City of Wilsonville, Oregon

NPDES MS4 Permit and
Willamette River TMDL Implementation Plan
Annual Report

2019–2020 Reporting Year

Prepared for the
Oregon Department of Environmental Quality

December 1, 2020

CITY OF WILSONVILLE

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) and
TMDL IMPLEMENTATION PLAN
ANNUAL REPORT

JULY 1, 2019 – JUNE 30, 2020

The undersigned hereby submits this National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater System Annual Report in accordance with NPDES Permit Number 101348. I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person, or persons, who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Chris Neamtzu, AICP
Community Development Director

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1.0 INTRODUCTION

The Oregon Department of Environmental Quality (DEQ) regulates stormwater runoff from the City of Wilsonville (City) through a Municipal Separate Storm Sewer System (MS4) National Pollutant Discharge Elimination System (NPDES) Permit 101348, issued to Clackamas County and its co-permittees, and through the total maximum daily load (TMDL) program.

This annual report fulfills the reporting requirement under the City's Phase 1 NPDES MS4 permit and the City's Willamette River TMDL Implementation Plan (TMDL Plan) for the reporting period of July 1, 2019 to June 30, 2020. The City implements a Stormwater Management Plan (SWMP) to address specific regulatory obligations of its NPDES MS4 permit for point source pollutant parameters and the TMDL Plan to address elevated temperature in Willamette River tributaries (e.g., Boeckman Creek, Coffee Lake Creek).

1.1 Regulatory Background – NPDES MS4 Permit

The City's NPDES MS4 permit was originally issued in 1995 to Clackamas County co-permittees including the cities of Lake Oswego, Oregon City, West Linn, Milwaukie, Wilsonville, Happy Valley, Johnson City, and Rivergrove, the Oak Lodge Water Services District (formerly the Oak Lodge Sanitary District), and Clackamas County.

The City's MS4 NPDES permit was most recently reissued March 16, 2012, after a multi-year negotiation process with DEQ and an additional year-long delay related to an appeal. The permit expired March 1, 2017, and has been administratively extended, which still makes it the effective NPDES MS4 permit for the City.

During the 2016-2017 reporting period, the City prepared its NPDES MS4 permit renewal application, which required an evaluation of proposed program and SWMP changes, development of TMDL benchmarks, mapping, a maximum extent practical evaluation, updates to the City's monitoring program, and evaluation of service area expansions and associated pollutant loading. This significant effort was compiled into a report and submitted to DEQ on February 28, 2017. Although an updated SWMP was prepared and submitted as part of the NPDES MS4 permit renewal application, the City's 2012 SWMP remains the effective NPDES MS4 program document.

1.2 Regulatory Background – TMDL Implementation Plan

The City originally submitted its TMDL Plan to DEQ on March 31, 2008. Comments from DEQ were received and addressed by the City, and DEQ approved of the City's TMDL Plan in May of 2009. In August 2014, at the end of the 5-year implementation period, the City updated its TMDL Plan to include refined measurable goals, performance measures and milestones. This 2014 TMDL Plan is the effective plan for the City, and the 2019-2020 reporting year reflects its sixth year of implementation.

In February 2019, the City submitted an updated TMDL Plan to DEQ for approval. On November 2, 2020, the City received confirmation from DEQ that this 2019 TMDL Plan was approved. Therefore, future annual reports will document implementation of the updated TMDL Plan.

The City's TMDL Plan identifies and describes management strategies that the City will implement to address nonpoint sources of pollution generated in the Middle Willamette River subbasin in the Willamette Basin. The **non-point source** TMDL parameter of concern is

temperature, and therefore, the TMDL Plan focuses on temperature management activities. The City's NPDES MS4 permit, as implemented through the SWMP, identifies practices the City will implement to address **point sources** of pollution. The point source TMDL parameters of concern are bacteria and mercury.

1.3 Document Organization

Table 1 below outlines the organization of this annual report document, with respect to the annual reporting requirements outlined in Schedule B.5 of the City's NPDES MS4 permit. This report emphasizes efforts and activities associated with individual Best Management Practices (BMPs) from the City's 2012 SWMP, as summarized in Appendix A. Activities related to the City's TMDL Plan are reported in Appendix B.

Table 1. Summary of the NPDES MS4 Annual Report Requirements

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

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

2.0 ADAPTIVE MANAGEMENT PROCESS IMPLEMENTATION

The City submitted its adaptive management approach to DEQ on November 1, 2012. The City's approach includes two elements:

1. An **annual** process to determine if the City's stormwater program is being implemented in accordance with the SWMP, and to determine if progress towards measurable goals is being made. The annual process may include program adjustments, if needed.

2. A comprehensive process at the **end of the permit term** and submitted as part of the City's permit renewal package, to identify proposed program modifications including modification, addition, or removal of BMPs incorporated into the SWMP. Such program modifications are based on a more in-depth evaluation of submitted program documentation and studies.

The City conducted a comprehensive process to identify proposed program modifications as part of their NPDES MS4 permit renewal application, submitted February 2017. For the 2019-2020 reporting year, because the City's NPDES MS4 permit is in administrative extension, no major permit modifications, including major changes to the SWMP, can be made. Review of BMP implementation during the preparation of this annual report did not reveal the need for immediate adaptive management changes.

3.0 PROGRAM EXPENDITURES

The City's stormwater management program is funded through a combination of its stormwater utility, system development charges (SDCs) for new development, and additional fees associated with erosion control, natural resources, and stormwater plan reviews and inspections. A portion of the utility fee and all SDC revenue is placed in a fund dedicated for capital improvement project (CIP) development.

For the 2019-2020 reporting year, the stormwater utility rate was $11.25 per equivalent residential unit (ERU). Over the next year, this rate is proposed to increase by 6% percent. For 2020-2021, the stormwater utility rate is scheduled to be $11.90.

A summary of the City's direct stormwater program expenditures for the 2019-2020 reporting year and anticipated stormwater program expenditures for the 2020-2021 reporting year are outlined below. The Natural Resources Program manages requirements for the NPDES permit, and costs are reflected under the Management Activities. The Public Works Department performs operations and maintenance activities, and costs are reflected under Maintenance Activities. Administrative support is funded separately.

Table 2. Stormwater Program Expenditures		
	Management Activities	**Maintenance Activities**
Reporting Year 2019-2020		
Wages and benefits	$255,623	$238,360
Materials and services	$60,089	$512,848
Reporting Year 2020-2021 (projected)		
Wages and benefits	$259,000	$270,080
Materials and services	$98,200	$782,453

4.0 OVERVIEW OF PLANNING AND LAND USE CHANGES, UGB EXPANSION AND NEW DEVELOPMENT ACTIVITIES

The City has experienced rapid growth over the last two decades. When the initial NPDES MS4 permit was issued, the City's population was approximately 9,300. The current (2019) population is approximately 25,635.

The following section outlines land use changes, Urban Growth Boundary (UGB) expansions, land annexations and new development activities that occurred during this reporting year. The City's NPDES MS4 permit renewal application also included a comprehensive review of projected (by 2022) service area expansions and annexations. Figure 1 reflects the City's current zoning and city limits.

4.1 Annexations and UGB Expansion

As of October 2019, the City's NPDES MS4 permit area is approximately 4,999 acres.

In Wilsonville, annexations are typically applicant- and development-driven. The City and City Council do not typically initiate the annexation of property outside of the city limits. The City actively conducts development-based concept planning for large development areas to facilitate annexation. Past concept planning efforts include the following:

- **Villebois.** This 480-acre area is located along the City's western boundary and prior to UGB expansion, this area was once the Dammasch State Hospital site, rural residential parcels and agricultural lands. The Villebois Village Master Plan was adopted in 2003 and incorporates sustainability practices and onsite stormwater management to minimize impacts of new development. Full build out assumes approximately 2,500 residential units within Villebois Village. To date, a total of 2,290 single and multi-family units have been constructed.

- **Frog Pond West.** This 181-acre area is located adjacent to the City's eastern boundary, north of Boeckman Road and west of Stafford Road. The Master Plan was adopted in spring 2017 and calls for the redevelopment of rural residential and agricultural lands to residential. A total of nearly 61 acres have been annexed within Frog Pond West. To date, three subdivisions consisting of 196 single family homes have been approved for construction.

- **Frog Pond East & South.** Metro approved a UGB expansion of 280 acres in December 2018 and received final approval from the Department of Land Conservation and Development in 2019. At full build-out, this area is expected to provide over 1,300 homes of varying housing types and sizes. Master Planning is scheduled to begin next year with adoption anticipated by December 2022.

- **Coffee Creek Industrial.** This 226-acre area is located adjacent to the City's northwestern boundary and is composed of industrial, residential, and agricultural land uses. The Coffee Creek Master Plan was adopted in 2007. Annexation and redevelopment, in accordance with the Master Plan, will include regionally significant industrial land uses including warehouse, manufacturing, and office space designed according to the City's Industrial Form-based Code provisions. The City is currently constructing an industrial roadway along SW Garden Acres Road between Ridder Road and Day Road in order to promote development in this area.

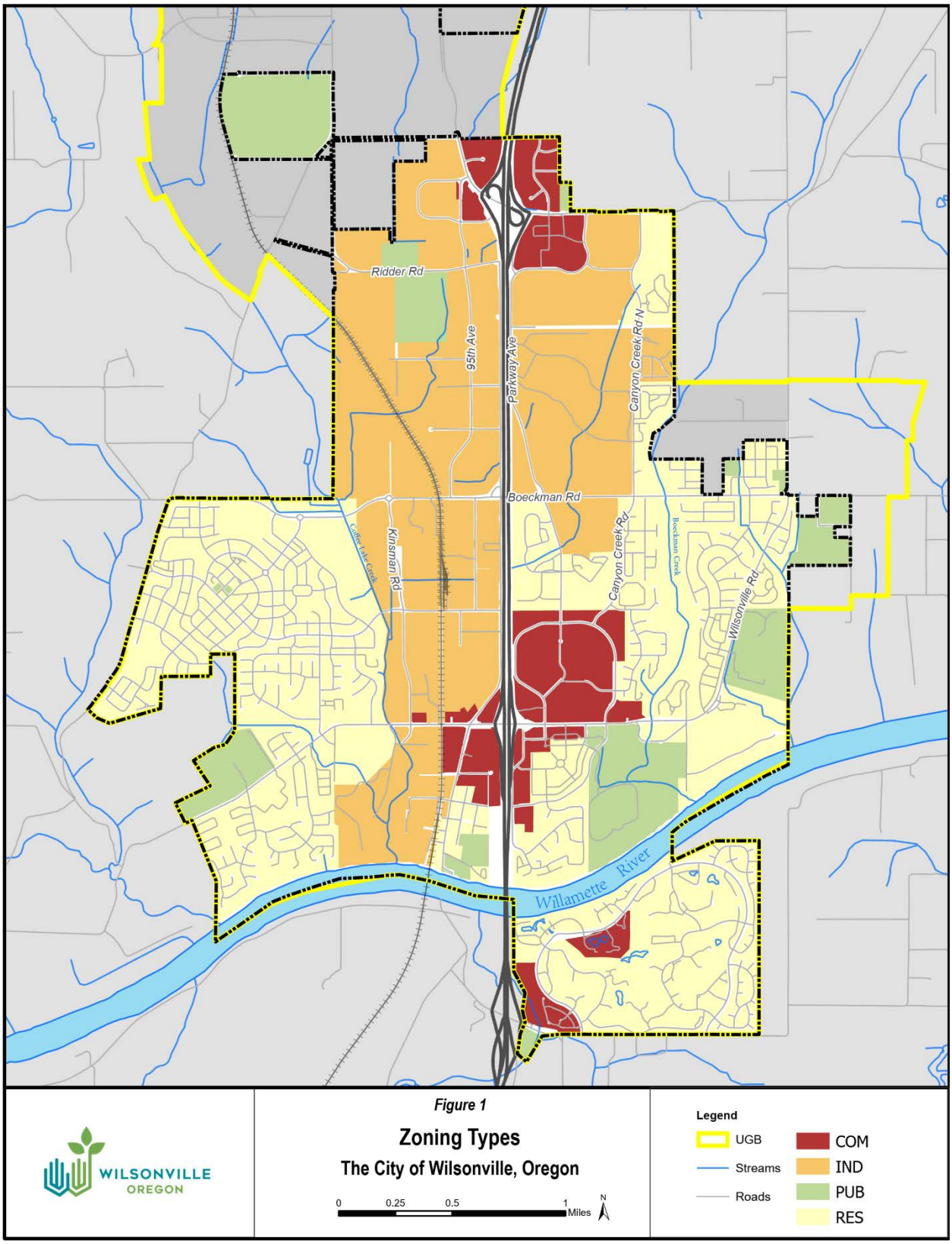
- **Basalt Creek.** This area is located along the north and northwest boundary of the City, bound by Basalt Creek Parkway and Greenhill Lane to the north, Coffee Lake Creek on the west, and I-5 to the east. A Transportation Refinement Plan for the area was completed in August 2013, and the Basalt Creek Concept Plan was adopted in August 2018. The City updated the Urban Planning Area Agreement with Washington County and adopted Comprehensive Plan Amendments in spring 2019. Master planning is still needed. Annexation and development, in accordance with these plans and policies, will result in an attractive business district including high-tech and craft industries with office, manufacturing, and warehouse space. To date, no developmental approvals have been granted by the City.

4.2 Land Use Changes and New Development Activities

In 2014, the City prepared updated stormwater design standards, as outlined in Section 3 of its Public Works Standards, to address post-construction stormwater control in accordance with the current NPDES MS4 permit requirements. The City requires structural stormwater controls for water quality and water quantity on all new and redevelopment projects that add or replace 5,000 square feet or more of impervious surface. The updated standards require the use of low impact development (LID) practices, stormwater facility sizing based on a flow duration standard, and inclusion of specific stormwater submittal requirements.

During the 2019-2020 reporting year, there were no zoning changes that would affect the types of development activities allowed or associated land usage.

During the 2019-2020 reporting year, the City issued five post-construction permits for development activities triggering stormwater management requirements. Development activities included public infrastructure improvements, an industrial site, a park, and a religious institution. Development activities from 81 housing units, one commercial site and multiple community and infrastructure improvements resulted in 272,964 square feet of new and replaced impervious surface.


Ridder Rd
95th Ave
Parkway Ave
Canyon Creek Rd N
Boeckman Rd
Kinsman Rd
Coffee Lake Creek
Canyon Creek Rd
Boeckman Creek
Wilsonville Rd
Willamette River
Figure 1
Zoning Types
The City of Wilsonville, Oregon
0
0.25
0.5
1
Miles
N
Legend
UGB
Streams
Roads
COM
IND
PUB
RES

5.0 ENVIRONMENTAL MONITORING

The 2019-20 reporting year is the third year the City implemented the Coordinated Clackamas County Stormwater Monitoring Plan (CCCSMP). In 2016, the City opted to participate in the CCCSMP and discontinue implementation of the City's Monitoring Plan. The 2017 CCCSMP reflecting the City's participation was submitted to DEQ on December 16, 2016. No DEQ comments were received within 30 days. The City submitted its NPDES MS4 permit renewal application to include an updated monitoring objectives matrix and the 2017 CCCSMP as their environmental monitoring program.

Detail related to the environmental monitoring activities conducted during the 2019-2020 reporting year are outlined in Section 5.1 and results summarized in Appendix C.

5.1 Summary of Monitoring Data

Under the City's Monitoring Plan, the City has two instream monitoring locations and one stormwater outfall monitoring location. Monitoring events are grouped into the dry season and wet season to maintain compliance with the permit. The City chose to collect three of the four instream sample events during the wet weather season. The sampling schedule was determined prior to the start of the sampling year. Grab samples are collected during dry weather conditions and time-composited grab samples during rainfall events. The City contracted stormwater and instream sample collection activities during the 2019-20 reporting year. Specific monitoring locations and frequencies are outlined in Table 3.

Table 3. Summary of Wilsonville Environmental Monitoring Activities per CCCSMP

Sampling type	Monitoring location	Waterbody name/ receiving water	Sampling frequency	Land use represented
Outfall (stormwater) monitoring	Library Detention Pond inlet at Memorial Park	Tributary to Boeckman Creek	3x/year	• Commercial • Residential
Ambient (instream) monitoring	Boeckman Creek at the Boeckman Road crossing	Boeckman Creek (upstream)	4x/year (min. of 2 events during the wet season)	• Agricultural (outside City limits) • Commercial • Residential
Ambient (instream) monitoring	Boeckman Creek at the Rose Lane footbridge in Memorial Park	Boeckman Creek (downstream)	4x/year (min. of 2 events during the wet season)	• Commercial • Residential

Monitoring results for all locations are summarized in Appendix C. The summary tables include parameters, methods, and results for each event collected. Additionally, a water quality standard has been added for comparison where applicable. Monthly rainfall totals for the 2019-20 reporting year are summarized in Table 4.

The Library Detention Pond stormwater monitoring location was sampled four times during the 2019-20 reporting year. The stormwater sampling event conducted on May 14, 2019 did not meet the minimum rainfall requirement as specified in the CCCSMP, therefore an additional

stormwater event was collected on March 14, 2020. The initial stormwater outfall monitoring event for the 2019-20 reporting year occurred on September 8, 2019. This event had exceedances of the copper, temperature, and E.coli water quality criteria. The copper criteria was also exceeded on October 16, 2019. No water quality criteria exceedances were recorded during the remainder of the sampling events.

Results of the instream monitoring indicate that Boeckman creek met the water quality criteria for both temperature and E.coli during the 2019-20 reporting year. The water quality criteria for phosphorous was exceeded during two of the four sampling events. A QA/QC issue has been identified for copper during the April 2020 sampling event. The reported result for dissolved copper was greater than the reported result for total copper. Similarly, the result for dissolved zinc at one site during the January sampling event was larger than the result for total zinc.

Table 4. Monthly Rainfall Totals (inches) 2019-20

July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	March	April	May	June
0.37	0.13	2.88	2.23	0.89	4.59	7.06	1.64	2.53	1.32	2.82	3.26

Data retrieved from the National Weather Service http://w2.weather.gov/climate/index.php?wfo=pqr

5.2 Temperature Monitoring

The City deployed four continuous temperature monitoring sensors during the summer of 2019. Boeckman Creek and Coffee Lake Creek were chosen as the two streams to monitor for temperature as they are the two streams within the City of Wilsonville that contribute the largest amount of flow to the Willamette River. The sensors were placed in an upstream location and at the mouth of Boeckman Creek and Coffee Lake Creek respectively, as identified on Figure 2.

Monitoring results are summarized in Appendix C. Monitoring data for Boeckman Creek shows the temperature at the mouth of Boeckman Creek is cooler than the upstream location. This finding was encouraging as most of the Boeckman Creek corridor is forested. The temperatures on Coffee Lake Creek are elevated the entire summer and do not reach below the temperature TMDL threshold of 64 degrees until mid-September. The elevated temperatures in Coffee Lake Creek are mostly due to a large, open wetland complex bisected by Seely Ditch which is unforested and unsuitable to shade tree planting efforts.

5.3 Specific Conductance Investigation

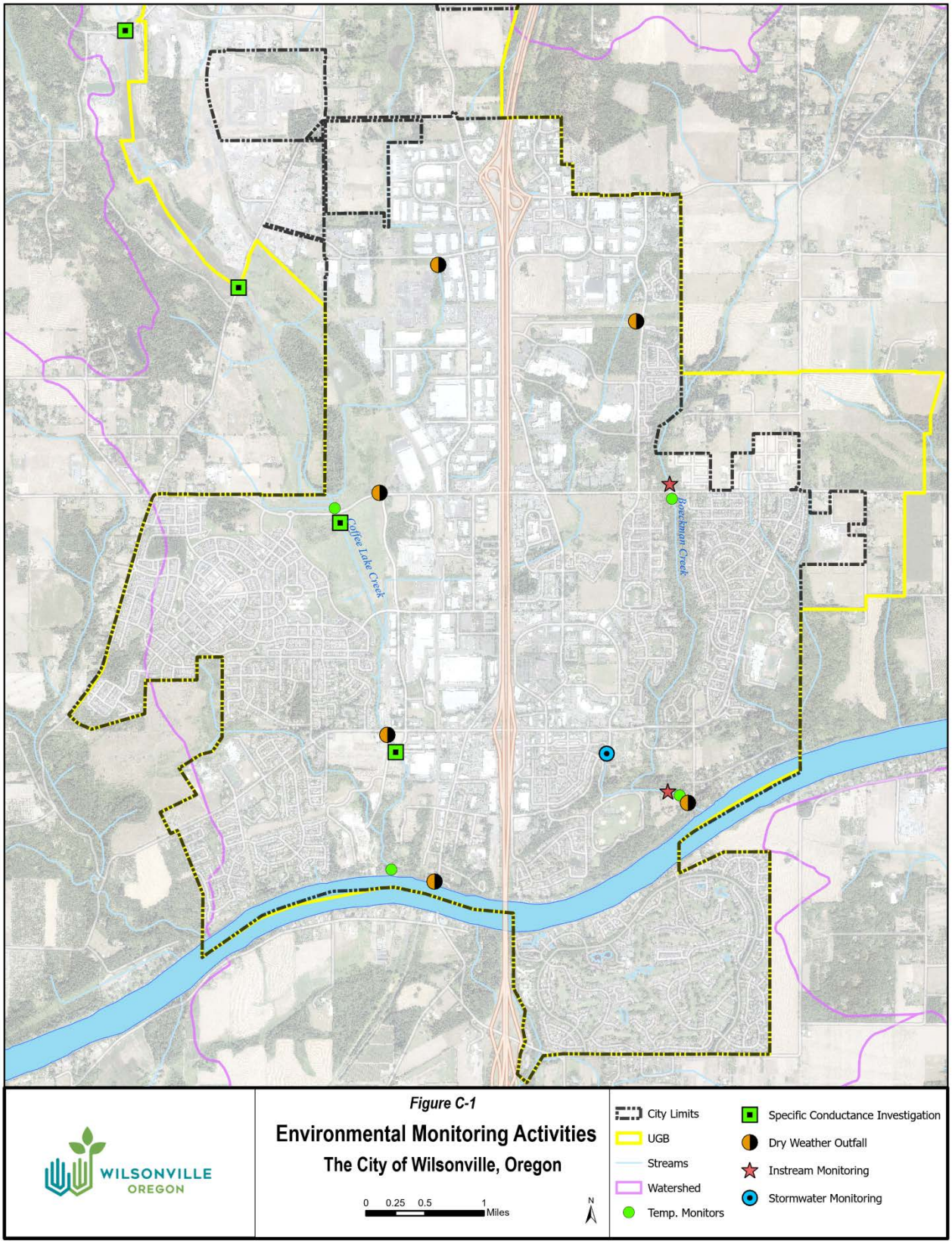
Elevated specific conductance readings are routinely found in Coffee Lake Creek during dry weather outfall sampling events. Due to this occurrence, the City makes an effort to sample Coffee Lake Creek for specific conductance on multiple occasions throughout the year. On August 21, 2019, City staff sampled two locations on Coffee Lake Creek within City limits, OrePac Bridge and Boeckman Road Bridge. Both sites had elevated levels of specific conductance. As follow-up, staff conducted a brief investigation into the origin of the elevated levels.

City staff initiated a brief investigation on August 22, 2019. Sampling for specific conductance was performed along Coffee Lake Creek at two sites in Wilsonville and two sites upstream, outside the City limits. The locations of the sampling sites are identified on Figure 2. Samples for Total Dissolved Solids (TDS) were collected at the two sites within City limits to verify the high specific conductance readings. The additional upstream monitoring revealed that the

elevated levels of specific conductance occur upstream, outside the City limits. Both of the sites upstream of City limits contained elevated levels of specific conductance, which indicates the origin of the high readings occurs upstream of the City. Two quarries and a landscape materials supply yard are located adjacent to Coffee Lake Creek upstream from the City.

Table 5. Coffee Lake Creek Specific Conductivity Readings in microsiemens

	8/21/2019	8/22/2019
OrePac Bridge - Downstream	7100	6720
Boeckman Rd – Annual dry weather outfall monitoring site	7640	7450
SW Grahams Ferry Rd – Upstream of City limits		7570
SW Tonquin Rd – Upstream of City limits		7600


Coffee Lake Creek
Boeckman Creek
Figure C-1
Environmental Monitoring Activities
The City of Wilsonville, Oregon
WILSONVILLE
OREGON
0 0.25 0.5 1
Miles
N
City Limits
UGB
Streams
Watershed
Temp. Monitors
Specific Conductance Investigation
Dry Weather Outfall
Instream Monitoring
Stormwater Monitoring

Appendix A

SWMP Implementation Status

Appendix A. SWMP Implementation Status

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

BMP Title	BMP Name	Program Element(s)	Addresses bacteria?	Addresses mercury?	Responsible City Department	Measurable goals (2012 SWMP)	Tracking measures (2012 SWMP)	Annual Report Information (Tracking Measure Status 2019-20)	Notes
CD1	Illicit Discharge Detection and Elimination	Illicit Discharge Detection and Elimination	○	○	Community Development Public Works	• Conduct annual dry weather illicit discharge screening/inspections for all major (15 total) and priority minor outfalls (85 total). • Continue to follow dry weather field screening procedures for all outfalls suspected of illicit discharges. • Notify the Public Works Director of all positively identified illicit connections and take necessary actions to eliminate them. • Revise procedures for conducting the illicit discharge elimination and investigation program in accordance with permit requirements by November 1, 2012.	1. Track number of outfalls inspected annually. 2. Summarize inspection results and indicate outfalls requiring monitoring (sampling) and/or investigations. 3. Document the outcome and resolution of any investigation activities conducted.	1. Six major outfalls identified as high priority sites were inspected in August and September after 72 hours of dry weather using the Dry Weather Field Screening Inspection Form. Outfall inspection locations can be found on figure 2. Throughout the reporting year, the Public Works Department inspected 55 outfalls as part of their routine maintenance program. 2. Elevated specific conductance readings were identified on Coffee Lake Creek at the OrePac bridge outfall inspection site. Specific sample results listed in the Notes column. All other five outfalls were either dry or had pH and specific conductance readings within limits not requiring further investigation. 3. Due to the regular occurrence of elevated specific conductance readings in Coffee Lake Creek, the City makes an effort to sample multiple times throughout the year. In August, City staff conducted a brief investigation of specific conductance and TDS on Coffee Lake Creek. Details of the investigation can be found in Section 5.3.	The City uses the exceedance of 500 microsiemens as an indicator for additional investigation. The OrePac monitoring site had a reading of 7100 microsiemens during the annual dry weather outfall inspection event on August 2019.
PW/CD2	Spill Prevention, Training, and Response	Illicit Discharge Detection and Elimination Education and Outreach	○	○	Community Development Public Works	• City staff to respond to non-hazardous material spills. • Notify appropriate parties, including State and National Emergency Response Systems as necessary, of all known spills within the City. • Train city staff to the OSHA First Responder Operations level.	1. Track number of City employees attending OSHA spill-response training and/or refresher courses. 2. Track the number of spills responded to by City staff. 3. Track the type/source of pollutant discharges associated with each reported spill.	1. No City employees attended OSHA spill-response training courses and/or refresher courses during the 2019-20 reporting year. Training was canceled due to COVID. 2. City staff responded to 12 spill reports during the 2019-20 reporting year. Follow up with City resources and staff were deployed to 8 spills. 3. The details related to the type or source of each specific spill are listed in the Notes column.	The City deployed resources to 8 spills: 3 spills related to the discharge of sewage, 3 oil spills related to motor vehicles, and 2 concrete truck leaks. The City followed up on an additional 4 illicit discharges: release of windshield washer fluid associated with paving practices, release of hydraulic oil from malfunctioning trash compactor, restaurant grease trap cleaning in curb line, soap bubbles found in creek.
PW/CD3	Industrial and Commercial Facilities	Industrial and Commercial Facilities	○	○	Community Development Public Works	• Review business license applications and SIC codes for new businesses to identify potential high source facilities. Obtain Environmental Survey from new businesses (i.e., non-residential sewer users) identified as a potential high pollutant source. • Update facility information by sending the Environmental Survey to applicable, existing businesses every three years. • Identify facilities needing NPDES 1200-Z permits and notify the facility and DEQ within 30 days. • Annually inspect facilities identified as warranting inspection. • Ensure illicit discharges are eliminated, if discovered.	1. Track the number of facilities inspected annually. 2. Track the number of existing and potential new NPDES 1200-Z permitted facilities identified annually. 3. Track any enforcement actions associated with inspections.	1. One facility received a joint inspection by the City's Industrial Pretreatment and Stormwater Management Coordinators. Eleven facilities identified as high potential pollutant sources received a windshield inspection of their outdoor areas. 2. Eleven NPDES 1200-Z facilities are currently in the City. One facility applied for a 1200-Z during the 2018-19 reporting year and another during the 2019-20 reporting year. 3. As a result of facility inspections, five letters were sent informing facilities of stormwater City code violations. Two of the five facilities needed additional follow up to comply with City codes. Three spills were reported or found at commercial or industrial facilities during the 2019-20 reporting year. Details related to the type of spill are listed in the notes column.	• A vinegar spill was reported by an industrial facility • Leaking trash compactors were found at two separate commercial facilities.

Appendix A. SWMP Implementation Status

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

BMP Title	BMP Name	Program Element(s)	Addresses bacteria?	Addresses mercury?	Responsible City Department	Measurable goals (2012 SWMP)	Tracking measures (2012 SWMP)	Annual Report Information (Tracking Measure Status 2019-20)	Notes
CD4	Erosion Control and Construction Site Management	Construction Site Runoff Control Education and Outreach	●	●	Community Development	• Require all new and redevelopment disturbing over 500 square feet to submit an erosion and sediment control plan. • Conduct weekly erosion control inspections on all construction sites disturbing over 500 square feet.	1. Track the number of erosion and sediment control plans approved. 2. Track the number of 1200-CN and 1200-C permits issued. 3. Track the number and frequency of erosion control inspections conducted. 4. Track the number and type of enforcement actions taken by the City or DEQ.	1. The City approved 12 erosion and sediment control plans for commercial, industrial, & public development sites during the 2019-20 reporting year. 2. There are currently two 1200-CN and six 1200-C permits active in the City. 3. Certified City inspectors performed a total of 669 erosion control inspections. Inspectors visit sites weekly during the wet months and monthly during dry months. Additional inspections occurred based on complaints or weather conditions. 4. DEQ issued an enforcement and penalty to a 1200-C permittee in Wilsonville on 11/27/2019 in response to an inspection conducted on 12/18/18. In February 2020, a construction contractor was required to remediate and clean a stormwater pond and conveyance system.	
CD5	Public Education Participation	Education and Outreach Pollution Prevention for Municipal Operations Stormwater Management Facilities Operation and Maintenance Activities	○	○	Community Development	• Publish stormwater related articles in the City newsletter and website. • Organize public outreach programs such as Adopt-a-Road and volunteer monitoring of stream corridors. • Label catch basins as necessary. • Distribute door hangers as necessary in neighborhoods where non-stormwater discharges have been identified. • Coordinate with other, local Phase I jurisdictions in providing/compiling information regarding public education effectiveness. Provide the results to DEQ by July 1, 2015.	1. Track the number of educational articles published per year. 2. Estimate public participation in City-sponsored volunteer events. 3. Track the number of catch basins labeled.	1. During the 2019-20 reporting year, five educational/informational articles were published in the City newsletter. 2. City-sponsored volunteer event details for the 2019-20 reporting year are listed in the Notes column. 3. Manhole lids over catch basins are stamped “Dump No Waste Drains to Stream”. During 2019-20 reporting year the City chose new metal catch basin makers and affixed 20. The City will prioritize catch basins in the future which drain directly to outfalls without receiving treatment.	• Adopt a Road Participants: 14 active groups, numbering 36 volunteers. • City’s WERK Day event was canceled due to the coronavirus.
CD6	Public Reporting for Spills, Illicit Discharges, and Dumping	Education and Outreach	○	○	Community Development	• Continue to implement the “Citizen Concern” form for public reporting of spills, illicit discharges, and dumping. • Include the phone number and website for reporting illicit discharges in a minimum of one published article each year.	1. Track the number of citizen reports of spills, illicit discharges, and dumping received each year and follow-up actions resulting from the requests.	1. The City received four complaints from citizens during the 2019-20 reporting year related to illicit discharges and dumping. Details are provided in the Notes column.	• January 2020 – Citizen reported a flooded parking lot. City staff observed the onsite catch basins full of sediment. Referred issue to property owner. • January 2020 – Citizen reported sewage on the ground. City staff responded to clear a clogged pipe. Property owner called a private contractor for additional cleanup. • March 2020 – Citizen reported private contractor dumping fluid. City staff responded to site and found contractor filling a tank with potable water. • March 2020 – Business reported neighbor power washing medical equipment in parking lot. City staff spoke to manager of offending business to explain City stormwater Codes. Manager stated they would discontinue practice.

Appendix A. SWMP Implementation Status

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

BMP Title	BMP Name	Program Element(s)	Addresses bacteria?	Addresses mercury?	Responsible City Department	Measurable goals (2012 SWMP)	Tracking measures (2012 SWMP)	Annual Report Information (Tracking Measure Status 2019-20)	Notes
PW/CD7	Municipal Staff Training for Stormwater Pollution Prevention	Education and Outreach Pollution Prevention for Municipal Operations			Community Development Public Works	• Conduct municipal staff training related to stormwater pollution prevention as appropriate. • Coordinate with other Clackamas County co-permittees regarding regional water quality efforts through scheduled co-permittee meetings. • Attend applicable conferences and trainings as appropriate.	1. Track the number of municipal staff training activities. 2. Track number of conferences attended. 3. Track any cost share or joint projects conducted annually with Clackamas County or other permitted agencies.	1. City staff participated in multiple stormwater trainings this year including: spill prevention and sediment & erosion control. Overall, 13 staff from the Engineering Division, Fleet Services, and Public Works participated in stormwater pollution prevention training. 2. Staff attended three conferences during the 2019-20 reporting year. 3. The City currently coordinates with WES and the City of Oregon City in updates to the BMP Sizing Tool (used to address post-construction stormwater requirements).	
CD8	Public Involvement and Participation	Public Involvement and Participation			Community Development	• Provide for public review and comment with the monitoring plan, SWMP revisions, and pollutant load reduction benchmarks.	N/A	N/A	• The City retains the last four years of NPDES MS4 reports on their website for public review. • The City posted their NPDES MS4 permit renewal application to DEQ on their website in September 2017
CD9	Planning and Development Review	Post-Construction Site Runoff Pollution Prevention for Municipal Operations	●	●	Community Development	• Continue to require new and redevelopment projects that add or replace over 5,000 square feet of impervious surface to install stormwater quality controls. • Review all new and redevelopment plans that add or replace over 5,000 square feet for compliance with stormwater control requirements.	1. Track number of development applications reviewed for compliance with the City's stormwater requirements. 2. Track the number and type of structural water quality and quantity facilities installed. 3. Track the number of CIPs or retrofits proposed/initiated for water quality improvement.	1. During the 2019-20 reporting year, three development applications were reviewed for compliance with the City's stormwater requirements, which pertain to development activities that add or replace 5,000 sq. ft. or more of impervious surface. 2. During the 2019-20 reporting year, a total of 42 structural water quality and quantity facilities were installed. Detail related to the private facilities are provided in the Notes column. 3. During the 2019-20 reporting year, one public street improvement project began construction and will consist of 26 stormwater planters. Two vegetated swale were retrofitted as a pilot project for multiple swales along a roadway.	• During the reporting period 26 vegetated swales, 11 planter boxes, and 5 rain gardens were installed throughout the City.
CD10	Review and Update Applicable Code and Development Standards Related to Stormwater Control	Post-Construction Site Runoff	○	○	Community Development	• Review the City's current public works standards to minimize or eliminate identified barriers related to the use of low impact development and green infrastructure techniques. • Review the City's current stormwater treatment and detention standards for compliance with new MS4 NPDES permit language (e.g., design storm, etc.). • Update the City's post-construction stormwater design standards and code language by November 1, 2014.	1. Track progress related to the review and update of the City's stormwater treatment and detention standards for compliance with the MS4 NPDES permit.	1. The City of Wilsonville adopted updated Public Works Standards for stormwater in September 2014 to address NPDES MS4 requirements for treatment and flow control. The City's Standards were amended in December 2015 to address minor editorial and clarification items. No additional updates were made during the 2019-20 reporting year.	

Appendix A. SWMP Implementation Status

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

BMP Title	BMP Name	Program Element(s)	Addresses bacteria?	Addresses mercury?	Responsible City Department	Measurable goals (2012 SWMP)	Tracking measures (2012 SWMP)	Annual Report Information (Tracking Measure Status 2019-20)	Notes
PW11	Routine Road Maintenance	Pollution Prevention for Municipal Operations	●	●	Public Works	• Sweep all curbed City streets monthly. • Schedule and conduct street maintenance activities during dry weather conditions. • Continue to sponsor Adopt-a-Road program.	1. Track street sweeping frequency. 2. Track length of roadway swept annually. 3. Track volume of debris removed annually.	1. During the 2019-20 reporting year, the City swept all curbed, public streets monthly. 2. During the 2019-20 reporting year, a total of 2,172 miles of road were swept. 3. During the 2019-20 reporting year, street sweeping resulted in removal of 567 cubic yards and 224 tons of debris.	
PW/CD12	Pest Management	Pollution Prevention for Municipal Operations			Community Development Public Works	• Follow the Integrated Pest Management principles and Pest Management Program for public landscape maintenance. • Require all staff and hired contractors applying chemicals within the City to be certified.	1. Track amount of pesticides and fertilizers applied to public property and general area of application. 2. Estimate number and area of sites where the planting of native vegetation was incorporated into the maintenance activities.	1. During the 2019-20 reporting year, the City applied 12.4 gallons of pesticides to 57 acres of public landscaping areas. The City applied 155 pounds and 2.5 gallons of fertilizer to 16.5 acres of City Parks and other public, City owned property. 2. During the 2019-20 reporting year, the Parks and Recreation Department planted approximately 400 native plants as part of regular landscape maintenance. Public Works planted 783 native plants within a 1700 sq ft vegetated swale retrofit project.	
PW/CD13	Municipal Facility Stormwater Management	Pollution Prevention for Municipal Operations	○	○	Community Development Public Works	• Inventory municipal facilities subject to this permit requirement. • Identify and implement strategies to minimize discharges from identified municipal facilities by July 1, 2013.	1. Inventory municipal facilities and develop strategies to reduce the impact of stormwater runoff from municipal facilities.	1. The City adopted their Stormwater Pollution Prevention Strategy (SWPPS) for municipal facilities in 2013. Applicable municipal facilities include the Three Bay Facility, the SMART Operations & Fleet Facility, and the Memorial Park Maintenance Barn. For the 2019-20 reporting period, the oil water separator at the SMART Operations & Fleet Facility and a stormwater pretreatment vault at the SMART Bus station were serviced quarterly.	
PW14	Conveyance System Cleaning	Stormwater Management Facilities Operation and Maintenance Activities	○	○	Public Works	• Inspect public conveyance system annually for maintenance needs. • Maintain and repair public conveyance system as needed based on inspections.	1. Estimate the length of conveyance system serviced each year. 2. Estimate type and volume of debris removed.	1. During the 2019-20 reporting year, the City cleaned and maintained approximately 26,297 linear feet of the stormwater conveyance system (mains and laterals). 2. During the 2019-20 reporting year, a total of 28 cubic yards of debris was removed and reported in conjunction with conveyance system cleaning activities.	
PW15	Catch Basin Cleaning	Stormwater Management Facilities Operation and Maintenance Activities	●	●	Public Works	• Clean all high-priority public catch basins (approximately 25% of all public catch basins) annually and the remaining public catch basins over a four-year period. • Inspect catch basins for maintenance and repair needs during catch basin cleaning activities. • Schedule catch basin repair activities as needed, based on inspections.	1. Track percent of total catch basins cleaned each year. 2. Track number of catch basin repair activities conducted each year. 3. Estimate volume of debris removed annually.	1. During the 2019-20 reporting year, the City cleaned 669 catch basins, reflecting 25 percent of all public catch basins in the City. 2. During the 2019-20 reporting year, a total of 6 catch basins were repaired. 3. During the 2019-20 reporting year, 40 cubic yards of debris was removed from catch basins.	

Appendix A. SWMP Implementation Status									
Key to Pollutant Symbols: A full circle (●) indicates the BMP is expected to address the parameter. An empty circle (○) indicates the BMP may be expected to address the parameter. A blank cell indicates that the effect of the BMP is unknown at this time.									
BMP Title	**BMP Name**	**Program Element(s)**	**Addresses bacteria?**	**Addresses mercury?**	**Responsible City Department**	**Measurable goals (2012 SWMP)**	**Tracking measures (2012 SWMP)**	**Annual Report Information (Tracking Measure Status 2019-20)**	**Notes**
PW/CD16	Structural Control Cleaning	Stormwater Management Facilities Operation and Maintenance Activities	●	●	Community Development Public Works	• Inspect public structural controls annually and maintain and repair as needed. • Ensure maintenance of new private structural stormwater facilities serving 5,000 square feet of area or greater through the tracking of *Stormwater Maintenance and Access Easement* agreements. • Maintain GIS "atlas" for both public and private water quality structural controls.	1. Track number of public stormwater structural controls inspected. 2. Track number of public stormwater structural controls maintained. 3. Track covenant agreements on file and annual maintenance reports submitted for private stormwater structural control facilities. 4. Track number of private stormwater structural controls inspected and maintained.	1. The City has identified 75 structural controls at 30 sites. During the 2019-20 reporting year, the City inspected 69 public structural controls. 2. During the 2019-20 reporting year, the City maintained 48 public structural controls. 3. For the 2019-20 reporting year, there were 101 private stormwater maintenance agreements on file. Annual inspection and maintenance report requests were sent to 108 facility owners in March 2020, and 70 maintenance reports were returned. 4. During FY 2019-20, the City inspected 266 private stormwater facilities. Most of the parties responsible for private facility maintenance performed some type of maintenance over the course of the year. Follow up inspections by City staff found that 11 facilities needed minor additional maintenance.	

Appendix B

TMDL Implementation Plan Status

Appendix B. TMDL Implementation Plan Implementation Status						
BMP or Activity	**Commitment/ Implementation Strategy**	**Measurable Goal(s)**	**Implementation Tracking/ Performance Measure**	**Milestones**	**Lead Department/Division**	**2019-20 Activities**
Riparian Area Management	Enforce riparian buffers to protect existing vegetation and minimize impacts to surface waters due to development.	Continue to implement Wilsonville Municipal Code (WMC), Chapter 4 – Planning and Land Development, related to the following: • Section 4.139 - Implementation of the Significant Resource Overlay Zone (SROZ). The SROZ reflects compliance with Title 3 and Title 13 requirements. • Section 4.600 – Limitations on tree removal and tree cutting in the SROZ.	• Annually track WMC and Comprehensive Plan updates related to Title 3/ 13 compliance.	N/A – WMC is currently consistent with Title 3/13 compliance.	Community Development	City staff will continue to regulate the development of riparian areas through the Significant Resource Overlay Zone and other relevant parts of the development code. During the 2019-20 reporting year, there were no development applications for a property that includes the SROZ.
	Conduct targeted planting efforts to improve shade conditions throughout Wilsonville waterbodies	Refine the extent and scope of riparian planting and restoration capital improvement projects (CIPs) per the 2012 Wilsonville Stormwater Master Plan.	• Over the implementation term, map riparian planting and restoration CIP coverage in conjunction with constraints and ownership characteristics documented on the Riparian Shade Zone maps. • Over the implementation term, conduct ground truthing of riparian enhancement CIP coverage areas. Annually report on progress. • Over the implementation term, refine the riparian enhancement CIP descriptions, coverage area, and cost estimates per ground truthing results and targeted plant densities defined in the 2008 TMDL Plan.	• By November 1, 2015, define existing CIPs with a shade or temperature management component. Prioritize CIPs in conjunction with the water quality retrofit strategy and 2015 Retrofit Plan (required per the NPDES MS4 permit). • By November 1, 2017, conduct ground truthing activities for a minimum of one, high priority, water quality CIP that is scheduled for design/ construction in accordance with the City's capital improvement program. • By the end of the permit term, refine the overall description and cost estimates for high priority water quality CIPs. Incorporate updates into the Master Plan itself or capital improvement program.	Community Development	Capital improvement projects have been prioritized in accordance with the water quality retrofit strategy and Retrofit Plan. Select projects include a planting and restoration component. During the 2019-2020 reporting year, no CIPs were constructed that included riparian planting and restoration. As the capital improvement program is implemented over subsequent years, planting shade on public and private properties will remain an important objective. Future updates to the Stormwater Master Plan or capital improvement program will include refinements to the descriptions and cost estimates for high priority water quality CIPs.
		Continue participation in opportunistic planting efforts with local and state agencies and organizations.	• As applicable, document planting and vegetation enhancement efforts on public property and private property.	N/A – Implementation is ongoing.	Community Development	In partnership with Friends of Trees, over the past 18 years, eleven sites have been planted.
		Continue partnerships with Friends of Trees in support of riparian planting projects. Partnership may include in-kind staff participation on governing boards, technical/ permitting support for sponsored projects within the City, or financial contributions.	• Annually document partnership efforts.	N/A – Implementation is ongoing.	Community Development	The City of Wilsonville has a strong partnership with Friends of Trees to enhance and restore native habitats in the community, including riparian areas. Friends of Trees worked within the City over the reporting year to perform maintenance activities and promote the volunteer plantings. No riparian sites were planted during the reporting year.
		Continue implementation of riparian planting and restoration CIPs and LID CIPs as documented in the 2012 Wilsonville Stormwater Master Plan.	• Annually document completion of riparian planting and restoration and LID CIPs per the 2012 Wilsonville Stormwater Master Plan.	N/A – CIP implementation schedules are based on prioritization outlined in the Master Plan and Retrofit Plan.	Engineering	During the 2019-20 reporting year, no LID facilities were installed as part of CIP projects (see CD9 in Appendix A). Riparian plantings were installed at various private sites. City staff will continue to identify shade projects and CIPs to implement and document the progress in achieving the goals of the Retrofit Plan.
Design Standards for New and Redevelopment	Implement design standards that promote infiltration.	Promote use of infiltration for stormwater management through updated stormwater design standards, facility details, and sizing tools.	• Over the permit term, adopt and implement updated stormwater design standards that include additional guidance for stormwater treatment using infiltration practices. • As applicable, document changes to stormwater design standards.	• By November 1, 2014, adopt updated stormwater design standards that include additional guidance for stormwater treatment using infiltration practices. • By November 1, 2016, prepare a user manual for developers and engineers	Engineering	Updated stormwater design standards were adopted in September 2014, and subsequently revised in December 2015. These standards require the use of LID principles and practices. Developers have been required to use the WES BMP Sizing Tool to demonstrate their stormwater treatment and control

Appendix B. TMDL Implementation Plan Implementation Status						
BMP or Activity	**Commitment/ Implementation Strategy**	**Measurable Goal(s)**	**Implementation Tracking/ Performance Measure**	**Milestones**	**Lead Department/Division**	**2019-20 Activities**
				with standard details for recommended stormwater treatment facilities.		facilities are properly sized. A user manual was developed, and it is available on the City's website.
Public Education for Temperature Management	Continue to provide information regarding temperature related issues and shade preservation efforts to the public.	Using the City newsletter, annually distribute a minimum of one article related to temperature issues and management approaches.	• Annually track the number and content of temperature – related articles distributed to City residents by the City. • Annually document shade planting incentives (materials, trainings, etc.) provided to citizens.	N/A – Ongoing implementation is addressed through implementation of the City's SWMP.	Community Development	One temperature related article was published during the 2019-20 reporting year. In 2015, the City of Wilsonville established an incentive program to provide native tree seedlings to private property owners. The incentive was advertised in the Boones Ferry Messenger twice during the 2019-20 reporting year. Overall, the incentive program has provided 300 trees to 50 property owners.
		Promote regional programs targeted at improving habitat on private property. Continually distribute information regarding regional programs in City outlets.	• Annually document the methods of information distribution conducted by the City.	N/A – Implementation is ongoing.		City staff routinely reviews the methods for providing information to the community. The City of Wilsonville coordinated with other Phase 1 permittees and submitted a public education effectiveness evaluation report to DEQ on July 1, 2015.
		Participate in student education and outreach activities in local schools, providing instruction on the importance of maintaining riparian buffers for shade and temperature management.	• As applicable, document participation and activities conducted with local schools.	N/A – Implementation is ongoing.	Community Development	City staff works cooperatively with the West Linn - Wilsonville School District to provide educational opportunities regarding the importance of maintaining shade and temperature management. City staff routinely partner with the School District on projects and educational activities through the Student Watershed Research Project and the Center for Research in Environmental Sciences and Technologies.
Environmental Monitoring	Monitor surface water temperature to document status and evaluate trends with respect to water quality standards.	In conjunction with NPDES MS4 requirements, conduct sampling for temperature at required instream monitoring locations.	• As applicable, annually report any modification to existing temperature monitoring activities.	By March 2017, update the City's Stormwater Monitoring Plan in conjunction with the NPDES MS4 permit renewal application.	Community Development	The City partners with other Clackamas co-permittees as part of the Coordinated Clackamas County Stormwater Monitoring Plan (CCCSMP). In addition, the City worked collaboratively with the U.S. Geological Survey (USGS) to research cold-water refuges in Wilsonville's tributaries (i.e., Boeckman Creek and Coffee Lake Creek) to the Willamette River. The research was part of a larger USGS study looking at cold water refugia in the Willamette River Basin. The USGS research surveyed temperature and dissolved oxygen to capture the spatial variability in these conditions at tributary mouths, potential groundwater seeps, and along the shoreline in Wilsonville. The survey was conducted May-July 2017 to coincide when migrating salmonids may be using cold-water refuges.

Appendix C

Environmental Monitoring Results 2019-2020

Instream Monitoring - 2018-2019 Location - Boeckman Creek at Boeckman Rd.				Results				
				DRY SEASON (July 1 to September 30; May 1 to June 30)		WET SEASON (October 1 to April 30)		
			COMPOSITE/ GRAB	Grab	Composite	Grab	Grab	
			RAINFALL (Y/N)	N	Y	N	N	
			DATE	7/17/2019	10/16/2019	1/15/2020	4/15/2020	
Analysis	**Method**	**Units**	**WQ Std**					**Notes**
Storm Event Rainfall (if applicable)	gauge or rainfall record	Inches			0.31			
Conductivity - Field	SM 2520B	uS		169.7	168.3	130.9	134.7	
Temperature - Field	SM 2550B	°C	18	16.5	11.70	6.4	11.2	2
pH - Field	SM 4500 H+B	Std Units		8.15	8.32	7.39	7.57	
Dissolved Oxygen - Field	SM 4500 O G	mg/L	6.5	9.18	9.72	11.94	10.57	3
BOD5	SM 5210B	mg/L		1.43	1.88	1.10	1.76	
Copper, TOTAL	EPA 200.8/3010A	ug/L		1.00	1.1	0.8	0.72	
Copper, DISSOLVED	EPA 200.8/FILTER	ug/L		0.9	0.7	0.8	0.74	
E. coli	SM 9223B	MPN/100mL	406	290.9	78.5	52.1	95.9	1
Hardness	SM 2340C	mg/L		56	48	24	36.0	
Lead, TOTAL	EPA 200.8/3010A	ug/L		0.13	0.10	0.2	0.14	
Lead, DISSOLVED	EPA 200.8/FILTER	ug/L		ND	0.08	0.13	0.026	
Ammonia Nitrogen	SM 4500 NH3F	mg/L		0.04	0.05	ND	0.02	
Nitrate-Nitrite	SM 4500-NO3 F	mg/L	10	0.55	0.36	3.82	1.64	4
Phosphorus, TOTAL	SM 4500-P F	mg/L	0.1	0.109	0.108	0.066	0.054	5
Phosphorus, ortho-phosphate	SM 4500-P F	mg/L		0.06	0.05	0.03	0.03	
Zinc, TOTAL	EPA 200.8/3010A	ug/L		8.9	5.2	433.0	5.3	
Zinc, DISSOLVED	EPA 200.8/FILTER	ug/L		5.2	3.6	431.0	4.3	
Total Dissolved Solids	SM 2540E	mg/L		103	123	100	90	
Total Suspended Solids	SM 2540D	mg/L		12.6	7.0	4.5	7.8	
Volatile Solids	SM 2540B	mg/L		22	28	42	ND	

Notes:
(1) MPN = Most Probable Number
(2) WQ standard of 18 C per DEQ's Temperature Water Quality Standard Implementation IMD 2008 for salmon and trout rearing and migration.
(3) No DO TMDL for the Willamette River; 6.5mg/L selected as target minimum DO concentration for cool water habitat.
(4) Table 20 - Protection of human health for water and fish ingestion.
(5) Water quality criteria value of 0.1 mg/L based on EPA standard to control algal growth in flowing waterbodies.

Instream Monitoring - 2018-2019 Location - Boeckman Creek at Memorial Park				Results				
				DRY SEASON (July 1 to September 30; May 1 to June 30)		WET SEASON (October 1 to April 30)		
			COMPOSITE/ GRAB	Grab	Composite	Grab	Grab	
			RAINFALL (Y/N)	N	Y	N	N	
			DATE	7/17/2019	10/16/2019	1/15/2020	4/15/2020	
Analysis	**Method**	**Units**	**WQ Std**					**Notes**
Storm Event Rainfall (if applicable)	gauge or rainfall record	Inches			0.31			
Conductivity - Field	SM 2520B	uS		230.9	222.5	179.5	173.6	
Temperature - Field	SM 2550B	°C	18	17.4	11.6	6.4	12.0	2
pH - Field	SM 4500 H+B	Std Units		7.79	8.66	7.14	7.47	
Dissolved Oxygen - Field	SM 4500 O G	mg/L	6.5	8.88	9.84	11.48	10.39	3
BOD5	SM 5210B	mg/L		1.45	1.30	0.90	1.50	
Copper, TOTAL	EPA 200.8/3010A	ug/L		1.7	1.3	1.2	0.8	
Copper, DISSOLVED	EPA 200.8/FILTER	ug/L		1.00	0.9	1.0	0.9	
E. coli	SM 9223B	MPN/100mL	406	41.3	93.3	48.8	260.2	1
Hardness	SM 2340C	mg/L		74	78	38	60	
Lead, TOTAL	EPA 200.8/3010A	ug/L		0.25	0.068	0.05	0.11	
Lead, DISSOLVED	EPA 200.8/FILTER	ug/L		ND	0.06	0.04	0.02	
Ammonia Nitrogen	SM 4500 NH3F	mg/L		0.03	0.02	ND	0.02	
Nitrate-Nitrite	SM 4500-NO3 F	mg/L	10	0.65	0.72	3.47	1.28	4
Phosphorus, TOTAL	SM 4500-P F	mg/L	0.1	0.199	0.156	0.073	0.083	5
Phosphorus, ortho-phosphate	SM 4500-P F	mg/L		0.09	0.09	0.04	0.05	
Zinc, TOTAL	EPA 200.8/3010A	ug/L		9.00	11.5	6.6	5.4	
Zinc, DISSOLVED	EPA 200.8/FILTER	ug/L		3.6	8.4	7.1	4.6	
Total Dissolved Solids	SM 2540E	mg/L		156	160	112	123	
Total Suspended Solids	SM 2540D	mg/L		5.8	3.5	6.0	3.0	
Volatile Solids	SM 2540B	mg/L		43	34	39	ND	

Notes:

(1) MPN = Most Probable Number

(2) WQ standard of 18 C per DEQ's Temperature Water Quality Standard Implementation IMD 2008 for salmon and trout rearing and migration.

(3) No DO TMDL for the Willamette River; 6.5mg/L selected as target minimum DO concentration for cool water habitat.

(4) Table 20 - Protection of human health for water and fish ingestion.

(5) Water quality criteria value of 0.1 mg/L based on EPA standard to control algal growth in flowing waterbodies.

Outfall Monitoring - 2018-2019 Location - Library Pond at Memorial Park								
				Results				
			COMPOSITE/ GRAB	Composite	Composite	Composite	Composite	
			RAINFALL (Y/N)	Y	Y	Y	Y	
			DATE	9/8/2019	10/16/2019	3/30/2020	3/14/2020*	
Analysis	**Method**	**Units**	**WQ Std**					**Notes**
Storm Event Rainfall (if applicable)	gauge or rainfall record	Inches		1.06	0.31	0.62	0.24	
Conductivity - Field	SM 2520B	uS		100.25	68.57	261.20	37.34	
Temperature - Field	SM 2550B	°C	18	19.3	14.2	10.8	7.6	2
pH - Field	SM 4500 H+B	Std Units		8.09	7.84	7.11	7.10	
Dissolved Oxygen - Field	SM 4500 O G	mg/L	6.5	9.0	9.8	10.71	11.34	3
BOD5	SM 5210B	mg/L		13.6	16.0	3.08	2.50	
Copper, TOTAL	EPA 200.8/3010A	ug/L	20	100.00	30.60	4.20	2.90	5
Copper, DISSOLVED	EPA 200.8/FILTER	ug/L		78.00	25.90	2.30	2.00	
E. coli	SM 9223B	MPN/100mL	406	547.5	218.7	27.8	114.5	1
Hardness	SM 2340C	mg/L		26.0	12.0	22.0	10.0	
Lead, TOTAL	EPA 200.8/3010A	ug/L	15	2.60	0.75	0.665	0.88	5
Lead, DISSOLVED	EPA 200.8/FILTER	ug/L		0.70	0.45	ND	0.10	
Ammonia Nitrogen	SM 4500 NH3F	mg/L		1.11	0.31	0.03	0.06	
Nitrate-Nitrite	SM 4500-NO3 F	mg/L	10	0.85	0.32	0.30	0.25	4
Phosphorus, TOTAL	SM 4500-P F	mg/L		0.423	5.13	0.069	0.042	
Phosphorus, ortho-phosphate	SM 4500-P F	mg/L		0.09	0.10	0.02	0.03	
Zinc, TOTAL	EPA 200.8/3010A	ug/L	120	107.00	61.50	33.90	32.30	5
Zinc, DISSOLVED	EPA 200.8/FILTER	ug/L		71.00	45.50	28.40	31.70	
Total Dissolved Solids	SM 2540E	mg/L		120	75	50	32	
Total Suspended Solids	SM 2540D	mg/L	100	47.2	6.0	12.4	2.2	5
Volatile Solids	SM 2540B	mg/L		111	45	23	10	

Notes:

(1) MPN = Most Probable Number.

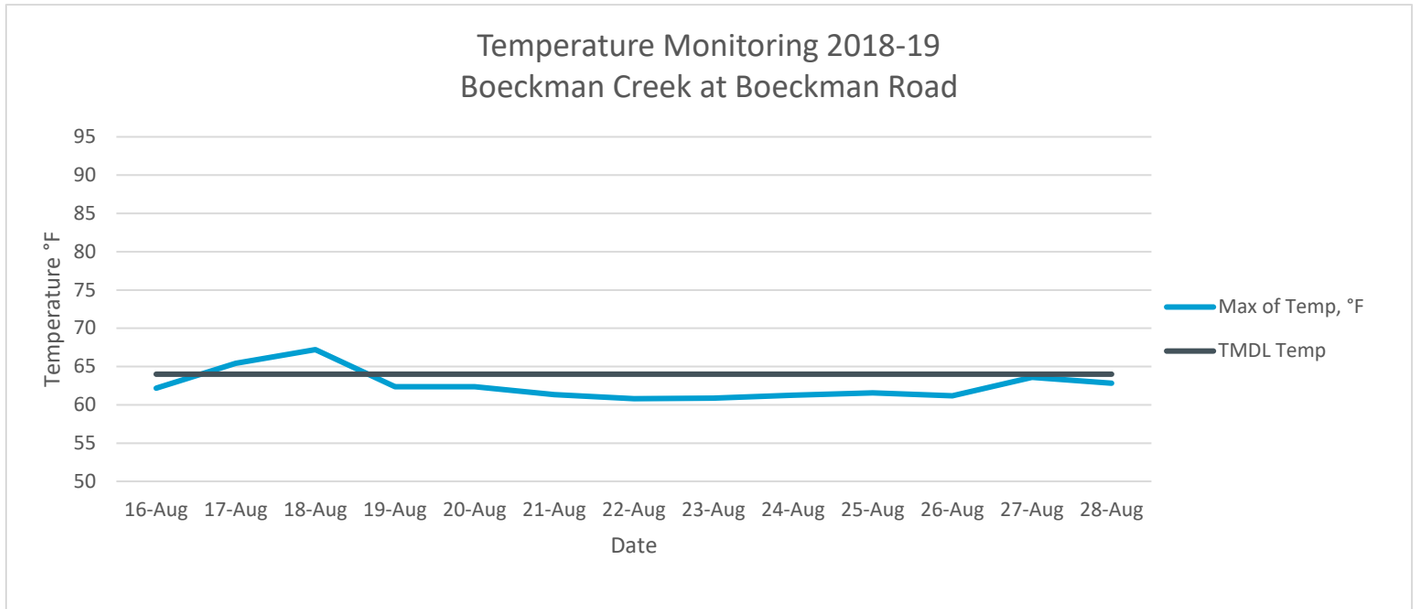
(2) WQ standard of 18 C per DEQ's Temperature Water Quality Standard Implementation IMD 2008 for salmon and trout rearing and migration.

(3) No DO TMDL for the Willamette River; 6.5mg/L selected as target minimum DO concentration for cool water habitat.

(4) Table 20 - Protection of human health for water and fish ingestion.

(5) Water quality criteria values based on current 1200-Z permit benchmarks. The benchmark for pH is 5.5 to 9.0

* Additional sample collected due to a sample error in the 2018-2019 reporting year.


Temperature Monitoring 2018-19
Boeckman Creek at Boeckman Road
Temperature °F
95
90
85
80
75
70
65
60
55
50
16-Aug
17-Aug
18-Aug
19-Aug
20-Aug
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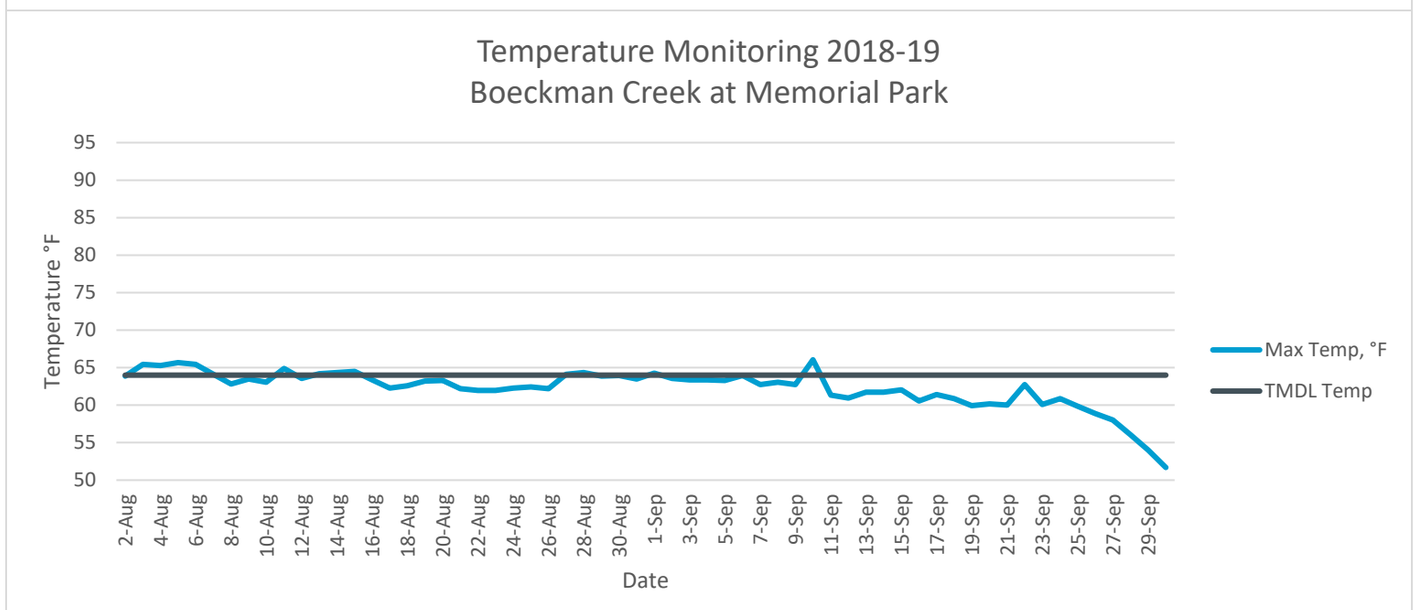
26-Aug
27-Aug
28-Aug
Date
Max of Temp, °F
TMDL Temp


Temperature Monitoring 2018-19
Boeckman Creek at Memorial Park
Temperature °F
95
90
85
80
75
70
65
60
55
50
2-Aug
4-Aug
6-Aug
8-Aug
10-Aug
12-Aug
14-Aug
16-Aug
18-Aug
20-Aug
22-Aug
24-Aug
26-Aug
28-Aug
30-Aug
1-Sep
3-Sep
5-Sep
7-Sep
9-Sep
11-Sep
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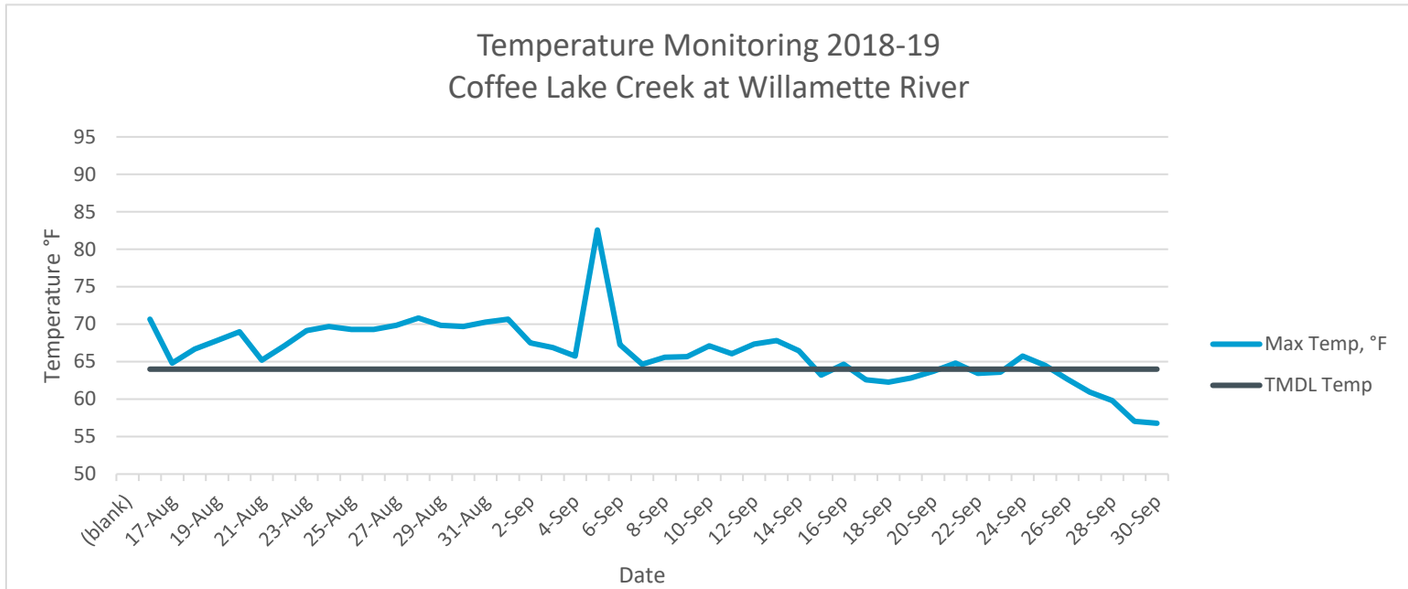
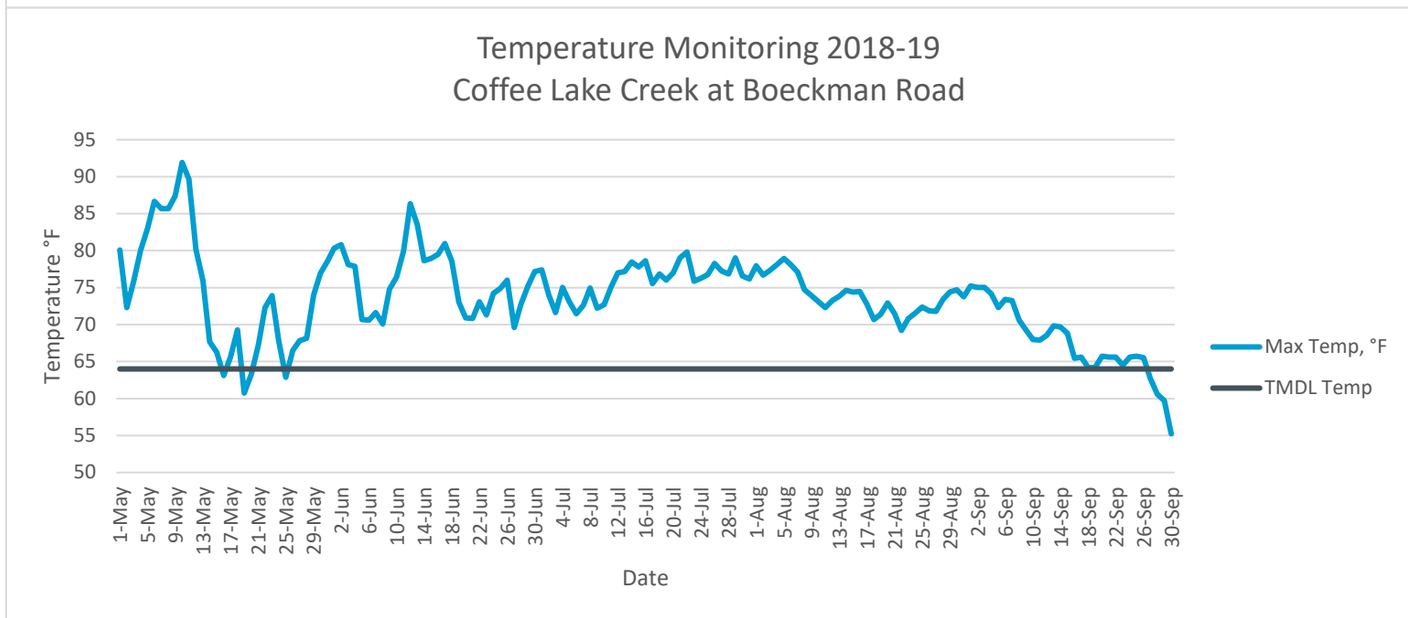
29-Sep
Date
Max Temp, °F
TMDL Temp


Temperature Monitoring 2018-19
Coffee Lake Creek at Willamette River
Temperature °F
95
90
85
80
75
70
65
60
55
50
(blank)
17-Aug
19-Aug
21-Aug
23-Aug
25-Aug
27-Aug
29-Aug
31-Aug
2-Sep
4-Sep
6-Sep
8-Sep
10-Sep
12-Sep
14-Sep
16-Sep
18-Sep
20-Sep
22-Sep
24-Sep
26-Sep
28-Sep
30-Sep
Date
Max Temp, °F
TMDL Temp


Temperature Monitoring 2018-19
Coffee Lake Creek at Boeckman Road
Temperature °F
95
90
85
80
75
70
65
60
55
50
1-May
5-May
9-May
13-May
17-May
21-May
25-May
29-May
2-Jun
6-Jun
10-Jun
14-Jun
18-Jun
22-Jun
26-Jun
30-Jun
4-Jul
8-Jul
12-Jul
16-Jul
20-Jul
24-Jul
28-Jul
1-Aug
5-Aug
9-Aug
13-Aug
17-Aug
21-Aug
25-Aug
29-Aug
2-Sep
6-Sep
10-Sep
14-Sep
18-Sep
22-Sep
26-Sep
30-Sep
Date
Max Temp, °F
TMDL Temp