CITY OF MILWAUKIE

National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Discharge Permit No. 101348

2021–2022 Annual Report

Prepared for the

Oregon Department of Environmental Quality

November 22, 2022

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CITY OF MILWAUKIE

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) ANNUAL REPORT

JULY 1, 2021 – JUNE 30, 2022

I, the undersigned, hereby submit this National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) 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 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 known violations.

Name: Peter Passarelli
Title: Public Works Director
City of Milwaukie

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1.0 Introduction

1.1 MS4 NPDES Permit Background

The Oregon Department of Environmental Quality (DEQ) regulates stormwater runoff from the City of Milwaukie through the Municipal Separate Storm Sewer System (MS4) National Pollutant Discharge Elimination System (NPDES) Permit No. 101348, issued to Clackamas County and its co-permittees. Clackamas County co-permittees include the City of Milwaukie along with the cities of Lake Oswego, Gladstone, West Linn, Oregon City, Wilsonville, Happy Valley, Johnson City, Rivergrove, the Oak Lodge Water Services District, Water Environment Services, and Clackamas County. Each co-permittee is a relatively small community, most having populations between 15,000 and 25,000 with some (Johnson City and Rivergrove) having populations significantly smaller.

After a multi-year negotiation process with DEQ, the City's MS4 NPDES permit was reissued September 15, 2021, with an effective date of October 1, 2021. The new permit requires submittal of an updated 2022 Stormwater Management Program (SWMP) Document (previously referred to as the Stormwater Management Plan), which is due to DEQ the same day as this annual report (December 1, 2022). The City's 2012 SWMP remains in effect until the new 2022 SWMP Document is approved by DEQ. Therefore, this annual report documents stormwater management activities from July 1, 2021 through June 30, 2022 in conjunction with the City's 2012 SWMP, and the 2021 NPDES MS4 Permit requirements for annual reporting as outlined in Schedule B.3.

1.2 Document Organization

The following table (Table 1) outlines the organization of this annual report document, with respect to the annual reporting requirements per Schedule B(3) of the city's MS4 NPDES permit.

Table 1: Summary of the MS4 NPDES Annual Report Requirements

Table 1 – 2021 NPDES MS4 Annual Reporting Requirements	
Annual Reporting Requirements from Schedule B.3.a. - l.	**Location in document**
a. The status of implementing the Stormwater Management Program (SWMP) and each control measure program element in Schedule A.3, including progress in meeting the measurable goals and program tracking and assessment metrics identified in the SWMP Document as well as additional annual reporting requirements identified in each section, or, prior to SWMP Document approval by DEQ, measurable goals and tracking metrics approved under the previous permit's approved SWMP.	Appendix A
b. A summary of the adaptive management implementation and any changes or updates to programs made during the reporting year, including rationales for any proposed changes to the SWMP (e.g., new BMPs), and review of related new and historical monitoring data. This summary should also include discussion of the implications of or any findings related to recent years' adaptive management and/or changes made to the SWMP Document, based on data from tracking measures, measurable goals, and/or any monitoring related to the change.	Section 2.0
c. Any proposed changes to SWMP program elements that are designed to reduce Total Maximum Daily Loads (TMDL) pollutants.	Section 2.0
d. A summary of education & outreach and public involvement activities, progress toward or achievement of measurable goals, and any relevant assessment of those activities. This should include planned adaptive management or other program enhancements to occur in the following years.	Appendix A/C
e. 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 6.0
f. A list of entities referred to DEQ for possible 1200-Z NPDES general permit coverage based on co-permittee screening activities, a list of categories of facilities inspected, and an overview of the results of inspections of commercial and industrial facilities.	Appendix A
g. 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
h. A summary of monitoring program results, including monitoring data that are accumulated throughout the reporting year submitted in the DEQ-approved Data Submission Template, and any assessments or evaluations of that data completed by the co-permittees or an authorized third party.	Section 4.0 and Appendix B
i. Any proposed modifications to the monitoring plan that are necessary to ensure that adequate data and information are collected to conduct stormwater program assessments.	Section 4.0
j. An overview, as related to MS4 discharges, of concept planning, land use changes and new development activities (including the number of new post-construction permits issued) that occurred within the Urban Growth Boundary (UGB) expansion areas during the reporting year, and those forecast for the following year, where such data is available.	Section 5.0 and Appendix A/C
k. The details of all corrective actions implemented associated with Schedule A.1.b.iii during the reporting year.	Section 6.0
l. Additional Annual Report requirements for 2022: • Winter maintenance activities. • Mercury Minimization Assessment	Section 6.0 and Appendix E

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

Each section of this report corresponds to the specific permit requirements in Schedule B(3). This report emphasizes efforts and activities associated with individual Best Management Practices (BMPs) from the city's 2012 SWMP, as summarized in Appendix A.

2.0 Adaptive Management Process Implementation

2.1 Adaptive Management Program

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

Historically, the city has implemented adaptive management principles to annually refine implementation methods and data collection activities in conjunction with their effective SWMP and BMPs. More significant modifications to SWMP activities occur every five years, in conjunction with their permit renewal application and updated permit requirements.
The city's adaptive management approach (submitted November 1, 2012) maintains consistency with the city's historical approach for implementing adaptive management principles.

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

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

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

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

During this reporting year, the City conducted a significant update to their SWMP for submittal to DEQ on December 1, 2022, as required by the permit. The SWMP review and update process was similar to a five-year review as summarized above, and also included any updates necessary to meet any new permit requirements.

2.2 SWMP Updates for the 2021-2022 Reporting Year

The 2021-2022 reporting year is the tenth full permit year in which the city's effective SWMP (dated 2012) has been implemented. The 2021-2022 reporting year experienced unusual circumstances with the surge of the COVID-19 virus. Restrictions set by the governor, recommendations from health organizations, and staff changes impeded some work pertaining to the MS4 permit.

For the 2021-2022 permit year, no major updates were made to the 2012 SWMP or BMP measurable goals and tracking measures due to regulatory limitations prohibiting modifications to the SWMP while in administrative extension. Modifications were submitted to DEQ February 27, 2017, however, have not been implemented due to reissuance of permit still pending.

3.0 Summary of Program Expenditures

Stormwater program expenditures are funded from stormwater utility fees collected. The stormwater utility fee for single family and duplex residential customers is $29.47 monthly, which was established in June 2022. Low-income customers pay 50% of the utility fee ($14.37). The commercial properties are charged based on the total amount of measured impervious surface divided by one EDU (2,706 sq. ft.).

Forecasted (non-audited) expenditures for 2021–2022 and 2022–2023 are listed below.

Table 2: Forecasted (Non-Audited) Expenditures for 2021-2022 and 2022-2023

2021-2022		**2022-2023**	
Personnel Services /8.0 FTEs	767,000	Personnel Services / 8.0 FTEs	829,000
Materials and Services	841,000	Materials and Services	790,000
Capital Outlay	1,099,000	Capital Outlay	4,028,000
Transfers	1,420,000	Transfers	1,405,000
Total	**$4,127,000**	**Total**	**$7,052,000**

4.0 Monitoring Data

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

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

In conjunction with requirements of the 2012 reissued MS4 NPDES permit, the 2007/2008 CCCSMP was reviewed for consistency with revised monitoring objectives. Monitoring locations and frequencies were adjusted to reflect requirements of the 2012 Permit. Additional efforts related to mercury monitoring, pesticide monitoring, macroinvertebrate (biologic) monitoring, and geomorphic monitoring were added to the CCCSMP. Detailed information related to use of the time-composite sampling technique was added as an appendix. Additional information such as quality assurance procedures were also added in conjunction with Schedule B.2 of the 2012 Permit. The updated (2012) CCCSMP was submitted to DEQ in September 2012. Comments from DEQ were received in October 2012, and final revisions to the 2012 CCCSMP were submitted to DEQ June 30, 2013.

Adaptive management changes were made to improve the CCCSMP at the end of the 5-year implementation period for the 2012 permit. An updated CCCSMP was submitted to DEQ in December 2016 and implemented beginning July 1, 2017. For this reporting year (2021-2022), the 2017 CCCSMP was the effective, implemented monitoring plan for the City of Milwaukie.

As described in the CCCSMP, the MS4 NPDES stormwater monitoring program requires two components. The first component is program monitoring, which involves the tracking and assessment of programmatic activities, as described in the individual permittees SWMP, through the use of performance indicators or metrics. Results of the program monitoring are reported in Appendix A as the annual tracking measures. The second component is environmental monitoring, which includes visual monitoring and the actual collection and analysis of samples. Visual monitoring efforts include dry weather field screening as described in the city's SWMP under the following BMP: "Implement the Illicit Discharge Elimination Program". Results of the visual monitoring efforts are reported in Appendix A under the applicable BMPs. Environmental monitoring also consists of instream sample collection and outfall sample collection, and the City's sampling efforts are outlined in more detail in Section 4.2 and 4.3 and in the CCCSMP.

Results of the instream and outfall sample collection efforts are provided in Appendix B and were submitted to DEQ online using DEQ's webportal for data submission.

4.2 CCCSMP Updates and Modifications for the 2021-2022 Reporting Year

New requirements related to stormwater monitoring were outlined in the City's reissued 2021 MS4 NPDES permit. As a result, participating Clackamas County co-permittees met regularly since the permit was issued to work on updates to the CCCSMP to meet new requirements including requirements for pesticide and mercury monitoring. Once a draft was completed, the City of Milwaukie posted the updated CCCSMP on our website for a 30-day public review period. No comments have been received to date and the city is submitting the updated plan to DEQ for approval on the same day this annual report is due (December 1, 2022). The 2017 CCCSMP will continue to be implemented until July 1, 2023 or when DEQ approves the new CCCSMP and provides an alternative implementation date.

4.3 Summary of Monitoring Data

In accordance with the 2017 CCCSMP, Milwaukie conducted instream and outfall monitoring. Continuous instream monitoring of Johnson Creek was also performed by USGS. The city conducted instream monitoring at one location (Minthorn Springs Creek at Harmony Road), a tributary to Kellogg Creek. While all the instream monitoring was conducted (2 storm events and 2 dry events), given workload issues associated with staff changes, the 2 dry weather instream monitoring events were delayed until past the end of the reporting period. As a result, data from these events will be reported in next year's annual report and two additional dry weather events will be conducted during this upcoming reporting year. Outfall monitoring was conducted at one stormwater outfall location during three storm events (Roswell Street prior to discharge in Johnson Creek).

Time composite grab samples are required at the instream monitoring location twice during the reporting year (during storm events over the wet weather season). Single grab samples are also required during two additional monitoring events (during the dry weather season) at the instream monitoring location. Time composite grab samples are required at the outfall monitoring location three times during the monitoring year.

Complete sampling results are summarized and included in Appendix B and were submitted to DEQ online. The sampling results presented have been formatted to simplify the data review process.

The City of Milwaukie completed the two Mercury monitoring events in 2013 as required by permit conditions and petitioned DEQ to request eliminating further Mercury monitoring in a letter sent to DEQ via email on January 30, 2015. The City of Milwaukie received confirmation of permission to eliminate Mercury monitoring from its environmental monitoring requirements in an email from Lisa Cox, Municipal Stormwater Coordinator at DEQ on April 16, 2015.

5.0 Overview of Planning and Land Use Changes, Urban Growth Boundary (UGB) Expansions and New Development Activities

5.1 Stormwater Planning, Land Use Changes, and UGB Expansions

The City of Milwaukie updated their Citywide Stormwater Master Plan during the 2012-2013 reporting year. The updated Master Plan includes an evaluation of flooding and capacity deficiencies and capital improvement project development and prioritization for water quality and water quantity control. As part of the master plan, an evaluation of UIC's requiring retrofit or decommissioning was also conducted. The updated Master Plan addresses requirements of the city's water quality retrofit assessment, due July 1, 2015. The Master Plan was approved by City Council in August 2013 and adopted January 2014. The city is planning on updating the Stormwater Master Plan in 2023.

During the 2021-2022 reporting year, Waverly Woods development zone change was finalized in March 2021 and Hillside Park was rezoned for its Planning Development in November 2021. On June 3, 2022, the new Moderate Density Residential (R-MD) zone took effect, which consolidated the R-10, R-7, and R-5 zones.

The City of Milwaukie is located entirely within the UGB. City expansion is planned for certain unincorporated areas of the city located within the UGB. Recent annexation efforts have focused on properties that lie within or near the Johnson Creek floodplain, especially those properties that have on-site sewage disposal systems. The city code requires hookup to public sewer upon annexation. The city annexed a total of five properties within the fiscal year 2021-2022.

5.2 Summary of Development Activities within the UGB

Current development activities mainly involve in-fill and redevelopment of existing properties ranging from single-family homes to larger commercial developments. The City of Milwaukie requires stormwater management for new and redevelopment activities exceeding 500 square feet of impervious surface in accordance with the City of Portland's Stormwater Management Manual. Stormwater management is considered early in the development process. Recent water quality facilities installed in the city include bioswales, rain gardens, and green street planter strips.

During the fiscal year 2021-2022, 172 private redevelopment projects submitted development applications. For all private redevelopment activities (both residential and commercial), a total of approximately 15,000 square feet of new/redeveloped right-of-way impervious area is associated. All permit review processes included review for requirements for stormwater treatment on site.

The private developments that triggered water quality requirements created 39,000 square feet of treatment area for commercial facilities and 71,000 square feet of treatment area for residential.

No Capital Improvement Projects (CIP) were completed during the FY 2021-2022. The city implemented two new CIP projects (42nd/ 43rd Ave. and Home/ Wood Ave.) during FY 2021-2022, all of which included stormwater quality improvements. These CIP projects included:

- 42nd/43rd Ave.- Installation of 220 tons of porous asphalt for a multi-use path on 43rd Avenue, 1,420 linear feet new storm pipe added, 2 storm manholes, 21 new inlets, and 1,420 square feet of vegetated stormwater facilities.

- Home/Wood – 250 linear feet of new storm pipe, 1 new drywell, 13 new inlets, and 4,316 square feet of vegetated stormwater planters.

6.0 Additional Activities

The following stormwater-related activities occurred within the city and are not currently documented in Appendix A. A description of activities is provided by applicable BMP.

Implement the Illicit Discharge Elimination Program

A total of six illicit discharges were reported to the Public Works Department during the 2021-2022 reporting year.

8/3/2021 - Staff notified of rock and sand stockpiled in front of 5474 SE Willow. The report given noted that the stockpile had been there for approximately two weeks. A notice was left on the front door with a 72-hour clean up notice. Environmental Services Coordinator followed up and no citation was given.

8/24/2021 - Public Works staff were notified by other staff of slurry along Main St. and Jefferson St. curb lines. Environmental Services Coordinator contacted employees of Beacon Oral & Maxillofacial Surgeons for more information. It was reported that the business was told by the city to not replace sidewalk panels or trees. After the business had a customer trip on the raised sidewalk, they decided to grind. The slurry was washed out into the street. The business hired River City to clean the curb line and downstream basin.

11/23/2021 - City staff notified Environmental Services Coordinator about dirt in a residential front yard getting into the road. Upon arriving at 10:30 am, the Environmental Services Coordinator and another staff spoke with the crew on site. The Environmental Services Coordinator required them to remove sediment from roadway without washing into the storm system and notified the crew that an erosion control permit was required. The crew notified the

owner of the requirements. An erosion control notice was left on site with a 24-hour response given.

12/30/2021 - City staff notified Environmental Services Coordinator about sheen going into catch basin at 2323 SE Clatsop. Upon arrival, the Environmental Services Coordinator found sheen entering basin and flowing into Johnson creek. ESC notified the business owner of Northwest Truck Repair and OERS. In addition, the Environmental Services Coordinator had a follow up conversation with DEQ. US Ecology was hired for additional cleanup measures. A later conversation with the business owner found there was gallon jug of oil, partially filled, in the back of his truck that tipped over and some spilled onto the gravel.

1/21/2022 - Code Enforcement Coordinator emailed the Erosion Control Coordinator pictures and a filed complaint about 11934 SE Beckman tracking mud onto the street. The Environmental Services Coordinator left a 72-hour notice on the front door to clean mud off streets without washing dirt into catch basin and to cease future tracking from property.

3/2/2022 - City staff notified the Environmental Services Coordinator of gravel pile in front of curb. The Environmental Services Coordinator talked with the owner at 10505 SE 23rd Avenue and gave a written notice to remove gravel from street within 72 hours. The owner followed up with the city on concern and for reason gravel was placed there. No citation given.

Conduct Annual Dry Weather Field Screening

Dry weather field screening for the 2021-22 reporting period occurred in August and early September 2021. 72 hours of no recorded rainfall had passed prior to the earliest inspection. No rain fell during the outfall inspection period.

All but one reading taken from samples collected from flows during inspections at outfalls were below pollutant parameter action levels. One outfall (#25225) had slightly higher than action levels for chlorine levels. High readings could be contributed to expired chlorine drops or a meter not calibrated properly.

Outfall #25273 8/24/2021 - Trace of flow present. No sample was collected for readings. Previous inspections have determined flow is piped under Oregon Liquor and Cannabis Commission warehouse, presumed to be groundwater. Video pipe inspection in 2013 revealed a 12 o'clock tap at 197.6' with no signs of discharge. Wet deposits were observed at several joints in pipe. At 358.5' a buried manhole was discovered, ending video pipe inspection.

Outfall #65003 8/18/2021 - Outfall fully submerged- upgradient manhole is backwatered by wetland. Did not measure stagnant water. Checked all basins within Marketplace- no signs of illicit discharges.

Outfall #65031 8/25/2021 - Small amount of flow from pipe; water appears clear. Not enough flow to sample this year. Video pipe inspection performed in 2013 revealed no illegal taps to storm line. Samples taken from discharge 8/30/2017 for: bacteria, nutrients, and metals. Conductivity has historically been measured high at this outfall with sample results being inconclusive as to the source of the high conductivity. The previous dye test at 12400 SE Freeman resulted in dye present in sanitary sewer, but no dye evident in the storm system. The city will continue to monitor this outfall and the adjacent area for possible causes of high conductivity.

Implement the Spill Response Program

A total of four spills were reported and/or responded to by the Milwaukie Public Works (PW) Department during the 2021-2022 reporting year:

11/9/2021 - Caller reported their neighbor set out a gallon of used motor oil for recycling and it wasn't picked up. A vehicle hit the container of oil and drug it into the road where it broke open in front of the caller's residence and spilled on the roadway. They covered the oil with kitty litter and called the city to complete the cleanup. City staff arrived on site to add absorbent material on top of the kitty litter and sweep up. The staff member called for a city street sweeper for additional help with removing material. Granular material was swept up and placed in a contractor garbage bag for disposal. No responsible party was found, and no citations were issued.

11/12/2021 - A spill occurred from a fire outside of Milwaukie city limits that resulted in a large container holding motor oil melting and releasing its approx. 250 gallons of oil to a storm drain. That storm drain leads directly to a tributary creek that ran into Kellogg Lake. A caller reported a lot of sheen observed from the pedestrian bridge near downtown Milwaukie.

12/20/2021 - City staff reported seeing sheen on Main St. in downtown Milwaukie to the Environmental Services Coordinator. The Environmental Services Coordinator found a puddle of oil type material in front of Wind Horse Cafe. There were drips of sheen down Main St. and another puddle near Adams St. Connector. The Environmental Services Coordinator cleaned puddles with absorbent material and called for sweeper operator to go over sheen on roadway. No responsible party found.

6/14/2022 - Garbage truck hauled away dumpster at 4691 SE Fieldcrest Drive and leaked some oily substance. Waste management had staff clean up the street.

Winter Maintenance Activities

The City of Milwaukie conducts minimal deicing activities. In the event of icy conditions, fine gravel, salt, and/or liquid deicer may be applied to public roadways and public walkways near public buildings. Following the icy weather conditions, roads are promptly swept to remove the residual fine gravel. The current winter weather response program is documented on the City of Milwaukie website. The city conducts annual inspections and training to ensure proper operation of the deicing chemical storage facility. During the 2021-2022 reporting year, there were a total of two de-icing events in the city.

12/14/2021 - A total of 75 gallons of 30% magnesium chloride solution was applied to 17,850.82 linear feet of roads throughout the Ardenwald, Historic Milwaukie, and Island Station neighborhoods.

2/24/2022 - A total of 100 gallons of 30% magnesium chloride solution was applied to 15,825.24 linear feet of roads throughout the Ardenwald, Historic Milwaukie, Lake Road, and Island Station neighborhoods.

Appendix A

Milwaukie SWMP
Implementation Status

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Appendix A. Status of Implementing Components of Milwaukie's 2012 SWMP for FY 2021-2022

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 currently.

2012 Best Management Practice or Activity	Addresses Bacteria?	Addresses Mercury?	Addresses DDT/Dieldrin? (via sediment management) (*addressed Note #2*)	Responsible Department	Measurable Goals (2012 SWMP)	Tracking Measures (2012)	Annual Report Information: Tracking Measure Status, Permit Year 2021-2022	Additional Detail Related to Activities Conducted
Element #1 Illicit Discharge Detection and Elimination								
Implement the Illicit Discharge Elimination Program	●	●	●	City of Milwaukie Public Works Department	• Document and implement the details of the city's IDDE program in a Standard Operating Procedures manual by November 1, 2012. • For identified illicit discharges, conduct appropriate actions to remove the discharge in conjunction with time frames outlined in the city's MS4 NPDES Permit and procedures documented in the city's IDDE SOP. • Track and record all identified illicit discharges and how such discharges were removed.	(1) Track the status of completing the IDDE SOP manual. (2) Track the number, location, resolution and enforcement activities related to any identified illicit discharge.	(1) The City of Milwaukie developed an IDDE SOP (effective date: November 1, 2012). The SOP includes guidelines for identification and enforcement of illicit discharges and pollutant parameter action levels and guidelines for tracking activities and follow-up procedures. This SOP was revised and updated on July 17, 2013, in preparation of an anticipated EPA audit. (2) Six illicit discharges were reported or responded to by Milwaukie Public Works staff during the reporting year. A description of the illicit connections and enforcement resolutions is described in Section 6.0.	See Section 6.0 for additional detail.
Conduct Annual Dry Weather Field Screening	○	○	○	City of Milwaukie Public Works Department	• Conduct annual dry-weather illicit discharge inspections for all priority outfalls. • Conduct investigations on all suspected non-permissible discharges. • Develop pollutant parameter action levels to assist in the identification of non-permissible discharges by November 1, 2012. • Annually maintain a map of dry weather screening priority locations (i.e., priority outfalls).	(1) Track the number and location of high priority outfalls inspected during dry weather illicit discharge inspection activities. (2) Summarize inspection results and indicate outfalls requiring sampling and/or investigations. (3) Indicate the outcome and resolution of any investigation activities conducted.	(1) 25 outfalls were inspected as part of the annual dry weather field screening activities (conducted August 18- September 4, 2021). (2) and (3) One outfall historically having high bacteria levels had too low of flow for sampling. Previous attempts to locate the source were unsuccessful. The city will continue to consider options to locate the source. 17 outfalls had flows, ranging from trace amounts to steady flows or ponded, of unknown origin and were investigated. Results of the three dry weather field screenings outfalls with unknown flows are documented in Section 6.0. Multiple tv camera inspections and crew time have been spent trying to determine unknown sources of flow. No cross connections have been found. All sources, at this point, appear to be groundwater derived.	See Section 6.0 for additional detail.
Implement the Spill Response Program	○	○	○	Clackamas Fire District #1 (Hazardous Materials Team) and Milwaukie Public Works Department	• Respond to all reported non-hazardous material spills. • Equip all Public Works vehicles with spill response equipment, the Spill and Illicit Discharge Investigation Form, and spill response procedures continuously during the permit term.	(1) Indicate the number of spills reported to the Public Works Department. (2) Indicate the number of spills responded to by the Public Works Department. (3) Indicate sources, causes, and resulting types of discharges resulting from spill activities.	(1) The City of Milwaukie Public works department received calls for four spills during reporting year 2021-2022. (2) There were four spills responded to by Public Works for the 2021-2022 reporting year.	See Section 6.0 for additional detail.

2012 Best Management Practice or Activity	Addresses Bacteria?	Addresses Mercury?	Addresses DDT/Dieldrin? (via sediment management) (*addressed Note #2*)	Responsible Department	Measurable Goals (2012 SWMP)	Tracking Measures (2012)	Annual Report Information: Tracking Measure Status, Permit Year 2021-2022	Additional Detail Related to Activities Conducted
Minimize Water Quality Impacts Related to Water Line Flushing				City of Milwaukie Public Works Department	• When chlorinated water is discharged to the city's stormwater distribution system, the city tests the chlorine residual at all entry points to the storm sewer for a maximum allowable concentration of 0.10 PPM. • Requirements for chlorination/DE chlorination are discussed at all pre-construction meetings and requirements are referenced in applicable contract documents.	(1) Chlorine test data is tracked in monitoring sampling logs and daily logs and data is kept on file at city.	(1) City of Milwaukie performed limited flushing in this period.	Chlorine test data and supporting documents are kept on file at the City of Milwaukie Public Works Johnson Creek facility. (1) City of Milwaukie performed limited flushing in this period.
Element #2 **Industrial and Commercial Facilities**								
Screen Existing and New Industrial Facilities	○	○	○	City of Milwaukie Public Works Department	• Review the business license inventory and new industrial development applications once during the permit term to identify additional facilities needing to obtain 1200-Z permits. If facilities are identified, DEQ and the facility will be notified within 30 days.	(1) Track the number of existing or new facilities subject to a stormwater industrial NPDES permit once during the permit term.	The City of Milwaukie Public Works Department continues to screen new Business Tax Receipts received from businesses locating within the city to assess for the possibility of discharging pollutants or to be subject to a NPDES Stormwater Permit. Per the city's measurable goals, review of the existing business tax receipt inventory will be conducted once over the permit term to determine whether any existing or new facilities would be subject to an industrial stormwater NPDES permit.	The new Business Tax Receipts reviewed during the 2021/2022 reporting year were for either small businesses, home based businesses, and/or not subject to an industrial stormwater permit. The City of Milwaukie performed screening of its business inventory in the spring of 2022. No new industrial facilities were identified as potentially meeting the criteria for an industrial stormwater 1200-Z permit from DEQ.
Conduct Industrial and Commercial Inspections	○	○	○	City of Milwaukie Public Works Department	• Inspect all facilities with 1200-Z permits two times per permit term. Inspect all commercial and industrial food service facilities required to install grease traps or grease interceptors in accordance with the city's FOG program at a minimum of semi-annually during the permit term. • Inspect any other high priority facilities if identified as potentially contributing a significant pollutant load. • Keep an inventory of all 1200-Z permitted industrial facilities within permit area and update it annually. • Require abatement measures for any industry found to be inappropriately discharging to the municipal stormwater system. • Develop an SOP for high priority facility inspections and implementation of strategies by July 1, 2013. • Develop an SOP for the FOG inspection program by July 1, 2013.	(1) Track the number of permitted (1200-Z) industrial facilities within the city. (2) Track the number of industrial and FOG inspections conducted. (3) Note any water quality concerns identified during inspections. (4) Report status and abatement measures required for any industry or food service facility found to be inappropriately discharging to the municipal stormwater system.	(1) The City of Milwaukie queried the active 1200-Z permits from DEQ in 2020. There are currently five active 1200-Z permit holders within the city's boundaries discharging to the City's MS4. (2) Per the city's measurable goals, the City of Milwaukie did inspect facilities with current 1200-Z Industrial Stormwater permits two times during the permit term. The city inspected the five 1200-Z permitted facilities for the second time within permit year 2016/2017. Additional inspection was completed in 2019. The city completed 231 Fats, Oils and Grease (FOG) work orders in 2021-2022 for grease trap or interceptor inspections for restaurants located in the city. (3)(4) No additional abatement measures required during this reporting year.	(1) There are currently five active 1200-Z permit holders within the city's boundaries discharging to the city's MS4. (2) The five active 1200-Z permit holders were last inspected during the months of May and June 2016 and another in November 2019, under the current extended permit using the updated inspection form and SOP that was developed for inspections of high priority facilities and FOG inspections by the City of Milwaukie on June 13, 2013.

2012 Best Management Practice or Activity	Addresses Bacteria?	Addresses Mercury?	Addresses DDT/Dieldrin? (via sediment management) (*addressed Note #2*)	Responsible Department	Measurable Goals (2012 SWMP)	Tracking Measures (2012)	Annual Report Information: Tracking Measure Status, Permit Year 2021-2022	Additional Detail Related to Activities Conducted
Element #3 Construction Site Runoff Control								
Implement Erosion Control for New and Redevelopment	●	●	●	City of Milwaukie Public Works and Engineering Departments	• Require structural and non-structural erosion and sediment control BMPs for all construction sites disturbing an area greater than 500 ft2. • Require sites disturbing over 500 ft2 to acquire an erosion control permit prior to issuing them a plumbing and electrical permit. • Conduct site plan reviews for applicable new and re-development to ensure compliance with the City's erosion control standards.	(1) Report any updates or modifications to the "Erosion Prevention and Sediment Control Planning and Design Manual (2008)". (2) Record the number of erosion control plan reviews completed and approved.	(1) During the 2021-2022 permit year, the Erosion Prevention and Sediment Control Planning and Design Manual was updated. (2) During the 2021-2022 reporting year, there were 23 erosion control plan reviews completed and approved.	
Provide Educational Information to Construction Site Operators	○	○	○	City of Milwaukie Public Works Department	• Coordinate with other jurisdictions to provide Erosion Control Certification programs at the Clackamas Community College. • Give discounts on erosion control permit fees to contractors participating in the Erosion Control Certification Program.	(1) Track the number of contractors receiving a discount on erosion control permit fees. (2) Track number of program sessions and refresher courses offered each year.	(1) During the 2021-2022 reporting year, no contractors applied for this discount. (2) Due to the lack of participation in the program, regional partners decided to not schedule program sessions and refresher courses.	
Conduct Erosion Control Inspections	●	●	●	City of Milwaukie Public Works Department	• Inspect all sites disturbing over 500 ft2 at least twice during construction activities. • Issue erosion control violations when ineffective erosion control is observed. • Issue stop work orders or fines if erosion control violations are not resolved. Timelines for corrections at construction sites are indicated on the inspection report given to the permit holder. Depending on the infraction, the timeline for correction could be 24, 48, 72 hrs. or other.	(1) Record the number of erosion control inspections conducted annually. (2) Report the number of written notices of non-compliance issued during inspections and the number of stop work orders issued annually.	(1) There was a total of 121 erosion control inspections conducted during the 2021-2022 reporting year. (2) There were four non-compliance notices issued and no stop work orders during the 2021-2022 reporting year.	

2012 Best Management Practice or Activity	Addresses Bacteria?	Addresses Mercury?	Addresses DDT/Dieldrin? (via sediment management) *(addressed Note #2)*	Responsible Department	Measurable Goals (2012 SWMP)	Tracking Measures (2012)	Annual Report Information: Tracking Measure Status, Permit Year 2021-2022	Additional Detail Related to Activities Conducted
Element #4 Education and Outreach								
Provide Public Education and Outreach Materials Regarding Stormwater Management	○	○	○	City of Milwaukie Public Works Department	• Promote public awareness of water quality issues through newsletters, brochures, and/or bill inserts. A minimum of one distribution of educational materials will be conducted annually. • Send an annual stormwater brochure to city residents. • Conduct annual catch basin stenciling.	(1) Track the number, types, and topics of public educational materials dispersed to the public annually. (2) Indicate any large-scale public educational campaigns initiated during a given year. (3) Track coordinated public outreach activities with local co-permittees. (4) Record the number of catch basins stenciled in a given year. (5) Record the number of storm manhole lids that have been retrofitted annually.	(1) Public awareness events and programs that are currently in place are: "Leaf Drop Program", Milwaukie Earth Day, Arbor Day. The city updated its public tree code as well. (1) The city's stormwater outreach person was unable to visit Milwaukie High School and Rowe Middle School as planned due to the Covid-19 lockdown. Staff will investigate options for creating online presentation content for schools in the upcoming year. (2) and (3) The City of Milwaukie is actively partnered with several other jurisdictions in the Regional Coalition for Clean Rivers and Streams. The Coalition has teamed with local news agency KPTV/FOX News for commercial spots educating the public on various topics related to stormwater health and how the public can help. KGW news interviewed the City's Urban Forester on its Urban Forest and Climate Action Goal. The city made a short video highlighting its Urban Forest and Natural Resources Departments and Climate Action goals. See Appendix D. (4) The City of Milwaukie conducted its 18th annual "Leaf Drop Program." The Leaf Drop program allows residents to dispose of their leaves five Saturdays each year, in the months of November and December, during heavy leaf season, at no charge to the residents. (4) During the fiscal year 2021-2022, stormwater crew members installed 159 medallions on storm catch basins for our public education. (4) During the fiscal year 2021-2022, stormwater crew members installed 99 thermoplastic labels at catch basins.	(1) The City of Milwaukie's public awareness programs are promoted on the city website and in the "Pilot" which is mailed to all city customers and residents. Programs promote healthy streams by keeping leaves out of the drains, and garbage from being dumped illegally. Pilot articles aim to educate on the topics of stream temperature, pesticide use, proper pool draining methods, and bacteria issues caused by animal feces. (1) The City of Milwaukie adopted its Urban Forest Management Plan in March 2019. Within the plan, is information on how both public and private properties can utilize trees for stormwater benefits. To gather public information, the city sent out an online survey in September 2018. In addition, the city added "Branch Out Milwaukie" tool to look at percentage of vegetated canopy in city specific areas. The city adopted a Climate Action Plan in October 2018 and began implementation of the actions within the plan in 2019. The Climate Action Plan contains many natural resource and land use actions and suggestions associated with additional stormwater benefits, including canopy expansion, inclusion of green infrastructure in development, reduction of paved and built surfaces, floodplain recovery, and more. City staff educate residents and businesses on the stormwater co-benefits on climate actions in public engagement opportunities. An update to MMC 16.32 was made in May 2022 to extend protections to privately owned trees on residential properties. Mailers were sent out to all residents for public comment.
Participate in a Public Education Effectiveness Evaluation	○	○	○	City of Milwaukie Public Works Department	• Coordinate with other local, Phase 1 jurisdictions in providing/compiling information regarding a public education effectiveness evaluation by July 1, 2015.	(1) Report on activities conducted annually.	(1) The ACWA Stormwater Committee initiated a coordinated effort to compile existing educational survey information and develop conclusions to inform how public education efforts result in behavioral change. A proposal was received from DHM Consulting. ACWA coordinated with DEQ to ensure that the study would meet DEQ's intended requirements. ACWA developed a cost share breakdown among interested Phase I and Phase II communities, and Milwaukie has agreed to participate in the effort. The City of Milwaukie completed the Public Education Effectiveness Evaluation permit requirement and submitted this report to DEQ via email 6/29/2015, following with mailing a paper copy to the Municipal Stormwater Coordinator. The coordinator acknowledged receipt of this report on 7/2/2015.	

2012 Best Management Practice or Activity	Addresses Bacteria?	Addresses Mercury?	Addresses DDT/Dieldrin? (via sediment management) (*addressed Note #2*)	Responsible Department	Measurable Goals (2012 SWMP)	Tracking Measures (2012)	Annual Report Information: Tracking Measure Status, Permit Year 2021-2022	Additional Detail Related to Activities Conducted
Conduct Annual Staff Training	○	○	○	City of Milwaukie Public Works and Engineering Departments	• Provide city storm crews with approximately 40 hours of stormwater related training per year. • Continue to train all public works operations and maintenance staff involved with stormwater activities. • Conduct regular stormwater staff meetings one to four times per year.	(1) Track the hours of stormwater related training provided to city Stormwater crews each year. (2) Track number and responsibilities of staff participating in training each year. (3) Track regular stormwater staff meetings.	(1) During reporting year 2021-2022, two members of the engineering department attended an online erosion control CESCL certification for approximately 12 hours total. 23 members of Public Works viewed the online city spill response training at .5 hours each for a total of 11.5 hours. Total training hours are approximately 23.5 hours. (2) The Stormwater department employs a total of 8.00 FTE. One half Stormwater Supervisor, one half Environmental Services Coordinator, one Lead Utility Technician, three Utility Technicians, one full-time sweeper operator, one Urban forester and one Natural Resources Technician 1. The duties include infrastructure maintenance, inspections, spill response, street sweeping, responding to flooding/citizen complaints, vehicle maintenance, training and education, administration and record keeping, assistance to the Engineering department, leaf pick up, rain garden and street tree maintenance, and erosion control plan review and inspections. (2) The Storm Department has paid for the training and materials for Tree Risk Assessment Qualification that the Urban Forester is required to have. The Stormwater Department paid for continuing education courses for the Natural Resource Technician and Urban Forester to maintain pesticide licenses. (2) The Stormwater department paid for training and materials for the Urban Forester to maintain certification as an arborist by the International Society of Arboriculture. The Urban Forester provides assessment of large trees damaged by storms or age, with the interest of keeping our large, beneficial trees for their stormwater benefits, and appropriate species and location for replacements if removal is warranted. (3) The Stormwater crew meets each morning for a minimum of 15 minutes to discuss stormwater issues, local projects and related issues and equipment needs for the day. They also discuss stormwater issues with the public.	
Element #5 Public Involvement and Participation								
Provide for Public Participation with Submittals				City of Milwaukie Public Works Department	• Provide a minimum 30-day public comment period for the updated SWMP elements and pollutant load reduction benchmarks prior to the permit renewal application deadline. • Provide a public comment period for the updated monitoring plan and annual reports prior to submittal to DEQ.	N/A	The City of Milwaukie posted the 2020-2021 annual report on the city website.	

2012 Best Management Practice or Activity	Addresses Bacteria?	Addresses Mercury?	Addresses DDT/Dieldrin? (via sediment management) (*addressed Note #2*)	Responsible Department	Measurable Goals (2012 SWMP)	Tracking Measures (2012)	Annual Report Information: Tracking Measure Status, Permit Year 2021-2022	Additional Detail Related to Activities Conducted
Participate in Intergovernmental Coordination Efforts	○	○	○	City of Milwaukie Public Works and Engineering Department	• Annually coordinate with other Clackamas County co-permittees regarding regional water quality efforts. • Annually participate with local agencies involved in water quality issues.	(1) Indicate groups, committees, and organizations with which the city is currently participating.	The City of Milwaukie is currently involved with the following groups and organizations: • Clackamas County NPDES MS4 Co-permittees. • Johnson Creek Watershed Council. • Oregon Association of Clean Water Agencies. • American Public Works Association. • Water Environment Federation. • ACWA Water Pollution Control Facility Permit Committee • Clean River Coalition • Friends of Trees • North Clackamas Watershed Council • Backyard Habitat Certification Program • Clackamas County Climate Utility Resiliency Group • Regional Habitat Connectivity Workgroup (Intertwine Alliance) • Connecting Canopies Workgroup	The City of Milwaukie has signed multiyear contracts with Backyard Habitat Certification Program, Johnson Creek Watershed Council, and North Clackamas Watershed Council for work related to plantings, including along stream banks. The Backyard Habitat Certification Program worked on 35 sites with a total of 321,414 sq. ft./7.38 acres. 20% of properties reached certification levels within the program. Johnson Creek Watershed Council worked on 7 tax lots with plant establishment, weed control and infill planting. They are also working with ODOT on an ODOT property within the City of Milwaukie along Johnson Creek. In total, 260 trees and 450 shrubs were planted in the City of Milwaukie during fiscal year (FY) 21-22. They anticipate much more planting happening in the coming year, as the larger properties that signed up late in FY 21-22 get planted this winter. North Clackamas Watershed Council worked on 13 sites, totaling 16.7 acres and 1,986 linear feet of streambank, and planted 250 trees and shrubs.

2012 Best Management Practice or Activity	Addresses Bacteria?	Addresses Mercury?	Addresses DDT/Dieldrin? (via sediment management) (*addressed Note #2*)	Responsible Department	Measurable Goals (2012 SWMP)	Tracking Measures (2012)	Annual Report Information: Tracking Measure Status, Permit Year 2021-2022	Additional Detail Related to Activities Conducted
Element #6 **Post-Construction Site Runoff**								
Implement Municipal Development Codes	●	●	●	City of Milwaukie Engineering Department	• Until completion of the city's review and possible update of their applicable code and development standards to meet provisions of the city's NPDES permit, continue to review all new and re-development plans for conformance with the city's Development Standards including design standards for water quality facilities. • By November 1, 2014, review and revise if necessary, the city's design storm and inspection and enforcement response procedures to be in accordance with permit requirements.	(1) Track the number of development applications reviewed and approved for compliance with the stormwater regulations. (2) Track status of the design storm reviews. Note: The number and type of water quality facilities constructed/implemented to address these requirements will be tracked and mapped under Element 8: BMP Private Water Quality Facility Maintenance Program.	(1) Development applications including drainage reports are routinely reviewed for proper compliance with stormwater regulations. The following applications were reviewed and approved during the 2021-2022 reporting year: • Commercial (New) = 1 • Commercial (Additions) = 0 • Residential (New) = 17 • Residential (Additions) = 1 • Right of Way (New) = 3 • Right of Way (Additions) = 0	Residential improvements do not trigger a Water Quality Facility Agreement. All residential improvements will follow the stormwater design manual adopted by the city. Commercial additions do require a Water Quality Facility Agreement if the addition increases any value or changes more than 500 square feet of impervious surface connected to the city storm system.
Element #7 **Pollution Prevention for Municipal Operations**								
Conduct Street Sweeping and Roadway Repair Activities	●	●	●	City of Milwaukie Public Works Department	• Sweep curbed streets once per month. • Sweep roads promptly after icy conditions recede to remove fine gravel used for de-icing. • Schedule and conduct routine road repair and maintenance as needed, during the dry-weather conditions if possible.	(1) Track the number of miles swept per year. (2) Track the volume of debris removed during sweeping activities.	(1) and (2) During fiscal year 2021-2022 our Streets maintenance department swept 1,257 miles of curbed streets and removed 1,237 cubic yards of debris.	
Minimize Water Quality Impacts Associated with Landscape Management Practices	○	○	○	City of Milwaukie Public Works Department and Clackamas County Parks Department	• Require all chemical applicators (both city employees and city contractors) to be licensed and certified. • Use the Portland Integrated Pest Management (IPM) Program as a guide for appropriate pesticide and fertilizer application procedures along roadways, within public rights-of-way, and around water quality facilities.	(1) Track any policy and/or procedural changes associated with pest management activities within the City. (2) Track current number of staff licensed and certified for chemical application.	(1) During the reporting year 2015-2016, the Stormwater Department changed its practice to only allow contractors and qualified staff to apply pesticides to undesired and invasive vegetation. During the 2021-2022 period 75 fluid ounces of glyphosate and 25 fluid ounces of triclopyr, and 2 gallons of phosphorous acid were applied to various parts of the city as needed. (2) The City of Milwaukie employs two staff persons licensed as Public Pesticide Applicators for invasive species management, tree care, and crack sealing. If the need arises, city staff can also hire a licensed and certified contractor.	For many years the Stormwater staff has conducted manual removal of vegetation at all detention ponds and rain gardens and will continue to do so. Chemical application is a last resort only if the potential of the chemical entering the stormwater system is removed. A total of 100 fluid ounces of herbicide and 2 gallons of fungicide were applied during the 2021-2022 period.

2012 Best Management Practice or Activity	Addresses Bacteria?	Addresses Mercury?	Addresses DDT/Dieldrin? (via sediment management) *(addressed Note #2)*	Responsible Department	Measurable Goals (2012 SWMP)	Tracking Measures (2012)	Annual Report Information: Tracking Measure Status, Permit Year 2021-2022	Additional Detail Related to Activities Conducted
Implement a Program to Reduce the Impact of Stormwater Runoff from Municipal Facilities	○	○	○	City of Milwaukie Public Works and Engineering Department	• Develop procedures for storage and disposal of street wastes in conjunction with operation of the covered, on-site Decant Facility. Such procedures shall be finalized by the beginning of the Decant Facility operation and implemented within 6 months thereafter.	N/A	The city completed construction of the Decant facility in July of 2012 and is continually working to enhance the facility operations for more sediment removal. The SOP for the facility was completed and the public works crews have been trained on the proper operation of the facility.	Public Works crews thoroughly understand the procedure for dumping and storing the sweeper and combo-machine materials. All material dumped in the facility is recorded daily. Electronic copies of the records are on file in the City of Milwaukie Public Works office.
Control Infiltration and Cross Connections to the Stormwater Conveyance System	●			City of Milwaukie Public Works and Engineering Department	• Investigate sanitary lines for damage every five to six years. • Inspect for cross-connections during annual dry weather outfall inspections and remove any discovered cross connections. • Review all new and re-development plans associated with new building permits for possible cross-connections; eliminate them upon discovery.	(1) Indicate whether any cross-connections were discovered during illicit discharge investigations and describe follow-up activities.	(1) Per results of the illicit discharge inspections, no cross connections were observed.	
Implement Master Plan Capital Improvement Projects for Stormwater Quality Improvement	●	●	●	City of Milwaukie Public Works and Engineering Department	• Annually contribute to the reserve fund for future CIP design and construction. • Review the CIP list and update as necessary each year.	(1) Track the number of CIP projects implemented each year and discuss the added benefit (water quality, habitat restoration, etc.) of each project. (2) Map the location and drainage area of CIPs. (3) Track the amount contributed to the CIP reserve fund each year. (4) Track changes to the CIP list.	(1) The city implemented two CIP projects (42nd/ 43rd Ave and Home/ Wood Ave) during FY 2021-2022, all of which included stormwater quality improvements. These CIP projects included installation of: 42nd/43rd - 220 tons of porous asphalt for a multi-use path on 43rd Avenue, 1,420 linear feet new storm pipe added, 2 storm manholes, 21 new inlets, and 1420 square feet of vegetated stormwater facility Home/Wood – 250 linear feet of new storm pipe, 1 drywell, 13 new inlets, and 4,316 square feet of vegetated stormwater planter (2) As CIPs are constructed, the city's Asset Manager Technician incorporates as-builts into the CityWorks system and city's GIS database for future mapping needs. (3) The amount contributed from the Stormwater Fund for Capital Outlay projects (CIPs) was 1,099,000 (4) The city completed their Stormwater Master Plan in August 2013, which included an updated CIP list.	See Section 3.0 and 5.0

2012 Best Management Practice or Activity	Addresses Bacteria?	Addresses Mercury?	Addresses DDT/Dieldrin? (via sediment management) (*addressed Note #2*)	Responsible Department	Measurable Goals (2012 SWMP)	Tracking Measures (2012)	Annual Report Information: Tracking Measure Status, Permit Year 2021-2022	Additional Detail Related to Activities Conducted
Element #8 Stormwater Management Facilities Operation and Maintenance								
Conduct Stormwater Conveyance System Cleaning and Maintenance	●	●	●	City of Milwaukie Public Works Department	• Inspect stormwater conveyance system components (i.e., manholes, culverts and ditches) every two years and perform maintenance based on inspection results. • Perform ditch maintenance activities through an IGA between Clackamas County and the city based on inspection results.	(1) Track percent of conveyance system inspected each year. (2) Estimate the volume of debris removed during conveyance system cleaning activities. (3) Track the conveyance system repair efforts conducted.	(1) The city Stormwater Division video inspected 440 storm mains and/or laterals for a total of 39,552 linear feet. 34.7% of the catch basins and 20% of the sedimentation manholes were cleaned and inspected during FY 2021-2022 (2) The following volumes of debris were removed during conveyance cleaning activities: • 7,788 linear feet of lines cleaned. • A total of 215 sediment manholes were inspected and then cleaned if needed for a total debris amount of 0.6 cubic yards of debris removed. (3) The following maintenance/ repairs were conducted during reporting year 2021-2022: • 101 new catch basins were installed. • 6,038 sq. ft. of new rain gardens •0 Storm main fixed. • 2 UIC raised. • 4 new drywells installed	
Conduct Catch Basin Cleaning and Maintenance	●	●	●	City of Milwaukie Public Works Department	• Clean 50% of public catch basins each year. • Schedule repair or replacement of catch basins based on inspection results.	(1) Track the percent of total public catch basins cleaned per year. (2) Track the volume of debris removed during cleaning activities.	(1) During the 2021-2022 reporting year 836 catch basins were cleaned which translates to 51% of the total public catch basins. (2) The following volume of debris was removed during catch basin cleaning activities: • Catch basins = 70 cubic yards.	
Private Water Quality Facility Maintenance Program	●	●	●	City of Milwaukie Public Works Department	• Develop procedures to guide the private facility maintenance program by July 1, 2013.	(1) Track the number of onsite private stormwater quality facility inspections conducted annually.	(1) The Water Quality Facility Maintenance Agreement Program was completed and implemented FY 2011–2012. The city did not conduct any private stormwater facility inspections for FY 21-22	The city participates in and promotes the regional Storm Drain Cleaning Assistance Program, (SCAP) incentivizing maintenance of storm drains on private property. During the 2021-2022 reporting year, 80 clients signed up for the program and 378 private storm drains were cleaned.
Public Structural Control Facility Cleaning and Maintenance	●	●	●	City of Milwaukie Public Works Department	• Inspect and maintain public water quality facilities annually.	(1) Track the percent of total structural facilities inspected and maintained each year. (2) Track the volume of debris removed during cleaning activities.	(1) and (2) During the 2021-2022 reporting year, all public water quality facilities were inspected and/or maintained. During the fiscal year 2021-2022, the Stormwater Division's Landscape Maintenance workers have maintained 115 rain gardens and 6 detention ponds. • 297 hours of rain garden and 17 hours of detention pond maintenance were completed. 174 trees were watered over 154 hours, using 9,525 gallons of water. 120 street trees were pruned in 66 hours for street sweeper access. Activities included weeding, debris removal, watering, pruning, tilling, and planting/transplanting. 58.6 cubic yards of debris were removed during maintenance.	

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Appendix B

Milwaukie Monitoring Data

Instream and Outfall Monitoring

Milwaukie collected three stormwater samples from one outfall during the wet season sampling period. Two in-stream samples were collected during wet weather conditions, but the city did not collect the two in-stream dry weather samples for 2021-2022 because of staff changes. Two dry season instream samples were collected in August and September 2022, so they will be included in the 2022-2023 annual report. The city will collect two additional in stream samples for 2022-2023 to make up for the missed samples in 2021-2022.

The Minthorn Springs Creek in-stream monitoring site is located at the box culvert at SE Harmony Road. The Roswell site is monitored at a point prior to flows being introduced to the Roswell Detention Pond & Wetland facility which offers further water quality treatment before discharging to Johnson Creek.

The City of Milwaukie did not monitor stormwater for Mercury in 2021-2022 as approved by DEQ. The City of Milwaukie was granted permission to eliminate Mercury monitoring from its sampling requirements in an email dated 4/16/2015 from Lisa Cox, DEQ Municipal Stormwater Coordinator.

Results are listed in Tables B-1 and B-2 below.

Table B-1 Environmental Monitoring Results—In-Stream
Minthorn Springs Creek at Harmony Road

Sample Date	Storm 11/04/2021	Storm 01/03/2022	Dry N/A	Dry N/A	Storm 2020/21 Mean	Storm 2021/22 Mean
Colilert (MPN/100ml)	2420	>2420	N/A	N/A	838.0*	N/A
Hardness (mg/L)	41.0	33.0	N/A	N/A	99.25	N/A
Nitrate-Nitrite (mg/L)	0.19	0.50	N/A	N/A	0.452	N/A
Orthophosphate (mg/L)	0.19	0.04	N/A	N/A	0.09425	N/A
Total Phosphate (mg/L)	0.31	0.11	N/A	N/A	0.185	N/A
Copper (µg/L)	5.6	4.13	N/A	N/A	0.006395	N/A
Dissolved Copper (µg/L)	2.7	1.27	N/A	N/A	0.004375	N/A
Lead (µg/L)	1.59	2.13	N/A	N/A	0.00078025	N/A
Dissolved Lead (µg/L)	0.24	0.052	N/A	N/A	0.00002025	N/A
Zinc (µg/L)	55.0	30.0	N/A	N/A	0.142325	N/A
Dissolved Zinc (µg/L)	30.0	12.9	N/A	N/A	0.08	N/A
TSS (mg/L)	22.0	20.0	N/A	N/A	18.125	N/A
Ammonia (mg/L)	0.022	.035	N/A	N/A	0.061*	N/A
Field Test						
Temperature (C)	13.0	12.5	N/A	N/A	14.675	N/A
pH	7.87	7.3	N/A	N/A	7.6525	N/A
DO (mg/l)	7.7	7.5	N/A	N/A	8.15	N/A
Conductivity (uS)	171.1	139.1	N/A	N/A	193.6	N/A
Rainfall (in.)	0.30	2.10	N/A	N/A	0.135	N/A

*= estimated mean calculated with a > or < value

Table B-2 Environmental Monitoring Results—Stormwater Outfall Roswell Outfall to Johnson Creek						
Sample Date	**11/04/2022**	**01/03/2022**	**03/01/2022**	**2020/21 Mean**	**2021/22 Mean**	**Trend from previous year**
Colilert (MPN/100ml)	2420	>2420	1000	1516.5	1946	↑
Hardness (mg/L)	19	9.0	12.3	25	13.4	↓
Nitrate-Nitrite (mg/L)	< 0.0625	0.26	0.12	0.3705	0.147	↓
Orthophosphate (mg/L)	0.23	<0.025	0.042	0.273	0.099	↓
Total Phosphate (mg/L)	0.36	0.14	0.118	0.375	0.206	↓
Copper (µg/L)	7.1	4.13	6.73	5.6595	5.98	↑
Dissolved Copper (µg/L)	4.1	1.27	2.99	3.5085	2.78	↓
Lead (µg/L)	2.21	2.13	2.41	0.675	2.25	↑
Dissolved Lead (µg/L)	0.25	0.052	0.123	0.042	0.141	↑
Zinc (µg/L)	41.0	30.0	40.2	329.024	37.0	↓
Dissolved Zinc (µg/L)	22.0	12.9	16.2	273.51	17.0	↓
TSS (mg/L)	18.0	20.0	18.0	17.5	18.6	↑
Ammonia (mg/L)	< 0.03	0.035	0.083	0.1465	0.14	↑
Field Test						
Temperature (C)	13.4	5.0	8.80	14.05	9.06	↓
pH	8.18	7.6	8.02	7.06	7.93	↑
DO (mg/l)	8.0	11.7	12.0	8.8	10.5	↑
Conductivity (uS)	174.4	310	172.3	75.3	218.7	↑
Rainfall (in.)	0.30	2.10	0.56	0.27	0.98	↑

Continuous Monitoring

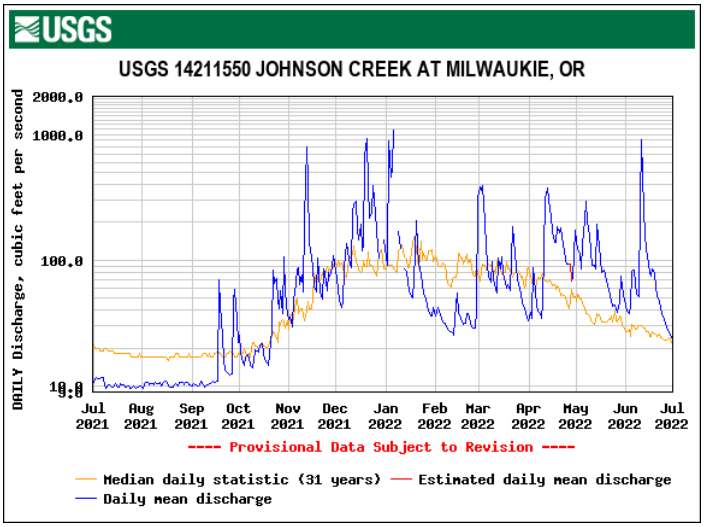
The City of Milwaukie continues to contract with the USGS for continuous hydrological monitoring of the Johnson Creek Basin at a cost of $11,800 per the 2021/2022 reporting year and the Joint Funding Agreement was renewed on 10/1/2022. Milwaukie is joined in this effort with the Cities of Gresham, and Portland, Multnomah and Clackamas Counties, and East Multnomah Soil and Water Conservation District. Continuous water quantity parameters- stream flow, gage height, and stream temperature are measured and recorded, with turbidity and suspended sediment monitoring occurring during USGS staff visits. Turbidity can be used as a surrogate for suspended sediment in the water which can be related to certain pesticides in the stream. Differences in turbidity between the upper basin (in Gresham) and this lower station may be related to land use. Further details for the data collected at this site can be found at:

https://waterdata.usgs.gov/nwis/dv?cb_00010=on&cb_00060=on&format=gif_stats&site_no=14211550&referred_module=sw&period=&begin_date=2020-07-28&end_date=2021-07-28

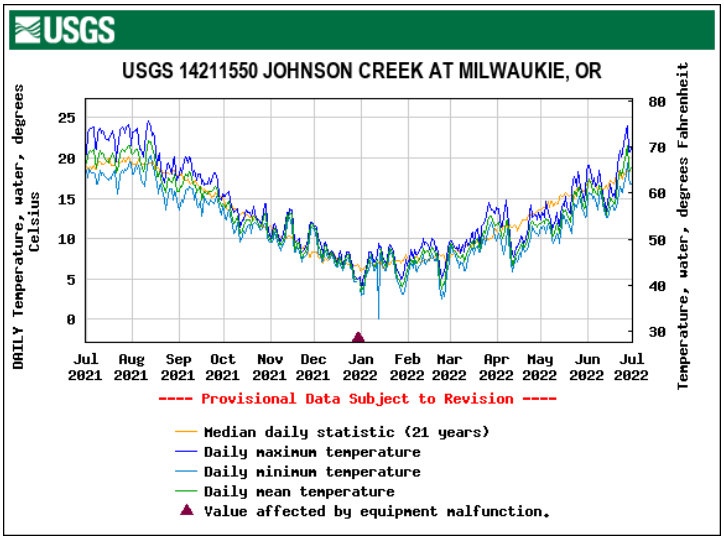
Continuous Monitoring Location information is as follows:

- USGS 14211550 Johnson Creek at Milwaukie, Oregon
- Location: Lat 45 degrees 27'11", Long 122 Degrees 38' 31", in NE ¼ SE ¼ SEC. 26, T. 1 S., R 1 E.
- Clackamas County, Hydrologic Unit 17090012, on the right bank upstream side of the Milport Rd. Bridge, in the city limits of Milwaukie, at mile 0.7.

Continuous flow monitoring data at USGS site #14211550 located on Johnson Creek at SE Milport Road in Milwaukie, Oregon.



Continuous temperature and discharge rate monitoring data at USGS site #14211550 located on Johnson Creek at SE Milport Road in Milwaukie, Oregon.



Appendix C

TMDL Implementation Plan
(TMDL Annual Report)

Management Strategies for
Nonpoint Source Pollution

Appendix C: TMDL Implementation Plan Annual Report
Nonpoint Source Pollution Management Strategies

Introduction

The City of Milwaukie (City) submitted its Willamette River Total Maximum Daily Load Implementation Plan (TMDL Plan) update drafts to the Oregon Department of Environmental Quality (DEQ) on August 18th, 2022. DEQ is currently in the process of approving the updated TMDL Plan**.**

The following section of the 2021-2022 Annual Report provides a summary of the City's efforts for the 2019 TMDL Plan.

Background

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

Management strategies for bacteria and mercury are summarized in the City's Municipal Separate Storm Sewer System (MS4) National Pollutant Discharge Elimination System (NPDES) stormwater permit and associated Stormwater Management Plan (SWMP). DEQ addresses TMDL requirements within the City's MS4 NPDES permit as they pertain to pollutants associated with point sources of stormwater runoff. The MS4 NPDES permit requires best management practices (BMPs) to be applied to address sources of pollution in stormwater runoff. For TMDL pollutant parameters, the MS4 NPDES permit also requires Milwaukie to develop pollutant load reduction benchmarks to show progress towards meeting TMDL wasteload allocations. Additionally, the MS4 NPDES permit requires an adaptive management approach that focuses on refining BMPs over time until wasteload allocations are achieved. The city was reissued their MS4 NPDES permit on September 15, 2021. The City's effective (2011) Stormwater Management Plan (SWMP) is effective until the 2022 SWMP Document is approved

by DEQ. The effective 2011 SWMP and the 2022 SWMP include BMPs that address TMDL point source pollutants.

Stormwater runoff in the Willamette Valley is not considered a problem with respect to temperature, and therefore, temperature is not a point source that is addressed under the City's MS4 NPDES permit. Management strategies for nonpoint sources of temperature were developed and identified in the TMDL Plan. Historically, riparian vegetation removal and channel modifications result in reduced baseflow, reduced stream shade, and increased instream temperatures. As part of the TMDL Plan, strategies to address temperature were identified.

Implementation Status

The City's MS4 NPDES permit and associated SWMP serves as the Willamette River TMDL Plan for bacteria and mercury. Progress towards implementing best management strategies (or BMPs) to address bacteria and mercury are summarized in the City's 2021-2022 MS4 NPDES Annual Report, submitted to DEQ by December 1, 2022. Additionally, the City conducts the following activities to specifically address bacteria:

- Provides bag stations at Milwaukie parks for picking up pet waste.
- Requires private systems to connect to the public system.
- Extends public collection systems to unincorporated areas northeast of the City.

Status related to these additional activities to address bacteria reduction are described in Section 5.1 of the City's 2021-2022 MS4 NPDES Annual Report.

The City sent both electronic and hard copies (11/22/2022) of the annual report to DEQ.

The City's progress towards implementing strategies to address temperature is summarized in Table C-1 of this technical memorandum. Such strategies include pursuing removal of the Kellogg Creek Dam and applying for grants to support shade preservation activities. Additionally, the City conducts public education and outreach activities and implementation of development standards that promote infiltration, both of which would be expected to improve temperature in receiving waters.

> On April 10, 2013, DEQ invited designated management agencies (DMAs) with TMDL obligations to a TMDL implementation workshop. The intent of the workshop was to: 1) provide background information and summarize TMDL implementation strategies conducted by select agencies, and 2) discuss the need for DEQ to conduct a 5-year look back on TMDL implementation this year (2013). At the time, the City of Milwaukie, along with other Clackamas County Phase I co-permittees, had only completed three years of TMDL implementation.
>
> Currently, the City's status with regards to implementing their TMDL Plan is documented in the submitted TMDL annual reports, and this annual report supplements the previously submitted information.

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Table C-1. TMDL Implementation Plan Management Strategies for Temperature Reduction				
BMP or Activity	Commitment/ Implementation Strategy	Measurable Goal(s)	Implementation Tracking/Performance Measure	City responses
Riparian Area Management	Promote preservation, restoration, and enhancement of riparian and instream habitat on public and private lands.	Continue to implement Milwaukie Municipal Code (MMC) Section 19.402 – Natural Resources and Comprehensive Plan Chapter 3 to address Title 3 and Title 13 requirements relative to designated water quality resource areas (including vegetated corridors) and habitat conservation areas (HCA) that may provide effective shade for surface waters.	• Annually track any changes to ordinances applicable to the MMC and Comprehensive Plan related to Title 3/ 13 compliance.	During the 2021-2022 year, the city made three updates to its city code and policies related to natural resources with relevance to, Metro Titles 3/13. These updates include: (1) an update to flood hazard regulations (March/April 2021), (2) adoption of a new Comprehensive Plan in August 2020 with additional policies on natural resources, climate and environmental quality, (3) the public tree code (MMC 16.32) was updated in November 2020 to expand protections of trees on city owned properties and (4)an update to MMC 16.32 was to extend protections to privately owned trees on residential properties effective May 2022.
		By November 1, 2014, review current development review processes with respect to development in a natural resource area. Refine the process to better track mitigation requirements and responsibilities.	• Annually track changes to development review processes.	There were changes to development review processes in the reporting year 2021-2022 due to the new private residential tree code and development tree code. Staff from stormwater and urban forestry engage developers to ensure compliance with stormwater regulations, tree code, and other natural resource requirements in and out of natural areas. There were a total of 23 development review meetings in 2021-2022.
		By November 1, 2015, initiate a desktop analysis/ GIS analysis to identify and prioritize riparian areas and vegetated stream buffers for vegetation enhancement. This effort may be conducted in conjunction with the hydromodification assessment requirement in the NPDES MS4 permit.	• Annually track efforts to map and prioritize shade opportunity areas. • As applicable, document planting activities on public properties.	The city engaged the GIS Coordinator to initiate an effort to track and prioritize shade opportunity areas. From year to year the city will look at infrared imagery and perform remote sensing techniques to classify vegetation to evaluate changes in vegetative concentrations in the vegetative buffer along streambanks. The City will review GIS data using vegetative spatial analysis annually and will further evaluate compiled data once per permit term to target shade opportunity areas. (*addressed Note #1, 3*) The city is expanding its urban forest by continuing to care for existing trees and promoting the plantings of more drought tolerant and climate adapted species. LiDAR data is continually used for determining regional canopy cover. In the 2021-2022 reporting year the city received 2019 canopy cover data from METRO for natural resource planning. The GIS analysis will be available in the 2022-2023 reporting year. The city is continuing to plant drought tolerant and evergreen tree species around Oak Street detention pond. Invasive species are being controlled and removed from the site. The city is restoring a site adjacent to Mt. Scott creek with native and drought resistant species to add vegetation, improving stream shading, erosion control and water quality. The property was previously a home in a floodplain along Rusk Rd. which was purchased and removed by FEMA with FEMA funding. The city started a one-acre habitat restoration and tree preservation project at Pennywood detention pond (Willow Place Natural Area). Over 2,500 lbs of English ivy was removed and 300 native trees/shrubs were planted in 2021/2022. Part of this work was accomplished through an Earth Day restoration event which included additional outreach and education for the 30+ participating community members.
				The city continues to utilize its Branch Out Milwaukie tool to perform a deeper analysis of the city's canopy cover on private and public property. This tool will help determine future planting sites as well as measuring current canopy coverage, including in relation to socio-economic backgrounds. Tree plantings in lower income and lower tree canopy neighborhoods are being prioritized.

Table C-1. TMDL Implementation Plan Management Strategies for Temperature Reduction				
BMP or Activity	Commitment/ Implementation Strategy	Measurable Goal(s)	Implementation Tracking/Performance Measure	City responses
				The city has also completed a pilot tree inventory which initiated the process of recording public tree locations, species, health, and site conditions. Results from this inventory will be used to perform initial assessments of public tree assets and the inventory creation process will help guide future inventory efforts. Staff have continued to add trees to the public tree inventory as they perform tree work. The pilot tree inventory and recorded tree asset information can be made available to DEQ upon request.
		During the desktop analysis to identify and prioritize riparian areas for vegetation enhancement, identify potential areas of cold water refugia and incorporate into the prioritization efforts.	N/A	In addition to the GIS/desktop analysis, the city discovered continuous temperature monitoring data from the USGS that indicates cold water refugia is potentially available for the Willamette River at the mouth of Johnson Creek. Please see Appendix 3-1 below. (*addressed Note #3)*
		Continue working with METRO to establish and implement drainage policies specific for Johnson Creek.	• Annually document coordination efforts with METRO.	The City of Milwaukie continues to coordinate with METRO on drainage policies within the City's boundaries.
		Partner with watershed councils (e.g., Johnson Creek Watershed Council)) 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.	The City of Milwaukie has a formal partnership with the Johnson Creek Watershed Council (JCWC) though a Memorandum of Agreement (MOA) and associated financial support. and Milwaukie staff participate in monthly Johnson Creek Inter-Jurisdictional Committee meetings. The City of Milwaukie has entered a 6-year MOA with JCWC group in July of 2020 and will be providing $7,500 per year to each. In 2020, Johnson Creek Watershed Council had an environmental consulting firm install 6 log jams in Johnson Creek between 17 Avenue and HWY 224 in Milwaukie to provide shade and resting areas for salmonid species. The project site is still being monitored. In addition, JCWC is applying for grants to complete a second large woody debris installation at the mouth of Johnson Creek in 2023/2024. The city has been a coordinating partner in this work due to the adjacent city-owned Milwaukie Bay Park and upcoming park renovations (design in process) which would include riparian habitat restorations. Johnson Creek Watershed Council's CreekCare program works with people who own or manage streamside property in the Johnson Creek Watershed, providing contract crews to control invasive plants and replace them with native trees and shrubs, to reduce stream temperatures through shading and to improve habitat for fish and wildlife. Within Milwaukie, Johnson Creek Watershed Council worked Creek Care program on 7 tax lots with plant establishment, weed control and infill planting. 260 trees and 450 shrubs were planted in the City of Milwaukie during the FY21-22 reporting year by JCWC. The city has also signed agreements with North Clackamas Watershed Council's Streamside Stewards Program though a $7,500 a year contract (for 6-years starting in 2020) to work with homeowners to remove invasive plants and replant with native vegetation to benefit stormwater and creek shading. North Clackamas Watershed Council worked on 17 sites through the Streamside Stewards Program, totaling 16.7 acres and 1,986 linear feet of streambank, and planted 250 trees and shrubs in this reporting year. In addition, the city has an ongoing contract with Portland Audubon Society and Columbia Land Trust to offer the Backyard Habitat Certification Program to introduce native, tree-friendly and waterwise landscaping to Milwaukie landscapes. The Backyard Habitat Program has performed

Table C-1. TMDL Implementation Plan Management Strategies for Temperature Reduction				
BMP or Activity	Commitment/ Implementation Strategy	Measurable Goal(s)	Implementation Tracking/Performance Measure	City responses
				work on 35 sites and a total of 7 properties have reached a certification level within the program this reporting year.
		Research incentive options (including a funding source) for riparian habitat restoration efforts on private property.	• As applicable, track efforts to develop incentives to improve riparian habitat on private property.	The City of Milwaukie continues to explore efforts for possible options for riparian habitat restoration on private property utilizing existing programs through JCWS Creek Care, NCWC Streamside Stewards and Backyard Habitat Certification Program for restoration efforts on private property through agreements funded by the City of Milwaukie.
Kellogg Creek Dam Removal	Continue efforts to remove Kellogg Creek Dam, return Kellogg Lake to a stream condition, and revegetate the affected area.	Continue coordinating with partners in pursuit of the Kellogg Creek Dam Removal project	• Annually track progress on the project.	The city signed a grant to assist North Clackamas Watershed Council with funding for a Kellogg Dam removal and impoundment restoration project focusing on alternative designs. A Technical Advisory Committee (TAC) consisting of city staff, state agencies, consultants, and non-profits was created in 2022 for the Kellogg Creek Restoration & Community Enhancement Project. Inter-Fluve was hired to conduct a conceptual site design and collect new data to compare with the 2011 studies by GSI Water Solutions. The conceptual site design is to be completed in Spring 2023.
Implement Stormwater Design Standards	Continue implementation and refinement of the City's stormwater design standards, which include provisions to prioritize use of infiltration-based stormwater treatment.	By November 1, 2014, review and update stormwater design standards to include additional guidance for stormwater treatment using infiltration practices.	• As applicable, document changes to stormwater design standards.	Milwaukie continues to use the City of Portland's 2016 stormwater manual. In addition, the City of Milwaukie adopted its Climate Action Plan on October 2, 2018. This plan discusses updating code and standards for stormwater benefits. Including updating the Stormwater Master Plan (2023), stormwater storage and filtration needs for future conditions and de-paving areas where possible.
Public Education for Temperature Management	Continue to provide articles regarding temperature related issues and shade preservation efforts in the City newsletter and direct mailings.	Distribute one article annually on temperature issues and management approaches. Promote regional programs targeted at improving habitat on private property. Continually distribute information regarding regional programs in City outlets.	• Annually track the number and content of temperature – related articles, commercials/ advertisements, or notices distributed to City residents.	The city has designated a space for stormwater-related articles in the city newsletter, which is mailed to all residents monthly. City staff contributed 4 urban forestry and 3 stormwater/restoration associated articles during the fiscal year 2021-2022 covering temperature and non-point source pollution issues. The city posted its Water Quality Report for 2021 and 2022 with tips to help conserve water. The City's Urban Forest Management Plan is available to the public and addresses benefits of trees and strategies to plant, protect and promote trees in Milwaukie. Key benefits referenced in the plan include the provision of shade for helping cool stream temperatures. The plan, educational materials, community resources and partner program information along with other tree-care materials are available online on the city website and in print at the city Community Development facility for resident use. City staff perform outreach at a variety of city events, including the local Farmer's Market, Earth Day event, and Arbor Day event.
Environmental Monitoring	Monitor temperature in surface waters to document status and evaluate trends with respect to water quality standards.	In conjunction with NPDES MS4 requirements, conduct time-weighted composite and grab sampling for temperature at required instream monitoring locations. To the extent that an intergovernmental agreement is maintained by all parties, continue participation with USGS on continuous monitoring efforts on Johnson Creek.	• As applicable, annually report any modification to existing temperature monitoring activities. • As applicable, annually confirm existing agreements and track new efforts to coordinate with other Clackamas co-permittees, existing cost-share partners, and the USGS to maintain the Johnson Creek USGS stream gauge.	There were no modifications to the existing temperature monitoring activities for the reporting year 2021-2022; temperature monitoring was conducted according to the City's MS4 Stormwater Monitoring Plan. The City of Milwaukie renewed the Joint Funding Agreement with USGS for continuous water quality monitoring on Johnson Creek for reporting year 2021-2022.

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Appendix D

Regional Coalition of Clean Rivers and Streams Annual Report

Regional Coalition for Clean Rivers and Streams

Fiscal Year 2021-2022 Annual Report

September 20, 2022

Prepared by:

enviroissues

FY 2021-22 Overview

The Regional Coalition for Clean Rivers and Streams (Coalition) continued its work – initiated in the late 1990s – of providing coordinated messaging about area water health and residential behaviors linked to stormwater pollution from across the Portland metropolitan region in Washington, Multnomah, and Clackamas counties. For many years, Clark County, WA was also a participant in the Coalition but due to staffing and resource constraints, are no longer a financial participant. However, the Coalition continues to collaborate voluntarily with the Southwest Stormwater Partners who work "on the other side of the river."

Population statistics for the tri-county Metro area are as follows: Washington County 600,372, Multnomah County, 815,428 and Clackamas County 421,401 (2020 Census). The Coalition continues its brand recognition efforts by consistently using the previously developed *The River Starts Here* creative concept in its various materials. Other Coalition activities in the 2021-22 fiscal year included sponsoring and promoting the Coalition and its messages at community events.

Coalition participants include:

- Clackamas Water Environment Services
- Clean Water Services
- City of Gladstone
- City of Gresham
- City of Lake Oswego
- City of Milwaukie
- City of Oregon City
- City of Portland, Bureau of Environmental Services
- City of Troutdale
- City of West Linn
- City of Wilsonville
- Oak Lodge Water Services
- Multnomah County

This report covers July 1, 2021 - June 30, 2022.

Background

As identified in the 2013 Strategic Plan, the Coalition continues its mission of collaborating across the Portland metropolitan region to improve watershed health by changing household behaviors, reducing polluted runoff and connecting people with their local waterways. Coalition members leverage their collective resources to conduct outreach to communities across the region with common stormwater information and messages. Coalition activities complement individual agency efforts to raise awareness of stormwater runoff and affect behavior change to prevent pollution and protect regional surface water quality. Coalition activities support commitments relative to state permits under the federal Clean Water Act (administered by the Oregon Department of Environmental Quality), including Total Maximum Daily

Load and National Pollution Discharge Elimination System Municipal Separate Storm Sewer System (MS4) programs, as well as compliance with the federal Endangered Species Act.

Participants in the Coalition represent agencies that serve diverse population sizes from very small (Troutdale) to very large (Clean Water Services). As such the ability to run programs specific to their community is limited by funding and staffing. The Coalition represents an efficient, effective method to combine stormwater outreach funds. Coalition members continue to provide funding for the collaborative work each fiscal year based on the size of the respective community. The group shares funds with Multnomah County acting as the fiscal agent to purchase associated consulting services, advertising, materials, and event sponsorships. By sharing resources, the group reaches many thousands of people in the region compared to what entities can typically achieve on their own.

The Coalition focuses on changing behaviors from residential sources linked to stormwater pollution prevention. Information and messages used by the Coalition are intended to reach those making purchasing and management decisions about yard care, pets and auto maintenance activities – some of the most likely sources of stormwater pollution from residents. Coalition activities address a range of surface water contaminants, including nutrients and toxins from fast-releasing synthetic fertilizers and pesticides applied to yards and lawns, pollutant loads from car washing soaps, metals and other toxics from vehicle maintenance (and unmaintained vehicles), *E. coli* from pet waste, turbidity, legacy pesticides, and mercury from eroded soils and other contaminants from illicit discharges.

Key Messages

The Coalition's key messages focus on raising awareness about pollution from stormwater runoff and motivating actions to protect surface water quality through action at the household level. The key messages are:

- Stormwater runoff goes directly to our local waterways without treatment. When it rains, pollutants from your home, car, and garden wash into our rivers and streams. Never dump anything into storm drains.
- Bacteria from uncollected dog waste washes into our rivers and streams. You can protect our water by picking up after your pets.
- Yard and garden products wash into our rivers and streams. You can protect our water by eliminating these products or using compost and slow-release fertilizer.
- Motor oil, solvents, and soaps wash into our rivers and streams. You can protect our water by keeping car-care chemicals out of storm drains, diverting wash water onto your landscaping, and going to a car wash.

FY 2021-22 Activities and Results

Activities during the reporting period focused on continuing to implement the Coalition's strategic plan with messaging and outreach using *The River Starts Here* creative concept, developed in FY 2014-15.

Strategic Plan Implementation

A strategic plan, adopted in 2013, continued to guide Coalition efforts during the fiscal year. The Coalition acted on strategic plan goals as summarized below:

Goal 1: Maintain a functioning Coalition

Each year, Coalition members prepare an updated cost-sharing approach and budget, which was implemented in 2020-21. Members of the Coalition share their knowledge with the broader regulated communities in Oregon via the Association of Clean Water Agencies (ACWA). Members have presented strategies on prioritizing public behaviors to maximize pollutant reduction success and on a water pollutant risk assessment database at the past two spring ACWA conferences.

Goal 2: Develop and adapt creative products to fulfill the Coalition's mission

The Coalition continued to use collateral materials developed with *The River Starts Here* creative concept through social media outreach and digital advertising, including messaging and news for the 2022 Student Video Contest. Partners continued to message on individual social media channels as well as the Regional Coalition for Clean Rivers and Streams.

Goal 3: Practice adaptive management

The Coalition is committed to leveraging available resources to maximize impact while setting the stage for future collaboration among agencies. Total member representation in the Coalition has increased in the past few years, bringing in more regional partners. During the beginning of the 2021-2022 fiscal year, the Coalition relied more on ongoing social media outreach as most in-person outreach opportunities were canceled or delayed due to the COVID-19 pandemic.

In spring 2021, the Coalition discussed the importance of acknowledging the intersectionality of the environmental and social justice movements. Independently, partner agencies had been in various stages of educating staff on the topics of diversity, equity, and inclusion. Partners committed together to think about practices that could be implemented that would result in more inclusivity for historically marginalized and underserved populations. This included opportunities to collaborate with community-based organizations and discussions about ways the Coalition can strengthen relationships with community partners. The partners agreed to broaden the content of their messages to include environmentally related social justice information and use their platform to amplify the voices of the Black, Indigenous, and People of Color (BIPOC) communities. Further, this resulted in the partners renaming a category within the Student Video Contest to, "Honoring Diverse Voices" to celebrate and recognize the impact, creativity, and contributions of BIPOC filmmakers.

The River Starts Here Messaging and Outreach

Community Events and Agency Collaboration

Summer 2021 still faced significant limitations on the number of in person events taking place; as such, few of the Coalition's agencies conducted physical outreach. However, the representatives of member agencies promoted the Student Video Contest, local watershed events, and Coalition messages throughout the fiscal year using Facebook, Instagram, YouTube, and Twitter.

Towards the spring and summer of 2022 digital outreach was used to promote in-person event opportunities with local watershed councils. Some of the events that received significant online engagement and in-person participation included the 10th Annual Soil School Event hosted by the West Multnomah Soil & Water Conservation District and Tualatin Soil and Water Conservation District, Greater Oregon City Watershed Council's Habitat Enhancement Event, a workshop with Clackamas River Basin Council, and a paddle trip with Tualatin Riverkeepers.

Student Video Contest

2021 Student Video Contest Winners:

- **Best BIPOC Filmmaker:** Grounding Waters with K by K (Kingston) Bonneau, Harriet Tubman Middle School
- **People's Choice Award:** Keep Our Rivers Clean by Shea Stephens, Grant High School
- **Clean Water Action Award for Leave No Trace:** Don't Litter Be Better by Liliana Jacobsen, Homeschool
- **Clean Water Action Award for Climate Change:** You, Doing Your Part by Maggie Sandberg, Summit Learning Charter School
- **Clean Water Action Award for Active Transportation:** Mindful Maintenance by Pauline Petersen, Lakeridge High School

The third annual Student Video Contest was launched in the Spring of 2022 with a deadline for video submission of April 24, 2022. 2022 Student Video Contest categories included People's Choice and Honoring Diverse Voices, in the following topics: Everyday Actions Add Up and Our Drinking Water/Don't Dump That. The 2022 winners and statistics will be reported in the 2023 annual report.

This Honoring Diverse Voices category was added to amplify the crucial perspectives and contributions of our Black, Indigenous, and People of Color (BIPOC) students in creating a more equitable and sustainable future. Despite extensive outreach directly to schools, community groups that serve youth, partnerships with watershed councils, and advertising on Instagram, Facebook, and Snapchat, the entries were significantly down from the previous two years to only three entries, which were uploaded to the Coalition's YouTube site. Coalition partners such as the City of Portland and Clean Water Services shared

on their individual social media accounts to promote the People's Choice voting for youth in their service area schools. Video submissions were viewed over 776 times and received 64 likes and 15 comments. Commenters shared their enthusiasm for these creative videos, and the winners were announced in June 2022.

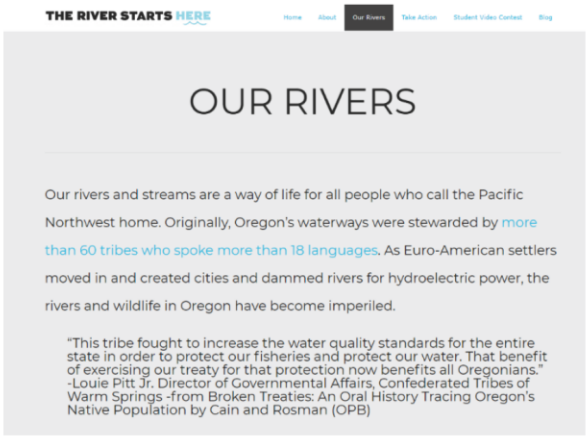
The next step for the Coalition is contracting with Outside the Frame, a nonprofit video firm that provides opportunities for underprivileged youth to gain skills to pursue work and careers in video production. Through this contract, fifteen of the best videos from all contests will be edited with River Starts Here branding and edited to create public call-to-action videos. These videos will also be available with subtitles and closed captioning in Spanish and Russian. These videos will then be used in the River Starts Here future social media digital advertising campaign.

"Great job of communicating a lot of useful information in an engaging way. Bravo!"
– Jumping Into Cool Water

"I love that this puts responsibility and action into the average person's hands and gives them a place to go to learn more!" – Madison Bryan

Website: TheRiverStartsHere.org

TheRiverStartsHere.org launched in June 2015 featuring *The River Starts Here* creative assets. It features an image slider highlighting Coalition messages and includes links to member websites and additional web resources.



Summary website analytics for the fiscal year are shown below. Statistics in parenthesis are the difference between last year's and this year's data. Positive changes are shown in green, negative changes are shown in red, and inconsequential changes are shown in lavender. New data points are presented in black.

Total sessions: 5,568 (▼2,288)

- **Users:** 4,533 (▼1,322)
- **Traffic type**
  - Direct: 2,193
  - Social: 868
  - Organic (search engine): 555
  - Referral: 439

The website has grown just a bit in visits each year, mostly due to the running of the Student Video Contest. That is a similar trend that was evident during the 2021-2022 fiscal year. The website had about 1,400 unique visitors from Oregon and about 800 visitors from Washington. As part of the RSH social media model, most of the posts advertised went directly to other websites such as registration for watershed council events, online resources, and partner websites. There were few posts that directed the public to the RSH website. The highest visited website pages were advertisements and information associated with the Student Video Contest and a page about how members of the public can safely get rid of moss. Due to the coalition's goal of reaching people where they are at and amplifying partner communications, website traffic is not a significant indicator of success.

The River Starts Here Blog

In December 2021, the Coalition began refreshing the website and updating the blog. The blog included cross links to partner webpages that supported student research to make a video entry submission.

Social media

The Coalition continued posting to its social media channels with the following types of content as emphasis: promotion of watershed council, soil and water conservation council and riverkeepers online or in person events, promotion of native plants for landscaping, promotion of good lawn and garden water protective techniques, promotion of the student video contest entry and voting for the people's choice, promotion of BIPOC events, opportunities, and nature organizations that focus on serving the BIPOC population, promotion of Native American tribal messages, videos, and public events/workshops, promotion of fall salmon migration watch, Earth Day events, World Water Day, the Nature of Oregon Day, and surface water drinking water protection from the Clackamas and Portland area Regional Water Providers.

The Coalition also leveraged its other campaign work by cross promoting the KPTV public service announcement campaign with Meteorologist Mark Nelson called "Clean Water, It's Our Future" and the statewide campaign launch of "Follow the Water –Connect the Drops" and "What's Your Lawn Style" as well as promoting the brand of the River Starts Here and its website via digital advertising buys.

Overall, the work was successful in reaching many audiences, although engagement and entry into the Student Video Contest was significantly lower than the previous two years.

Summary Table of Social Media Advertising Results

Facebook & IG Paid Ad Reach	96,192	Likes were up by 108%, IG followers added 146
Facebook Annual Reach (includes organic posts)	173,761 (up 15.5%) Total posts: 113	Total followers 1,978 (up 302)
Instagram Annual Reach (includes organic posts)	8,673	

Annual Reach of IG/FB Ads & Boosted Posts	101,421	Engagement (likes, shares, comments) 8,225

The Coalition's social media across platforms is majority women (see graphic below). In particular, Facebook and Twitter reach women between 35-54, whereas on Instagram, the majority categories are 25-54. Consistent with industry stats for social media, the Coalition is reaching an older population 55+ on Facebook as compared to Instagram, and is reaching more people under 25 on Instagram.

To increase the number of followers who interact with the Facebook page, account administrators invite individuals who like posts to follow the Facebook page, as management time allows. Statistics also show that more consumer engagement occurs in the morning before 9 a.m. and in the late afternoon and evening after 4 p.m. Therefore, scheduling posts or posting within these time frames is a best practice, when possible, especially with a short video. Continuing to add hashtags and tagging River Starts Here partners is also a best practice.

Social Media Age and Gender Demographics for Reporting Year

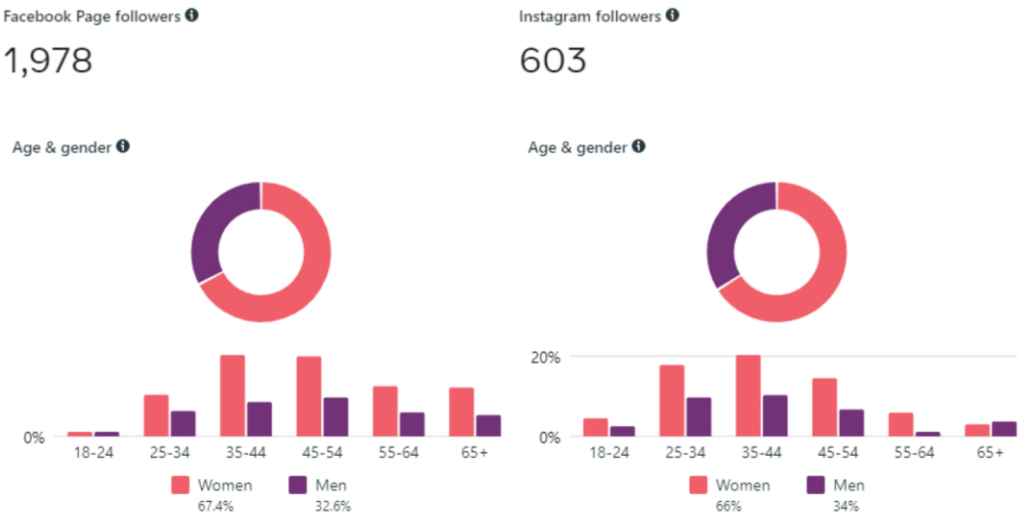


Table 1: Facebook followers by age range and gender. A large portion of the Coalition's Facebook audience is made up of women from age 35-54.

Facebook & Instagram ads, The River Starts Here

The Coalition continued to use low-cost social media advertising as part of its campaign in FY 2021-22. Continuing to focus on defined target audiences for messages (male v. female, age level for behavior, etc.) as well as targeting by ZIP code is a primary strategy. Most advertising was on Facebook. Increasing the consistency and number of paid ads and boosted posts would be influential in gaining more reach from Facebook users.

Top Performing Ads, Boosts, & Posts during FY 21-22

Topic	Engagement	Reach
Black History Month: J. Drew Lanham	1,054	9,146
Black History Month: Estella Ehelebe	2,091	11,543
Black History Month: People of Color Outdoors	30	70
Black History Month: Blueprint Foundation	398	8,264
Water IQ	516	6,085
Salmon Water Conservation Curriculum for Teachers	173	3,071
Black History Month: Chad Brown	171	3,279
Follow the Water	26	10,980
Greater Oregon City Watershed Habitat Cleanup	444	6,518
Forest Park Conservancy/Love is King MLK day Event	110	7,042
Student Video Contest Ad	16	4,315
Earth Day Events	32	270
Student Video Contest	1	4,225
Student Video Contest Winners	200	368
Spring Lawn Care—What's Your Lawn Style	479	10,980
Organic Posts typical reach		~70

Engagement is an interaction such as a like, comment, or click thru. **Reach** is the number of individuals who saw or interacted with the post. **Cost per result** indicates how cost-efficiently you achieved the objectives you set in your ad campaign.

*Some ads also ran on Instagram.

Twitter, @riverstartshere

A summary of use during the fiscal year is as follows:

- **Followers:** 1,449 (▲8)
- **Tweets:** 11 (▼51)

The Coalition continued to utilize Twitter to primarily share posts and information about the Student Video Contest and reshare content from partners. Posts with images and content from affiliated groups received the most engagement. As a strategy, the Coalition can increase the number of tweets that are promoted and encourage partners to like and retweet content from The River Starts Here Twitter page.

Instagram, @theriverstartshere

A summary of Coalition Instagram account use during the fiscal year is as follows:

- **Followers:** 602 (▲238)
- **Posts:** 14 (▼17)

The Coalition's move in 2020-2021 to consolidate Instagram handles and grow its audience continues to have noticeable effects on the diversity of people reached in comparison to last year. The Coalition can continue to build a following from youth by utilizing the Instagram Reels and Stories, adapting current social media challenges to fit River Starts' mission, and promoting Tik Tok content, and short clips, while reaching an older population through Facebook. All things to consider given the Coalitions' members limited time to manage multiple types of posting, advertising, and content generation.

YouTube, The River Starts Here

A summary of the Coalition YouTube account during the fiscal year is as follows:

- **Subscribers:** 170 (▲2)
- **Videos added:** 3 (▼38)
- **Watch time (hours):** 25 (▼107)
- **Views:** 2.1K (▼14.7K)
- **Impressions: ~17K**

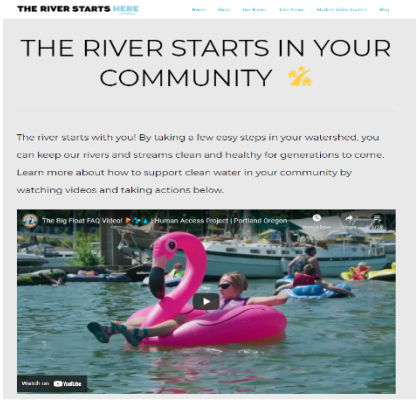
Since the 2019 inception of the Student Video Contest, entries have declined each year. The 2021 contest resulted in 234 video playlist views as a result of the People's Choice voting promotion. The most popular video across all playlists during the year was one of the 2021 contest winners "You, Doing Your Part" which has been seen 252 times.

FY 2021-22 EXPENDITURES

Category	Services	Investment
2022 Student Video Contest		
Participant awards		$1,500
Hollywood Theater	Honored Student Videos placement in the Portland EcoFilm Festival	$750
Advertisements		
Facebook & Instagram	Digital advertisements & Boosted posts	2, 179. 43
Snapchat	Student Video Contest Ads	$500
Coordination support		
EnviroIssues	Meeting support and member coordination, website maintenance, social media authoring	$19,998.00
	TOTAL	**$24,927.43**

OBSERVATIONS

The following observations are based on the results of FY 2021-22 activities and suggest additional direction the Coalition may take in its mission of educating the public about the impact of stormwater runoff pollution on the health of our rivers and streams.



The FY 2021-22 efforts consisted of the Coalition continuing to use digital advertising, contracting with EnviroIssues to assist with continued social media posts, meeting coordination and data analytics, and maintaining a YouTube page and blog.

While the Coalition's social media audience and its engagement grew slightly during the fiscal year, outreach for the Student Video Contest through schools continued to be challenging. The community capacity of schools, teachers, and students to become involved during the ongoing COVID-19 pandemic, with disruption and uncertainty for our education system, was severely impacted.

Based on feedback from partners, community members, and students, the River Starts Here team is exploring alternative ways to inform and engage youth during FY 22-23. The team is having ongoing conversations about finding alternative educational opportunities to bring attention to the importance

of water preservation and protection such as an art contest, social media contest, photo challenge, or potential Tik Tok challenge, as a new variation of the video contest.

The Coalition plans to continue to consult with social media specialists at Regional Coalition of Clean Rivers and Streams member agencies, including staff at the Oak Lodge Water District and Clean Water Services. The Coalition will also invest time in building and maintaining relationships with community partners and organizations that work with youth and Black, Indigenous, and People of Color (BIPOC) communities through outreach events and partnership opportunities.

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Appendix E

Mercury Minimization Assessment

Mercury Minimization Assessment for the City of Milwaukie

A Total Maximum Daily Load (TMDL) is a calculation of the maximum amount of a pollutant that a waterbody can receive and still meet applicable water quality standards. TMDLs assign wasteload allocations (WLAs) to point sources of pollutants, and load allocations (LAs) to nonpoint sources of pollutants. The Oregon Department of Environmental Quality (DEQ) has the regulatory authority to implement TMDL programs in Oregon with responsibility for: 1) requiring and reviewing TMDL Implementation Plans for nonpoint sources; and, 2) incorporating TMDL related requirements for point sources in NPDES permits. Therefore, with respect to municipal stormwater discharges regulated under an NPDES MS4 permit, DEQ includes TMDL requirements directly within those permits.

As stated in DEQ's Permit Evaluation Report (PER) for the 2021 Clackamas Group NPDES MS4 Permit,

> "*DEQ has determined that implementation of the permit conditions, BMPs identified in the SWMP Document, and the adaptive management process will meet TMDL WLAs for municipal stormwater* (PER, pp 36)."

The City of Milwaukie's NPDES MS4 permit identifies applicable TMDLs and associated WLAs. Schedule D, *Special Conditions* of the permit lists specific conditions for addressing those TMDLs. These permit conditions include requirements to conduct a TMDL pollutant load reduction evaluation in comparison to assigned WLAs for stormwater, and to develop pollutant load reduction benchmarks targeting achievement of WLAs for specified TMDL pollutants over time. DEQ included TMDL requirements in the 2005, 2012, and the recently issued 2021 NPDES MS4 permits for Phase I permittees.

The City has complied with permit requirements to conduct pollutant load reduction evaluations and establish TMDL pollutant load reduction benchmarks. However, WLAs were not established for mercury until 2021 and, therefore, mercury was neither required nor included in the City's prior TMDL analyses.[1] The 2021 mercury TMDL includes a water quality management plan (WQMP) developed by DEQ, that outlines management strategies for both point and nonpoint sources of mercury. Specific management strategies for Phase I NPDES MS4 permittees are outlined in Section 13.3.2.2 of the revised TMDL (Appendix A) and were subsequently included in Schedule D.3.b of the Clackamas County Group NPDES MS4 permit. Per Schedule D.3.b, requirements specific for mercury are detailed below:

i. Develop and submit a mercury minimization assessment with the annual report due December 1, 2022, that documents the current actions, such as BMPs implemented, that reduce the amount of solids discharged into and from the permitted MS4 system (similar to the actions currently required in Schedule A). If the assessment indicates that mercury and sediment reducing BMPs

[1] Mercury was originally included in the 2006 Willamette River TMDL, but establishment of WLAs was deferred due to lack of data. On November 22, 2019, DEQ issued a revised Willamette River TMDL for mercury. The United States Environmental Protection Agency (EPA) disapproved DEQ's TMDL on December 30th, 2019 and the final TMDL was issued on February 4, 2021.

are fully incorporated into the SWMP Document, a report documenting the results as such is sufficient.

ii. *Continued implementation of the BMPs and other actions described in the mercury minimization assessment that are effective for mercury reduction, along with documentation of implementation in each subsequent annual report.*

iii. *An analysis of the effectiveness of the best management practices and any other actions taken and qualitative pollutant load reductions achieved in the MS4 Permit Renewal Application Package. Due to data limitations, mercury benchmarks are not applicable in the first permit cycle after the TMDL is finalized.*

iv. *Collection of paired total mercury and total suspended solids samples, as described in Schedule B.*

v. *Submittal of paired mercury and total suspended solids monitoring data in the appropriate DEQ data submission template. Given the lack of sufficient mercury data, pollutant load reduction evaluations, benchmarks, and waste load allocation attainment analyses for mercury will not be required in this permit cycle.*

The purpose of this Mercury Minimization Assessment, included with the City's 2022 MS4 Annual Compliance Report is to address the requirement outlined in bullet *i.* above.

Chapter 4 of EPA's 2021 *TMDL for Mercury in the Willamette Basin* includes summary information regarding mercury sources. Atmospheric deposition of mercury from global sources is presented as the dominant source of mercury in the Willamette River Basin. Additional sources identified include: nonpoint sources such as runoff from forestry and agricultural land management practices that can transport sediment and mercury to streams; background/anthropogenic sources that include mercury in groundwater due to local geology, and naturally occurring sediment-bound mercury that is eroded and transported to streams; and point sources such as municipal waste discharges, industrial discharges, suction dredge mining and stormwater. Mercury loads in urban stormwater are believed to be predominantly associated with atmospheric deposition and active erosion or transport of sediment that is carried in runoff to downstream water bodies. As a result, stormwater best management practices (BMPs) implemented by NPDES MS4 permittees are focused on reducing the discharge of sediment as the primary method to reduce discharges of mercury.

The prevention and reduction of sediment in runoff has been a focus of the City's stormwater management program since the first MS4 permit-required Stormwater Management Plan (SWMP) was developed in the early 1990's. The City uses an adaptive management approach to continually improve upon existing stormwater BMPs over time as new knowledge is gained regarding the effectiveness and efficiency of these practices. The City has submitted the results

of its adaptive management process as applicable in annual reports since the original SWMP became effective. The City has also conducted detailed quantitative and qualitative adaptive management analyses as part of each NPDES MS4 permit renewal. The City's 2022 MS4 Annual Compliance Report, due to DEQ on December 1, 2022, provides the latest summary of BMP implementation according to the pre-existing 2012 SWMP. A new SWMP that meets the conditions of the recently issued 2021 NPDES MS4 permit is also being submitted to DEQ for approval on December 1, 2022.

Based on the City's long-term ongoing adaptive management process, a review of the current/approved 2012 SWMP, and a comprehensive MS4 program evaluation and update as per the 2021 permit, we have determined that **effective sediment and mercury reducing BMPs are fully incorporated into the City's new/proposed 2022 SWMP Document**. BMP tables in the proposed SWMP (Sections 2.1 through 2.7) provide a cross-reference for each BMP to potential TMDL pollutants addressed, including total mercury (i.e., by way of addressing sediments). To meet the NPDES MS4 permit standard, these BMPs have been developed as part of an overall program to reduce pollutants to the maximum extent practicable (MEP).

In summary, the City's BMPs, or Stormwater Program Management Control Measures as termed in the 2022 SWMP, include the following major categories of BMPs and activities that prevent sediment and mercury in stormwater discharges:

- Public Education & Outreach (Section 2.1)
- Public Involvement & Participation (Section 2.2)
- Illicit Discharge Detection & Elimination (Section 2.3)
- Construction Site Runoff Control (Section 2.4)
- Post-Construction Site Runoff for New Development and Redevelopment (Section 2.5)
- Pollution Prevention and Good Housekeeping for Municipal Operations (Section 2.6)
- Industrial & Commercial Facilities (Section 2.7)

The 2022 SWMP includes detailed descriptions of each major MS4 strategy and associated BMPs, including measurable goals and tracking measures. As noted in the BMP tables, every strategy and nearly all program activities support the prevention and reduction of mercury and sediment.

Further, the city submitted an updated TMDL Implementation Plan in September, 2022 that addresses requirements of the 2021 *TMDL for Mercury in the Willamette Basin* for nonpoint sources of mercury in Milwaukie.

As a result of this Mercury Minimization Assessment, the city finds that sediment and mercury reducing BMPs are fully incorporated into the SWMP Document.