	5.29	5.09	5.96	5.52	4.92	4.55	4.24
BAT12	4.27	4.20	4.20	4.79	4.87	4.94	4.87	5.20	4.99	4.77	4.60	4.41
CLK1	3.96	3.87	3.93	4.40	4.42	4.42	4.37	4.65	4.50	4.35	4.18	3.90
CLK12	3.93	3.91	3.93	4.25	4.26	4.26	4.22	4.45	4.34	4.20	4.08	4.00
GLE3	4.09	4.04	4.08	4.56	4.63	4.70	4.64	5.22	4.87	4.52	4.35	4.22
GLE12	0.71	NA	NA	0.97	1.11	1.17	1.14	1.44	1.25	1.06	0.97	0.87
LPW1	0.00	NA	NA	1.77	1.86	2.01	1.90	2.30	2.30	2.30	2.04	NA
MIC3	5.15	5.27	5.33	6.35	6.36	6.51	6.31	7.24	6.93	6.15	6.24	5.60
MIC12	7.12	7.19	7.22	8.03	8.12	8.17	7.93	8.75	8.52	7.75	7.50	7.37
PRI3	4.25	4.23	4.25	4.70	4.69	4.81	4.70	5.70	5.22	4.71	4.48	4.33
PRI4	7.41	7.37	7.40	8.06	8.05	8.11	8.01	8.54	8.27	7.94	7.63	7.43
PRI12	4.26	4.25	4.21	4.59	4.62	4.70	4.59	5.01	4.81	4.57	4.45	4.37
SHE3	6.28	6.33	6.34	6.83	6.89	6.95	6.80	7.53	7.34	6.68	6.33	6.31

Presented median values consist of A and B grade data only.

NA = 60% of the continuous record for a given month is not represented by A and B grade data.

Table 11.
Instream Storm Monitoring Data (RY 2016/17)

Site Name: CLK1																			
Site Description: Lower Clark Creek just upstream of confluence with Pringle Creek																			
Sample Collection Date/Time	E. Coli	Diss. Oxygen	pH	temp	Sp. Cond, field	Sp. Cond, comp	Cu	Cu diss	Zn	Zn diss	Pb	Pb diss	Hardness	NH3	NO ₃ -NO ₂	Ortho P	TP	BODs	TSS
mm/dd/yyyy HH:MM	MPN/100 mL	mg/L	S.U	°C	µS/cm	µS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
02/15/2017 07:27	135	11.44	7	8.7	54.3														
02/16/2017 10:27						42.7	0.0083	< 0.0025	0.144	0.0803	0.0076	< 0.0005	26	< 0.050	1.06	0.032	0.229	1.9	160

Site Name: PRI3																			
Site Description: Lower Pringle Creek in Pringle Park, just upstream of confluence with Shelton Ditch																			
Sample Collection Date/Time	E. Coli	Diss. Oxygen	pH	temp	Sp. Cond, field	Sp. Cond, comp	Cu	Cu diss	Zn	Zn diss	Pb	Pb diss	Hardness	NH3	NO ₃ -NO ₂	Ortho P	TP	BODs	TSS
mm/dd/yyyy HH:MM	MPN/100 mL	mg/L	S.U	°C	µS/cm	µS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
2/15/2017 8:20	326	11.34	6.83	8.7	69.9														
2/15/2017 8:22 - DUP	517	11.28	6.92	8.6	69.7														
2/16/2017 10:48						51.9	0.0035	< 0.0025	0.0399	0.0169	0.002	< 0.0005	24	< 0.050	1.14	0.018	0.085	1.9	38.6

Site Name: PRI12																			
Site Description: Upper East Fork Pringle Creek																			
Sample Collection Date/Time	E. Coli	Diss. Oxygen	pH	temp	Sp. Cond, field	Sp. Cond, comp	Cu	Cu diss	Zn	Zn diss	Pb	Pb diss	Hardness	NH3	NO ₃ -NO ₂	Ortho P	TP	BODs	TSS
mm/dd/yyyy HH:MM	MPN/100 mL	mg/L	S.U	°C	µS/cm	µS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
2/15/2017 9:15	276	10.46	6.45	8.8	70.4														
2/16/2017 11:20						60.6	< 0.0025	< 0.0025	0.01	0.0048	< 0.0005	< 0.0005	26	< 0.050	2.08	0.02	0.073	0.8	15.8

Data in red exceed applicable water quality criteria (see Table 4).

NA= Median not calculated because ≥ 50% of values were censored values.

Table 12.
Stormwater Monitoring Data (RY 2016/17)

Site Name:		Electric¹																	
Land use Type:		Residential																	
Sample Collection Date/Time	E. Coli	Diss. Oxygen	pH	temp	Sp. Cond, field	Sp. Cond, comp	Cu	Cu diss	Zn	Zn diss	Pb	Pb diss	Hardness	NH3	NO₃-NO₂	Ortho P	TP	BOD5	TSS
mm/dd/yyyy HH:MM	MPN/100 mL	mg/L	S.U	°C	µS/cm	µS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
2/15/2017 7:45	261	11.68	6.86	8.2	37.2														
2/16/2017 10:13						37.2	0.0032	< 0.0025	0.0268	0.019	< 0.0005	< 0.0005	26	< 0.050	2.08	0.02	0.073	0.8	15.8

Site Name:		Hilfiker																	
Land use Type:		Commercial																	
Sample Collection Date/Time	E. Coli	Diss. Oxygen	pH	temp	Sp. Cond, field	Sp. Cond, comp	Cu	Cu diss	Zn	Zn diss	Pb	Pb diss	Hardness	NH3	NO₃-NO₂	Ortho P	TP	BOD5	TSS
mm/dd/yyyy HH:MM	MPN/100 mL	mg/L	S.U	°C	µS/cm	µS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
2/15/2017 8:50	228	10.91	6.85	9	22.1														
2/16/2017 11:35						29.8	0.0059	< 0.0025	0.0469	0.0244	0.003	< 0.0005	16	< 0.050	0.66	< 0.010	0.077	< 2.0	49.2

Site Name:		Salem Industrial																	
Land use Type:		Industrial																	
Sample Collection Date/Time	E. Coli	Diss. Oxygen	pH	temp	Sp. Cond, field	Sp. Cond, comp	Cu	Cu diss	Zn	Zn diss	Pb	Pb diss	Hardness	NH3	NO₃-NO₂	Ortho P	TP	BOD5	TSS
mm/dd/yyyy HH:MM	MPN/100 mL	mg/L	S.U	°C	µS/cm	µS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
2/15/2017 9:40	21	10.76	6.66	7.9	24.1														
2/16/2017 12:31						22	0.0055	0.0026	0.154	0.124	0.0008	< 0.0005	11	< 0.050	0.1	0.033	0.125	2.3	20.5

¹Due to the velocity and lift of water coming through the pipe at this site, the flow module is unable to detect the height of the water and often doesn't sample; therefore a time paced sampling method is utilized.

Attachment A.

Dry Weather Priority Outfall Screening Inspection Results (RY
2016/2017)

Dry Weather Priority Out Fall Screening Inspection Results - 2016

Basin	Primary Outfall	Inspection Location	Asset Type	Date	Time	Flow?	Est. Flow (GPM)	Temp °C Receiving Water	Temp °C	pH S.U.	Sp Cond µS/cm	Turbidity NTU	Total Cl mg/L	FI mg/L	Detergents mg/L	NH3 mg/L	K mg/L	NA mg/L	E. coli MPN/100 mL	Outfall Notes	Inspection Comments
Battle Creek	D45444224	D45444224	Outfall	9/12/2016	09:00	Yes	5-10	14.9	20.4	7.30	123.2	14.7	0.08	0.3	0.0	0.11	0.578	5.750	< 1	Very warm air coming from outfall.	Environmental Services notified after inspection. Investigation yeilded no definitive answers. TV inspection revealed groundwater infiltration to storm line, likely from adjacent wetland. Need to resample and potentially request water leak detection.
Clark Creek	D39460252	D39460252	Outfall	9/27/2016	12:30	Yes			16.7	6.33	81.3	3.23	0.03		< 0.25	0.0	0.7	5.435	109		Upon arrival there appeared to be some sort of foam and/suds below outfall
Clark Creek	D42466417	D42466417	Outfall	9/26/2016	12:50	Yes	1-5	17	18.6	7.29	136.2	2.89	0.02	0.0						Likely groundwater	
Clark Creek	D42468244	D42468244	Outfall	9/26/2016	13:25	Yes	30-50	17.9	17.9	7.30	118.9	4.87	0.06	0.0		0.05	0.9	8.1			
Clark Creek	D42468244	D39466262	CleanOut	5/10/2016	13:40	Yes							0	0						Likely Groundwater	
Clark Creek	D42468PVT	D42468PVT	Outfall	9/26/2016	13:10	No															
East Bank Willamette	D42480205	D42480205	Outfall	9/9/2016	08:45	No															
East Bank Willamette	D42480215	D42480215	Outfall	8/4/2016	11:05	Yes	10-15	20.0	19.1	7.76	65.4	1.10	0.02	0.5	< 0.25	0.0					Splashing water noise located at Union Pacific Railroad and Madison St NE. Reported to Water Department. Leak Detection investigating.
East Bank Willamette	D42480223	D42480223	Outfall	8/4/2016	10:20	Yes	1-5	20.0	16.8	7.35	215.7	2.46	0.02	0.4	0	0.06				Pipe sections broken and laying in river below.	Field notes in notebook.
East Bank Willamette	D42480223	D48478220	ManHole	9/27/2016	13:50	Yes	1			7.17	65.4	23.7	0.12						121	Follow-up after leak detection.	Line was TV'd. small sources of I&I noted at joints. Water Department investigated for leaks, but found none.
East Bank Willamette	D42482212	D42482212	Outfall	9/9/2016	10:15	No															
East Bank Willamette	D42482213	D42482213	Outfall	9/9/2016	10:15	No															First Inspection of this Outfall
East Bank Willamette	D42482223	D42482223	Outfall	9/9/2016	09:00	Yes	1-5	15.8	16.7	7.94	258.3	2.43	0.22	0.2	< 0.25	0.0	2.230	12.0			
East Bank Willamette	D42482230	D42482230	Outfall	9/9/2016	10:00	Yes	1-5		16.0	7.38		8.51	0.23	0.1	< 0.25	< 0.50	1.600	7.380		Grid map does ot seem to reflect ground conditions.	Did not get receiving water temp due to distance to water body and inaccessibility due to vegetation and terrain.
East Bank Willamette River	D42476279	D39476238	ManHole	9/27/2016	10:00	No															

Basin	Primary Outfall	Inspection Location	Asset Type	Date	Time	Flow?	Est. Flow (GPM)	Temp °C Receiving Water	Temp °C	pH S.U.	Sp Cond µS/cm	Turbidity NTU	Total Cl mg/L	Fl mg/L	Detergents mg/L	NH3 mg/L	K mg/L	NA mg/L	E. coli MPN/100 mL	Outfall Notes	Inspection Comments
Lower Claggett Creek	D51488203	D51488203	Outfall	8/18/2016	09:53	Yes	< 1													Very slight trickle of clean water. Likely condensation or ground water as upstream manholes are dry. Previous years' flow may have been irrigation related.	Outfall not sampled due to small amount of water and clean results last year. Flow reduced from last year indicating that last year's flow may have been irrigation related.
Lower Claggett Creek	D51488236	D51488236	Outfall	8/18/2016	09:50	No														Outfall dry.	
Lower Claggett Creek	D54494201	D54494201	Outfall	8/18/2016	09:15	No														Backwater from stream.	Recon of two upstream manholes revealed no flow.
Mill Creek	D42476203	D42476203	Outfall	8/23/2016	13:11	No														No Flow	
Mill Creek	D45476207	D45476207	Outfall	9/9/2016	11:45	Yes	50-100	15.6	16.6	7.79	282.8	0.74	0.0	0.2			2.380	10.1			Flow is from wetland at State Hospital
Mill Creek	D45476217	D45476217	Outfall	8/18/2016	14:00	Yes	5-10	20.0	21.2	7.5	233.0	2.93	0.01	0.1		0.0				Outfall has been flowing for many years. Water has slight yellow tinge to it. Pipeshed reconnaissance performed on 08/22/2016. Traced at least a portion of the flow to State Capitol Mall (D45474219). Water in line has yellow tinge and appears to be coming	Discussions w/facilities staff revealed 2 irrigation well mains had been leaking; have been repaired. Line was smoke tested; showed connectivity between lawn and stormline. May be responsible for color and high Sp. Conductivity.
Mill Creek	D45476217	D45474219	ManHole	8/23/2016	14:00	Yes	5-10						0.07	0.4						Majority of flow traced to unmapped, private line feeding manhole D45474219. Definite yellow tinge to water. Chlorine and Fluoride samples collected. Recommend collecting full suite of parameters.	
Mill Creek	D51470205	D51470205	Outfall	8/18/2016	13:14	No														Upstream manholes have backwater far up line. Multiple upstream manholes are covered by landscaping at Nat'l Guard facility or do not exist. Recommend TV'ing line.	
Mill Creek	D54470205	D54470205	Outfall	8/18/2016	12:37	No														Inside of outfall is wet, possibly from backwater from stream. Bottom of pipe covered in roots. Upstream manholes are dry.	
Pringle Creek	D39456229	D39456229	Outfall	9/14/2016	13:04	Yes	5-10													Pipe joints are seperating above outfall due to undercutting from plunge.	No parameters taken. TV inspection and leak detection performed upstream just prior confirmed major groundwater input on Liberty St. Additional drinking water leak being repaired on Idylwood between Jones and Lone Oak. Pipeshed may be fully characterized.

Basin	Primary Outfall	Inspection Location	Asset Type	Date	Time	Flow?	Est. Flow (GPM)	Temp °C Receiving Water	Temp °C	pH S.U.	Sp Cond µS/cm	Turbidity NTU	Total Cl mg/L	Fl mg/L	Detergents mg/L	NH3 mg/L	K mg/L	NA mg/L	E. coli MPN/100 mL	Outfall Notes	Inspection Comments
Pringle Creek	D39456229	D39456229	Outfall	9/27/2016	13:15	Yes	5-10	17.0	16.9	6.58	78.7	1	0.07							Primary source of water was discovered far up pipe network through source tracking and TV inspection. Water department investigation for leaks and found none. Primary source appears to be ground water w/ potentially very small drinking water leak. Will be	
Pringle Creek	D42456216	D42456PVT	CatchBasin	9/26/2016	11:20	Yes	1-5		14.9	6.88	58.2	1.05	0.0	0.2						Catch basin in day care paking lot above MH D42456209.	Extensive source tracking required. Flow extends very far up into pipe network.
Pringle Creek	D42468235	D42468235	Outfall	8/23/2016	12:59	No															
Pringle Creek	D45464207	D45464206	ManHole	9/14/2016	12:30	Yes	5-10		17.6	7.83	106.6	1.78	0.03							There are 2 suspected drinking water sources in this pipeshed. Additional source tracking needed.	Receiving water inaccessible for temperature. Sample collected at first upstream manhole due to backwater at outfall.
Pringle Creek	D45466212	D45466212	Outfall	8/23/2016	15:00	No															
Pringle Creek	D48460229	D48460229	Outfall	9/26/2016	09:42	Yes	5-10	14.2	14.6	6.78	103.3	6.98								Flow cannot be determined at outfall, but up-pipe flow is observable. Flow being diverted. Possibly due to beaver dam in adjacent stormline. O&M has been notified.	
Pringle Creek	D48460229	D48458502	CatchBasin	9/26/2016	09:25	Yes	50-100		17.9	6.83	141.4	2.39	0.02	0.1		0.02	3.1	10.9		Wetland water appears to be diverted from adjacent line backing up through detention basin and back into catch basin outlet. Likely due to beaver activity in stormline. Backup has been reported to stormwater O&M. Large water valve leak nearby. Reported	Source tracking for D48460229. Sample collected from two flows into catch basin
Pringle Creek	D48464203	D48464203	Outfall	8/23/2016	12:24	No														Upstream manholes are dry	Upstream Manholes are dry
Pringle Creek	D48464249	D48464249	Outfall	8/23/2016	12:24	No														Upstream manholes are dry	Upstream manholes are dry
Shelton Ditch	D45468241	D45468241	Outfall	9/9/2016	13:45	Yes	20-30	16.1	19.0	8.08	172.4	0.73	0.0	0.1	0.0	0.0	0.862	8.170		Source tracking needed though source likely groundwater	Source is likely groundwater. Pipeshed investigation revealed no obvious sources. Very heavily trafficed road will need major traffic control to perform thorough investigation.
Upper Claggett Creek	D48486207	D48486207	Outfall	9/14/2016	11:05	Yes	50-100													Structure is actually an infall not outfall. Shares same pipeshed as D51486201. Recommend removing this structure from inspection program.	Structure is actually an infall up-pipe from D51486201.

Basin	Primary Outfall	Inspection Location	Asset Type	Date	Time	Flow?	Est. Flow (GPM)	Temp °C Receiving Water	Temp °C	pH S.U.	Sp Cond μS/cm	Turbidity NTU	Total Cl mg/L	Fl mg/L	Detergents mg/L	NH3 mg/L	K mg/L	NA mg/L	E. coli MPN/100 mL	Outfall Notes	Inspection Comments	
Upper Claggett Creek	D51486201	D51486201	Outfall	9/14/2016	10:40	Yes	10-15													Backwater from wetland extends far up this line past the first major contributing lines. There are known drinking water leaks, but source tracking in this pipeshed is very difficult because of the amount of private industrial property. Many manholes are i	Visual inspection conducted. Flow in upstream lines characterized as likely drinking water and ground water.	
Upper Claggett Creek	D51486216	D51486216	Outfall	8/18/2016	10:15	Yes	1-5	17.0	18.3	7.66	62.7	2.57	0.03	0.3	0.0	0.0	0.6750	6.395		Flow appears to be drinking water. Pipeshed reconnaissance recommended. Pipeshed recon occurred on 8/23/2016. Two drinking water leaks found (Bruce St NE & Lynn ST NE, Lansing Ave NE & Sunnyview). Leaks reported to Water Dept. on 08/24/2016.	Pipeshed recon occurred on 8/23/2016. Two drinking water leaks found (Bruce St NE & Lynn ST NE, Lansing Ave NE & Sunnyview). Leaks reported to Water Dept. on 08/24/2016.	
Upper Claggett Creek	D51486216	D51478218	CleanOut	8/23/2016	10:40	Yes	15-20						1.17							Pipeshed reconaisance revealed two leaks 1.5 miles upstream from outfall. Drinking water flowing into cleanout from unmapped 6-8" storm line.		
Upper Claggett Creek	D54486217	D54486217	Outfall	8/18/2016	11:53	Yes	100-200	17.0	17.0	7.58	72.5	2.02	0.01	0.3		0.0	0.6660	5.720		Known drinking water leak is a major contributor to this flow. Location of leak has been isolated to short section of pipe south of Hawthorne and Sunnyview. Line has been cleaned and TV'd but access is limited for equipment due to the way pipe is structur	Very large (>100 gpm) water main repaied at Hawathorne and Sunnyview week of 9/26/2016.	
Willamette Bank	D30470203	D30470203	Outfall	9/27/2016	08:25	Yes	< 1		16.7	7.19	74.3	5.94	0.02							Stream Crew cleared vegetation so that actual outfall could be located. Previous year's inspection did not locate actual outfall, but found broken concrete pipe that was likely riprap from property owner.		
Willamette Bank	D36472203	D36472203	Outfall	9/27/2016	10:30	Yes	< 1	17.3	16.2	7.89	333.6	11.9	0.4	0	< 0.25	0.02	0.9	12.4	1314	< 0.5 gpm	Up pipe sampling very difficult due to lack of flow. Will require TV inspection to isolate source	
Willamette Slough	D39478271	D39478271	Outfall	9/27/2016	09:25	Yes	20-30		17.5	7.55	108.9	0.03	0.04				0.7	9.714		Upstream manhole is dry. Historical maps show ephemeral stream at location that has been built over or diverted. May be source of groundwater. TV inspection should be ordered to confirm.	No Fluoride sample collected because Geren island is not fluoridating.	
Total Inspections:				Total number of Outfall Inspections				Total number of manhole inspections														
43				35				8														