MS4
PERMIT RENEWAL APPLICATION

MS4 PERMIT RENEWAL APPLICATION PACKAGE

SUBMITTED BY

CLEAN WATER SERVICES

DECEMBER 2, 2020

Clean Water Services

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INTRODUCTION

Oregon DEQ issued a watershed-based NPDES waste discharge permit (Permit) to Clean Water Services (District), effective June 1, 2016. The Permit includes terms, conditions, and requirements applicable the District's Municipal Separate Storm Sewer System (MS4), file number 108014, EPA Reference Number ORS108014. Schedule D.12 of the Permit describes the required contents of the MS4 permit renewal application package, which must be submitted at least 180 days prior to permit expiration. This document includes material responsive to the Permit requirements, which are quoted below.

> 12. MS4 Renewal Application Package
> At least 180 days prior to permit expiration, the permittee must submit a permit renewal application package to support their proposed modifications to the stormwater management program for the renewed permit. One printed copy must be submitted to DEQ. An electronic copy must also be made available on the permittee's website and/or other similar method approved by DEQ. The application package must include an evaluation of the adequacy of the proposed storm water management program modifications in reducing pollutants in discharges from the MS4. The application package must contain:
>
> a. Proposed program modifications including the modification, addition or removal of BMPs incorporated into the SWMP, and associated measurable goals.
>
> b. The information and analysis necessary to support the DEQ's independent assessment that the permittee's proposed stormwater management program addresses the requirements of the new permit. The permittee must describe how the proposed management practices, control techniques, and other provisions to be implemented as part of the stormwater program were evaluated using a permittee-defined and standardized set of objective criteria relative to the following MEP general evaluation factors:
>
> i. Effectiveness - program elements effectively address stormwater pollutants.
> ii. Local Applicability-technically feasible considering local soils, geography, etc.
> iii. Program Resources - program elements are being implemented considering availability of resources and the permittee's stormwater management program priorities.
>
> c. An updated estimate of total annual stormwater pollutant loads for applicable TMDL pollutants or applicable surrogate parameters, and the following pollutant parameters: CBOD, chemical oxygen demand (COD), nitrate, total phosphorus, dissolved phosphorus, cadmium, copper, lead and zinc. The estimates must be accompanied by a description of the procedures for estimating pollutant loads and concentrations, including any modeling, data analysis and calculation methods.

d. A proposed monitoring program objectives matrix and proposed monitoring plan including the information required in Schedule B.15.b.iv for each proposed monitoring project/task.

e. A description of any service area expansions that are anticipated to occur during the following permit term and a finding as to whether or not the expansion is expected to result in a substantial increase in area, intensity or pollutant loads.

f. A fiscal evaluation summarizing program expenditures for the current permit cycle and projected program allocations for next permit cycle.

g. Updated MS4 maps, including the service boundary of the MS4, projected changes in land use and population densities, anticipated Urban Growth Boundary expansion or areas planned to be incorporated through land annexation, location of permittee-owned operations, facilities or properties with storm sewer systems, and the location of facilities issued an industrial NPDES permit that discharge to the MS4.

h. If applicable, the established TMDL pollutant load reduction benchmarks, as required in Schedule D.11.c.iv.

Schedule D.11.c.iv requires:

iv. Establishment of TMDL Pollutant Reduction Benchmarks: A TMDL pollutant reduction benchmark must be developed for each applicable TMDL parameter where existing BMP implementation is not achieving the applicable WLA. An updated TMDL pollutant reduction benchmark must be submitted with the permit renewal application at least 180 days prior to expiration of this permit, as follows:

A. The TMDL pollutant load reduction benchmark must reflect:
   1. Additional pollutant load reduction necessary to achieve the benchmark estimated for the current permit term, if not achieved per Schedule D.11.c.iii; and,
   2. The pollutant load reduction proposed to achieve additional progress towards the TMDL WLA during the next permit term.

B. The TMDL pollutant load reduction benchmark submittal must include the following:
   1. An explanation of the relationship between the TMDL wasteload allocations and the TMDL benchmark for each applicable TMDL parameter;
   2. A description of how SWMP implementation contributes to the overall reduction of the TMDL pollutants during the next permit term;
   3. Identification of additional or modified BMPs that will result in further reductions in the discharge of the applicable TMDL pollutants, including the rationale for proposing the BMPs; and,

4. An estimate of current pollutant loadings that reflect the implementation of the current BMPs and the BMPs proposed to be implemented during the next permit term.

PROPOSED PROGRAM MODIFICATIONS

Requirement:
a. Proposed program modifications including the modification, addition or removal of BMPs incorporated into the SWMP, and associated measurable goals.

Response: The District has a mature MS4 program that has been in place for more than 25 years. The program elements are well-developed and effective in reducing pollutants to the maximum extent practicable. As such, the District is not proposing major programmatic modifications to the current MS4 program with the permit renewal application.

As explained in more detail in the following section, the SWMP included with this renewal application is the SWMP that was implemented under the 2016 Permit, with a DEQ-approved modification to the Industrial and Commercial Facilities BMP, and adaptive management-based revisions that were submitted with the 2020 Stormwater Annual Report. Based on the permits issued to other Phase I MS4 permittees, the District anticipates a requirement to submit a new SWMP Document within 18 months after issuance of the new permit. That SWMP Document will address any new permit requirements, which are not known in detail at this time. The District intends that the SWMP provided with this renewal application will be the applicable SWMP until a new SWMP Document is developed and approved under the new permit.

The proposed SWMP and an annotated version are included as Attachment A and Attachment B, respectively, of this renewal application. The annotated version shows the revisions that were included in the 2020 Stormwater Annual Report.

STORMWATER MANAGEMENT PLAN ANALYSIS

Requirement
The application package must include an evaluation of the adequacy of the proposed stormwater management program modifications in reducing pollutants in discharges from the MS4.

b. The information and analysis necessary to support the DEQ's independent assessment that the permittee's proposed stormwater management program addresses the requirements of the new permit. The permittee must describe how the proposed management practices, control techniques, and other provisions to be implemented as part of the stormwater program were evaluated using a permittee defined and standardized set of objective criteria relative to the following MEP general evaluation factors:
   i. Effectiveness - program elements effectively address stormwater pollutants.
   ii. Local Applicability-technically feasible considering local soils, geography, etc.
   iii. Program Resources - program elements are being implemented considering availability of resources and the permittee's stormwater management program priorities.

Response
As noted in the preceding section, the District is not proposing to make any major programmatic modifications to the Stormwater Management Plan (SWMP) that the District is currently implementing. Based on an adaptive management review of the SWMP, the District determined that multiple, minor, non-programmatic revisions consisting of clarifications, corrections, and affirmation of completed items were necessary. In addition, revisions to the *Design & Construction Standards,* which prioritized LIDA throughout the District, and the lack of public/private partnership candidate projects, led the District to end the formal School LIDA and public/private partnership programs. (The District will still participate in such projects as opportunities arise.) These revisions were made to the SWMP by inclusion in the 2020 MS4 Annual Report, resulting in the proposed SWMP that is included with this renewal application. As described in the history below, the proposed SWMP builds on 25 years of experience by the District and its co-implementers developing, implementing, and adaptively managing programs to reduce the discharge of pollutants from the MS4 to the maximum extent practicable and otherwise comply with permit conditions. The District anticipates that it will be required to develop a new SWMP under the renewed permit, the exact terms of which are unknown at this time.

History
The District (then known as the Unified Sewerage Agency of Washington County (USA)) applied for its first MS4 permit in 1993, as a co-permittee with Washington County Department of Land Use and Transportation (DLUT) and the Oregon Department of Transportation (ODOT). The application included a proposed SWMP, which was developed through a comprehensive process involving multiple stakeholders and technical experts. The working groups identified local stormwater quality problems, identified 130 candidate BMPs to address the problems, evaluated and screened the BMPs, and selected a final set of 40 BMPs for inclusion in the SWMP. The BMPs addressed:

- maintenance of structural controls (mapping, maintenance practice review, private facilities inspection, public facility cleaning, and public education);

- discharges from new development and redevelopment (standards and procedures review, education of plan checkers);
- controls for streets (sweeping and road maintenance evaluation, prohibition of salt for de-icing, control leaking trucks);
- integration of flood management and water quality (retrofits, structural controls development, regional facility site identification);
- municipal waste facilities control;
- pesticides, herbicides and fertilizers control (encourage the use of native vegetation, review certification of applicators, evaluate practices on public lands);
- controls for open space and agricultural lands;
- elimination of illicit discharges (illicit connection program development, public education, illicit dumping program development, spill response, failing septic systems);
- industrial and waste disposal sites (education and technical guidance, oil/water separator inspection and maintenance, coordination with DEQ's industrial permit program);
- control pollutants from construction sites (continue and expand existing erosion control programs); and
- research and development.

DEQ issued an MS4 permit to USA, DLUT and ODOT as co-permittees on July 26, 1995, approving the submitted SWMP.

In 1999 ODOT applied for its own statewide MS4 permit and in June 2000 USA and Washington County DLUT submitted an application for renewal of the MS4 permit as co-permittees, including a revised SWMP. During the renewal process, the co-permittees re-evaluated the previous SWMP. Through that process, some BMPs were found to have been completed, others were deemed beyond the scope of the MS4, others were enhanced to ensure their effectiveness, and the SWMP was re-organized. The co-permittees operated under the administratively extended 1995 permit and the 1995 SWMP until DEQ issued a new permit to the District in February 2004. (Washington County DLUT was removed from the permit pursuant to an Intergovernmental Agreement with the District.) DEQ re-issued the permit in 2005, based on a Petition for Reconsideration, and designated the applicable SWMP as that submitted in June 2000.

The 2005 permit was a watershed-based permit that integrated the MS4 permit with the NPDES permits that applied to the District's four wastewater treatment plants. Pursuant to a requirement of the 2005 permit, the District submitted the Interim Evaluation Report (IER) in May 2006, which included a new proposed SWMP. The IER process involved consultants, District staff, city engineers, operation staff, and the public. As a result of the analysis, the existing BMPs were refined to better describe activities that were found to be practical and effective, and to better describe activities that were merged or grouped together to facilitate program tracking and management. New practices and procedures were added where it was determined that improvements could be made. The final 2006 SWMP included the following BMP categories with commitments, tracking measures, and performance measures:

- Erosion Control (inspector and developer training; update design manual; update Design & Construction Standards; conduct inspections)
- Illicit Discharges (graduated enforcement; incident tracking; interagency coordination; public education)

- Industrial and Commercial Facilities with 1200-Z Permits (staff training; 1200-Z report review; collaborate with DEQ on enforcement; review pollution control plans; survey and outreach to non-1200-Z facilities; certify "no-exposure" facilities; inspect oil/water separators)
- Operations and Maintenance (maintain vegetated public facilities; map system, coordinate O&M with co-implementers; repair facilities as needed; install new sumped catch basins and retrofit unsumped catch basins; meet goals for routine work set in IGAs)
- Public Involvement, Education and Outreach (encourage stream-side residents to adopt healthy watershed behaviors; support community groups; present River Ranger program in elementary schools; promote healthy stormwater behaviors at community events; use electronic and print media to educate on hazardous waste, yard debris, and garden chemicals; sponsor Eco-Logical business program; mark storm drains and distribute door hangers on proper disposal of waste and yard debris; conduct customer awareness and behavior surveys)
- Structural and Source Controls (continue implementing *Design & Construction Standards* (*D&C Stds.*); train private and public personnel on water quality facility design; review development plans for consistency with *D&C Stds*.; maintain GIS database on structural controls; inspect structural controls, revise private maintenance agreements to include conveyance; develop inspection template for private systems; identify private system owners; distribute materials on maintenance to private system owners; correct sanitary/storm cross connections; evaluate pretreatment design options; implement a retrofit program including outlets at water quality facilities, manholes, and catch basins, upgrade of detention facilities to provide treatment, and outfall pretreatment)
- Low Impact Development (LID) Practices (evaluate *D&C Stds.* for appropriateness of LID; identify and remove barriers to LID and revise *D&C Stds* to remove barriers and include LID design details; provide technical guidance and educational materials; participate in public/private partnerships to evaluate and implement LID; evaluate incentives)

As part of the 2008 renewal application, the District submitted a proposed SWMP. Given the short period of time since the in-depth assessment and revisions required for the IER, no significant programmatic changes were made in preparing the 2008 submittal. The SWMP was reviewed for permit compliance, revised to address issues raised in the EPA's 2007 MS4 Program Evaluation Guidance, and reviewed with respect to state-of-the-art practices in similar regional jurisdictions. The District incorporated these findings into the revised SWMP. The program descriptions for each BMP category were enhanced and measurable goals and tracking measures were established for key elements in collaboration with the co-implementers. The LID provisions were incorporated within the Structural and Source Control category. The resulting BMP categories were:

- Construction Site Stormwater (increased scope beyond erosion control; site planning procedures, site BMPs; inspection and enforcement procedures and training; training site operators)

- Operation and Maintenance (street sweeping, leaf pickup; catch basin cleaning; water quality manhole cleaning; line cleaning and TV inspection; facility maintenance; deicing materials, pesticide, herbicide and fertilizer pollutant reduction)
- Structural and Source Control Measures (new and redevelopment standards and plan review; training; Low Impact Development Approaches; private water quality facilities, including inventory, inspection and owner education; retrofit of outfalls, manholes and catch basins)
- Illicit and Non-Stormwater Discharges (minimizing impacts of non-prohibited non-stormwater discharges; addressing sanitary to storm cross connections; illegal dumping and accidental spills)
- Select Industrial and Commercial Facilities (District as DEQ agent for 1200-Z General Permit: identify facilities, review applications and stormwater pollution control plans, provide technical assistance, inspect facilities, review Discharge Monitoring Report, coordinate with DEQ on enforcement)
- Public Education and Outreach (pesticide, herbicide and fertilizer education; illicit discharge reporting; used oil and toxic materials; litter and yard debris; use of native plants; storm drain marking and door hangers on proper disposal of yard debris and toxics)

Although the 2008 proposed SWMP did not fundamentally change any programmatic aspects of the stormwater management program, it was a much improved document over the 2006 IER. Therefore, based on the District's and co-implementers' experience, through the adaptive management process, the District proposed changes to the SWMP in the 2008 MS4 Annual Report to reflect those proposed in the 2008 renewal application. Those changes included updated program element descriptions and new measurable goals and tracking measures. The District proposed further changes based on adaptive management in the 2009 MS4 Annual Report. Those changes improved the Construction Site Stormwater BMP (clarified inspection frequencies), the Operations and Maintenance BMP (clarified catch basin cleaning standards), and the Structural and Source Control BMP (clarified the scope of water quality facility requirements and provided for GIS-based facility inventory; clarified the LIDA tracking measure; added a private water quality facility tracking measure; clarified the scope of water quality facilities to be tracked, and clarified the tracking measures for retrofits). Additional minor revisions that clarified annual notice requirements for private water quality facility owners and clarified the storm line cleaning measurable goal were proposed in the 2010 MS4 Annual Report. The 2011 MS4 Annual Report corrected the storm line TV inspection standard.

In August 2013, the District submitted a revised SWMP to update the 2008 renewal application. To address changes made to the MS4 permit since submittal of the initial renewal application, the District developed subsequent discussion drafts of the SWMP, culminating in the 2015 submittal. In the permit issued effective June 1, 2016, DEQ identified the applicable SWMP as that submitted in August 2015 and subsequently updated on October 8, 2015 (2016 SWMP) and any subsequent changes made to the SWMP in accordance with the permit. (Although the permit was the subject of a Petition for Reconsideration, none of the issues in the Petition touched on the MS4 portions of the permit; the 2016 permit remained in effect, although DEQ granted the Petition.)

Since issuance of the 2016 permit, the District has been implementing the 2016 SWMP. On April 4, 2018, DEQ approved a requested modification of the SWMP, changing the inspection frequency for 1200-Z permitted facilities. Originally set at annual inspection of all facilities, the new approach bases the inspection frequency on the risk of discharge of pollutants, to make the frequency proportional to risk. To assess the risk for this purpose, the District considers the complexity of the facility, its compliance history, and history of benchmark exceedances. Regardless of risk, the District inspects all 1200-Z permitted facilities at least once during the permit term.

The District's adaptive management system specifies a permit-cycle review of the SWMP to determine whether the SWMP needs to be revised to continue to meet the MEP standard. In reviewing the 2016 SWMP, the District determined that, while no major programmatic changes were necessary in the SWMP, the document should be revised to reflect tasks accomplished during the permit term and to make necessary minor revisions. The District also decided to end the formal School LIDA and Public/Private Partnership programs. These programs were instituted when LIDA was a novel approach that required active promotion to encourage its use. The goal of these programs was to work toward implementing two LIDA facilities per year. With the recent changes to the *Design & Construction Standards*, LIDA is now a priority for new development (i.e., required unless infeasible), resulting in over 100 LIDA facilities installed every year. In addition, despite active outreach, there continues to be a lack of candidate public/private partnership projects. The District will continue to participate in such projects as opportunities arise. These changes to the SWMP were included in the 2020 MS4 Annual Report. None of the proposed changes substantially alters the nature or scope of the SWMP. It is the 2016 SWMP as modified in 2018 and 2020 that the District is proposing as the new SWMP with this permit renewal application. The proposed SWMP is included as Attachment A, along with an annotated version in Attachment B, showing changes made in the 2020 Annual Report submittal.

The proposed SWMP includes the following program elements:

- Illicit Discharge Detection and Elimination (dry weather field screening; outfall documentation and mapping; enforcement response; spill prevention and response; non-prohibited discharges; training)
- Industrial and Commercial Facilities (agent for DEQ 1200-Z permit; facility identification; facility inspection; complaint response; technical assistance)
- Construction Site Runoff Control (agent for DEQ 1200-C and CN permits; plan review, local permitting; inspection; enforcement; education; inspector training)
- Education and Outreach (implement public awareness campaigns using multiple media; support community groups and Eco-Logical Business certification; proper pesticide, herbicide and fertilizer education; private water quality facility maintenance education; ; employee training; effectiveness evaluation; illicit discharge reporting; proper disposal of oil, household hazardous waste, litter, yard debris and toxics; storm drain marking)
- Public Involvement and Participation (provide public opportunity to comment on SWMP, retrofit strategy, monitoring plan, annual reports, and *D&C Stds.*)
- Post-Construction Site Runoff and Retrofit Programs (implement *D&C Stds.* for water quality at development and redevelopment sites; implement *D&C Stds.* that prioritize low impact development; implement *D&C Stds.* that address runoff quantity and

hydromodification; implement a documented strategy to retrofit developed areas identified as impacting water quality and lacking in stormwater quality or flow controls; complete 75 catch basin retrofits per year; review and approve site development plan applications; inspect development and redevelopment sites for compliance with approved plans; track program activities)

- Pollution Prevention for Municipal Operations (minimize the discharge of pollutants from streets through street sweeping, fall leaf collection, and deicing management; implement an integrated pest management program to control the use of pesticides, herbicides and fertilizers on permittee and co-implementer operated properties, including training and program evaluation; use Storm Water Pollution Control Plans to reduce the impact of runoff from municipal maintenance yards)
- Stormwater Management Facilities Operation and Maintenance Activities (implement a strategy for long-term maintenance of District and co-implementer operated stormwater facilities, including mapping, inspection, maintenance, and program tracking, water quality manhole cleaning, catch basin cleaning, public water quality facility inspection and maintenance; inspect and maintain public proprietary system; implement a private water quality facility program including inventory, outreach and education, inspection, and enforcement)

Evaluation of Proposed SWMP

The proposed SWMP is the product of many years of investigation, analysis, experience, and adaptation. Since the first SWMP, the District has ensured that the SWMP describes a program that is effective at removing pollutants from stormwater discharges, is carefully crafted to be applicable to local conditions and needs, and reflects available program resources. In 2015, the District worked with other Oregon Phase I MS4 permittees to develop a set of objective criteria related to these three MEP general evaluation factors. While each permittee ultimately chose slightly different criteria, those used below provide a framework for evaluating the proposed SWMP. Evaluating the proposed SWMP using these criteria shows it meets the MEP general evaluation factors as follows:

Factor: Program effectiveness

- Criterion: The program includes a range of BMPs that encompass pollution prevention, source control, and treatment approaches.

  Evaluation: BMPs that use pollution prevention and source control approaches include:
  - Industrial and Commercial Facilities (facility inspections; technical assistance; review of Storm Water Pollution Control Plans, including spill prevention)
  - Construction Site Runoff Control (review, approval and enforcement of Erosion Prevention and Sediment Control Plans to prevent erosion and pollutant discharge; inspections as a means to ensure proper implementation of pollution prevention and source control measures)
  - Education and Outreach (public education programs to provide information on proper disposal of wastes and use of pesticides; elementary school education to raise awareness and change behaviors)

- Pollution Prevention for Municipal Operations (street sweeping and fall leaf collection implementation of Integrated Pest Management Program; implementation of Stormwater Pollution Control Plans at municipal yards)

BMPs that use (or support) treatment approaches:

- Industrial and commercial facilities (administration of 1200-Z permits, which require treatment by some dischargers)
- Construction Site Runoff Control (some BMPs may involve treatment)
- Post-Construction (implementation of *D&C Stds.* that require treatment of runoff from developed sites and retrofitting areas that lack stormwater treatment)
- Operations and Maintenance (maintain public stormwater treatment facilities)

- Criterion: The program includes BMPs that are technically feasible, effective, and implementable.

  Evaluation: The previous and proposed District SWMPs include Measurable Goals and Tracking Measures for multiple activities within elements of the SWMP. These Measurable Goals and Tracking Measures are designed to track program implementation. As required by the permit, the District annually reports the status of program implementation and progress on meeting the Measurable Goals. These annual reports have consistently shown (with minor exceptions) attainment of the measurable goals, confirming that the associated BMPs are technically feasible and implementable.

  One measure of MS4 program effectiveness is water quality of the receiving streams and the quality of stormwater discharges. The District conducted water quality assessments of the program's effectiveness with the 2017, 2018, and 2019 annual reports. The results are summarized below.

  For the 2017 Stormwater Annual Report, the District evaluated trends for monitoring data from seven Tualatin tributaries for copper, lead, zinc, and mercury and the trends for these data compared to the appropriate water quality criteria (expressed as toxic units). All of the statistically significant trends were decreasing, indicating improved water quality. The results of the trend analyses for copper indicated significant decreasing trends for the sample sites at Dairy, McKay, Rock, Beaverton, Gales, Chicken, and Fanno creeks. For copper chronic toxic unit data, significant decreasing trends were found for the sites at Gales, Dairy and Chicken creeks. For lead, significant decreasing trends were found for the sample sites at Gales, Dairy, McKay, Rock and Beaverton creeks. There were no statistically significant trends for lead chronic toxic units. The trend analyses for zinc indicated that there were significant decreasing trends for total recoverable zinc, dissolved zinc, and zinc chronic toxic units for the sample sites at Gales, Dairy and McKay creeks. There were no statistically significant trends found for total mercury or mercury chronic toxic units at any of the sample sites.

  The District analyzed data from stormwater discharges in the 2018 Stormwater Annual Report. Of 23 parameters analyzed at five land-use based sites (115 trends), only 10

showed statistically significant trends. While total dissolved solids decreased at the 39th Loop site and lead decreased at Maple Street, increasing trends were noted for zinc at 209th, copper at Paddington and 39th Loop, total suspended solids and nickel at Amberglen, and ammonia at Maple Street. The District also reported the results of pesticide monitoring of stormwater in the 2018 Stormwater Annual Report. Of six pesticides sampled at five stormwater discharges, only one (2,4-D at 0.17 µg/L at Maple Street) was detected above the method reporting limit.

In 2019, the District included in its Stormwater Annual Report an analysis of trends in metals concentrations in the tributaries over the previous ten years. Of the 51 statistically significant (and tentatively significant) trends identified, 35 were downward trends, indicating that pollutant concentrations are decreasing over time. Sixteen of those trends indicated increasing pollutant concentrations. Although statistically significant, these increasing trends do not indicate potential exceedances of water quality standards. Details may be found in the 2019 Stormwater Annual Report.

These evaluations do not indicate that water quality in the tributaries of the Tualatin is in general degrading and in many cases indicate that it is improving; the majority of trends show no statistical significance. This is particularly noteworthy given the pressure exerted by the population growth and development that occurred in the District during the permit term. Since 2016, the population of Washington County increased by 16,682 residents, or 2.8 percent. During the same period 3,014 acres were developed in the District resulting in more than 1,090 acres of additional or replaced impervious surface. The maintenance and improvement of water quality under these circumstances is evidence of the effectiveness of the District's MS4 program. Since the MS4 program described in the proposed SWMP is little changed from that in the current SWMP, it is reasonable to conclude that the BMPs in the proposed SWMP are technically feasible, effective, and implementable.

- Criterion: The program includes BMPs that target applicable 303(d) parameters, help achieve TMDL pollutant load reduction benchmarks, and support progress toward TMDL wasteload allocations.

  Evaluation: In November 2019, the District submitted a permit-required evaluation of whether, based on a review of 303(d) listed pollutants, stormwater discharges from the MS4 had a reasonable likelihood of causing or contributing to water quality degradation, and an evaluation of the SWMP's effectiveness at reducing those pollutants. The District found that the 303(d) parameters that are reasonably associated with discharges from the MS4 are biocriteria, copper, dieldrin, dissolved oxygen, iron, mercury, and zinc. The report concluded that the program elements in the SWMP are effective at reducing the discharge of 303(d) listed pollutants. See the benchmark analysis in this application for a discussion of the status of benchmarks and TMDL wasteload allocations.

- Criterion: The program targets pollutant discharges in stormwater from a variety of sources: industrial, commercial, residential, development, municipal, and transportation.

Evaluation: The MS4 program targets the discharge of pollutants from a variety of sources, including industrial, commercial, residential, development, municipal, and transportation. The program elements and the sources of pollutant discharges they target are:

- Illicit Discharge Detection and Elimination (all sources)
- Industrial and Commercial Facilities (industrial and commercial sources)
- Construction Site Runoff Control (development sources)
- Education and Outreach (all sources)
- Public Involvement and Participation (all sources)
- Post-Construction Site Runoff and Retrofit Programs (industrial, commercial, residential, municipal, and transportation sources)
- Pollution Prevention for Municipal Operations (municipal and transportation sources)
- Stormwater Management Facilities Operations and Maintenance (all sources)

Factor: Local applicability

- Criterion: The program is consistent with local ordinances and current legal authority.
- Criterion: Stormwater design standards implemented as part of the program reflect local conditions specific to soils, rainfall, infiltration rates, and stream conditions.
- Criterion: The program is developed with feedback and involvement from stakeholders to ensure consistency with community-wide goals and values.

Evaluation: The District was formed as the Unified Sewerage Agency of Washington County, Oregon (USA), in 1970 as a county service district under ORS 451 to "construct, maintain and operate sewage works including all facilities necessary for collecting, pumping, treating and disposing of sanitary or storm sewage…" On April 18, 1989, the Washington County Board of Commissioners passed Washington County Resolution & Order 89-55, expanding the authority of USA to include providing "storm and surface water drainage services and facilities." Among other powers, ORS 451.550 grants districts formed under ORS 451.410 to 451.610 the power to supervise, manage, control, operate and maintain service facilities, compel all residents and property owners in a district to connect their property, houses and structures requiring sewage disposal or surface drainage with adjacent sewers or other sewage or drainage facilities in the district, adopt storm and surface water management plans, programs and regulations relating to the quality and quantity of such waters and conduct water quality studies. In addition, ORS 451.570 grants districts the powers to control sewage disposal in the district and to adopt and enforce reasonable and necessary regulations for the management of storm and surface water discharge, including standards relating to the quantity and quality of such discharges, and for all other purposes consistent with the type of service facilities the district is authorized to construct, operate and maintain and not in conflict with the laws of this state. ORS Chapter 198 covers special districts generally and provides for criminal prosecution of violation of district regulations at ORS 198.600. The District's elected Board of Directors* has passed ordinances and resolutions and orders regulating

* The members of the Washington County Board of Commissioners serve as the Board of Directors of Clean Water Services.

the discharge of stormwater, development (including design and construction standards for post-construction runoff quality and quantity), and construction site discharges. In addition, the District operates under agreements with DEQ to administer construction site permits and industrial stormwater discharge permits.

The stormwater design standards included in the *Design and Construction Standards* reflect local conditions. As the District implements its hydromodification strategy through the development of subbasin plans, local conditions will be examined at a finer scale and will be taken into account in setting standards applicable to each subbasin.

As described in the history of District SWMP, the District has from its inception reached out to local experts and stakeholders in developing its stormwater management program. The *Design and Construction Standards* were developed based on local conditions specific to soils, rainfall, infiltration rates, and stream conditions. Most recently, the revision of *Design and Construction Standards* to incorporate the findings of the hydromodification assessment required many months and multiple meetings with the development, engineering, municipal, and environmental communities and the public at large. This effort yielded a result that was ultimately approved by the Board of Directors. The approval of the *Design and Construction Standards* by an elected body ensures that the public interest is served by their passage. The Board also appoints members to the Clean Water Services Advisory Commission, which is a 15-member committee comprising representatives from each of the Directors' geographical districts and from the business, development, agriculture, and environmental communities. The Commission meets regularly to provide input from stakeholders on District policies and programs.

Factor: Program resources

- Criterion: The program is included in the current budget allocations.
- Criterion: The program considers implementation costs and practicability within the overall context of permittee priorities and resources.

Evaluation: The District's stormwater program is included in budget allocations. As reported in the 2020 Stormwater Annual Report:

> For FY 2020 (July 1, 2019 – June 30, 2020) the District and co-implementers had estimated total expenditures of $62.3 million for stormwater and related watershed operations and capital project investments. The District and co-implementers had estimated total stormwater funding sources of $113.2 million for this period, including beginning balance, operating reserves and capital reserves. Available funding exceeds expenditures in part to maintain operating reserves. The expenditures and funding amounts are based on budget estimates and preliminary data because final auditable actuals were not available by the due date for this report. Final actuals will be available on request at a later date.

For FY 2021 (July 1, 2020 – June 30, 2021) it is estimated that the District and co-implementers will have expenditures of $64 million for stormwater and related watershed operations and capital project investments. It is estimated that the District and co-implementers will have stormwater funding sources of $122.5 million for this period, including beginning balance, operating reserves and capital reserves.

See the fiscal evaluation included with this application for further information.

As a public agency accountable to its ratepayers, the District considers the costs (including capital, operation and maintenance) of implementing its programs. The District's budget is developed through a public process that includes members of its Board and the Clean Water Advisory Commission to ensure that local priorities and District resources are considered in setting the budget, which must be approved by the Board of Directors.

One example of how the District considers costs and implementability in program development is found in the District's Adaptive Management Program. When potential program changes are identified, the District applies the following criteria to ensure cost-effectiveness:

- The proposed change must be necessary to meet the MEP standard and no superior option is available at a reasonable cost.
- The proposed change's efficacy appears favorable from available information and will be established through monitoring, when possible.
- The proposed change appears cost-effective and is within the limits of practicability.

POLLUTANT LOAD ESTIMATES

Requirement

c. An updated estimate of total annual stormwater pollutant loads for applicable TMDL pollutants or applicable surrogate parameters, and the following pollutant parameters: CBOD, chemical oxygen demand (COD), nitrate, total phosphorus, dissolved phosphorus, cadmium, copper, lead and zinc. The estimates must be accompanied by a description of the procedures for estimating pollutant loads and concentrations, including any modeling, data analysis and calculation methods.

Response

The District conducted stormwater pollutant load calculations using a spreadsheet-based tool. The approach used to calculate pollutant loads for this assessment was similar to the procedures used to calculate pollutant loads for the District's TMDL wasteload allocation attainment assessment and pollutant load reduction evaluation (TMDL WLAA) submitted to DEQ in October 2019.

There are three TMDL parameters (total phosphorus, total suspended solids, and bacteria) for which wasteload allocations have been established for MS4 discharges in the Tualatin River watershed. Estimated annual pollutant loads for total suspended solids and total phosphorus are presented in the Benchmark Analysis section of this application. For bacteria, estimated summer and winter loads were calculated as part of the TMDL WLAA and are shown in Table 1 and are also included in the Benchmark Analysis section of this application.

Estimated Pollutant Load (lbs/TMDL Season)	Winter Bacteria	Summer Bacteria
Without BMPs	7.18E+13	4.03E+12
With Nonstructural and Structural BMPs	3.06E+13	1.72E+12

Table 1: TMDL Bacteria Loads with and without Nonstructural and Structural BMPs

The following sections describe the inputs that were used in the spreadsheet model to calculate pollutant loads for total suspended solids (TSS), total dissolved solids (TDS), CBOD, COD, nitrate, total phosphorus, dissolved phosphorus (Ortho-P), cadmium, copper, lead and zinc.

Land Use Designations

Land use designations for the Tualatin River watershed were based on Metro data and the following land use categories were assigned.

Land Use
Residential (SFR)
Multi-Family (MFR)
Multi-Use (MUR)
Commercial (COM)
Industrial (IND)
Industrial No Exposure (INE)
Public Open Space (POS)
Rural (RUR)

Table 2: Land Use Categories

Note that industrial land use was separated into two categories. Land uses that have industrial activities subject to DEQ's 1200-Z industrial stormwater permit were categorized as "Industrial (IND)". Land uses that do not have industrial activities subject to DEQ's 1200-Z industrial stormwater permit were categorized as "Industrial No Exposure (INE)".

Runoff Calculation

Stormwater runoff was calculated using the EPA Simple Method, a commonly used approach for estimating pollutant loads from urban land uses. The following equations were used to determine runoff volume and pollutant loads. The runoff coefficient was determined for each land use type using the following equation:

$$Rvu = 0.05 + (0.009 \times Iu)$$

where:
Rvu = Runoff coefficient for land use type u, inches runoff/inches rain
Iu = Percent Imperviousness, %

Percent imperviousness was determined using the total impervious area (TIA) associated with each land use category and the surface water connectivity of the impervious area, referred to as effective impervious area (EIA). The following equations were used to determine the EIA:

$$EIA = 0.1 * TIA^{1.5} \text{ for systems with TIA } > 10\%$$
$$EIA = 0.04 * TIA^{1.7} \text{ for systems with TIA less than equal to } 10\%$$

These equations were based on work done by Roger Sutherland with Pacific Water Resources (http://projects.vhb.com/stormwaterseminars/resources/methods%20of%20estimating%20impervious%20cover.pdf). Table 3 presents the total impervious area and the effective impervious area for each land use category.

Land Use	Total Impervious Area % (TIA)	Effective Impervious Area % (EIA)
Residential (SFR)	35	20.7
Multi-Family (MFR)	50	35.4
Multi-Use (MUR)	50	35.4
Commercial (COM)	85	78.4
Industrial (IND)	85	78.4
Industrial No Exposure (INE)	85	78.4
Public Open Space (POS)	0	0.0
Rural (RUR)	10	2.0

Table 3: Total Impervious Area and Effective Impervious Area by Land Use Category

Calculating Pollutant Loads without BMPs and with Nonstructural BMPs

Pollutant loads were calculated without and with the implementation of nonstructural and structural best management practices (BMPs). The pollutant loads for each parameter were calculated without BMPs and with the implementation of nonstructural BMPs using the following equation:

Pollutant Load (lbs/year) = Σ u (P × Rvu × Cu × Au × [2.72/12])
where:
Pollutant Load = Total pollutant load for all land use types u, lb/year
P = Precipitation, average inches over 5 years
Rvu = Runoff coefficient for land use type u, inches runoff/inches rain
Cu = Event mean concentration for land use type u, milligrams/liter
Au = Area of land use type u, acres
12 = conversion factor to convert inches to feet
2.72 = conversion factor from mg/L and acre-feet to pounds

Average annual precipitation data from 2015 through September 2020 from the Hillsboro Airport station (KHIO) was used in the above equation. The equation above and the conversion factors yield a result in pounds per year. The equations used to calculate pollutant loads for each parameter with the implementation of structural BMPs are described in a later section.

Event Mean Concentrations (EMC) by Land Use

The 1990-1996 Association of Clean Water Agencies (ACWA) stormwater event mean concentration data as summarized in the *Analysis of Oregon Runoff Water Quality Monitoring Data Collected from 1990–1996* report (1997 ACWA Report) were used to calculate pollutant loads without BMP implementation. Event mean concentrations (EMCs) for each pollutant based on land use are presented in Table 4.

Note that there are some minor differences between the EMCs used to calculate pollutant loads for this analysis and the values used for the District's TMDL WLAA assessment. This is

because the 1997 ACWA Report used geometric means to represent medians. The District used medians to calculate stormwater pollutant loads for the TMDL WLAA assessment because the MS4 WLAs for phosphorus are derived from summer medians concentrations.

Land Use Category	BOD (mg/L)	COD (mg/L)	TSS (mg/L)	TDS (mg/L)	NO3 (mg/L)	TKN (mg/L)	TP (mg/L)	Ortho-P (mg/L)	Cadmium (mg/L)	Copper (mg/L)	Lead (mg/L)	Zinc (mg/L)
Residential (SFR)	5.8	33.4	43.2	45.0	0.37	0.84	0.21	0.050	0.0003	0.01	0.01	0.069
Multi-Family (MFR)	5.8	33.4	43.2	45.0	0.37	0.84	0.21	0.050	0.0003	0.01	0.01	0.069
Multi-Use (MUR)	6.6	40.3	49.4	57.0	0.37	0.92	0.23	0.050	0.0004	0.016	0.018	0.092
Commercial (COM)	7.4	47.2	55.6	69.0	0.36	1.00	0.25	0.050	0.0005	0.022	0.026	0.115
Industrial (IND)	18.0	81.0	93.2	77.0	0.30	1.53	0.55	0.050	0.00078	0.032	0.021	0.251
Industrial No Exposure (INE)	7.4	47.2	55.6	69.0	0.36	1.00	0.25	0.050	0.0005	0.022	0.026	0.115
Public Open Space (POS)	3.7	19.0	24.7	106.0	1.60	0.69	0.17	0.090	0.00017	0.004	0.002	0.012
Rural (RUR)	3.7	19.0	24.7	106.0	1.60	0.69	0.17	0.090	0.00017	0.004	0.002	0.012

Table 4: Event Mean Concentrations Based on Land Use

Nonstructural Best Management Practices

The District implements nonstructural and structural BMPs to reduce pollutant loads to the maximum extent practicable. A significant portion of the District's resources are geared toward implementing nonstructural elements of the MS4 program. Nonstructural practices include source control activities, public education and outreach, and operation and maintenance activities (e.g., street sweeping, catch basin cleaning, storm line cleaning, etc.).

It is difficult to quantify the cumulative effectiveness of nonstructural management practices. There are no literature data to assess the cumulative effect of source control, public education and outreach, and operation and maintenance activities. Studies tend to evaluate the effectiveness of a single type of operation and maintenance practice such as street sweeping or catch basin cleaning. Furthermore, there is little or no information regarding the effectiveness of source control and public education programs in reducing pollutant loads. In an effort to quantify the effectiveness of nonstructural BMPs, the land use data in the original ACWA study were compared with data collected following full implementation of nonstructural practices. Since implementation of nonstructural practices were in their early stages when the data for the 1997 ACWA Report was gathered in the early 1990's, a comparison of the two land use data sets provides a method to estimate the effectiveness of nonstructural BMPs. Based on this comparison, a percent reduction was applied to the land use concentrations from the 1997 ACWA Report to estimate pollutant concentrations with the implementation of nonstructural BMPs. In the TMDL WLA attainment analysis, the District used this approach to estimate the effectiveness of non-structural management practices for TSS and TP. The annual stormwater pollutants load estimate continues this approach. A 25 percent reduction was used for all pollutants except TSS (40%) and TDS (0%) to estimate the effectiveness of nonstructural management practices.

Structural Best Management Practices

Structural BMPs consist of physical structures such as swales, wet ponds, storm filters, etc. that are designed to treat stormwater runoff. The District began requiring the installation of structural

BMPs in the early 1990s prior to the implementation of the MS4 program and currently has more than 3,600 BMPs in its service area. The District and co-implementers maintain the structural BMPs and ensure their functionality in treating stormwater runoff.

Table 6 presents the BMP type, number of BMPs, and acres served for the structural BMPs in the District's service area. Structural BMPs were grouped into the following categories: constructed wetlands, wet ponds, extended dry ponds, stormwater filters and swales. Some simplifying assumptions were made to group BMPs into these categories and to address the different nomenclature used by the District and co-implementers. For example, retention basins were categorized as wet ponds. Low Impact Development Approaches, water quality facilities, and planters were categorized as swales.

Structural BMP Type	Number	Acres Served
Constructed Wetland	52	108
Wet Pond	153	983
Extended Dry Pond	859	4,952
Filter Facility	692	2,281
Swale	1,870	9,477
Unknown	9	49
Total	3,635	17,849

Table 6: Structural BMP Type and Acres Served

The District has made significant progress to obtain the necessary information regarding the structural BMPs in the service area. However, BMP type and/or drainage area is not available for all BMPs. As a result, some simplifying assumptions were made to fill in the data gaps. For example, where the BMP type was not known, the effluent concentrations and flow reduction percentage were assumed to be similar to swales which is the most common BMP type in the District's service area. Where the drainage area associated with the BMPs was not available, the average BMP drainage area based on the data that were available was assigned as the BMP drainage area.

The structural BMP effluent concentrations and flow reduction percentages were primarily based on information compiled by an ACWA committee that reviewed BMP performance data from several sources. The ACWA committee's recommendations are presented in a document entitled *Stormwater BMP Effectiveness Report (May 2005)*. Much of the structural BMP effectiveness data was updated by the committee in 2014 but was not published. The District used the 2014 structural BMP performance data for all of the pollutants except for nitrate and TKN, for which there was no 2014 data so the 2005 data was used.

For COD, TDS and cadmium, no reduction in pollutant concentrations were assumed through structural BMPs; only the flow reduction component and acreage associated with the structural BMP were considered in the pollutant load calculation.

The structural BMP type, drainage area, effluent concentrations and flow reduction percentages were then used to calculate the stormwater pollutant loads.

Summary of Pollutant Loads

Some simplifying assumptions were made to incorporate the effectiveness of structural BMPs. First, an area weighted average of structural BMP effectiveness (concentration and flow reduction) was calculated for each parameter except for COD, cadmium and TDS where no reduction from structural BMPs was assumed. Second, the lower of the either the non-structural BMP effectiveness concentration or the area weighted average structural BMP concentration were used to calculate pollutant loads. Flow reduction associated with the implementation of structural BMPs were then applied to the portion of the service area treated by structural BMPs.

Table 7 presents the pollutant load for all parameters with and without the implementation of nonstructural and structural BMPs.

Estimated Annual Pollutant Load (lbs/year)	BOD	COD	TSS	TDS	NO3	TKN	TP	Ortho-P	Cadmium	Copper	Lead	Zinc
Without BMPs	1,324,265	7,954,897	9,684,354	11,244,260	71,597	179,131	45,685	32,092	79	3,203	3,538	18,572
With Nonstructural and Structural BMPs	928,539	5,628,247	5,439,027	10,607,381	44,352	126,739	32,092	6,786	56	2,189	2,384	12,536

Table 7: Annual Pollutant Loads with and without Nonstructural and Structural BMPs

MONITORING PLAN

Requirement
d. A proposed monitoring program objectives matrix and proposed monitoring plan including information required in Schedule B.15.b.iv for each proposed monitoring project/task.

Response
The proposed NPDES MS4 Monitoring Plan included as Attachment D in this application includes a program objectives matrix and otherwise meets this requirement.

ANTICIPATED SERVICE AREA EXPANSIONS

Requirement
e. A description of any service area expansions that are anticipated to occur during the following permit term and a finding as to whether or not the expansion is expected to result in a substantial increase in area, intensity or pollutant loads.

Response
Based on areas designated as Urban Reserve Areas (URA), areas within the Urban Growth Boundary (UGB) but not yet included within the District boundary, and the pace of development activity, it is reasonable to anticipate that service area expansions will occur. The size of those anticipated expansions may be estimated from the history of District annexations and from the size of parcels that are currently going through the land use process.

Annual expansion through annexations over the past 10 years has been quite variable, from 0.98 acres in 2011 to 946 acres in 2016, with an average over the past five years of 578 acres per year. Applying this average over the five-year permit term gives a total anticipated expansion of 2,890 acres.

The total acreage of parcels currently going through concept planning, but not yet added to the UGB is 2,410 acres. Based on current concept plan activity, the District anticipates the addition of this acreage to its service area over the near term.

The estimates based on annexation history and concept plan activity are of similar magnitude and indicate that the District can anticipate that service area annexations will continue at approximately the recent pace over the next five-year permit term. The anticipated expansion would result in an increase in the District's 76,184 acre service area of just over 3 percent, which is not a substantial increase.

It is reasonable to assume that intensity and pollutant loads are proportional to area, all else being equal. However, new development in expansion areas will be subject to current development standards that moderate runoff intensity and reduce pollutant loads, while much of the District was developed under older stormwater management standards (or none at all). Therefore, the District expects lower runoff intensity and pollutant loads per acre in expansion areas than for the District as a whole. The reasonably expected expansion of the District's service area over the next five years is thus not anticipated to result in a substantial increase in area, intensity or pollutant loads.

FISCAL EVALUATION

Requirement

f. A fiscal evaluation summarizing program expenditures for the current permit cycle and projected program allocations for the next permit cycle.

Response

For the current permit cycle FY 2017 through FY 2021 (July 1, 2016 – June 30, 2021) the District and co-implementers have estimated total expenditures of $235.5 million for stormwater and related watershed operations and capital project investments. The District and co-implementers have estimated total stormwater funding sources of $527.4 million for this period, including beginning balance, operating reserves, and capital reserves. Available funding exceeds expenditures in part to maintain operating reserves. The expenditures and funding amounts are based on budget estimates and preliminary data because final auditable actuals were not available by the due date for this report. Final actuals will be available on request at a later date.

For the next permit cycle FY 2022 through FY 2026 (July 1, 2021 – June 30, 2026) it is estimated that the District and co-implementers will have expenditures of $621.3 million for stormwater and related watershed operations and capital project investments. It is estimated that the District and co-implementers will have stormwater funding sources of $825.1 million for this period, including beginning balance, operating reserves, and capital reserves.

MS4 MAPS

Requirement
g. Updated MS4 maps, including the service boundary of the MS4, projected changes in land use and population densities, anticipated Urban Growth Boundary expansion or areas planned to be incorporated through land annexation, location of permittee-owned operations, facilities, or properties with storm sewer systems, and the location of facilities issued an industrial NPDES permit that discharge to the MS4.

Response
The following maps are included in Attachment E:

- Figure 1: CWS MS4 Services Area with Facilities with Industrial Stormwater Permits and CWS Facilities with Storm Sewer Systems: This figure presents the location of facilities with 1200-Z industrial stormwater general permits and the District's Administrative Building Complex, Field Operations Center, and Rock Creek, Durham, Forest Grove and Hillsboro wastewater treatment facilities.
- Figure 2: CWS MS4 Service Area with Defined Zoning: This figure presents zoning within the MS4 service area boundary as of 2020.
- Figure 3: CWS MS4 Service Area with Water Quality Facilities: This figure presents the location of water quality facilities within the District's MS4 service area boundary.
- Figure 4: CWS MS4 Service Area with Urban Reserves and Urban Growth Boundary: This figure presents the urban reserve areas and the urban growth boundary as of 2020.

The updated MS4 maps meet the permit renewal application requirements as follows:

- *Updated service boundary of the MS4*
  All four maps show the updated MS4 service area boundary.
- *Projected changes in land use and population densities*
  Figures 2 and 4 present zoning, urban reserve areas and the urban growth boundary as of 2020. The District anticipates future land use patterns to be similar to current patterns and changes in population density to be consistent with changes in land use as undeveloped areas are brought into the District's service area and developed.
- *Anticipated Urban Growth Boundary expansion or areas planned to be incorporated through land annexation*
  Figure 4 presents the urban reserve areas and the urban growth boundary as of 2020.
- *Location of permittee-owned operations, facilities, or properties with storm sewer systems*
  Figure 1 presents the location of the District's Administrative Building Complex, the Field Operations Center, and the four wastewater treatment facilities which are all owned by the District and have storm sewer systems.
- *The location of facilities issued an industrial NPDES permit that discharge to the MS4*
  Figure 1 presents the location of facilities with 1200-Z industrial stormwater general permits that discharge to the MS4.

BENCHMARK ANALYSIS

Requirement
h. If applicable, the established TMDL pollutant load reduction benchmarks, as required in Schedule D.11.c.iv.

Schedule D.11.c.iv:
Establishment of TMDL Pollutant Reduction Benchmarks: A TMDL pollutant reduction benchmark must be developed for each applicable TMDL parameter where existing BMP implementation is not achieving the applicable WLA. An updated TMDL pollutant reduction benchmark must be submitted with the permit renewal application at least 180 days prior to expiration of this permit.

Response
In October 2019, the District submitted its Evaluation of 303(d) listed Pollutants and TMDL Pollutant Load Reduction Evaluation, including a Wasteload Allocation Attainment Assessment and TMDL Pollutant Load Reduction Evaluation for total phosphorus, total suspended solids, and bacteria (2019 Report). With no significant changes to either the District's service area or the number of pollutant removal facilities since that time, the data in the 2019 Report remain valid and are used in this benchmark analysis.

Total phosphorus
While the 2019 Report's modeling results for total phosphorus showed that wasteload allocations (WLAs) were being met for the Gales Creek and Rock Creek subwatersheds, the total phosphorus pollutant loads in the other subwatersheds exceeded the WLA, with BMP implementation, as shown in Figure 1.

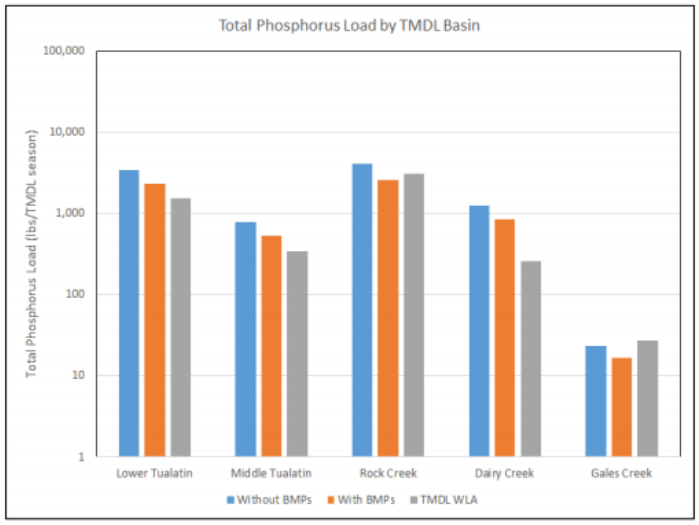


Figure 1: Total Phosphorus by TMDL Basin

Since the primary effect of total phosphorus loading is on the lower portion of the Tualatin River, the 2019 Report evaluated the actual total phosphorus concentrations in the lower Tualatin

River. Ambient data from 2014 to 2018 at two locations in the lower Tualatin River compared to TMDL WLAs are presented in Table 8.

Year	Tualatin River @ Boones Ferry Rd (RM 8.7) (mg/L)	Tualatin River @ Stafford Rd (RM 5.4) (mg/L)	TMDL WLA for Lower Tualatin (mg/L)
2014	0.09	0.09	0.14
2015	0.09	0.09	0.14
2016	0.1	0.09	0.14
2017	0.09	0.08	0.14
2018	0.08	0.08	0.14

Table 8: Seasonal Median Total Phosphorous Concentrations and TMDL WLAs

These data show that the lower Tualatin River meets the total phosphorus WLAs for the lower Tualatin identified in Table 47 of the 2001 Tualatin Subbasin TMDL.

Total Suspended Solids (surrogate for Settleable Volatile Solids)

The 2001 Tualatin Subbasin TMDL identified sediment oxygen demand (SOD) as a significant oxygen sink in the tributaries and the primary oxygen sink in the mainstem Tualatin River. The TMDL identified settleable volatile solids (SVS) as one of the pollutants contributing to SOD, although it acknowledged that the exact relationship between SVS and SOD was unknown. Due to lack of data on SVS, the TMDL allowed the use of Total Suspended Solids (TSS) as a surrogate for tracking SVS reduction, since it was reasonable to assume that reductions in TSS would lead to reductions in SVS, although the volatile fraction of solids varies depending on the source.

The 2001 Tualatin Subbasin TMDL requires 20 or 30 percent reduction of TSS levels relative to the "without BMP" condition in each sub-watershed, except the Lower Tualatin, which requires a 50 percent reduction. These reductions were then translated into TMDL WLAs, expressed as TSS loads.

The 2019 Report results for TSS are shown in Figure 2, comparing the TSS loads with and without BMP implementation to the TMDL TSS WLA. With the implementation of BMPs, the TSS WLAs are being met in all sub-watersheds, except the Lower Tualatin.

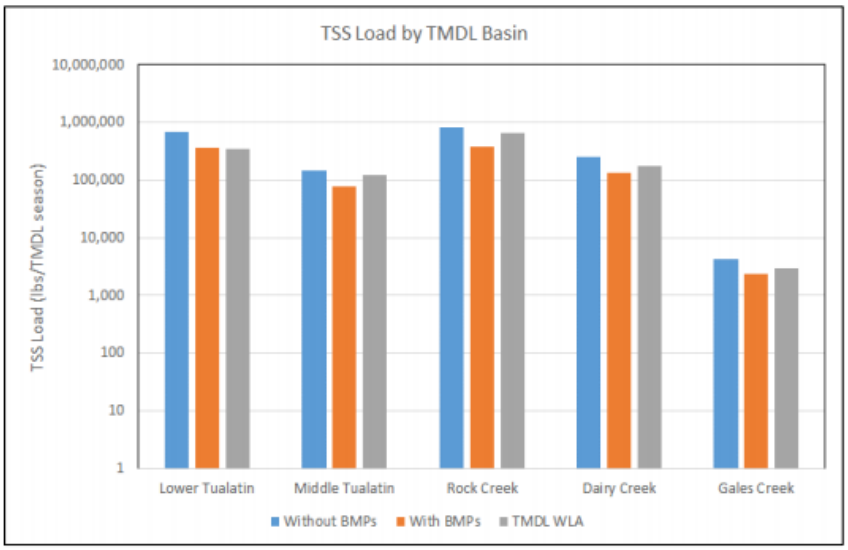


Figure 2: TSS Load by TMDL Basin

Although these model results show that the TSS WLAs are either being met or close to being met in all the subwatersheds, water quality monitoring data show that dissolved oxygen levels in the tributaries remain impaired. Therefore, it is likely that the focus on SVS (and the use of TSS as a surrogate) may not be sufficient to address the complex interactions that lead to low dissolved oxygen. An understanding of these complex interactions informs the District's integrated approach to improving dissolved oxygen levels in tributaries.

In 2015, the USGS published a study of the sources, transport, and fate of organic matter in Fanno Creek. The study found that organic matter in Fanno Creek originates primarily from terrestrial inputs, most likely riparian vegetative biomass that enters the stream via litterfall and overland transport. This material is then transported through the system episodically through hydrologic processes. Although eroding, the streambank did not contain enough organic matter to be a dominant source of organic matter. Organic matter transported in the first fall storm was characteristically different, with a larger fraction of microbially derived organic matter that probably resulted from the accumulation of easily mobilized and decomposing material in the streambed during previous months of summer low-flow conditions.

The District's integrated approach to improving water quality, including dissolved oxygen, consists of programs described in the SWMP, riparian restoration, flow enhancement, and a hydromodification reduction strategy. Specific SWMP programs (and their relationship to improving dissolved oxygen) include:

- Illicit Discharge Detection and Elimination (investigating and removing illicit sources of oxygen-depleting substances, including raw sewage);
- Industrial and Commercial Facilities (regulating facilities that have a significant potential to discharge pollutants, including those that impact dissolved oxygen);
- Construction Site Runoff Control (preventing the discharge of sediments and construction-related pollutants);
- Education and Outreach (informing the public of the need to properly manage wastes, including yard debris);

- Post-construction and Retrofit (addressing the discharge of sediments from newly developed areas, and expanding structural treatment to areas that were developed before modern standards were in place. One of the stated objectives of the retrofit program is to ensure progress toward applicable TMDL wasteload allocations.);
- Pollution Prevention for Municipal Operations (removing leaf litter and sediments from urban streets and conducting a fall leaf program); and
- Stormwater Facilities Operation and Management (ensuring the proper functioning of facilities designed to remove pollutants from stormwater, including removal of accumulated organic matter and sediments).

Riparian Restoration: Restoration of riparian vegetation is a key component of improving dissolved oxygen levels in the tributaries since solar radiation also contributes to impaired tributary DO levels. From 2004 to 2019, the District implemented 160 riparian planting projects along streams in the Tualatin River watershed. These projects restored 73 miles of riparian vegetation in urban and rural areas of the Tualatin River watershed. In addition to reducing anthropogenic heating effects, these projects also provide numerous ecosystem benefits including improved stream functions (e.g., floodplain roughness, bank stabilization, peak flow attenuation, and habitat creation), increased diversity of aquatic and terrestrial plant and animal species, and improved water quality.

Flow Enhancement: The District also releases stored water from Hagg Lake and Barney Reservoir during the summer to provide sustainable base flows, offset a portion of thermal load from the District's four wastewater treatment facilities, and improve overall water quality in the Tualatin River and its tributaries. In 2019, the District released an average of 37 cfs of stored water from Hagg Lake and Barney Reservoir from July to October. Stored water was released into the Tualatin River and into key tributaries (Gales Creek, West Fork Dairy Creek, East Fork Dairy Creek, and McKay Creek). The releases of stored water reduce stream temperature, increase dissolved oxygen levels, and improve overall water quality in these streams.

Hydromodification Strategy: The District developed a comprehensive and innovative strategy that addresses both legacy hydromodification impacts and the threat of further degradation from continued development and climate variability. This strategy considers the risk of hydromodification posed by development projects and integrates upland controls, including Low Impact Development Approaches and engineered detention, with in-stream and riparian corridor enhancement actions to increase overall corridor resilience through improved habitat complexity and connectivity.

Bacteria

Figures 3 and 4 present bacteria loads for each sub-watershed for summer and winter conditions, respectively. These figures present the bacteria load without BMPs and with the implementation of BMPs, and compare them with the summer and winter TMDL WLA loads.

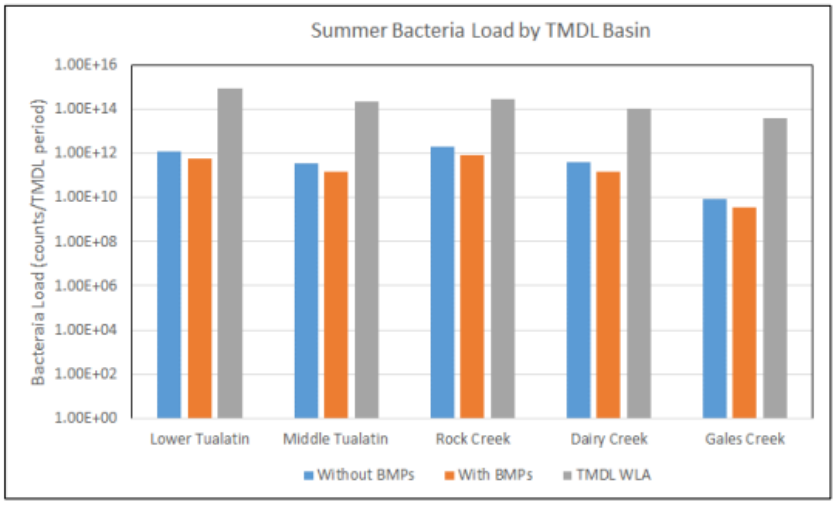


Figure 3: Bacteria Loads for Each Sub-Watershed (Summer)

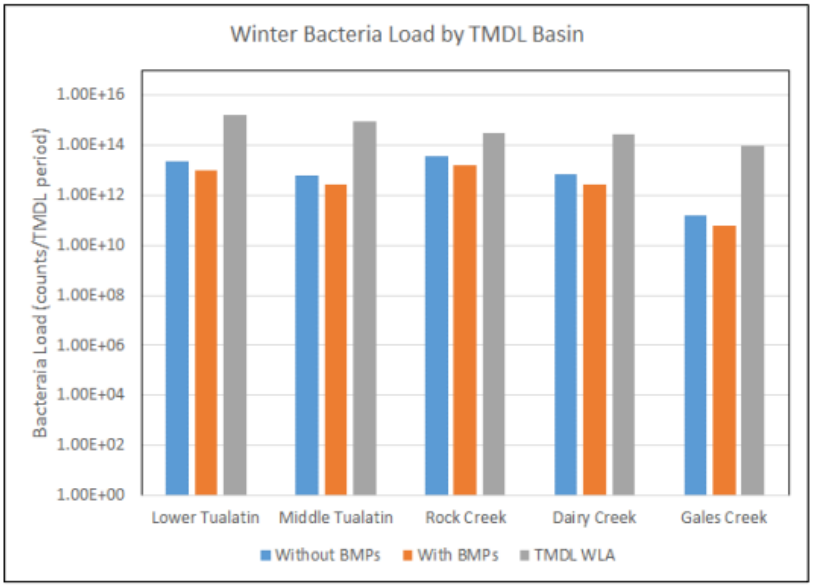


Figure 4: Bacteria Loads for Each Sub-Watershed (Winter)

These results show that the bacteria loads in each sub-watershed meet the 2001 Tualatin Subbasin TMDL WLAs for both summer and winter conditions.

ATTACHMENTS

ATTACHMENT A
PROPOSED STORMWATER MANAGEMENT PLAN

Stormwater Management Plan
Best Management Practices

This Stormwater Management Plan groups stormwater best management practices according to permit requirements into the following sections:

1. Illicit Discharge Detection and Elimination
2. Industrial and Commercial Facilities
3. Construction Site Runoff Control
4. Education and Outreach
5. Public Involvement and Participation
6. Post-Construction Site Runoff and Retrofit Programs
7. Pollution Prevention for Municipal Operations
8. Stormwater Management Facilities Operation and Maintenance Activities

Each section includes the applicable permit language and describes the program elements that address permit requirements. At the end of each section, a BMP category summary specifies measurable goals for key program elements and the tracking measures associated with the measurable goals. Clean Water Services (District) will report progress on attaining the measurable goals and tracking measures in the Municipal Separate Storm Sewer System (MS4) Annual Report. All references to "annual" refer to the MS4 reporting year, i.e., July 1 of the previous year through June 30 of the current year.

1. Illicit Discharge Detection and Elimination

The permittee must continue to implement a program to prevent, detect, characterize, trace, and eliminate illicit discharges to the MS4. The permittee must:

The District describes its Illicit Discharge Detection and Elimination (IDDE) program in a separate document, *Illicit Discharge Detection and Elimination Program Description* (*IDDE Description*, 2015). The IDDE program is designed to prevent, detect, characterize, trace and eliminate unpermitted discharges of pollutants to the MS4. The IDDE program is implemented by the District and co-implementers. The *IDDE Description* includes an Enforcement Response Plan describing how the District and the co-implementers eliminate illicit discharges.

The IDDE program includes activities to detect illicit discharges through inspection of permitted industrial facilities, observations during routine maintenance of MS4 facilities, annual dry weather outfall inspections, and facilitation of public reporting of spills and illicit discharges.

1.1 Ordinance to Prohibit Illicit Discharges

A. Prohibit, through ordinance or other legal mechanism, illicit discharges into the permittee's MS4.

District Ordinance 27 prohibits specific non-stormwater discharges to the publicly owned storm and surface water system within the District's jurisdiction, which

includes the MS4. More details regarding this ordinance are included in the *IDDE Description*.

1.2 Enforcement Response

L. Develop a written enforcement response plan or similar document by April 22, 2017, describing the escalating enforcement response procedures the permittee must implement when an illicit discharge investigation identifies a responsible party.

The *IDDE Description* includes the District's and co-implementers' enforcement response plans. In addition, the District has a *Source Control Program Enforcement Response Plan* and an *Industrial Stormwater and Water Quality Enforcement Response Plan* to supplement the *IDDE Description*. If evidence of a potential illicit discharge is discovered through facility inspections, routine MS4 work, annual dry weather field screening, public reports, or through any other source, the District and co-implementers will follow the *IDDE Description* enforcement response plan and supplemental enforcement response plans to investigate and eliminate the discharge.

The plans describe enforcement response procedures for the following activities:

A. Permitted Facilities - Industrial Users
B. Permitted Facilities - 1200-Z Permittees
C. Sanitary Sewer Cross Connections
D. Non-Sanitary Illicit Discharges from other than Permitted Facilities
E. All Illicit Discharges

1.3 Dry Weather Field Screening

B. Develop or identify dry-weather pollutant parameter action levels. The action levels must identify concentrations for identified pollutants that if exceeded, require further investigation by the permittee, including laboratory sample analyses, to identify the source of the illicit discharge. The pollutant parameter action levels and rationale for using the action levels must be documented, and must be reported to DEQ by April 22, 2017.

C. Conduct dry-weather inspection activities during the term of the permit. The dry-weather inspection activities must include, at a minimum, an annual inspection of identified priority locations documented by the permittee. Priority locations must, where possible, be located at an accessible location downstream of any source of suspected illicit discharge or at other locations selected by the permittee to support source identification and elimination of illicit discharges. Priority locations must be identified based on an equitable consideration of hydrological conditions, total drainage area of the location, population density of the location, traffic density, age of the structures or buildings in the area, history of the area, land use types, personnel safety, accessibility, historical complaints or other appropriate factors as identified by the permittee. The permittee may change the dry-weather inspection priority locations at any time as long as the rationale for changing the location is documented, and the new priority location is identified on maps in accordance with subsection K. The total number of priority locations may not be reduced.

D. Conduct annual dry-weather inspection activities after an antecedent dry period of at least 72-hours. The dry-weather inspection activities must be documented, and the activities must include:

1. General observations, including visual presence of flow, turbidity, oil sheen, trash, debris or scum, condition of conveyance system or outfall, color, odor and any other relevant observations related to the potential presence of non-storm water or illicit discharges.

2. Field Screen - If flow is observed during general observations, and the source is unknown, a field screen must be conducted to determine the cause of the dry-weather flow. The field

screen must include either sampling for pollutant parameters that are likely to be found based upon the suspected source of discharge, or other effective investigatory approaches or means to identify the source or cause of the suspected illicit discharge. Where appropriate, the permittee must use the identified dry-weather pollutant parameter action levels. If the source of the dry-weather flow has been determined, the permittee must document the source or source type and all other relevant information related to the identification of the source. Suspected sources of discharge include, but are not limited to, sanitary cross-connections or leaks, spills, seepage from storage containers, non-stormwater discharges or other residential, commercial, industrial or transportation-related activities.

3. *Laboratory Analysis - If general observations and the field screen indicate an illicit discharge and the source of a suspected illicit discharge cannot be identified through other investigatory methods, the permittee must collect a water quality sample of ongoing discharges for laboratory analyses. The water quality sample must be analyzed for pollutant parameters or identifiers that will support the permittee's identification of the source of the illicit discharge.*

E. *Document and implement procedures to investigate portions of the MS4 that likely are receiving an illicit discharge based on the results of general observations, field screening, laboratory analysis or other relevant information, including but not limited to a complaint or referral. The procedures must reflect the goal to identify the source and/or responsible party in an expeditious manner, and must clearly define responsibility for implementing the procedures. If the permittee implements the procedures, and the permittee is unable to identify the illicit discharge source, the permittee may suspend the source investigation if the permittee has verified and documented that all reasonable action and effort has been taken to identify the source. The permittee must reopen its investigation for any suspended source investigation if new or additional information related to the suspended source investigation becomes available.*

The District developed the following pollutant parameter action levels and submitted them to DEQ on April 18, 2017.

Parameter	Action level	Suspected source
Surfactants (as MBAS)	> 0.25 mg/L	Presence of surfactants likely indicates washwater or sewage. When MBAS > 0.25 mg/L, confirm which source is more likely using ammonia/potassium ratio.
Potassium	(see ratio below under ammonia nitrogen)	Relatively high concentrations of potassium (> 20 mg/L) may indicate sewage or industrial process waters
Ammonia nitrogen	NH3/K > 1.0	Presence of ammonia > 0.5 mg/L likely indicates sewage, industrial waste or pets/wildlife. Ammonia/potassium ratio > 1.0 indicates possible sewage
Total chlorine	> 0.25 mg/L	Presence of chlorine, absent other parameters that exceed action levels, likely indicates municipal treated water or discharge of municipal water or pool/hot tub water
Conductivity	> 2000 µS	Indicative of industrial discharge
pH	< 5	Indicates industrial discharge. High pH values may also indicate an industrial discharge but residential washwaters can have a high pH as well.

To identify and detect illicit discharges, the District conducts annual dry weather inspections as described in the *IDDE Description*. Dry weather inspection procedures include:

- Pollutant parameter action levels
- Priority locations for conducting inspections
- Inspection procedures, and
- Sampling procedures

BMP 2, Dry Weather Field Screening, describes the goals and tracking measures associated with meeting this requirement.

1.4 Documentation and Mapping

H. Implement and maintain a system to document and track illicit discharge complaints and referrals, investigation activities, and actions taken to eliminate the illicit discharge. The system must include, but is not limited to, the date of the complaint or referral, date and type of investigation activity, of elimination action, and resolution.

K. Maintain maps identifying permittee-owned or operated MS4 outfalls discharging to waters of the State. If the permittee identifies modifications to outfall locations, or is informed of the need to modify its map(s) by DEQ, the maps must be updated in digital or hard-copy within six months of identification.

The District and co-implementers maintain records of all investigation and enforcement of suspected illicit discharges, including field notes, analytical results, correspondence, and enforcement documents. The District developed and uses a web-based Lucity system for reporting and tracking illicit discharges. The system documents complaints and referrals of illicit discharges and activities related to their investigation and elimination. This information is readily available and used to produce the MS4 Annual Report.

The District and co-implementers maintain maps of known MS4 outfalls within the permit boundary. The dry weather field screening priority locations are maintained in GIS so that maps can be generated.

BMP 3, Report and Response Tracking System, describes the goals and tracking measure associated with meeting this requirement.

1.5 Illicit Discharge Elimination

G. 1. Except as provided in Schedule A.2d.i.G.2, the permittee must eliminate illicit discharges within five working days of identification of the source.

2. If the permittee determines that the elimination of the illicit discharge will take more than five working days due to technical, logistical or other reasonable issue, the permittee must, within 20 days of identifying the source of an illicit discharge, develop an action plan for eliminating the illicit discharge in an expeditious manner, and must implement the action plan according to its terms. In lieu of developing an individual action plan for each instance of a typical type of illicit discharge, the permittee may develop or reference, and must implement, a standardized IDDE elimination procedure for each type of typical illicit discharge. The action plan and standardized procedure must include a timeframe to eliminate the discharge in an expeditious

manner, and must identify the entity or individual permittee responsible for implementing the corrective action.

The *IDDE Description* includes a summary of actions to be taken to identify the source of an illicit discharge and to abate an illicit discharge once the source has been identified. In all instances of illicit discharges, the enforcing authority (the District or co-implementer) acts to abate the discharge within five working days of identifying the source of the discharge. If the enforcing authority determines that technical, logistical or other reasonable circumstances will prevent the abatement within five working days, the enforcing authority will develop an action plan within 20 days of identifying the source and will implement that plan to abate the illicit discharge as expeditiously as possible. For common types of illicit discharges (such as sanitary–to-storm cross connections), the *District Source Control Program Enforcement Response Plan,* the *Industrial Stormwater and Water Quality Investigation Enforcement Response Plan,* the *IDDE Description*, and the *District Industrial Stormwater Program Implementation Manual* include standard procedures to be followed in lieu of developing an individual action plan. For unique or unusual circumstances, the enforcing authority will develop an individual action plan.

BMP 1, Illicit Discharges, Including Sanitary Cross Connections and Accidental Spills, describes the goals and tracking measures associated with meeting this requirement.

1.6 Spill Prevention and Response

F. Implement response procedures to prevent, contain, respond to and mitigate spills or similar illicit discharges that may or have discharged into the MS4. The permittee must review its written response procedures, and update the procedures as necessary, by April 22, 2017. Spills, or other similar illicit discharges, that may endanger human health or the environment must be reported in accordance with all applicable federal and state laws, including proper notification to the Oregon Emergency Response System.

The District prevents accidental spills at industrial facilities that are permitted to discharge to the sanitary conveyance system and the MS4 through industrial discharger slug control plans and administration of the 1200-Z permitting program, respectively. The District and co-implementers prevent spills at construction sites through permit terms and inspections conducted under the Construction Site Stormwater program. The District and co-implementers also prevent spills by implementing Stormwater Pollution Control Plans at municipal facilities. These programs are described in the *IDDE Description*, which was reviewed in April 2017.

Response, containment, and mitigation actions are carried out by emergency first responders, including city fire departments. The District is available to provide technical advice to these agencies as requested. The District has an emergency environmental response company under contract for assistance with cleanups.

The District and the co-implementers comply with all applicable federal and state laws regarding reporting of accidental spills and other similar illicit discharges that endanger human health or the environment, including proper notification to the Oregon Emergency Response System.

BMP 1, Illicit Discharges, Including Sanitary Cross Connections and Accidental Spills, describes the goals and tracking measures associated with meeting this requirement.

1.7 Notification to Adjacent Jurisdiction

I. In the case of a known illicit discharge that originates within the permittee's MS4 regulated jurisdiction and that discharges directly to a storm sewer system or property under the jurisdiction of another public body, the permittee must notify the affected jurisdictional authority as soon as practicable, but no more than one working day of becoming aware of the discharge.

J. In the case of a known illicit discharge that is identified within the permittee's MS4 regulated jurisdiction, but is determined to originate from a contributing storm sewer system or property under the jurisdiction of another public body, the permittee must notify the jurisdictional authority of the area contributing the discharge as soon as practicable, but no more than one working day of identifying the illicit discharge.

If a known illicit discharge originates within the jurisdiction of a co-implementer or the District and discharges directly to a storm sewer system or property under the jurisdiction of another municipality, the co-implementer or the District notifies the affected municipality as soon as practicable and at least within one working day of confirming the origin of the discharge.

If a known illicit discharge is identified within the jurisdiction of the District or a co-implementer, and it is determined to originate from a storm sewer system or property under the jurisdiction of another municipality, the District or the co-implementer notifies the contributing municipality or municipality with jurisdiction as soon as practicable, and at least within one working day of confirming the origin of the discharge.

During any investigation of an illicit discharge within the jurisdiction of a co-implementer, the District and the co-implementer communicate and cooperate as needed to complete the investigation and abate the illicit discharge.

1.8 Non-Stormwater Discharges

M. Unless the following non-stormwater discharges are identified by the permittee or DEQ as a significant source of pollutants to waters of the State, these types of non-stormwater discharges into the MS4 are authorized by this permit: water line flushing; landscape irrigation; diverted stream flows; rising ground waters; uncontaminated groundwater infiltration; uncontaminated pumped ground water; discharges from potable water sources; start up flushing of groundwater wells; potable groundwater monitoring wells; draining and flushing of municipal potable water storage reservoirs; foundation drains; air conditioning condensate; irrigation water; springs; water from crawl space pumps; footing drains; lawn watering; individual residential car washing; charity car washing; flows from riparian habitats and wetlands; dechlorinated swimming pool discharges; street wash waters; discharges of treated water from investigation, removal and remedial actions selected or approved by DEQ pursuant to Oregon Revised Statute (ORS) Chapter 465; and discharges or flows from emergency fire fighting activities. If any of these non-stormwater discharges under the permittee's jurisdiction is a significant source of pollutants, the permittee must develop and require implementation of appropriate BMPs to reduce the discharge of pollutants associated with the source.

Non-stormwater discharges that have the potential to enter the MS4 are listed in Table 1. The District has reviewed the listed non-stormwater discharges to the MS4 and has determined those that are not significant sources of pollutants. For the remainder, Table 1 notes "Program in place." For those with a program in place, the agency that administers the program is identified and the "Notes" briefly describe the approach to reducing the discharge of pollutants associated with the source.

TABLE 1.
Controls and Limitations—Non-Stormwater Discharges

Non-Stormwater Discharge	Status	Notes
Water line flushing	Program in place (DEQ)	Addressed by the DEQ's BMP entitled *Disposing Chlorinated Waters from Swimming Pools and Hot Tubs (DEQ, 2017).*
Landscape irrigation/Lawn Watering/Irrigation Water	Program in place (District)	The District addresses potential pollutants from lawn watering, irrigation water, and landscape irrigation into the MS4 through its public education campaigns, which include: • Go Native: Less Water, Fewer Chemicals, And Healthy Streams. The District advocates the use of the integrated pest management and good irrigation scheduling practices described in *Environmentally Responsible Landscape Services: A Best Management Practices Guide for Landscape Businesses* (Pollution Prevention Outreach Team, 2010).
Diverted stream flows	Program in place (DSL, COE, District)	Diverting stream flows into the MS4 system is a very uncommon occurrence. Where deemed appropriate by permitting authorities that regulate in-water work, the District may allow the temporary diversion of stream flows into the MS4 provided it meets applicable requirements.
Rising groundwater	Not a significant source of pollutants	
Uncontaminated groundwater infiltration	Not a significant source of pollutants	
Uncontaminated pumped groundwater	Program in place (District)	Groundwater pumped to the MS4, such as from excavation dewatering, requires District approval, verification that it is uncontaminated, and may require flow controls to prevent detrimental effects on receiving streams.
Discharge from potable water sources	Program in place (DEQ)	Addressed by DEQ's BMP entitled *Disposing Chlorinated Waters from Swimming Pools and Hot Tubs* (DEQ, 2017).
Start-up flushing of groundwater wells	Program in place (District, DEQ)	Requests for the discharge of start-up well flushing activities are reviewed to ensure that the discharge would not result in impacts to surface waters. Where there is potential for surface water impacts, treatment is required or discharge to sanitary sewer.
Potable groundwater monitoring wells	Program in place	Similar to groundwater well-flushing.
Draining and flushing of municipal potable water storage resources	Program in place (DEQ)	Addressed by the DEQ's BMP entitled *Disposing Chlorinated Waters from Swimming Pools and Hot Tubs* (DEQ, 2017).
Foundation drains/Footing drains	Not a significant source of pollutants	
Air conditioning condensate	Not a significant source of pollutants	Commercial and industrial units are regulated by the Oregon Plumbing Code. Per this code, systems that require outlet piping would be required to connect to a legal point of disposal, specifically sanitary sewer lines.
Springs	Not a significant source of pollutants	

Water from crawl space pumps	Not a significant source of pollutants	
Individual residential car washing	Program in place (District)	The District does not regulate individual residential car washing, but has an education program that encourages the use of commercial car washes that discharge to sanitary systems.
Charity car washes	Not a significant source of pollutants	
Flows from riparian habitats and wetlands	Not a significant source of pollutants	
Dechlorinated swimming pool discharges	Program in place (DEQ)	The District advocates use of the BMPs set forth in *Disposing Chlorinated Waters from Swimming Pools and Hot Tubs* (DEQ, 2017).
Street wash waters	Program in place (District)	Street washing activities are typically conducted near construction sites. The pertinent BMPs for this activity are included in the *Erosion Prevention and Sediment Control Planning and Design Manual* (CWS et al., 2008).
Discharges of treated water from DEQ approved investigation, removal, and remedial actions	Program in Place (District)	Initial discharge is to the sanitary sewer, under the Pretreatment Program, *Source Control Pretreatment Program Implementation Manual* 2003, § III Procedures. No discharges shall occur without prior District approval and NPDES permit, if applicable.
Discharges from emergency fire-fighting activities	Program in Place (local fire dept.)	Stormwater protection measures are implemented when possible by Tualatin Valley Fire & Rescue, Cornelius Fire Dept., Hillsboro Fire Dept., Forest Grove Fire Dept., Banks Fire Dist. #13, and Washington County Fire Dist. #2

COE = U.S. Army Corps of Engineers
DSL = Oregon Department of State Lands

1.9 Training

N. Design and implement an ongoing training program for all staff, who as part of their normal job responsibilities come into contact with or otherwise observe an illicit discharge or illicit connections to the MS4, on the identification of an illicit discharge and/or connection, and on the proper procedures for reporting and responding to the illicit discharge and/or connection. Follow-up training shall be provided as needed to address the changes in procedures, techniques, requirements or staffing. Permittee shall document and maintain records of the training provided and the staff trained.

The District provides annual training for all co-implementer staff who clean and inspect MS4 components where signs of illicit discharges and connections could be observed. The training covers identification of illicit discharges and connections and proper responses for reporting and responding to them. BMP 4, Annual Training, describes the goals and tracking measures associated with meeting this requirement.

BMP CATEGORY: ILLICIT DISCHARGE DETECTION AND ELIMINATION

Introduction: The purpose of this BMP category is to improve water quality by proactively investigating and removing illicit discharges to the stormwater system. This BMP meets the regulatory requirements for a program to detect and remove illicit discharges and improper disposal to the storm sewer system.

Measurable goals and tracking measures:

1. Illicit Discharges, Including Sanitary Cross Connections and Accidental Spills

a. Goal: Respond to reports of illicit discharges. Abate identified illicit discharges.

***Tracking measure**: Annual number of illicit discharges reported to District/co-implementers by the public and illicit discharges identified through routine MS4 work.*

***Tracking measure**: Annual number of District/Co-implementer field investigations and other follow-up actions in response to reports.*

***Tracking measure**: Number of on-going illicit discharges identified and number abated by the District/Co-implementers.*

***Tracking measure**: Number of cross connections identified and number abated.*

b. Goal: Take enforcement actions according to the District's IDDE Program in response to illicit discharges.

***Tracking measure**: Number and type of enforcement actions taken to abate illicit discharges.*

2. Dry Weather Field Screening

a. Goal: Conduct annual dry weather illicit discharge inspections at 55 identified priority locations.

***Tracking measure**: Number of priority locations inspected annually.*

b. Goal: Conduct investigations of suspected illicit discharges. Abate illicit discharges identified through dry weather screening

***Tracking measure**: Number of suspected illicit discharges identified through dry weather screening and follow-up investigations conducted.*

***Tracking measure**: Number of illicit discharges confirmed and abated through dry weather screening.*

c. Goal: Annually review and maintain a map of priority locations for dry weather field screening.

***Tracking measure**: Changes, and rationale for changes, to priority locations.*

3. Annual Training

a. Goal: Provide annual training for all co-implementer staff who clean and inspect MS4 components where signs of illicit discharges and connections could be observed. The training will cover identification of illicit discharges and connections and proper responses for reporting and responding to them.

***Tracking measure:** Number of co-implementer staff attending annual training.*

Relationship to TMDLs

Bacteria. This BMP will reduce the human-related sources of bacteria by identifying and removing any cross-connections or other illicit discharges of bacteria-contaminated water into the MS4.

Phosphorus. This BMP will reduce the discharge of organic matter into the MS4, which will result in the reduction of phosphorus.

Settleable Volatile Solids. This BMP will reduce the discharge of organic matter into the MS4 and into the streams directly, which will result in the reduction of sediment oxygen demand.

Related documents:

- IDDE Description
- Source Control Program Enforcement Response Plan
- Industrial Stormwater and Water Quality Investigation Enforcement Response Plan

- Clean Water Services Industrial Stormwater Program Implementation Manual
- Clean Water Services Ordinance No. 27

2. Industrial and Commercial Facilities

The permittee must continue to implement a program to reduce pollutants in stormwater discharges to the MS4 from: facilities the permittee identified as being subject to an industrial stormwater NPDES permit; hazardous waste treatment, disposal and recovery facilities; industrial facilities that are subject to section 313 of title III of the Superfund Amendments and Reauthorization Act of 1986; and, facilities that have been identified as contributing a significant pollutant load to the MS4. The permittee must:

There are no hazardous waste treatment, disposal, and recovery facilities within the District's service area. To ensure that the District oversees industrial facilities subject to Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA Title III), the District reviews industrial user surveys of new businesses to identify facilities that are subject to these provisions. The District also annually obtains a list of industrial facilities in its service area that are subject to Toxic Release Inventory (TRI) reporting under SARA Title III to determine whether any facilities in its service area that are subject to TRI reporting were missed by the industrial user survey process. If facilities subject to reporting under SARA Title III are identified through the TRI report that were not previously screened for potential MS4 impact, the District will survey the facility and inspect it for chemical storage and spill potential to evaluate whether its stormwater discharges warrant additional controls. Stormwater discharges from industrial facilities that are subject to SARA Title III and other industrial facilities are managed through the 1200-Z NPDES Stormwater General Permit assigned to industrial facilities by the Oregon Department of Environmental Quality (DEQ).

The District's industrial stormwater program operates under a memorandum of agreement (MOA) with DEQ to regulate industrial facilities requiring an NPDES Permit. In the state of Oregon, this is the 1200-Z Stormwater General Permit for industrial facilities. Under the current MOA, the District acts as DEQ's agent in regulating industrial facilities that discharge to the MS4 and are required to have a 1200-Z permit. The District implements the industrial stormwater program for the entire service area.

The District performs the following activities for the 1200-Z facilities:

- Identifies facilities requiring industrial stormwater permits
- Reviews industrial stormwater permit application
- Reviews Stormwater Pollution Control Plans (SWPCP)
- Provides technical assistance
- Inspects facilities
- Reviews industrial Discharge Monitoring Reports (DMRs)
- Coordinates with DEQ on enforcement matters

2.1 Priorities and Procedures for Inspections and Control Measures

A. Screen new industrial facilities to assess whether the facility has the potential to be subject to an industrial stormwater NPDES permit or has the potential to contribute a significant pollutant load to the MS4.

B. Within 30 days after a facility is newly identified by the permittee as potentially subject to an industrial stormwater NPDES permit, the permittee must notify, in writing, the industrial facility that it is potentially subject to an industrial stormwater NPDES permit.

C. Implement an updated written strategy to reduce pollutants in stormwater discharges to the MS4 from industrial and commercial facilities where site-specific information has identified a significant industrial or commercial pollutant load to the MS4. The strategy must include a description of the approach to and rationale for identifying commercial and industrial facilities as a contributor of significant pollutant load, and establish the priorities and procedures for facility inspection and stormwater control measure implementation at the identified facilities. The updated strategy must be implemented by October 22, 2017 and subsequently applied within one calendar year from the date a new source contributing a significant pollutant load to the MS4 has been identified by the permittee.

1200-Z Permitted Facilities

The District identifies and contacts industrial facilities through the ongoing Sewer Use Information Card survey program. Industrial facilities are then classified by Standard Industrial Classifications (SICs). After these facilities are identified as needing a permit, the District directs the facility operators to apply for the 1200-Z permit.

The District inspects 1200-Z permitted facilities based on a system that prioritizes inspections so that the frequency of inspection is roughly proportional to the risk of discharges of pollutants and other noncompliance. In prioritizing inspections, the District considers the complexity of the facility, its compliance history and benchmark exceedances. Regardless of risk, the District inspects every 1200-Z permitted facility at least once during the MS4 permit term. In addition to these inspections, the District conducts technical assistance inspections at facilities that need additional help and provides "no exposure" certifications to facilities that do not have industrial activities that are exposed to stormwater.

Industrial facilities subject to the 1200-Z permit are required to submit monitoring results for pollutants specified in the permit on a quarterly basis. The District receives and reviews the monitoring reports from each of the 1200-Z industrial permittees in its service area. The District evaluates this information for accuracy and completeness, and compares it to the Quality Assurance and Quality Control (QA/QC) laboratory data that is submitted per requirements of the 1200-Z permit.

Facilities Identified as Having the Potential to Contribute Pollutants

As described in its written strategy, the District initially determines whether an industrial facility has the potential to contribute a significant pollutant load to the MS4 based on the facility's SIC code. The District also responds to site-specific information, such as might be gained in investigating a complaint or an illicit discharge, indicating that an industrial or commercial facility has the potential to contribute a significant pollutant load to the MS4. In determining whether a facility has the potential to contribute a significant pollutant load to the MS4, the District considers the nature of materials and wastes stored at the facility, the condition and location of storage structures, the protective measures in place (including personnel training, spill response plans, and inspection programs), and the history of actual releases. The District inspects all facilities where there is credible site-specific information suggesting the potential to contribute a significant pollutant load to the MS4. Sites with known releases are prioritized. Facilities that are found with SIC codes requiring 1200-Z coverage are brought into the 1200-Z program.

Where inspection confirms the potential to contribute a significant pollutant load to the MS4, the District initially works with the owner/operator to implement practices

designed to eliminate the potential. If this technical assistance is not effective, the District may bring enforcement action under Ordinance 27 to compel compliance and/or may request that DEQ require the facility to obtain coverage under a 1200-Z general permit pursuant to 40 CFR 122.26(a)(9)(i)(D), or may take other action as appropriate.

In addition to the program for industrial facilities that are covered by the 1200-Z stormwater general permit, the District implements a program for select industrial and commercial facilities that conduct washing operations. With respect to the discharge from washing operations, the District's program consists of the following:

- Identifying facilities that discharge process waters from washing operations to the MS4
- Providing technical assistance to eliminate these discharges to the MS4
- Requiring permits and necessary controls for discharges to the sanitary sewer
- Conducting annual inspections of permitted facilities

BMPs 1a through g, Industrial and Commercial Facilities, describe the goals and tracking measures associated with meeting these requirements.

BMP CATEGORY: INDUSTRIAL AND COMMERCIAL FACILITIES

Introduction: The purpose of this BMP category is to improve water quality by regulating select industrial and commercial discharges to the storm sewer system. This is accomplished by identifying facilities subject to industrial permitting requirements, reviewing stormwater pollution control plans, conducting inspections, reviewing discharge monitoring data and providing technical assistance.

Measurable goals and tracking measures:

1. a. Goal: Identify industrial facilities that need a 1200-Z stormwater general permit.

   Tracking Measure*: Number of newly permitted 1200-Z facilities in the service area.*

   b. (1) Goal: Conduct all of the priority 1200-Z facility inspections scheduled for the reporting year in the service area.

   Tracking Measure*: Number of priority 1200-Z permitted facility inspections scheduled for the reporting year; number of scheduled priority 1200-Z facility inspections conducted during the reporting year.*

   b. (2) Goal: Inspect 20 per cent of 1200-Z permitted facilities annually during permit administrative extension.

   Tracking Measure*: Total number of 1200-Z permitted facilities; number inspected*

   c. Goal: Provide technical assistance if requested by owner/operator of a facility.

   Tracking Measure*: Number of technical assistance inspections performed in response to owner/operator requests.*

   d. Goal: Issue "No Exposure" certifications to facilities that are determined to meet DEQ qualifying criteria.

   Tracking Measure*: Number of "No Exposure" certifications issued.*

   e. Goal: Review monitoring reports from all 1200-Z facilities.

   Tracking Measure*: Number of monitoring reports submitted and number reviewed.*

   f. Goal: Identify facilities subject to section 313 of SARA Title III and not already covered by 1200-Z or other stormwater discharge permit and determine their potential to contribute a substantial pollutant loading to the MS4.

   Tracking Measure: Number of unpermitted facilities identified through the annual review of the TRI.

   Tracking Measure: Number of unpermitted facilities identified through the TRI review that were inspected, number determined to have potential to discharge a substantial pollutant loading, action taken.

   g. Goal: Reduce pollutants in stormwater discharges from facilities other than those with SIC codes requiring 1200-Z general permit coverage.

   Tracking Measure: Number of facilities (other than those with 1200Z-qualifying SIC codes) where site-specific information leads to a facility inspection, number of facilities determined to be contributing a significant pollutant load to the MS4, action taken.

Relationship to TMDLs

Implementing this BMP and the 1200-Z permitting program reduces the potential discharge of all of the TMDL parameters.

Related documents:

- *Stormwater Pollution Control Manual* (Clean Water Services, 1999)
- Industrial Stormwater Implementation Manual
- MOA with DEQ to implement the 1200-Z program

3. Construction Site Runoff Control

The permittee must continue to implement a program to reduce pollutants in stormwater runoff to the MS4 from construction activities. The permittee must:

A. Implement and enforce ordinances or other enforceable regulatory mechanisms that require erosion prevention and sediment control (EPSC) best management practices to be designed, implemented, and maintained on construction sites to minimize the transport of construction-related pollutants to waters of the State and prevent adverse impacts to water quality by construction-related pollutants. The construction site runoff control program ordinances or other enforceable regulatory mechanism must apply to construction activities that result in a land disturbance of 500 ft^2 or greater.

The District's Ordinance 27 authorizes rules and regulations for construction site stormwater management through adoption of resolutions and orders. The specific rules and regulations are located in the *Clean Water Services Design and Construction Standards for Sanitary Sewer and Surface Water Management* (*D&C Standards*). The *D&C Standards* include requirements that are intended to protect the beneficial uses of waters within the Tualatin River Basin and the District's service boundary, and are implemented in combination with state, federal, and local laws and ordinances. Within the Tualatin River Basin, the Tualatin Basin Rule (OAR 340-041-0345(4)) regulates erosion control and stormwater quality related to land development. Under this rule, the District regulates all land development activities that disturb more than 500 square feet. In addition, construction activities that affect areas greater than one acre are also regulated under NPDES Stormwater Discharge Permits (1200-C and 1200-CN Permits). The District acts as an agent for the administration of the 1200-CN and 1200-C program on behalf of DEQ. Applicants may prepare and submit a single Erosion Prevention and Sediment Control Plan (EPSCP) for approval under both the District's regulations and the state (DEQ's) regulations, thereby streamlining the permitting process.

To provide further guidance to the development and construction community, the District, in partnership with other local jurisdictions, publishes the *Erosion Prevention and Sediment Control Planning and Design Manual (Manual)*. The *Manual* provides a detailed and comprehensive description of erosion control materials and installation practices that have proven effective.

The erosion control program and rules include BMPs for erosion prevention and sediment control, with emphasis on proactive erosion prevention rather than reactive sediment control. Prevention techniques include site planning and scheduling, retention or use of ground cover, etc. Sediment control measures include silt fences, sediment barriers, settling basins, etc.

The Construction Site Runoff control BMP fact sheet at the end of this section contains a summary of the program, measurable goals and tracking items.

3.1 Site Planning Procedures and BMP Requirements

B. Require construction site operators to prevent or control the discharge of pollutants to the MS4 from construction-related non-stormwater waste that may cause adverse impacts to water quality, such as discarded building materials, concrete truck washout, chemicals, litter, and sanitary waste.

C. Require construction site operators to develop EPSC site plans that incorporate appropriate and effective EPSC best management practices. At a minimum, EPSC site plans for sites

disturbing one acre to less than five acres of land must be consistent with the substantive requirements of the State of Oregon's 1200-CN permit, and for sites disturbing 5 acres or greater of land, the construction EPSC site plans must be consistent with the substantive requirements of the State of Oregon's 1200-C permit. In place of individual site-specific EPSC plans, the permittee may allow operators of individual single-family home sites less than one acre to use a permittee-documented list of effective EPSC BMPs and site sketch showing appropriate use and placement of the EPSC BMPs. By April 22, 2017, the permittee must develop written EPSC site plan review procedures that the permittee must use to verify that the EPSC site plan or site sketch incorporate appropriate EPSC BMPs for the construction activities being proposed.

D. *Require the construction site operator to implement and maintain appropriate and effective EPSC best management practices, as reflected in the applicable EPSC site plan or site sketch for the construction site, and update the EPSC site plan or site sketch as necessary to remain effective.*

The *D&C Standards* specify the required elements (management practices) that must be included in an EPSCP. In addition to management practices, the EPSCP requires identification and protection of water quality sensitive areas, floodplains, and drainage hazard areas. The *D&C Standards* outline the required elements of an EPSCP. The EPSCP serves as a blueprint to prevent erosion and control sediment from leaving the site during construction and requires modification throughout the life of the project as needed. The District and co-implementers follow written procedures to review and approve EPSCPs prior to issuing site development erosion control permits.

The development plan review and permitting process is streamlined for construction of individual single-family homes on sites less than one acre and does not require an EPSCP. At a minimum, all construction projects of individual single-family home sites less than one acre require down-gradient perimeter control, inlet protection, and a construction entrance, which are standard construction practices. An EPSCP template showing the location of typical erosion and sediment control BMPs is provided with each single family erosion control permit issued.

A detailed EPSCP is required for all commercial, industrial and multi-family residential sites, regardless of lot size. The EPSCP submittal and review is part of the engineering plan review process through which a Site Development Permit is issued. A Site Development Permit cannot be issued without EPSCP approval. Permit issuance requires installation and maintenance of temporary and permanent erosion control measures on all sites in accordance with an approved EPSCP. However, compliance with the approved plan does not preclude the District or co-implementer from requiring a permittee to provide additional measures not identified in the EPSCP if erosion is occurring.

The *D&C Standards* specify erosion prevention and sediment control requirements and include BMPs for use on sites within the Tualatin River sub-basin, some of which are minimum requirements. The *D&C Standards* also include numerous BMPs for effective erosion prevention and sediment control, and BMPs for "non-stormwater pollution control," including BMPs that address concrete truck washout areas, spill prevention/response, employee training and protected areas for storage and maintenance. In addition to the required and allowed BMP list, the *Manual* provides designers with information regarding advantages and disadvantages, design,

inspection, and maintenance requirements for a wide variety of erosion control BMPs and helps the designer choose the most appropriate measure or control for an individual site.

BMP 2.b, Training and Outreach, describes the goals and tracking measures associated with notifying site development permit holders of these erosion control requirements.

3.2 Procedures for Identifying Priorities for Site Inspections and Enforcement of Control Measures

E. Perform regular on-site inspections to ensure that the applicable EPSC site plan or site sketch is properly implemented. The construction site inspections must include inspection of disturbed areas of the site, material and waste storage areas, stockpile areas, construction site entrances and exits, sensitive areas, discharge locations to the MS4, and, if appropriate, discharge locations to receiving waters. The permittee must document inspections to support its findings, including taking photographs of the construction site, as appropriate, and documenting environmental monitoring results when water quality sampling is conducted. By April 22, 2017, the permittee must develop written site inspection procedures and criteria the permittee must use during its site inspections to ensure proper implementation of the EPSC site plan and compliance with the applicable ordinance or regulatory mechanism.

F. By April 22, 2017, the permittee must develop and implement a written escalating enforcement response procedure to ensure construction activities are in compliance with the ordinances or other regulatory mechanisms and eliminate non-compliance in an expeditious manner.

G. Maintain a record-keeping system to document and track construction site runoff program activities.

The District and co-implementers conduct three types of inspections: initial inspections, regular inspections, and final inspections. On all sites, with the exception of individual single family lots, erosion prevention and sediment control measures must be installed and the initial inspection completed before any permitted construction activity begins.

Regular inspections are performed at least weekly on all active site development projects. Regular inspections are performed at least monthly on all active single-lot sites (residential, commercial, and industrial). Inactive site development and single-lot projects are inspected at a frequency based on site conditions; they are inspected at least monthly. Additional inspections may be conducted on sites that have challenging site characteristics such as topography, size of the lot, proximity to sensitive areas, and the nature and complexity of the construction activity. The District and co-implementers document all inspections.

The District and co-implementers' inspection of all active sites and frequent follow-up inspections help ensure that the approved EPSCP and BMPs are being implemented. An escalating enforcement system is used for violations, depending on the severity and the nature of the violation. The escalating enforcement may include verbal warnings, written warnings (e.g., Deficiency Notices), imposition of re-inspection fees, Stop Work Orders, and Civil Citations. The District and co-implementers have the ability to bypass verbal or written warnings to address severe violations. For example, working without a proper permit may result in an immediate Stop Work Order and potentially a Civil Citation. Photo documentation is collected when appropriate to

support Stop Work Orders. These procedures are documented in the District's *Construction Site Runoff Inspection Guidance* (*Guidance*). The co-implementers either use this *Guidance*, or their own equivalent document. The District and co-implementers document the activities they carry out to implement the construction site runoff program.

BMP 1, Erosion Prevention & Sediment Control (EPSC) Inspection and Enforcement, and BMP 2.a, Training and Outreach, describe the goals and tracking measures associated with meeting this requirement.

3.3 Education and Training for Construction Site Operators

The following addresses a permit requirement listed in Schedule A.2.d.iv.F for Education and Outreach:

Schedule A.2.d.iv.F: Notify construction site operators where education and training to meet erosion prevention and sediment control requirements can be obtained.

The District provides information regarding opportunities for training and education for construction site operators.

BMP CATEGORY: CONSTRUCTION SITE RUNOFF CONTROL

Introduction: The purpose of this BMP category is to improve water quality by reducing or preventing soil erosion and implementing sediment control measures at construction sites through regulation, inspection, enforcement, and education.

Measurable goals and tracking measures:

1. Erosion Prevention & Sediment Control (EPSC) Inspection and Enforcement

a. Goal: Conduct initial, regular and final inspections for all active site development projects.

***Tracking measure**: Annual number of site development inspections–initial, regular, and final.*

b. Goal: Conduct initial, regular and final inspections for all active single lot construction sites.

***Tracking measure**: Annual number of single lot construction inspections–initial, regular, and final.*

c. Goal: Implement an escalating enforcement system which may include written warnings (e.g., Deficiency Notices or similar action), Stop Work Orders, and Civil Citations.

***Tracking measure**: Annual number of enforcement actions–written warnings (e.g., Deficiency Notices or similar action), Stop Work Orders, and Civil Citations.*

2. Training and Outreach

a. Goal: Provide annual inspector training on erosion control techniques and enforcement measures for continuing education. Except for inspectors who have an active EPSC certification that includes a continuing education requirement, require all erosion control inspectors to attend annual training on erosion control techniques.

***Tracking measure**: Number of non-certified inspectors and number attending annual EPSC training.*

***Tracking measure**: Number of inspectors with active EPSC certification.*

***Tracking measure**: List of annual training sessions conducted and participating agencies.*

b. Goal: Provide annual notification of wet-weather requirements to active site development (i.e., not single family home construction) permit holders.

***Tracking measure**: Number of site development permits active at the time when wet weather notices are issued; annual number of wet weather notices issued.*

Relationship to TMDLs

Phosphorus. The District's Erosion Control program was established under the Tualatin Basin Rule (OAR 340-041-0345(4)) to meet the phosphorus allocations in the 1988 Tualatin TMDL.

Settleable Volatile Solids. Erosion Control BMPs significantly reduce the discharge of organic matter associated with soil erosion. Organic matter can result in increased sediment oxygen demand in the receiving waters.

Related Documents:

- *D&C Standards*, 2019 (Chapter 6)
- Erosion Prevention and Sediment Control Planning and Design Manual, 2008
- Erosion Control Internal Inspection Procedures Handbook

4. Education and Outreach

The District implements the education and outreach program throughout the service area and has typically taken the lead in crafting education and outreach messages. Therefore, the discussion below mentions the District as the entity that implements the program. However, it should be noted that the District and co-implementers share responsibility for education and outreach.

The District's Strategic Communications Plan is based on established communication principles including open two-way communication, community problem solving, and strong and consistent messages.

The District's primary message is: protect and enhance watershed health. To encourage stream-healthy behaviors, the District uses a variety of print, electronic and other media including: newspaper, cable TV, radio, social media, billing inserts, signage, brochures, community events, workshops, vehicle murals, electronic newsletters and the website. Partnerships are a key factor in the success of the District's public education and outreach programs. As a member of the Regional Coalition for Clean Rivers and Streams and the Tualatin Basin Public Awareness Committee, the Tualatin River Watershed Council, and other groups working to inform people about water quality, the District has leveraged dollars and resources to have greater reach and impact.

The overall program requirement from the permit is as follows:

The permittee must implement an education and outreach program designed to achieve measurable goals for target audiences, and address specific stormwater quality issues or identified pollutants of concern in its jurisdictional area. The permittee must describe and use effective education and outreach methods, and the permittee must address, at a minimum, the following:

The permit goes on to describe the eight specific components of a public education program that are required. The SWMP elements for each of these specific components are described according to permit requirements in the following subsections.

4.1 Conduct Outreach

A. Continue to implement a documented public education and outreach strategy that effectively promotes pollutant source control and a reduction of pollutants in stormwater discharges. The strategy must identify targeted pollutants of concern, the targeted audience, specific education activities, and the entity or individual responsible for implementation. The public education and outreach strategy may incorporate cooperative efforts. The cooperative efforts conducted within the MS4 jurisdictional area must be tracked, documented, and the results reported annually.

B. Provide educational materials or activities to the public that describe the impacts of stormwater discharges on water bodies and the steps or actions the public can take to reduce pollutants in stormwater runoff.

The District's public education and outreach strategy is documented in its Strategic Communications Plan. Through this plan the District commits to programs that meet the permit requirements for public education and outreach. Examples of these programs include the following:

Public Awareness Campaigns

The District will continue to conduct its Public Awareness Campaigns on a three-year cycle. These campaigns focus on a targeted audience, targeted behaviors and targeted

pollutants. The District will use results from the customer surveys (see below) and feedback from other customer interactions (e.g., social media, District events, etc.) to adapt and refine the public awareness campaigns as necessary. As an example, the District sponsors the "Canines for Clean Water" campaign to encourage proper disposal of pet waste. Dog owners are asked to pledge that they will pick up and properly dispose of pet waste, and in return they receive a colorful bandana for their pet and have the opportunity to have their dog's photo posted on the District website. The purpose of this program is to reduce the discharge of bacteria to surface waters. This popular program puts heart and humor into water quality education.

Public Education

The District developed the Tualatin River Rangers classroom presentation to teach elementary students the impact of daily activities on water quality. The District will continue to present this program. Schools throughout the Tualatin watershed host the Tualatin River Rangers, and District staff teach children how to protect water quality by reducing the use and properly disposing of toxic materials including fertilizers and herbicides, and reporting illicit discharges. The students are encouraged to share this information with their parents through a take-home exercise that engages parents in identifying toxic household materials and putting a sticker on them for proper disposal. This award-winning program has been marketed throughout the U.S.

Outreach Program to Diverse and Underserved Residents

The District will continue to seek opportunities to collaborate with diverse and underserved communities through educational programs and outreach materials that address water quality protection practices.

Community Events

District staff will continue its presence at community events including the Washington County Fair, Public Works Fair, Earth Day events, and Children's Clean Water Festival. At these events District staff talk with individuals about water quality protection and provides brochures, magnets, temporary tattoos, River Ranger handouts, and many other giveaways that help reinforce water quality messages.

Streamside Education

The District will continue building relationships with streamside homeowners who can have the greatest impact on surface water quality. The District will maintain its website, which provides specific educational information for streamside property owners, including contact information for technical assistance and information regarding use of native plants to protect water quality. The District will also provide up to five free native plants to streamside residents annually to reduce erosion and encourage stewardship activities.

Financial Support

The District has provided organizational, financial and technical support to stream and wetland "friends" groups in the Tualatin Basin for more than a decade. These groups use newsletters, websites, tours and activities to convey water quality messages to larger audiences. The District intends to continue this effort as budgetary constraints allow.

Certification

The District will continue to sponsor the Eco-Logical Business certification program, which encourages residents to patronize certified businesses. The Eco-Logical Business certification program includes auto repair shops and other businesses that have met rigorous standards that ensure their policies and procedures protect water resources.

BMP 1, Education and Outreach Strategy, BMP 2, Pesticides/Herbicides/Fertilizers, and BMP 5, Education Regarding Illicit Discharges, describe the goals and tracking measures associated with meeting this requirement.

4.2 Pesticide, Herbicide and Fertilizer Educational Activities

C. Provide public education on the proper use and disposal of pesticides, herbicides, fertilizers and other household chemicals.

The District will continue its public education and outreach programs that address issues associated with the application and disposal of pesticides, herbicides, and fertilizers. Key program activities include:

- Educating the public on alternatives to pesticides, herbicides and fertilizers via the annual public awareness campaign with newspaper, cable TV, radio, billing inserts and online advertisements (www.cleanwaterservices.org/)
- Educating the public on the use of native plants by distributing the *Gardening with Native Plants* brochure.

BMP 2, Pesticides/Herbicides/Fertilizers, describes the goals and tracking measures associated with meeting this requirement.

4.3 Education Regarding Private Stormwater Facility Maintenance

D. As appropriate, provide education on the proper operation and maintenance of privately-owned or operated stormwater quality management facilities to owners and/or operators of private WQ facilities.

See Section 8.3, Privately Owned Stormwater Structural Facilities, for information on how this requirement is addressed.

4.4 Training for Construction Site Operators

F. Notify construction site operators where education and training to meet erosion prevention and sediment control requirements can be obtained.

See Section 3.3 for information on how this requirement is addressed.

4.5 Conduct or Participate in an Effectiveness Evaluation

G. Conduct or participate in an effectiveness evaluation to measure the success of public education activities during the term of this permit by assessing changes in targeted behaviors. The results of the effectiveness evaluation must be used in the adaptive management of the education and outreach program, and reported to DEQ no later than November 1, 2019.

An integral component of the District's Strategic Communications Plan is to conduct biennial customer surveys. These surveys are conducted by a professional research firm that provides statistically valid and reliable results of customer attitudes and behaviors related to water quality. The surveys include questions related to the current public awareness campaign. The District uses the survey results to measure the effectiveness of the public awareness campaigns in changing behaviors related to

water quality and to establish trends over time. Programs that prove to be ineffective in encouraging water quality-behavior changes are modified as necessary to result in a greater level of responsible behavior from those who live and work in the Tualatin River Basin.

BMP 3, Effectiveness Evaluation and Adaptive Management, describes the goals and tracking measures associated with meeting this requirement.

4.6 Employee Training

H. Provide training for permittee employees involved in MS4-related activities, as appropriate. The permittee must also provide the opportunity for jurisdictions within the MS4 service area to attend such trainings, as appropriate. At a minimum, the training must be tailored for the targeted audience, and include information related to stormwater pollution prevention and reduction BMPs associated with the following municipal operations or activities: parks and open space maintenance, fleet and building maintenance, new municipal facility construction, erosion and sediment control associated with land disturbances, design and construction of street and storm drain systems, discharges from non-emergency fire fighting-related training activities, and stormwater system maintenance.

The District and co-implementers train their employees involved in MS4-related activities through a combination of on-the job-training, informal workgroup sessions, and formal classes. Training opportunities are available through agencies, trade associations and educational groups.

BMP 4, Employee Training, describes the goals and tracking measures associated with meeting this requirement.

4.7 Illicit Discharges

E. Promote, publicize, and facilitate public reporting of illicit discharges.

The District promotes, publicizes, and facilitates public reporting of illicit discharges and water quality impacts. Key program activities include:

- Brochures, billing inserts and electronic newsletters that include regular articles on watershed protection and enhancement, proper disposal practices, and reporting information for illicit discharges and water quality impacts.
- Brochures with contact information and the "Report a problem" page on the District's website (www.cleanwaterservices.org) facilitate public reporting of illicit discharges and water quality problems. In addition, the District's and co-implementers' main phone numbers and websites are the entry points for reporting problems.
- Many of the District's public education and outreach programs also address the proper management and disposal of used oil and toxic materials. Key program activities include:
    - Regular articles on proper disposal of oil, household hazardous waste and litter and yard debris in billing inserts, print and electronic newsletters, and websites.
    - Storm drain marking program and distribution of educational door hangers regarding the proper disposal of yard debris and toxic materials.

BMP 5, Education Regarding Illicit Discharges, describes the goals and tracking measures associated with meeting this requirement.

BMP CATEGORY: EDUCATION AND OUTREACH

Introduction: The purpose of this BMP category is to inform and educate the public, business, industry, and government about the causes of stormwater pollution, the effects on local streams and rivers, and to promote stream healthy behavior. These BMPs encourage behavior change and participation that will reduce stormwater pollution and promote the health of the Tualatin River Watershed.

Measurable goals and tracking measures:

1. Education and Outreach Strategy

a. Goal: Following the District's *Strategic Communications Plan*, educate the public on stormwater quality issues including the impacts of stormwater discharges and the actions the public can take to reduce pollutants in stormwater, the proper use and disposal of pesticides, and information for reporting illicit discharges. The District will publish 12 monthly electronic newsletters per year and place inserts in customer bills five times per year covering one or more of these topics.

***Tracking measure**: Summarize activities and participation on an annual basis, including the number of electronic newsletters published and billing inserts mailed during the year.*

b. Goal: Following the District's *Strategic Communications Plan*, carry out campaigns designed to change the behavior of the intended audience relevant to reducing stormwater pollution.

***Tracking measure**: Annually track outreach campaigns being conducted, and the intended audiences and behaviors targeted through those campaigns.*

2. Pesticides/Herbicides/Fertilizers

a. Goal: Educate the public on the use of alternatives to pesticides, herbicides and fertilizers through the annual public awareness campaign.

***Tracking measure**: Summarize awareness campaign activities and participation regarding the use of alternatives to pesticides, herbicides and fertilizers on an annual basis.*

b. Goal: Educate the public on the use of native plants by distributing 500 copies of the *Gardening with Native Plants* brochure.

***Tracking measure**: Summarize outreach efforts and participation regarding the use of native plants on an annual basis, including the number of* Gardening with Native Plants *brochures distributed.*

3. Effectiveness Evaluation and Adaptive Management

Goal: Assess and improve the effectiveness of the District's *Strategic Communications Plan* by collecting data on program effectiveness, analyzing the data to determine the effectiveness of the District's educational and behavioral change efforts, identifying programmatic changes to improve outcomes, and implementing those improvements. Conduct a customer survey every two years. Annually use the Logic Model (or other appropriate process) to evaluate the effectiveness of at least one program in the District's *Strategic Communications Plan*, identify and implement needed revisions.

***Tracking measure**: Report on status of biannual customer survey and the application of the Logic Model.*

***Tracking measure**: Track changes made to the public education program as a result of customer surveys and the Logic Model.*

4. Employee Training

a. Goal: Conduct training for District and co-implementer employees associated with stormwater management.

b. Goal: Include training in recognition and reporting of illicit discharges.

c. Goal: Conduct annual training session for District and co-implementer personnel—on water quality facility design.

***Tracking measure**: List of annual training sessions on stormwater management, recognizing and reporting illicit discharges, and design of water quality facilities, participating agencies, and number of staff attending training sessions.*

5. Education Regarding Illicit Discharges

a. Goal: Ensure that District and co-implementer websites facilitate public reporting of illicit discharges and water quality problems.

***Tracking measure**: Summarize annual progress on developing user-friendly web-based methods for facilitating public reporting of illicit discharges and water quality problems.*

b. Goal: Use a variety of outreach mechanisms (i.e., print, electronic, and other media) to promote proper disposal of oil, household hazardous waste and litter, and yard debris in billing inserts, print and electronic newsletters, and websites.

***Tracking measure**: Summarize outreach related to disposal activities on an annual basis.*

c. Goal: Conduct the storm drain marking program and distribute educational door hangers regarding the proper disposal of yard debris and toxic materials.

***Tracking measure**: Number of drains marked and door hangers distributed.*

Relationship to TMDLs

Phosphorus. Public education regarding the proper application and usage of phosphorus-containing products is critical to the overall reduction in phosphorus in the watershed.

Bacteria. Public education about pet waste management and feeding waterfowl, such as ducks and geese, and other wildlife is important to reducing the concentration of bacteria in stormwater discharges. The District's strategy to reduce bacteria is greatly dependent on this BMP.

Settleable Volatile Solids. Public education and awareness is very important to reducing the loading of settleable volatile solids from the MS4. These include education about the proper use of landscaping materials, leaf disposal, etc.

Related documents:

- *Clean Water Services Strategic Communications Plan* (Clean Water Services, 2015)

5. Public Involvement and Participation

The permittee must provide opportunities for the public to effectively participate in the development, implementation and modification of the permittee's stormwater management program. The permittee must document and implement provisions for receiving and considering public comments on the monitoring plan, annual reports, SWMP revisions, the retrofit strategy, and the TMDL pollutant load reduction benchmark development.

The District will provide the monitoring plan to the public for review and comment on the District's website prior to submission to DEQ. The District will post its annual report on its website for public review and comment within five business days after November 1st of each year. The District will consider comments regarding the annual report in its adaptive management program.

SWMP revisions and pollutant load reduction benchmarks are required for submittal to DEQ at the permit renewal submittal (180 days prior to permit expiration). Prior to submittal of these items, the District will provide the public with an opportunity to comment on the revisions to the SWMP and proposed pollutant load reduction benchmarks for a minimum of 30 days. Comments on the documents will be collected and considered and the response to comments will be publicly provided.

The District provides opportunities for the public to participate in implementing the SWMP through:

- Enlisting pet owners in reducing the discharge of bacteria-laden pet wastes through Canines for Clean Water;
- Facilitating public reporting of illicit discharges;
- Providing the opportunity for businesses to reduce their discharges through the EcoBiz certification program; and
- Offering free on-site technical assistance in stormwater-friendly landscaping to reduce polluted runoff through the Clean Water Heroes program.

6. Post-Construction Site Runoff and Retrofit Programs

To address these requirements, this section of the SWMP is divided into six subsections covering: 1) Post-construction stormwater runoff quality; 2) Low Impact Development Approaches; 3) Post-construction stormwater runoff quantity and hydromodification; 4) Retrofit strategy development and implementation; 5) Site plan review, inspection, and enforcement; 6) Site limitations; and 7) Recordkeeping.

The permittee must continue to implement and enforce its post-construction stormwater runoff control and retrofit programs.

In accordance with the compliance dates listed below, the post-construction site runoff program must apply to new development and redevelopment projects that create or replace 1000 ft^2 or greater of impervious surface and must capture and treat 80% of the annual average runoff volume based on the documented local or regional rainfall frequency and intensity. The permittee must include a defined water quality design storm or an acceptable continuous simulation method to address the capture and treatment of 80% of the annual average runoff.

The post-construction and retrofit program must be designed to reduce site specific post-development stormwater runoff volume, duration, and rates of discharge to the MS4 to minimize hydrological and water quality impacts to waters of the State from impervious surfaces.

The District implements a post-construction stormwater pollutant and runoff control program through development requirements that are incorporated in the District's *D&C Standards*. Legal authority for the implementation and enforcement of the requirements referenced in this document is provided in the District's Ordinance 27. The *D&C Standards* require water quality treatment and water quantity control for specified thresholds of new and re-development.

The District actively pursues opportunities to retrofit existing areas that lack adequate stormwater controls. These areas include those that were developed in the decades prior to current stormwater management requirements and are typified by roadside ditches, flow-through catch basins, and direct discharges of untreated stormwater to surface waters. To address these areas, the District uses a formal outfall prioritization process that considers land use, pollutant load (including traffic), and the availability of open space for constructing system elements. Retrofit projects are often carried out in partnership with other public agencies as part of other public projects (road improvements, park expansion, etc.), allowing the District to leverage public resources.

BMP 1, Development Services, and BMP 2, Low Impact Development Approaches (LIDA), under this section describe the goals and tracking measures associated with implementing the post-construction site runoff program. BMP 5, Outfall Retrofits, and BMP 6, Catch Basin Retrofits, under section 7, Pollution Prevention for Municipal Operations, describe the goals and tracking measures associated with implementing the retrofit program.

6.1 Post-Construction Stormwater Runoff Quality

A. Stormwater Runoff Quality. By April 22, 2017, the permittee must implement and enforce a program to control post-construction stormwater runoff quality. The permittee must:

Incorporate BMPs that maximize pollutant removal, as identified in pollutant removal efficiency performance goals. The performance goals specify the design requirements and are not intended to be used as a basis for performance evaluation or compliance determination of the practices that are implemented pursuant to this section. The Design and Construction Standards must include a description of the following for each BMP:

1. Site-specific design requirements, including estimated removal efficiency performance goals;
2. Design requirements that do not inhibit maintenance; and,
3. Conditions where the BMP applies or conditions where BMP implementation is impracticable.

The District controls post-construction water quality by implementing and enforcing the *D&C Standards*. The District's Board of Directors approved Resolution and Order 17-05 on March 28, 2017, revising the District's *D&C Standards* to control post-construction runoff water quality.

6.2 Low-Impact Development Approaches

B. Low Impact Development Approaches. By April 22, 2018, the permittee must:

1. Evaluate, prioritize and include implementation of Low-Impact Development (LID), Green Infrastructure (GI), or an equivalent design and construction approach in its post construction runoff control program.

2. Include a description of the conditions where implementation of LID, GI, or an equivalent approach may be impracticable in its Design and Construction Standards.

The District's *D&C Standards* include implementation of Low Impact Development Approaches (LIDA) to meet the runoff treatment and control requirements. The D*&C Standards* include approvable LIDA and the process for evaluating and approving other LIDA proposed by the applicant. The District's Board of Directors approved Resolution and Order 17-5 on March 28, 2017, revising the District's *D&C Standards* to prioritize the use of LIDA, including a description of conditions where implementation of LIDA may be impracticable.

3. Minimize or eliminate ordinance, code and development standard barriers that inhibit design and implementation techniques intended to minimize impervious surfaces and reduce stormwater runoff (e.g., Low Impact Development, Green Infrastructure) where practicable and within its legal authority. Such modifications to ordinance, code and development standards are only required to the extent they are permitted under federal and state laws.

The District developed the *Low Impact Development Approaches Handbook, July 2009* (*LIDA Handbook*) and updated it in June 2016 The *LIDA Handbook* promotes and encourages LIDA. The District's code is consistent with guidance provided in the handbook. The *LIDA Handbook* addresses concerns about integration with building, plumbing, and maintenance departments.

6.3 Post-Construction Stormwater Runoff Quantity and Hydromodification

C. Hydromodification and Stormwater Runoff Quantity. The permittee must implement and enforce a program to control post-construction stormwater runoff quantity.

1. The permittee must complete a hydromodification assessment examining impacts related to the permittee's MS4 discharges, including erosion, sedimentation, and/or alteration to stormwater flow, volume and duration that may cause or contribute to water quality degradation. The permittee must implement the strategies and priorities for preventing or reducing hydromodification impacts identified in the assessment as part of its post-construction stormwater quantity control program. The permittee must comply with the following requirements in performing the hydromodification assessment and implementing its strategies and priorities:

a. By April 22, 2018, the permittee must develop and submit a scope of work and schedule for performing the hydromodification assessment. The scope of work and schedule are subject to DEQ's review and approval. The scope and schedule for performing the assessment must include the following:

i. Description of planned coordination and involvement of stakeholders focused on the permittee's proposed approach to performing the assessment and implementing its findings and mechanisms for public review and feedback.
ii. Examination and assessment of the hydromodification impacts related to the permittee's MS4 discharges, including erosion, sedimentation, and/or alteration to stormwater flow, volume and duration that may cause or contribute to water quality degradation).
iii. Description and justification of decision-making approaches and tools that will be used to develop the program.
iv. An implementation plan, describing where the proposed approach will be implemented sand a timeline for implementation.
v. A description of the information that will be collected and maintained to inform future stormwater management decisions related to hydromodification based on local conditions and needs.
vi. Identification or development of strategies to address hydromodification information or data gaps related to waterbodies within the permittee's jurisdiction.
vii. Identify strategies and priorities for preventing or reducing hydromodification impacts related to the permittee's MS4 discharges. The strategies and priorities must include performance standards equivalent to or more stringent than the following:

a. Site-specific post-construction management practices that, at a minimum, target predevelopment site hydrologic functions, and where practicable, natural surface hydrology. The site-specific post-construction management practices must optimize on-site retention based on the site conditions of the project.
b. Effective decision-making approaches and tools to address hydromodification.

2. No less than 60 days before the third anniversary of permit issuance (February 20, 2019), permittee shall submit a draft report of the hydromodification assessment based on the submitted scope and schedule to DEQ for review and approval.

3. No more than 60 days after receipt of DEQ's comments on the draft report, the permittee must submit the final hydromodification assessment report to DEQ and within 30 days begin implementing the timelines contained in the report for implementing the strategies and priorities identified in the final report.

4. By April 22, 2019, the permittee must develop and implement the post-construction stormwater runoff quantity program applicable to new development and redevelopment projects. The permittee must implement the strategies and priorities for preventing or reducing hydromodification impacts identified in the hydromodification assessment as part of its post-construction stormwater quantity control program.

In February 2019 the District submitted a draft Hydromodification Assessment Report to DEQ. On April 2, 2019, the District's Board of Directors approved Resolution and Order 19-5 revising the District's *D&C Standards* to incorporate the findings, strategies, and priorities of the hydromodification assessment. The District began implementing the revisions on April 22, 2019, when they went into effect. The District completed the final Hydromodification Assessment Report in June 2019.

6.4 Retrofit Strategy Development and Implementation

D. Retrofit Strategy. By April 22, 2019, permittee must implement a stormwater retrofit program that applies to developed areas identified by the permittee as impacting water quality and that are insufficient or lacking stormwater quality and flow controls. The permittee must document its stormwater retrofit program in a plan, and submit its plan to DEQ by April 22, 2019. The permittee must use this plan to guide the implementation of its stormwater retrofit program. The program must meet the following requirements:

1. *The stormwater retrofit program must be designed to implement a permittee-defined set of stormwater retrofit objectives and a comprehensive evaluation of a range of stormwater retrofit control measures and their appropriate use. The permittee-defined objectives must be designed assure progress towards applicable TMDL wasteload allocations. The permittee must provide opportunity for public comment and consider public input for the development of the stormwater retrofit program.*

2. *The permittee must include the following components in its stormwater retrofit plan:*

   a. *A stormwater retrofit strategy statement and summary, including objectives and rationale.*
   b. *Summary of current stormwater retrofit control measures implemented within the permittee's jurisdiction, and a current estimate of annual program resources directed towards stormwater retrofits.*
   c. *Identification of high priority retrofit areas.*
   d. *The examination of new or additional stormwater retrofit control measures.*
   e. *The preferred retrofit structural control measures, including rationale.*
   f. *A retrofit project or approach priority list, including rationale, identification and map of potential stormwater retrofit locations, where appropriate, and an estimated timeline and cost for implementation of each project or approach.*

3. *The permittee must identify, at a minimum, five stormwater quality improvement retrofit projects. The identified projects must be designed, and constructed or implemented, to effectively reduce applicable TMDL pollutant parameters by April 22, 2021.*

4. *The permittee must include a summary report describing the status of retrofit program in each annual report.*

As described above, the District actively pursues opportunities to retrofit areas that impact water quality due to lack of stormwater controls. The District included its Stormwater Retrofit Program Plan with the final Hydromodification Assessment and Report in June 2019. Outfall and catch basin retrofits are covered under subsection 7.6 of this SWMP.

6.5 Site Plan Review, Inspection, and Enforcement

E. The permittee must require submittal of post-construction runoff management site plans and/or other documentation for all new development and redevelopment projects subject to the conditions of this section. The site plans and/or other documents must show or describe the stormwater practices that will be installed or implemented as part of the development project to ensure compliance with the post-construction stormwater runoff control program requirements. The permittee must review, approve, and verify proper implementation of the post-construction site plans.

G. The permittee must document and implement inspection and escalating enforcement response procedures to ensure new development and redevelopment projects are compliant with the applicable post-construction stormwater management requirements.

A site development permit is required for all new and re-development projects. A site development plan application requires detailed engineering plans for sufficient

sanitary and stormwater infrastructures for the site. As related to the MS4 system, all site development plan applications must include:

- A plan for water quality and quantity management
- Erosion Prevention and Sediment Control Plans
- Drainage Reports, including the basis for the stormwater facilities design
- A maintenance plan to address long-term functionality of private stormwater facilities

A site development permit (including the requirement for an erosion prevention and sediment control plan) is issued after the plans are reviewed and all issues are addressed. Per *D&C Standards*, all new stormwater facilities that provide treatment to multiple properties are designated "public" facilities and are maintained by the District and co-implementers that implement the Operations and Maintenance BMPs (see Section 8). All facilities, public or private, are designed and constructed to meet the *D&C Standards.*

Inspection of development projects by District or co-implementer staff during construction ensures that stormwater facilities are constructed in compliance with approved plans. See Section 8.3 regarding the inspection and enforcement procedures related to private stormwater quality facilities.

6.6 Site Limitations

F. Where a new development or redevelopment project site is characterized by factors limiting use of on-site stormwater management methods to achieve the post-construction site runoff requirements, such as high water table, shallow bedrock, poorly-drained or low permeable soils, contaminated soils, steep slopes or other constraints, the permittee must require equivalent pollutant reduction and runoff management measures, such as off-site stormwater quality and quantity management. Off-site stormwater quality and quantity management may include, but is not limited to, off-site mitigation, such as construction of a structural stormwater facility within the sub-watershed, a stormwater quality or quantity structural facility mitigation bank or a payment-in-lieu program.

A water quality treatment approach is required by the District for the creation of new impervious surface unless, 1) due to topography, soils, or other site conditions implementation of an on-site approach is impractical, ineffective or results in the inefficient use of District or city resources for long-term operations or maintenance; or 2) there is a more efficient and effective regional approach within the sub-basin that was designed to incorporate the development or there is an approach in the sub-basin which is demonstrated to have the capacity to treat the site. In these situations, an in-lieu of fee is required.

6.7 Recordkeeping

H. The permittee must maintain a record-keeping system or approach to document and track post-construction site runoff program activities.

The District and co-implementers maintain records of standards development, site plan review and permitting, construction inspection, and private water quality facility inspections.

BMP CATEGORY: POST CONSTRUCTION SITE RUNOFF AND RETROFIT PROGRAMS

Introduction: The purpose of this BMP category is to improve water quality by developing and applying appropriate design and construction standards to development.

Measurable Goals and Tracking Measures

1. Development Services

a. Goal: Implement D&C Standards that require water quality facilities to be built as part of new development and redevelopment with a goal to provide treatment for 100 percent of impervious areas from new and re-development areas (that meet impervious area thresholds) with the exception of the fee-in-lieu projects.

***Tracking measure**: New development area (in acres) added annually within the service area.*

***Tracking measure**: New re-development area (in acres) added annually within the service area.*

***Tracking measure**: New development area (in acres) added annually with structural controls within the service area.*

***Tracking measure**: New re-development area (in acres) added annually with structural controls within the service area.*

***Tracking measure**: Percentage of the service area served by structural controls.*

***Tracking measure**: Percentage of all areas developed or re-developed annually that is served by structural controls.*

***Tracking measure**: Track all structural controls implemented annually by location, type and drainage area served.*

2. Low Impact Development Approaches (LIDA)

a. Goal: Prioritize the use of LIDA through implementation of D&C Standards. .

***Tracking measure**: Annual number of LIDA facilities implemented and the type of facility.*

b. Goal: Provide technical assistance through the *LIDA Guidance Manual.*

***Tracking measure**: Provide the* LIDA Guidance Manual *on the District's public website.*

Relationship to TMDLs

Phosphorus. The District's *D&C Standards* for water quality facilities are designed for phosphorus removal from 100 percent of the impervious area from newly constructed impervious surfaces that meet the thresholds for requiring treatment.

Settleable Volatile Solids. Structural controls can reduce the discharge of settleable volatile solids through various detention and retention processes.

Related documents:

- *Clean Water Services Design and Construction Standards for Sanitary Sewer and Surface Water Management, December 2019*
- *LIDA Guidance Manual, June 2016*

7. Pollution Prevention for Municipal Operations

The overall program requirement from the permit is as follows:

The permittee must continue to implement a program to reduce the discharge of pollutants to the MS4 from properties owned or operated by the permittee for which the permittee has authority, including, but not limited to, parks and open spaces, fleet and building maintenance facilities, transportation systems and fire-fighting training facilities. The permittee must conduct, at a minimum, the following program activities:

The permit goes on to describe the six specific components of the program. This section applies to properties owned or operated by the District and co-implementers, regardless of whether they are owned or operated by the permittee. The SWMP elements for each of these specific components are described according to the permit requirements in the following subsections:

7.1 Street Operations and Maintenance

A. Operate and maintain public streets, roads and highways over which the permittee has authority in a manner designed to minimize the discharge of stormwater pollutants to the MS4, including pollutants discharged as a result of anti-icing or deicing activities.

Public streets, roads, highways, and other transportation corridors within the service boundary are maintained by several jurisdictions, including Washington County, the individual cities, the District, and the Oregon Department of Transportation (ODOT). Among these, ODOT holds its own MS4 NPDES permit for the discharge of stormwater and manages street operations and maintenance in accordance with its MS4 NPDES permit and local land use laws, while the District, cities, and Washington County are co-implementers of this permit.

The key operation and maintenance (O&M) program activities for roadways include street sweeping, fall leaf collection, and deicing. Each of these activities is discussed below. A complete list of these O&M activities, frequencies, and performance standards is presented in the *Sanitary, Storm and Surface Water Management Performance and Reporting Standards (R&O 18-11)* (*Performance Standards*), which is updated as needed.

The maintenance frequencies for street sweeping were initially based on an analysis for coordinated, on-going, and efficient delivery of storm sewer system maintenance services for the entire service area conducted in 1998. Maintenance frequencies were established to enhance stormwater quality, and retain the function and capacity of the storm sewer system. The District has updated the frequencies since that time on an on-going basis.

- **Street Sweeping**

Public curbed streets within the service area are swept 12 times per year. Sweepers are used that effectively remove fine sediment (regenerative air sweepers or equivalent water quality sweepers). Sweepers are run at optimum speeds, and a recording device documents speed while sweeping, miles swept, and hours swept.

BMP 1, Street Sweeping, describes the goals and tracking measures associated with meeting this requirement.

- **Fall Leaf Collection**

The fall leaf collection program may include one or more of the following components, which may vary by jurisdiction: a curbside leaf pickup program, increased recycling, and leaf drop off day(s).

- **Deicing/Anti-icing**

A number of jurisdictions apply anti-skid/anti-icing materials to roadways within the service area, including the co-implementer cities, Washington County, ODOT, and Tri-Met. Typically, crushed, graded aggregate (i.e., sanding rock) is applied to highways, arterials, collectors, and other roadways with steep grade. In addition, anti-icing materials such as magnesium chloride are also applied—mostly at bridges and overpasses. Sanding rock is picked up no later than at the next regularly scheduled monthly sweeping.

7.2 Control the Use of Pesticides, Herbicides, and Fertilizers

B. Implement a management program to control the use and application of pesticides, herbicides and fertilizers on permittee-owned properties.

A pesticide is any substance or mixture intended to prevent, destroy, repel, or mitigate any pest. Pesticides include insecticides, herbicides, fungicides, and other substances such as a plant regulator, defoliant, or desiccant. Pesticide use is regulated primarily by the Federal Insecticide, Fungicide and Rodenticide Act, the Oregon Pesticide Control Law (Oregon Revised Statutes - Chapter 634), or the Oregon Pesticide Regulations (Oregon Administrative Rules [OAR], Chapter 603, Division 57).

The District and co-implementers employ an integrated pest management (IPM) program to reduce stormwater pollutants stemming from the use of pesticides, herbicides, and fertilizers in landscaping, water quality facility maintenance, and public facility maintenance. *MS4 Provisions of the District Integrated Pest Management Program* describes the basic aspects of the IPM program. Co-implementers must either adopt this program or develop and implement their own equivalent program. The program contains best practices, including knowing the pest, setting appropriate thresholds, use of appropriate control techniques (starting with the least toxic), following label instructions, maintaining equipment and handling materials safely, and requiring appropriate licensure for all applicators.

The District's *Integrated Pest Management Plan* focuses on avoidance of pests through cultural practices, prevention, and early detection, then evaluation of pests before a chemical option is selected. District operations generally focus on management of invasive plants and animals as they impinge upon the establishment of geographically appropriate, local native plant communities where applicable, including as part of stormwater quality facilities, and in riparian vegetative corridors. In its facilities, the District also applies the Plan to cultivated landscapes.

The District implements specific practices for stormwater quality facilities, public right-of-ways, and cultivated landscapes:

- Pesticides are not applied when water quality facilities are wetted or within three feet of the wetted perimeter.
- Pesticides are evaluated for use in water quality facilities by their persistence and active breakdown products; the most persistent categories avoided.

- Pesticide applications are limited within a zone of three feet from a waterbody. If possible, they are not applied unless a chemical control and the severity of pest warrants treatment as identified in the IPM strategy.
- Pesticides will only be applied during dry weather windows appropriate to the period when the ingredients are active and have time to break down to their more benign byproducts.
- Pesticides and surfactants will be evaluated on an annual basis for efficacy and potential ecological effects. This evaluation will be shared with District employees, contractors and co-implementers.
- Pests and best pest control measures will be evaluated on an annual basis. This evaluation will be shared with District employees, contractors and co-implementers.
- District vegetation management contractors participate in a pesticide closed container program that limits spills, mixing errors, and rinseate issues.

BMP 2, Integrated Pest Management, describes the goals and tracking measures associated with meeting this requirement.

7.3 Reduce the Impact of Runoff From Municipal Facilities

C. Inventory, assess, and implement a strategy to reduce the impact of stormwater runoff from municipal facilities that treat, store or transport municipal waste, such as yard waste or other municipal waste and are not covered under a 1200 series NPDES permit, a DEQ solid waste permit, or other permit designed to reduce the discharge of pollutants;

The only municipal facilities that treat, store, or transport municipal waste are municipal maintenance yards that store green wastes generated in maintaining public facilities (parks, etc.) and small amounts of other wastes generated during maintenance activities (used oil, etc.). All District and co-implementer maintenance yards implement Storm Water Pollution Control Plans to reduce the discharge of pollutants to stormwater from these facilities.

BMP 3, Stormwater Management at Municipal Facilities, describes the goals and tracking measures associated with meeting this requirement.

7.4 Limit Infiltration from the Sanitary Sewer System to the MS4

D. Limit infiltration of seepage from the municipal sanitary sewer system to the MS4.

The District has an Infiltration/Inflow (I/I) abatement program that addresses the soundness of the sanitary conveyance system. By detecting and abating points of I/I, the program also prevents seepage from the sanitary sewer to the MS4.

7.5 Fire-Fighting Training Activities

E. Implement a program to prevent or control the release of materials related to fire-fighting training activities.

There are no identified firefighting training facilities that discharge to the District's MS4. So-called "burn to learn" activities are conducted outside the urban area so do not discharge to the MS4. Working with the District, the Fire Defense Board approved a list of BMPs that are included in firefighting training materials.

7.6 Retrofit Projects

F. Assess flood control projects to identify potential impacts on the water quality of receiving water bodies and determine the feasibility of retrofitting structural flood control devices for additional stormwater pollutant removal. The permittee must consider and incorporate the results of this assessment as part of the Stormwater Retrofit Strategy Development required in Schedule A.2.d.vi.D.

The District conducts activities to retrofit the existing storm system in order to further reduce pollutants. As explained in Section 5, *Stormwater Pollutant Loads, TMDLs, and Benchmarks*, of the permit renewal application, the District identifies and prioritizes retrofit opportunities and projects through its capital improvements plan. Retrofit projects may include re-vegetation and outlet modifications at water quality facilities, retrofit or reconstruction of existing manholes and catch basins, conversion or upgrade of water quantity detention facilities to provide water quality treatment, and installation of outfall pretreatment. These categories overlap and a project may include one or more of these attributes. The District's retrofit strategy, required in Schedule A, 2.d.vi.D of the permit will guide the District's future retrofit activities.

Outfall Retrofits

The District and co-implementers' outfall retrofit program includes modifying existing facilities and constructing new treatment facilities where none exist. These projects may include outlet modification and re-vegetation at water quality facilities, installation of water quality manholes for outfall pretreatment, and providing water quality treatment on existing water quantity facilities. An inventory identified more than 205 major outfalls, which were prioritized for retrofitting based on the ability to obtain easements, land use, receiving water quality, contributing drainage area, percentage of drainage area not currently treated, and ability to coordinate with other planned infrastructure projects. The District and co-implementers completed nine retrofit projects during the 2016-2021 permit term.

Un-sumped Catch Basin Retrofits

The District and co-implementers also retrofit or reconstruct un-sumped catch basins to improve the removal of pollutants. The District and co-implementers retrofitted or reconstructed 584 un-sumped catch basins during the 2016-2021 permit term. If the permit is administratively extended, retrofitting/reconstruction will continue at a rate of 75 catch basins per year until a new SWMP is approved. Note that as the District and co-implementers continue to implement this program, the number of catch basins that will need to be retrofitted may change since the District may choose not to sump catch basins that are upstream of water quality manholes or water quality facilities; thus, the measurable goals for this program will be updated periodically.

BMP 4, Catch Basin Retrofits, describes the goal and tracking measure associated with meeting this requirement.

BMP CATEGORY: POLLUTION PREVENTION FOR MUNICIPAL OPERATIONS

Introduction: The purpose of this BMP category is to improve water quality and reduce impacts associated with municipal operations.

Measurable goals and tracking measures:

1. Street Sweeping

a. Goal: Sweep public curbed streets 12 times per year.

***Tracking measure**: Curbed street miles swept and total number of curbed street miles; and amount of material collected.*

2. Integrated Pest Management

a. Goal: Conduct one annual training session related to the District's Integrated Pest Management program.

***Tracking measure**: Report date of IPM training.*

b. Goal: All pesticide applicators employed by co-implementers in positions potentially impacting the MS4 will be licensed as required.

***Tracking measure:** Report number of state licensed applicators employed by each co-implementer.*

c. Goal: Keep the District's IPM program current by annually evaluating pesticides and surfactants for efficacy and potential ecological effects and evaluating pests and pest control measures.

***Tracking measure:** Documentation of annual evaluation.*

3. Stormwater Management at Municipal Facilities

a. Goal: Inspect municipal facilities that store wastes as required in their SWPCPs. ***Tracking measure:*** Number of facility inspections performed

4. Outfall Retrofits

a. Goal: Continue to implement the District's Retrofit Plan

***Tracking measure**: Identify the number of outfall retrofit projects in planning, design, construction or completed, the phase of each project during the year, and the treatment BMP used, including locations and area treated by the retrofit.*

5. Catch Basin Retrofits

a. Goal: Retrofit or reconstruct 75 existing catch basins annually between May 31, 2021, and the issuance of the new permit to include improvements for water quality.

***Tracking measure**: Number of existing catch basins that were retrofitted or reconstructed to include improvements for water quality during the year and cumulatively during the permit term.*

Relationship to TMDLs

Phosphorus. Street sweeping, outfall retrofits, and catch basin retrofits remove phosphorus-bearing sediments.

Bacteria. Addressing discharges from municipal waste sites will reduce the discharge of bacteria from these sites.

Settleable Volatile Solids. Street sweeping, outfall retrofit, catch basin retrofits and addressing discharges from municipal waste sites will reduce the discharge of settleable volatile solids.

Related documents:

- *Sanitary, Storm and Surface Water Management Performance and Reporting Standards (R&O 18-11)* or as amended
- Integrated Pest Management Plan

8. Stormwater Management Facilities Operations and Maintenance Activities

A. By April 22, 2018, the permittee must inventory and map stormwater structural facilities and controls, and implement a program to verify that stormwater management facilities and controls are inspected, operated and maintained to function as designed for effective pollutant removal, infiltration and/or flow control. At a minimum, the program must include the following:

1. Legal authority to inspect and require effective operation and maintenance;

2. A program to inventory and map public and private stormwater management facilities as provided under Schedule A.2.d.viii.B; and,

3. Public and private stormwater facility inspection and maintenance requirements for stormwater management facilities that have been inventoried and mapped as provided under Schedule A.2.d.viii.B.

To address these requirements, this section of the SWMP is divided into three subsections for: 1) facility inventory; 2) public stormwater structural facilities; and 3) privately-owned stormwater structural facilities.

The following terms, as defined, are used in this section:

Water Quality Facility (WQF): a part of the stormwater system engineered to meet the water quality treatment design efficiency as defined in the District's *D&C Standards* section 4.04.3 (December 2019 version). Examples of WQFs include vegetated surface facilities (i.e., swales), constructed water quality wetlands, Low Impact Development Approaches (LIDA or green infrastructure), and proprietary treatment systems (typically an underground vault with filter media).

Public WQF: a WQF constructed to serve multiple tax lots and intended to be maintained by the District. Public WQFs are often constructed to provide water quality treatment as part of a residential subdivision project where a larger tax lot is divided into many smaller tax lots and public right of way.

Private WQF: a WQF constructed to serve larger single lots, often commercial or industrial properties, where the property owner owns and maintains the facility. Private WQFs are inspected by the District, but maintained by the property owner.

Proprietary treatment system: an engineered device approved for use in accordance with District's *D&C Standards* section 4.07.8 (December 2019 version) and used to fulfill the District's water quality treatment requirement. A device is considered proprietary if system components (e.g., a filter or cartridge) are only available for purchase through the original manufacturer. Proprietary treatment systems are typically underground vaults with filters or cartridges filled with media that is used to treat stormwater by removing contaminants.

8.1 Facility Inventory

The District maintains an inventory of the public stormwater system using the District's GIS database.

8.2 Public Stormwater Structural Facilities

B. As part of the Stormwater Management Facilities Inspection and Maintenance program, the permittee must document and implement a strategy that guides the long-term maintenance and management of all permittee-owned and identified privately-owned stormwater structural facilities and controls. At a minimum, the permittee's strategy must address the following:

1. For publicly-owned or operated stormwater management facilities

a. Inventory and mapping process.
b. Inspection and maintenance schedule.
c. Inspection, operation and maintenance criteria, priorities, and procedures.
d. Description of inspector type and staff position or title.
e. Inspection and maintenance tracking mechanisms.

Public Water Quality Facility Maintenance

Routine maintenance activities for vegetated water quality facilities includes: mowing, trimming, maintaining levee/bank, maintaining inlet/outlet, removing debris, performing visual inspections during the wet season to ensure functionality, watering, fertilizing, and applying herbicide. Non-routine maintenance activities include planting vegetation, reshaping/reconstructing, and removing silt and sediment.

The District uses an outcome-based approach for maintaining public vegetated water quality facilities. The District or co-implementer inspects, assesses, and documents the condition of all vegetated water quality facilities in their jurisdiction to identify necessary maintenance activities at least twice per year, once during the winter and once during the growing season. The inspector assesses whether the vegetated facility requires routine or non-routine maintenance. If non-routine maintenance is required, the inspector describes the maintenance activities necessary to address the conditions. For any vegetated facility with non-routine maintenance activities identified, the District or co-implementer develops a plan and schedule to perform those activities. The District and co-implementers document all assessments, plans, and schedules.

The District and co-implementers also maintain proprietary systems such as filter structures. Filter structures are inspected once per year and filter canisters are replaced as determined necessary by inspections.

Water Quality Manhole Cleaning

Public water quality manholes are cleaned twice per year.

Catch Basin Cleaning

Sumped catch basin cleaning consists of removing sediment, gravel and other debris from the inlet grate and the sumped areas of the catch basin. The District and co-implementers strive to clean all public sumped catch basins within the service area once per year. However, issues such as cars parked over catch basins, road construction, etc., lower the actual rate to approximately 95 percent of sumped catch basins being cleaned per year. Cleaning of un-sumped catch basins occurs in conjunction with storm line cleaning.

BMP 1, Public Water Quality Facility Inspections and Maintenance, describes the goals and tracking measures associated with meeting this requirement.

8.3 Privately-Owned Stormwater Structural Facilities

2. For privately-owned or operated stormwater management facilities

a. Procedures for and types of stormwater facilities that will be inventoried and mapped, including the rationale and criteria used. At a minimum, the inventory and mapping must include the following:

i. Private stormwater management facilities for new development and redevelopment projects constructed under the permittee's post-construction management manual or equivalent document.

ii. Private stormwater management facilities identified by the permittee and used to estimate the pollutant load reduction as part of the TMDL benchmark evaluation.

iii. Any major private stormwater management facilities or structural controls.

b. Inspection criteria, rationale, priorities, frequency and procedures for inspection of private stormwater facilities that have been inventoried and mapped;

c. Required training or qualifications to inspect private stormwater facilities;

d. Reporting requirements.

e. Inspection and maintenance tracking mechanism.

Private water quality facilities are generally located on single lot commercial and industrial sites, and on multi-family residential sites. The majority of single family residential water quality facilities constructed after 1993 are publicly maintained. However, some older and a few newer facilities serving residential lots are maintained by homeowners' associations. To address new and existing private water quality facility maintenance, the District and co-implementers have developed a Private Water Quality Facilities Management Program. The Private Water Quality Facilities Management Program, as documented in the *Performance Standards*, consists of:

- Inventory
- Active outreach and education
- Inspection
- Enforcement

The inventory consists of locating facilities, estimating the drainage area served by the facility and inspecting and rating the facility based on specified criteria for functionality. An electronic database is maintained for program management. For each facility, attributes such as inspection dates, location, owner information, condition assessment rating, and follow-up actions are included. Documentation regarding correspondence with owners and follow-up inspections is also maintained.

With respect to outreach and education, District inspectors work closely with owners and operators of private water quality facilities to ensure that they have the information needed to manage their facilities. On first contact, they are provided a packet containing information specific to the design, function, operation and maintenance of their type of facility, the results of the District's inspection, and a log for tracking facility maintenance. In addition, the packet includes information on

controlling invasives and selecting native plants. The District provides the owner/operator with the results of regular (every four years) inspections and mails annual reminders regarding operation, maintenance and inspection. District staff follows up with owner/operators (including on-site visits) at their request to answer questions about their facilities. The District maintains a page on its website with information on private water quality facilities.

Maintenance requirements for on-site LIDAs differ from more traditional ponds and swales; therefore, education is a key element of the Private Water Quality Facilities Management Program. Owner/operators are informed about proper facility maintenance to maximize water quality benefits cost effectively. Maintenance agreements are required for new facilities prior to issuance of a Site Development Permit and are recorded with the property deed.

The District inspects 25 percent of the private water quality facilities per year and applies rating criteria during the inspections to guide follow-up actions. For facilities with an excellent, good, or fair ranking, inspection occurs on the regular rotation (i.e., 25 percent per year). For facilities with a poor or very poor ranking, the District works with the owner or operator to develop a plan and schedule to bring the facility to an acceptable level. The District then conducts inspections as frequently as needed to monitor progress on the plan and schedule, until the condition of the facility is deemed to be acceptable.

Details regarding enforcement are documented in the Private Water Quality Facilities Management Program.

BMP 2, Private Structural Water Quality Facility Maintenance, describes the goals and tracking measures associated with meeting this requirement.

8.4 Adaptive Management of Stormwater Facility O&M Activities

The District may apply its Adaptive Management program to improving its operation and maintenance activities by conducting investigational studies or pilot projects. These approaches may require temporarily altering established activities within a defined area in order to evaluate the effectiveness of alternatives. Therefore, when necessary, the program descriptions, BMPs, Measurable Goals, and Tracking Measures in this section will not apply to the area or facilities covered by any study or pilot project carried out under the District's Adaptive Management program.

BMP CATEGORY: STORMWATER MANAGEMENT FACILITIES O&M ACTIVITIES

Introduction: The purpose of this BMP category is to improve water quality by implementing appropriate operations and maintenance practices for both public and private stormwater management facilities.

Measurable goals and tracking measures:

1. Public Water Quality Facility Inspections and Maintenance:

a. Goal: Inspect, assess and document the condition of all vegetated water quality facilities to identify necessary maintenance activities at least twice per year, once during the winter and once during the growing season. Assess whether the vegetated facility requires routine or non-routine maintenance. If non-routine maintenance is required, describe the maintenance activities necessary to address conditions/issues. For any vegetated facility with non-routine maintenance activities identified, develop a plan and schedule to perform those activities.

***Tracking measure**: Number of public water quality facilities; number of public water quality facilities assessed for maintenance needs; number found to need non-routine maintenance.*

b. Goal: Inspect annually and maintain all public proprietary water quality facilities per manufacturer's specifications to ensure functionality.

***Tracking measure**: Total number of public proprietary water quality facility maintenance visits and the total number of public proprietary water quality facilities within the service area.*

Goal: Replace filters in public proprietary filter treatment systems as needed.

***Tracking measure:** Number of systems renewed.*

c. Goal: Clean all public water quality manholes twice per year.

***Tracking measure**: Number of public water quality manholes cleaned; and total number of public water quality manholes within the service area.*

d. Goal: Clean 95 percent of public sumped catch basins per year.

***Tracking measure**: Number of sumped catch basins cleaned; and total number of sumped catch basins within the service area.*

2. Private Structural Water Quality Facility Maintenance:

a. Goal: Annually inspect 25 percent of privately maintained structural water quality facilities to ensure system functionality.

***Tracking measure**: Total number of facilities and number of facilities inspected.*

b. Goal: Conduct annual training for District and co-implementer inspection staff on proper water quality facility maintenance:

***Tracking measure**: Training sessions conducted and staff/co-implementer attendance.*

Relationship to TMDLs

Phosphorus. The District's *D&C Standards* are developed to remove phosphorus. Efficiency is contingent on maintaining the constructed systems to operate as designed.

Bacteria. Through appropriate maintenance and inspection of both the sanitary and storm sewer systems, cross connections and other illicit sources of bacterial contamination will be identified and corrected. This will result in lower bacteria concentrations in stormwater.

Settleable Volatile Solids. Adequate maintenance of the stormwater system will reduce the discharge of settleable volatile solids that accumulate in the system.

Related Documents:

- Private Water Quality Facilities Management Program
- *Performance Standards*

ATTACHMENT B
PROPOSED STORMWATER MANAGEMENT PLAN
(ANNOTATED)

Stormwater Management Plan
Best Management Practices

This Stormwater Management Plan groups stormwater best management practices according to permit requirements into the following sections:

1. Illicit Discharge Detection and Elimination
2. Industrial and Commercial Facilities
3. Construction Site Runoff Control
4. Education and Outreach
5. Public Involvement and Participation
6. Post-Construction Site Runoff and Retrofit Programs
7. Pollution Prevention for Municipal Operations
8. Stormwater Management Facilities Operation and Maintenance Activities

Each section includes the applicable permit language and describes the program elements that address permit requirements. At the end of each section, a BMP category summary specifies measurable goals for key program elements and the tracking measures associated with the measurable goals. Clean Water Services (District) will report progress on attaining the measurable goals and tracking measures in the Municipal Separate Storm Sewer System (MS4) Annual Report. All references to "annual" refer to the MS4 reporting year, i.e., July 1 of the previous year through June 30 of the current year.

Commented [A1]: Note: The SWMP was submitted before the final 2016 permit was issued, so does not include due dates in the quoted permit language, which was not finalled until the permit issued. The due dates have been inserted in the quoted permit text (shown in gray boxes in this document.) All of these dates have passed and all requirements have been met.
There are also a few places where the text of the permit was changed after the SWMP was submitted. These are primarily organizational, not substantive, changes,. All changes to the text of permit language in this SWMP are to incorporate the final 2016 permit language.

1. Illicit Discharge Detection and Elimination

The permittee must continue to implement a program to prevent, detect, characterize, trace, and eliminate illicit discharges to the MS4. The permittee must:

The District describes its Illicit Discharge Detection and Elimination (IDDE) program in a separate document, *Illicit Discharge Detection and Elimination Program Description* (*IDDE Description*, 2015). The IDDE program is designed to prevent, detect, characterize, trace and eliminate unpermitted discharges of pollutants to the MS4. ~~to the maximum extent practicable.~~ The IDDE program is implemented by the District and co-implementers. The *IDDE Description* includes an Enforcement Response Plan describing how the District and the co-implementers eliminate illicit discharges.

Commented [A2]: Deleting this clause since the Permit requires ***effective prohibition of illicit discharges,*** and MEP legitimately applies to the MS4 program as a whole, not to specific elements.

The IDDE program includes activities to detect illicit discharges through inspection of permitted industrial facilities, observations during routine maintenance of MS4 facilities, annual dry weather outfall inspections, and facilitation of public reporting of spills and illicit discharges.

1.1 Ordinance to Prohibit Illicit Discharges

A. Prohibit, through ordinance or other legal mechanism, illicit discharges into the permittee's MS4.

District Ordinance 27 prohibits specific non-stormwater discharges to the publicly owned storm and surface water system within the District's jurisdiction, which

Commented [A3]: Although CWS is revising Ord. 27, it will still be in force and the referenced section will still be in place.

includes the MS4. More details regarding this ordinance are included in the *IDDE Description*.

1.2 Enforcement Response

L. Develop a written enforcement response plan or similar document by ~~[ADD SPECIFIC DATE]~~April 22, 2017, describing the escalating enforcement response procedures the permittee must implement when an illicit discharge investigation identifies a responsible party.

The *IDDE Description* ~~provides a summary of~~includes the District's and co-implementers' enforcement response plans. In addition, the District has a *Source Control Program Enforcement Response Plan* and an *Industrial Stormwater and Water Quality Enforcement Response Plan* to supplement the *IDDE Description*. If evidence of a potential illicit discharge is discovered through facility inspections, routine MS4 work, annual dry weather field screening, public reports, or through any other source, the District and co-implementers will follow the *IDDE Description* enforcement response plan and supplemental enforcement response plans to investigate and eliminate the discharge.

The plans describe enforcement response procedures for the following activities:

A. Permitted Facilities - Industrial Users
B. Permitted Facilities - 1200-Z Permittees
C. Sanitary Sewer Cross Connections
D. Non-Sanitary Illicit Discharges from other than Permitted Facilities
E. All Illicit Discharges

1.3 Dry Weather Field Screening

B. Develop or identify dry-weather pollutant parameter action levels. The action levels must identify concentrations for identified pollutants that if exceeded, require further investigation by the permittee, including laboratory sample analyses, to identify the source of the illicit discharge. The pollutant parameter action levels and rationale for using the action levels must be documented, and must be reported to DEQ by ~~[insert date~~April 22, 2017~~]~~.

C. Conduct dry-weather inspection activities during the term of the permit. The dry-weather inspection activities must include, at a minimum, an annual inspection of identified priority locations documented by the permittee. Priority locations must, where possible, be located at an accessible location downstream of any source of suspected illicit discharge or at other locations selected by the permittee to support source identification and elimination of illicit discharges. Priority locations must be identified based on an equitable consideration of hydrological conditions, total drainage area of the location, population density of the location, traffic density, age of the structures or buildings in the area, history of the area, land use types, personnel safety, accessibility, historical complaints or other appropriate factors as identified by the permittee. The permittee may change the dry-weather inspection priority locations at any time as long as the rationale for changing the location is documented, and the new priority location is identified on maps in accordance with subsection K. The total number of priority locations may not be reduced.

D. Conduct annual dry-weather inspection activities after an antecedent dry period of at least 72-hours. The dry-weather inspection activities must be documented, and the activities must include:

1. General observations, including visual presence of flow, turbidity, oil sheen, trash, debris or scum, condition of conveyance system or outfall, color, odor and any other relevant observations related to the potential presence of non-storm water or illicit discharges.

Commented [A4]: The Pollutant Parameter Action Levels are in the IDDE Description document, as noted below. They have been added to the SWMP in the table below.

2. *Field Screen - If flow is observed during general observations, and the source is unknown, a field screen must be conducted to determine the cause of the dry-weather flow. The field screen must include either sampling for pollutant parameters that are likely to be found based upon the suspected source of discharge, or other effective investigatory approaches or means to identify the source or cause of the suspected illicit discharge. Where appropriate, the permittee must use the identified dry-weather pollutant parameter action levels. If the source of the dry-weather flow has been determined, the permittee must document the source or source type and all other relevant information related to the identification of the source. Suspected sources of discharge include, but are not limited to, sanitary cross-connections or leaks, spills, seepage from storage containers, non-stormwater discharges or other residential, commercial, industrial or transportation-related activities.*
3. *Laboratory Analysis - If general observations and the field screen indicate an illicit discharge and the source of a suspected illicit discharge cannot be identified through other investigatory methods, the permittee must collect a water quality sample of ongoing discharges for laboratory analyses. The water quality sample must be analyzed for pollutant parameters or identifiers that will support the permittee's identification of the source of the illicit discharge.*

E. *Document and implement procedures to investigate portions of the MS4 that likely are receiving an illicit discharge based on the results of general observations, field screening, laboratory analysis or other relevant information, including but not limited to a complaint or referral. The procedures must reflect the goal to identify the source and/or responsible party in an expeditious manner, and must clearly define responsibility for implementing the procedures. If the permittee implements the procedures, and the permittee is unable to identify the illicit discharge source, the permittee may suspend the source investigation if the permittee has verified and documented that all reasonable action and effort has been taken to identify the source. The permittee must reopen its investigation for any suspended source investigation if new or additional information related to the suspended source investigation becomes available.*

The District developed the following pollutant parameter action levels and submitted them to DEQ on April 18, 2017.

Parameter	**Action level**	**Suspected source**
Surfactants (as MBAS)	> 0.25 mg/L	Presence of surfactants likely indicates washwater or sewage. When MBAS > 0.25 mg/L, confirm which source is more likely using ammonia/potassium ratio.
Potassium	(see ratio below under ammonia nitrogen)	Relatively high concentrations of potassium (> 20 mg/L) may indicate sewage or industrial process waters
Ammonia nitrogen	NH3/K > 1.0	Presence of ammonia > 0.5 mg/L likely indicates sewage, industrial waste or pets/wildlife. Ammonia/potassium ratio > 1.0 indicates possible sewage
Total chlorine	> 0.25 mg/L	Presence of chlorine, absent other parameters that exceed action levels, likely indicates municipal treated water or discharge of municipal water or pool/hot tub water
Conductivity	> 2000 µS	Indicative of industrial discharge
pH	< 5	Indicates industrial discharge. High pH values may also indicate an industrial discharge but

		residential washwaters can have a high pH as well.

To identify and detect illicit discharges, the District conducts annual dry weather inspections as described in the *IDDE Description*. Dry weather inspection procedures include:

- Pollutant parameter action levels
- Priority locations for conducting inspections
- Inspection procedures, and
- Sampling procedures

BMP 2, Dry Weather Field Screening, describes the goals and tracking measures associated with meeting this requirement.

1.4 Documentation and Mapping

H. Implement and maintain a system to document and track illicit discharge complaints and referrals, investigation activities, and actions taken to eliminate the illicit discharge. The system must include, but is not limited to, the date of the complaint or referral, date and type of investigation activity, of elimination action, and resolution.

K. Maintain maps identifying permittee-owned or operated MS4 outfalls discharging to waters of the State. If the permittee identifies modifications to outfall locations, or is informed of the need to modify its map(s) by DEQ, the maps must be updated in digital or hard-copy within six months of identification.

The District and co-implementers maintain records of all investigation and enforcement of suspected illicit discharges, including field notes, analytical results, correspondence, and enforcement documents. The District ~~will ensure that District and co-implementers have~~ developed and uses a web-based Lucity system for reporting and tracking illicit discharges. The system~~s in place that~~ document~~s~~ complaints and referrals of illicit discharges and activities related to their investigation and elimination~~, and that T~~this information is readily available and ~~provided for~~ used to produce the MS4 Annual Report.

Commented [A5]: The web-based Lucity system was developed and continues to be implemented to meet this requirement.

The District and co-implementers maintain maps of known MS4 outfalls within the permit boundary. The dry weather field screening priority locations are maintained in GIS so that maps can be generated.

BMP 3, Report and Response Tracking System, describes the goals and tracking measure associated with meeting this requirement.

1.5 Illicit Discharge Elimination

G. 1. Except as provided in Schedule A.2d.i.G.2, the permittee must eliminate illicit discharges within five working days of identification of the source.

2. If the permittee determines that the elimination of the illicit discharge will take more than five working days due to technical, logistical or other reasonable issue, the permittee must, within 20 days of identifying the source of an illicit discharge, develop an action plan for eliminating the illicit discharge in an expeditious manner, and must implement the action plan according to its terms. In lieu of developing an individual action plan for each instance of a typical type of

illicit discharge, the permittee may develop or reference, and must implement, a standardized IDDE elimination procedure for each type of typical illicit discharge. The action plan and standardized procedure must include a timeframe to eliminate the discharge in an expeditious manner, and must identify the entity or individual permittee responsible for implementing the corrective action.

The *IDDE Description* includes a summary of actions to be taken to identify the source of an illicit discharge and to abate an illicit discharge once the source has been identified. In all instances of illicit discharges, the enforcing authority (the District or co-implementer) acts to abate the discharge within five working days of identifying the source of the discharge. If the enforcing authority determines that technical, logistical or other reasonable circumstances will prevent the abatement within five working days, the enforcing authority will develop an action plan within 20 days of identifying the source and will implement that plan to abate the illicit discharge as expeditiously as possible. For common types of illicit discharges (such as sanitary–to-storm cross connections), the *District Source Control Program Enforcement Response Plan,* the *Industrial Stormwater and Water Quality Investigation Enforcement Response Plan,* the *IDDE Description*, and the *District Industrial Stormwater Program Implementation Manual* include standard procedures to be followed in lieu of developing an individual action plan. For unique or unusual circumstances, the enforcing authority will develop an individual action plan.

BMP 1, Illicit Discharges, Including Sanitary Cross Connections and Accidental Spills, describes the goals and tracking measures associated with meeting this requirement.

1.6 Spill Prevention and Response

F. Implement response procedures to prevent, contain, respond to and mitigate spills or similar illicit discharges that may or have discharged into the MS4. The permittee must review its written response procedures, and update the procedures as necessary, by ~~[date to be determined].~~ April 22, 2017. Spills, or other similar illicit discharges, that may endanger human health or the environment must be reported in accordance with all applicable federal and state laws, including proper notification to the Oregon Emergency Response System.

The District prevents accidental spills at industrial facilities that are permitted to discharge to the sanitary conveyance system and the MS4 through industrial discharger slug control plans and administration of the 1200-Z permitting program, respectively. The District and co-implementers prevent spills at construction sites through permit terms and inspections conducted under the Construction Site Stormwater program. The District and co-implementers also prevent spills by implementing Stormwater Pollution Control Plans at municipal facilities. These programs are described in the *IDDE Description*, which was reviewed in April 2017. ~~The District will review and update these procedures as required by the Permit.~~

Response, containment, and mitigation actions are carried out by emergency first responders, including city fire departments. The District is available to provide technical advice to these agencies as requested. The District has an emergency environmental response company under contract for assistance with cleanups.

The District and the co-implementers comply with all applicable federal and state laws regarding reporting of accidental spills and other similar illicit discharges that endanger human health or the environment, including proper notification to the Oregon Emergency Response System.

BMP 1, Illicit Discharges, Including Sanitary Cross Connections and Accidental Spills, describes the goals and tracking measures associated with meeting this requirement.

1.7 Notification to Adjacent Jurisdiction

I. In the case of a known illicit discharge that originates within the permittee's MS4 regulated jurisdiction and that discharges directly to a storm sewer system or property under the jurisdiction of another public body, the permittee must notify the affected jurisdictional authority as soon as practicable, but no more than one working day of becoming aware of the discharge.

J. In the case of a known illicit discharge that is identified within the permittee's MS4 regulated jurisdiction, but is determined to originate from a contributing storm sewer system or property under the jurisdiction of another public body, the permittee must notify the jurisdictional authority of the area contributing the discharge as soon as practicable, but no more than one working day of identifying the illicit discharge.

If a known illicit discharge originates within the jurisdiction of a co-implementer or the District and discharges directly to a storm sewer system or property under the jurisdiction of another municipality, the co-implementer or the District notifies the affected municipality as soon as practicable and at least within one working day of confirming the origin of the discharge.

If a known illicit discharge is identified within the jurisdiction of the District or a co-implementer, and it is determined to originate from a storm sewer system or property under the jurisdiction of another municipality, the District or the co-implementer notifies the contributing municipality or municipality with jurisdiction as soon as practicable, and at least within one working day of confirming the origin of the discharge.

During any investigation of an illicit discharge within the jurisdiction of a co-implementer, the District and the co-implementer communicate and cooperate as needed to complete the investigation and abate the illicit discharge.

1.8 Non-Stormwater Discharges

M. Unless the following non-stormwater discharges are identified by the permittee or DEQ as a significant source of pollutants to waters of the State, these types of non-stormwater discharges into the MS4 are authorized by this permit: water line flushing; landscape irrigation; diverted stream flows; rising ground waters; uncontaminated groundwater infiltration; uncontaminated pumped ground water; discharges from potable water sources; start up flushing of groundwater wells; potable groundwater monitoring wells; draining and flushing of municipal potable water storage reservoirs; foundation drains; air conditioning condensate; irrigation water; springs; water from crawl space pumps; footing drains; lawn watering; individual residential car washing; charity car washing; flows from riparian habitats and wetlands; dechlorinated swimming pool discharges; street wash waters; discharges of treated water from investigation, removal and remedial actions selected or approved by DEQ pursuant to Oregon Revised Statute (ORS) Chapter 465; and discharges or flows from emergency fire fighting activities. If any of these non-stormwater discharges under the permittee's jurisdiction is a significant source of pollutants, the permittee must develop and require implementation of appropriate BMPs to reduce the discharge of pollutants associated with the source.

Non-stormwater discharges that have the potential to enter the MS4 are listed in Table 1. The District has reviewed the listed non-stormwater discharges to the MS4 and has determined those that are not significant sources of pollutants. For the remainder, Table 1 notes "Program in place." For those with a program in place, the agency that administers the program is identified and the "Notes" briefly describe the approach to reducing the discharge of pollutants associated with the source.

TABLE 1.
Controls and Limitations—Non-Stormwater Discharges

Non-Stormwater Discharge	Status	Notes
Water line flushing	Program in place (DEQ)	Addressed by the DEQ's BMP entitled *Disposing Chlorinated Waters from Swimming Pools and Hot Tubs (DEQ, 2017).* ~~*Management Practices for the Disposal of Chlorinated Water* (DEQ, 2007).~~
Landscape irrigation/Lawn Watering/Irrigation Water	Program in place (District)	The District addresses potential pollutants from lawn watering, irrigation water, and landscape irrigation into the MS4 through its public education campaigns, which include: • Go Native: Less Water, Fewer Chemicals, And Healthy Streams. The District advocates the use of the integrated pest management and good irrigation scheduling practices described in *Environmentally Responsible Landscape Services: A Best Management Practices Guide for Landscape Businesses* (Pollution Prevention Outreach Team, 2010).
Diverted stream flows	Program in place (DSL, COE, District)	Diverting stream flows into the MS4 system is a very uncommon occurrence. Where deemed appropriate by permitting authorities that regulate in-water work, the District may allow the temporary diversion of stream flows into the MS4 provided it meets applicable requirements.
Rising groundwater	Not a significant source of pollutants	
Uncontaminated groundwater infiltration	Not a significant source of pollutants	
Uncontaminated pumped groundwater	Program in place (District)	Groundwater pumped to the MS4, such as from excavation dewatering, requires District approval, verification that it is uncontaminated, and may require flow controls to prevent detrimental effects on receiving streams.
Discharge from potable water sources	Program in place (DEQ)	Addressed by DEQ's BMP entitled ~~*Management Practices for the Disposal of Chlorinated Water*~~ *Disposing Chlorinated Waters from Swimming Pools and Hot Tubs* (DEQ, 20~~0~~17).
Start-up flushing of groundwater wells	Program in place (District, DEQ)	Requests for the discharge of start-up well flushing activities are reviewed to ensure that the discharge would not result in impacts to surface waters. Where there is potential for surface water impacts, treatment is required or discharge to sanitary sewer.
Potable groundwater monitoring wells	Program in place	Similar to groundwater well-flushing.

Commented [A6]: This table has been reviewed and updated.

Draining and flushing of municipal potable water storage resources	Program in place (DEQ)	Addressed by the DEQ's BMP entitled *Disposing Chlorinated Waters from Swimming Pools and Hot Tubs* (DEQ, 2017). ~~*Management Practices for the Disposal of Chlorinated Water* (DEQ, 2007).~~
Foundation drains/Footing drains	Not a significant source of pollutants	
Air conditioning condensate	Not a significant source of pollutants	Commercial and industrial units are regulated by the Oregon Plumbing Code. Per this code, systems that require outlet piping would be required to connect to a legal point of disposal, specifically sanitary sewer lines.
Springs	Not a significant source of pollutants	
Water from crawl space pumps	Not a significant source of pollutants	
Individual residential car washing	Program in place (District)	The District does not regulate individual residential car washing, but has an education program that encourages the use of commercial car washes that discharge to sanitary systems.
Charity car washes	Not a significant source of pollutants	
Flows from riparian habitats and wetlands	Not a significant source of pollutants	
Dechlorinated swimming pool discharges	Program in place (DEQ)	The District advocates use of the BMPs set forth in *Disposing Chlorinated Waters from Swimming Pools and Hot Tubs* (DEQ, 2017). ~~*Management Practices for the Disposal of Chlorinated Water from Swimming Pools and Hot Tubs* (DEQ, 1999).~~
Street wash waters	Program in place (District)	Street washing activities are typically conducted near construction sites. The pertinent BMPs for this activity are included in the *Erosion Prevention and Sediment Control Planning and Design Manual* (CWS et al., 2008).
Discharges of treated water from DEQ approved investigation, removal, and remedial actions	Program in Place (District)	Initial discharge is to the sanitary sewer, under the Pretreatment Program, *Source Control Pretreatment Program Implementation Manual* 2003, § III Procedures. No discharges shall occur without prior District approval and NPDES permit, if applicable.
Discharges from emergency fire-fighting activities	Program in Place (local fire dept.)	Stormwater protection measures are implemented when possible by Tualatin Valley Fire & Rescue, Cornelius Fire Dept., Hillsboro Fire Dept., Forest Grove Fire Dept., Banks Fire Dist. #13, and Washington County Fire Dist. #2

COE = U.S. Army Corps of Engineers
DSL = Oregon Department of State Lands

1.9 Training

N. Design and implement an ongoing training program for all staff, who as part of their normal job responsibilities come into contact with or otherwise observe an illicit discharge or illicit connections to the MS4, on the identification of an illicit discharge and/or connection, and on the proper procedures for reporting and responding to the illicit discharge and/or connection. Follow-up training shall be provided as needed to address the changes in procedures,

techniques, requirements or staffing. Permittee shall document and maintain records of the training provided and the staff trained.

The District provides annual training for all co-implementer staff who clean and inspect MS4 components where signs of illicit discharges and connections could be observed. The training covers identification of illicit discharges and connections and proper responses for reporting and responding to them. BMP 4, Annual Training, describes the goals and tracking measures associated with meeting this requirement.

BMP CATEGORY: ILLICIT DISCHARGE DETECTION AND ELIMINATION

Introduction: The purpose of this BMP category is to improve water quality by proactively investigating and removing illicit discharges to the stormwater system. This BMP meets the regulatory requirements for a program to detect and remove illicit discharges and improper disposal to the storm sewer system.

Measurable goals and tracking measures:

1. Illicit Discharges, Including Sanitary Cross Connections and Accidental Spills

a. Goal: Respond to reports of illicit discharges. Abate identified illicit discharges.

***Tracking measure**: Annual number of illicit discharges reported to District/co-implementers by the public and illicit discharges identified through routine MS4 work.*

***Tracking measure**: Annual number of District/Co-implementer field investigations and other follow-up actions in response to reports.*

***Tracking measure**: Number of on-going illicit discharges identified and number abated by the District/Co-implementers.*

***Tracking measure**: Number of cross connections identified and number abated.*

b. Goal: Take enforcement actions according to the District's IDDE Program in response to illicit discharges.

***Tracking measure**: Number and type of enforcement actions taken to abate illicit discharges.*

2. Dry Weather Field Screening

a. Goal: Conduct annual dry weather illicit discharge inspections at 55 identified priority locations.

***Tracking measure**: Number of priority locations inspected annually.*

b. Goal: Conduct investigations of suspected illicit discharges. Abate illicit discharges identified through dry weather screening

***Tracking measure**: Number of suspected illicit discharges identified through dry weather screening and follow-up investigations conducted.*

***Tracking measure**: Number of illicit discharges confirmed and abated through dry weather screening.*

c. Goal: Annually review and maintain a map of priority locations for dry weather field screening.

***Tracking measure**: Changes, and rationale for changes, to priority locations.*

~~3. Report and Response Tracking System~~

~~a. Goal: Within one year of permit issuance have in place a system or approach meeting permit requirements.~~

~~***Tracking measure**: Submit report on system status with the first MS4 Annual Report.*~~

Commented [A7]: This Goal was met and can be deleted. Goals 1.a and 1.b and their Tracking Measures continue to track its implementation.

34. Annual Training

a. Goal: Provide annual training for all co-implementer staff who clean and inspect MS4 components where signs of illicit discharges and connections could be observed. The training will cover identification of illicit discharges and connections and proper responses for reporting and responding to them.

***Tracking measure:** Number of co-implementer staff attending annual training.*

Relationship to TMDLs

Bacteria. This BMP will reduce the human-related sources of bacteria by identifying and removing any cross-connections or other illicit discharges of bacteria-contaminated water into the MS4.

Phosphorus. This BMP will reduce the discharge of organic matter into the MS4, which will result in the reduction of phosphorus.

Settleable Volatile Solids. This BMP will reduce the discharge of organic matter into the MS4 and into the streams directly, which will result in the reduction of sediment oxygen demand.

Related documents:

- IDDE Description
- Source Control Program Enforcement Response Plan
- Industrial Stormwater and Water Quality Investigation Enforcement Response Plan
- Clean Water Services Industrial Stormwater Program Implementation Manual
- Clean Water Services Ordinance No. 27

2. Industrial and Commercial Facilities

The permittee must continue to implement a program to reduce pollutants in stormwater discharges to the MS4 from: facilities the permittee identified as being subject to ~~the following:~~ an industrial stormwater NPDES permit; hazardous waste treatment, disposal and recovery facilities; industrial facilities that are subject to section 313 of title III of the Superfund Amendments and Reauthorization Act of 1986; and, facilities that have been identified as contributing a significant pollutant load to the MS4. The permittee must:

There are no hazardous waste treatment, disposal, and recovery facilities within the District's service area. To ensure that the District oversees industrial facilities subject to Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA Title III), the District reviews industrial user surveys of new businesses to identify facilities that are subject to these provisions. The District also annually obtains a list of industrial facilities in its service area that are subject to Toxic Release Inventory (TRI) reporting under SARA Title III to determine whether any facilities in its service area that are subject to TRI reporting were missed by the industrial user survey process. If facilities subject to reporting under SARA Title III are identified through the TRI report that were not previously screened for potential MS4 impact, the District will survey the facility and inspect it for chemical storage and spill potential to evaluate whether its stormwater discharges warrant additional controls. Stormwater discharges from industrial facilities that are subject to SARA Title III and other industrial facilities are managed through the 1200-Z NPDES Stormwater General Permit assigned to industrial facilities by the Oregon Department of Environmental Quality (DEQ).

The District's industrial stormwater program operates under a memorandum of agreement (MOA) with DEQ to regulate industrial facilities requiring an NPDES Permit. In the state of Oregon, this is the 1200-Z Stormwater General Permit for industrial facilities. Under the current MOA, the District acts as DEQ's agent in regulating industrial facilities that discharge to the MS4 and are required to have a 1200-Z permit. The District implements the industrial stormwater program for the entire service area.

The District performs the following activities for the 1200-Z facilities:

- Identifies facilities requiring industrial stormwater permits
- Reviews industrial stormwater permit application
- Reviews Stormwater Pollution Control Plans (SWPCP)
- Provides technical assistance
- Inspects facilities
- Reviews industrial Discharge Monitoring Reports (DMRs)
- Coordinates with DEQ on enforcement matters

2.1 Priorities and Procedures for Inspections and Control Measures

A. Screen new industrial facilities to assess whether the facility has the potential to be subject to an industrial stormwater NPDES permit or has the potential to contribute a significant pollutant load to the MS4.

B. Within 30 days after a facility is newly identified by the permittee as potentially subject to an industrial stormwater NPDES permit, the permittee must notify, in writing, the industrial facility that it is potentially subject to an industrial stormwater NPDES permit.

C. *Implement an updated written strategy to reduce pollutants in stormwater discharges to the MS4 from industrial and commercial facilities where site-specific information has identified a significant industrial or commercial pollutant load to the MS4. The strategy must include a description of the approach to and rationale for identifying commercial and industrial facilities as a contributor of significant pollutant load, and establish the priorities and procedures for facility inspection and stormwater control measure implementation at the identified facilities. The updated strategy must be implemented by ~~[date to be inserted]~~October 22, 2017 and subsequently applied within one calendar year from the date a new source contributing a significant pollutant load to the MS4 has been identified by the permittee.*

1200-Z Permitted Facilities

The District identifies and contacts industrial facilities through the ongoing Sewer Use Information Card survey program. Industrial facilities are then classified by Standard Industrial Classifications (SICs). After these facilities are identified as needing a permit, the District directs the facility operators to apply for the 1200-Z permit.

The District inspects 1200-Z permitted facilities based on a system that ~~annually~~ prioritizes inspections so that the frequency of inspection is roughly proportional to the risk of discharges of pollutants and other noncompliance. ~~-~~In prioritizing inspections, the District considers the complexity of the facility, its compliance history and benchmark exceedances. ~~-~~Regardless of risk, the District inspects ~~20% of the 1200-Z permitted facilities every year and inspects~~ every 1200-Z permitted facility at least once during the MS4 permit term. ~~-~~In addition to these ~~scheduled~~ inspections, the District conducts technical assistance inspections at facilities that need additional help and provides "no exposure" certifications to facilities that do not have industrial activities that are exposed to stormwater.

Industrial facilities subject to the 1200-Z permit are required to submit monitoring results for pollutants specified in the permit on a~~n~~ quarterly ~~annual~~ basis. The District receives and reviews the monitoring reports from each of the 1200-Z industrial permittees in its service area. The District evaluates this information for accuracy and completeness, and compares it to the Quality Assurance and Quality Control (QA/QC) laboratory data that is submitted per requirements of the 1200-Z permit.

Commented [A8]: Prioritization may occur throughout the year, not just once annually.

Commented [A9]: The requirement to inspect 20% annually is being deleted, since it is redundant of the requirement to inspect all during the 5-year permit term. It is being retained as an interim annual standard during administrative extension. See Measurable Goals and Tracking Measures, below.

Commented [A10]: Clarifying that the measuring term is the MS4 permit, not the 1200-Z permit.

Commented [A11]: This was changed to "quarterly" to reflect the new 1200-Z requirement

Facilities Identified as Having the Potential to Contribute Pollutants

As described in its written strategy, ~~T~~the District initially determines whether an industrial facility has the potential to contribute a significant pollutant load to the MS4 based on the facility's SIC code. ~~-~~The District also responds to site-specific information, such as might be gained in investigating a complaint or an illicit discharge, indicating that an industrial or commercial facility has the potential to contribute a significant pollutant load to the MS4. ~~-~~In determining whether a facility has the potential to contribute a significant pollutant load to the MS4, the District considers the nature of materials and wastes stored at the facility, the condition and location of storage structures, the protective measures in place (including personnel training, spill response plans, and inspection programs), and the history of actual releases. ~~-~~The District inspects all facilities where there is credible site-specific information suggesting the potential to contribute a significant pollutant load to the MS4. ~~-~~Sites with known releases are prioritized. ~~-~~Facilities that are found with SIC codes requiring 1200-Z coverage are brought into the 1200-Z program.

Where inspection confirms the potential to contribute a significant pollutant load to the MS4, the District initially works with the owner/operator to implement practices designed to eliminate the potential. If this technical assistance is not effective, the District may bring enforcement action under Ordinance 27 to compel compliance and/or may request that DEQ require the facility to obtain coverage under a 1200-Z general permit pursuant to 40 CFR 122.26(a)(9)(i)(D), or may take other action as appropriate.

~~As required by the permit, the District will update its strategy to reduce pollutant discharges to the MS4 from industrial and commercial facilities.~~

Commented [A12]: Deleted because this commitment has been met.

In addition to the program for industrial facilities that are covered by the 1200-Z stormwater general permit, the District implements a program for select industrial and commercial facilities that conduct washing operations. With respect to the discharge from washing operations, the District's program consists of the following:

- Identifying facilities that discharge process waters from washing operations to the MS4
- Providing technical assistance to eliminate these discharges to the MS4
- Requiring permits and necessary controls for discharges to the sanitary sewer
- Conducting annual inspections of permitted facilities
-

BMPs 1a through g, Industrial and Commercial Facilities, describe the goals and tracking measures associated with meeting these requirements.

BMP CATEGORY: INDUSTRIAL AND COMMERCIAL FACILITIES

Introduction: The purpose of this BMP category is to improve water quality by regulating select industrial and commercial discharges to the storm sewer system. This is accomplished by identifying facilities subject to industrial permitting requirements, reviewing stormwater pollution control plans, conducting inspections, reviewing discharge monitoring data and providing technical assistance.

Measurable goals and tracking measures:

1. a. Goal: Identify industrial facilities that need a 1200-Z stormwater general permit.

   ***Tracking Measure**: Number of newly permitted 1200-Z facilities in the service area.*

   b. (1) Goal: Conduct all of the priority 1200-Z facility inspections scheduled for the reporting year in the service area.

   ***Tracking Measure**: Number of priority 1200-Z permitted facility inspections scheduled for the reporting year; number of scheduled priority 1200-Z facility inspections conducted during the reporting year.*

   b. (2) Goal: Inspect ~~all~~ 20 per cent of 1200-Z permitted facilities annually during permit administrative extension ~~in the service area at least once during the permit term~~.

   ***Tracking Measure**: Total number of 1200-Z permitted facilities; number inspected~~Annually report progress toward this goal and confirm final compliance in the 2020-2021 Annual Report.~~*

   c. Goal: Provide technical assistance if requested by owner/operator of a facility.

   ***Tracking Measure**: Number of technical assistance inspections performed in response to owner/operator requests.*

   d. Goal: Issue "No Exposure" certifications to facilities that are determined to meet DEQ qualifying criteria.

   ***Tracking Measure**: Number of "No Exposure" certifications issued.*

   e. Goal: Review monitoring reports from all 1200-Z facilities.

   ***Tracking Measure**: Number of monitoring reports submitted and number reviewed.*

   f. Goal: Identify facilities subject to section 313 of SARA Title III and not already covered by 1200-Z or other stormwater discharge permit and determine their potential to contribute a substantial pollutant loading to the MS4.

   Tracking Measure: Number of unpermitted facilities identified through the annual review of the TRI.

   Tracking Measure: Number of unpermitted facilities identified through the TRI review that were inspected, number determined to have potential to discharge a substantial pollutant loading, action taken.

   g. Goal: Reduce pollutants in stormwater discharges from facilities other than those with SIC codes requiring 1200-Z general permit coverage.

   Tracking Measure: Number of facilities (other than those with 1200Z-qualifying SIC codes) where site-specific information leads to a facility inspection, number of facilities determined to be contributing a significant pollutant load to the MS4, action taken.

Relationship to TMDLs

Implementing this BMP and the 1200-Z permitting program reduces the potential discharge of all of the TMDL parameters.

Related documents:

- *Stormwater Pollution Control Manual* (Clean Water Services, 1999)
- Industrial Stormwater Implementation Manual
- MOA with DEQ to implement the 1200-Z program

Commented [A13]: This does *not* require that all inspections be scheduled at the start of the year. Priorities need to be flexible during the year; this will be the net for the year, some may be added or dropped during the year.

Commented [A14]: The goal of inspecting all 1200-Z facilities during the permit term was met. The 20% per year requirement will continue until the new SWMP is approved.

3. Construction Site Runoff Control

The permittee must continue to implement a program to reduce pollutants in stormwater runoff to the MS4 from construction activities. The permittee must:

A. Implement and enforce ordinances or other enforceable regulatory mechanisms that require erosion prevention and sediment control (EPSC) best management practices to be designed, implemented, and maintained on construction sites to minimize the transport of construction-related pollutants to waters of the State and prevent adverse impacts to water quality by construction-related pollutants. The construction site runoff control program ordinances or other enforceable regulatory mechanism must apply to construction activities that result in a land disturbance of 500 ft^2 or greater.

The District's Ordinance 27 authorizes rules and regulations for construction site stormwater management through adoption of resolutions and orders. The specific rules and regulations are located in the ~~-~~*Clean Water Services Design and Construction Standards for Sanitary Sewer and Surface Water Management ~~Design and Construction Standards.~~* (*D&C Standards*). The *D&C Standards* include requirements that are intended to protect the beneficial uses of waters within the Tualatin River Basin and the District's service boundary, and are implemented in combination with state, federal, and local laws and ordinances. Within the Tualatin River Basin, the Tualatin Basin Rule (OAR 340-041-0345(4)) regulates erosion control and stormwater quality related to land development. ~~-~~Under this rule, the District regulates all land development activities that disturb more than 500 square feet. In addition, construction activities that affect areas greater than one acre are also regulated under NPDES Stormwater Discharge Permits (1200-C and 1200-CN Permits). The District acts as an agent for the administration of the 1200-CN and 1200-C program on behalf of DEQ. Applicants may prepare and submit a single Erosion Prevention and Sediment Control Plan (EPSCP) for approval under both the District's regulations and the state (DEQ's) regulations, thereby streamlining the permitting process.

To provide further guidance to the development and construction community, the District, in partnership with other local jurisdictions, publishes the *Erosion Prevention and Sediment Control Planning and Design Manual (Manual)*. The *Manual* provides a detailed and comprehensive description of erosion control materials and installation practices that have proven effective.

The erosion control program and rules include BMPs for erosion prevention and sediment~~ation~~ control, with emphasis on proactive erosion prevention rather than reactive sediment~~ation~~ control. Prevention techniques include site planning and scheduling, retention or use of ground cover, etc. Sediment control measures include silt fences, sediment barriers, settling basins, etc.

The Construction Site Runoff control BMP fact sheet at the end of this section contains a summary of the program, measurable goals and tracking items.

3.1 Site Planning Procedures and BMP Requirements

B. Require construction site operators to prevent or control the discharge of pollutants to the MS4 from construction-related non-stormwater waste that may cause adverse impacts to water

quality, such as discarded building materials, concrete truck washout, chemicals, litter, and sanitary waste.

C. *Require construction site operators to develop EPSC site plans that incorporate appropriate and effective EPSC best management practices. At a minimum, EPSC site plans for sites disturbing one acre to less than five acres of land must be consistent with the substantive requirements of the State of Oregon's 1200-CN permit, and for sites disturbing 5 acres or greater of land, the construction EPSC site plans must be consistent with the substantive requirements of the State of Oregon's 1200-C permit. In place of individual site-specific EPSC plans, the permittee may allow operators of individual single-family home sites less than one acre to use a permittee-documented list of effective EPSC BMPs and site sketch showing appropriate use and placement of the EPSC BMPs. By ~~[date to be inserted].~~April 22, 2017, the permittee must develop written EPSC site plan review procedures that the permittee must use to verify that the EPSC site plan or site sketch incorporate appropriate EPSC BMPs for the construction activities being proposed.*

D. *Require the construction site operator to implement and maintain appropriate and effective EPSC best management practices, as reflected in the applicable EPSC site plan or site sketch for the construction site, and update the EPSC site plan or site sketch as necessary to remain effective.*

Commented [A15]: This was completed as required.

The *D&C Standards* specify the required elements (management practices) that must be included in an EPSCP. In addition to management practices, the EPSCP requires identification and protection of water quality sensitive areas, floodplains, and drainage hazard areas. The *D&C Standards* outline the required elements of an EPSCP. The EPSCP serves as a blueprint to prevent erosion and control sediment from leaving the site during construction and requires modification throughout the life of the project as needed. The District and co-implementers follow written procedures to review and approve EPSCPs prior to issuing site development erosion control permits.

The development plan review and permitting process is streamlined for construction of individual single-family homes on sites less than one acre and does not require an EPSCP. At a minimum, all construction projects of individual single-family home sites less than one acre require down-gradient perimeter control, inlet protection, and a construction entrance, which are standard construction practices. An EPSCP template showing the location of typical erosion and sediment control BMPs is provided with each single family erosion control permit issued.

A detailed EPSCP is required for all commercial, industrial and multi-family residential sites, regardless of lot size. The EPSCP submittal and review is part of the engineering plan review process through which a Site Development Permit is issued. A Site Development Permit cannot be issued without EPSCP approval. Permit issuance requires installation and maintenance of temporary and permanent erosion control measures on all sites in accordance with an approved EPSCP. However, compliance with the approved plan does not preclude the District or co-implementer from requiring a~~n applicant~~ permittee to provide additional measures not identified in the EPSCP if erosion is occurring.

The *D&C Standards* specify erosion prevention and sediment control requirements and include BMPs for use on sites within the Tualatin River s~~S~~ub-basin, some of which are minimum requirements. The *D&C Standards* also include numerous BMPs for effective erosion prevention and sediment control, and BMPs for "non-stormwater pollution

control," including BMPs that address concrete truck washout areas, spill prevention/response, employee training and protected areas for storage and maintenance. In addition to the required and allowed BMP list, the *Manual* provides designers with information regarding advantages and disadvantages, design, inspection, and maintenance requirements for a wide variety of erosion control BMPs and helps the designer choose the most appropriate measure or control for an individual site.

BMP 2.b, Training and Outreach, describes the goals and tracking measures associated with notifying site development permit holders of these erosion control requirements.

3.2 Procedures for Identifying Priorities for Site Inspections and Enforcement of Control Measures

E. Perform regular on-site inspections to ensure that the applicable EPSC site plan or site sketch is properly implemented. The construction site inspections must include inspection of disturbed areas of the site, material and waste storage areas, stockpile areas, construction site entrances and exits, sensitive areas, discharge locations to the MS4, and, if appropriate, discharge locations to receiving waters. The permittee must document inspections to support its findings, including taking photographs of the construction site, as appropriate, and documenting environmental monitoring results when water quality sampling is conducted. By April 22, 2017~~[insert date]~~, the permittee must develop written site inspection procedures and criteria the permittee must use during its site inspections to ensure proper implementation of the EPSC site plan and compliance with the applicable ordinance or regulatory mechanism.

Commented [A16]: This was completed as required.

F. By April 22, 2017~~[insert date]~~, the permittee must develop and implement a written escalating enforcement response procedure to ensure construction activities are in compliance with the ordinances or other regulatory mechanisms and eliminate non-compliance in an expeditious manner.

Commented [A17]: This was completed as required.

G. Maintain a record-keeping system to document and track construction site runoff program activities.

The District and co-implementers conduct three types of inspections: initial inspections, regular inspections, and final inspections. On all sites, with the exception of individual single family lots, erosion prevention and sediment control measures must be installed and the initial inspection completed before any permitted construction activity begins.

Regular inspections are performed at least weekly on all active site development projects. Regular inspections are performed at least monthly on all active single-lot sites (residential, commercial, and industrial). Inactive site development and single-lot projects are inspected at a frequency based on site conditions; they are inspected at least monthly. Additional inspections may be conducted on sites that have challenging site characteristics such as topography, size of the lot, proximity to sensitive areas, and the nature and complexity of the construction activity. The District and co-implementers document all inspections.

Commented [A18]: This text clarifies existing practice and was added in response to public comment.

The District and co-implementers' inspection of all active sites and frequent follow-up inspections help ensure that the approved EPSCP and BMPs are being implemented. An escalating enforcement system is used for violations, depending on the severity and the nature of the violation. The escalating enforcement may include verbal warnings, written warnings (e.g., Deficiency Notices), imposition of re-inspection fees, Stop Work Orders, and Civil Citations. The District and co-implementers have the ability to bypass verbal or written warnings to address severe violations. For example, working without a proper permit may result in an immediate Stop Work Order and potentially a Civil Citation. Photo documentation is collected when appropriate to support Stop Work Orders. These procedures are documented in the District's *Construction Site Runoff Inspection Guidance* (*Guidance*). The co-implementers either use this *Guidance*, or their own equivalent document. The District and co-implementers document the activities they carry out to implement the construction site runoff program.

BMP 1, Erosion Prevention & Sediment Control (EPSC) Inspection and Enforcement, and BMP 2.a, Training and Outreach, describe the goals and tracking measures associated with meeting this requirement.

3.3 Education and Training for Construction Site Operators

The following addresses a permit requirement listed in Schedule A.2.d.iv.F for Education and Outreach:

Schedule A.2.d.iv.F: Notify construction site operators where education and training to meet erosion prevention and sediment control requirements can be obtained.

The District provides information regarding opportunities for training and education for construction site operators.

BMP CATEGORY: CONSTRUCTION SITE RUNOFF CONTROL

Introduction: The purpose of this BMP category is to improve water quality by reducing or preventing soil erosion and implementing sediment control measures at construction sites through regulation, inspection, enforcement, and education.

Measurable goals and tracking measures:

1. Erosion Prevention & Sediment Control (EPSC) Inspection and Enforcement

a. Goal: Conduct initial, regular and final inspections for all active site development projects.

***Tracking measure**: Annual number of site development inspections–initial, regular, and final.*

b. Goal: Conduct initial, regular and final inspections for all active single lot construction sites.

***Tracking measure**: Annual number of single lot construction inspections–initial, regular, and final.*

c. Goal: Implement an escalating enforcement system which may include written warnings (e.g., Deficiency Notices or similar action), Stop Work Orders, and Civil Citations.

***Tracking measure**: Annual number of enforcement actions–written warnings (e.g., Deficiency Notices or similar action), Stop Work Orders, and Civil Citations.*

2. Training and Outreach

a. Goal: Provide annual inspector training on erosion control techniques and enforcement measures for continuing education. Except for inspectors who have an active EPSC certification that includes a continuing education requirement, require all erosion control inspectors to attend annual training on erosion control techniques.

***Tracking measure**: Number of non-certified inspectors and number attending annual EPSC training.*

***Tracking measure**: Number of inspectors with active EPSC certification.*

***Tracking measure**: List of annual training sessions conducted and participating agencies.*

b. Goal: Provide annual notification of wet-weather requirements to active site development (i.e., not single family home construction) permit holders.

***Tracking measure**: Number of site development permits active at the time when wet weather notices are issued; annual number of wet weather notices issued.*

Relationship to TMDLs

Phosphorus. The District's Erosion Control program was established under the Tualatin Basin Rule (OAR 340-041-0345(4)) to meet the phosphorus allocations in the 1988 Tualatin TMDL.

Settleable Volatile Solids. Erosion Control BMPs significantly reduce the discharge of organic matter associated with soil erosion. Organic matter can result in increased sediment oxygen demand in the receiving waters.

Related Documents:

- *D&C Standards*, 201907 (Chapter 6)
- Erosion Prevention and Sediment Control Planning and Design Manual, 2008
- Erosion Control Internal Inspection Procedures Handbook

4. Education and Outreach

The District implements the education and outreach program throughout the service area and has typically taken the lead in crafting education and outreach messages. Therefore, the discussion below mentions the District as the entity that implements the program. However, it should be noted that the District and co-implementers share responsibility for education and outreach.

The District's Strategic Communications Plan is based on established communication principles including open two-way communication, community problem solving, and strong and consistent messages.

The District's primary message is: protect and enhance watershed health. To encourage stream-healthy behaviors, the District uses a variety of print, electronic and other media including: newspaper, cable TV, radio, social media, billing inserts, signage, brochures, community events, workshops, vehicle murals, electronic newsletters and the website. Partnerships are a key factor in the success of the District's public education and outreach programs. As a member of the Regional Coalition for Clean Rivers and Streams and the Tualatin Basin Public Awareness Committee, the Tualatin River Watershed Council, and other groups working to inform people about water quality, the District has leveraged dollars and resources to have greater reach and impact.

The overall program requirement from the permit is as follows:

The permittee must implement an education and outreach program designed to achieve measurable goals for target audiences, and address specific stormwater quality issues or identified pollutants of concern in its jurisdictional area. The permittee must describe and use effective education and outreach methods, and the permittee must address, at a minimum, the following:

The permit goes on to describe the eight specific components of a public education program that are required. The SWMP elements for each of these specific components are described according to permit requirements in the following subsections.

4.1 Conduct Outreach

A. Continue to implement a documented public education and outreach strategy that effectively promotes pollutant source control and a reduction of pollutants in stormwater discharges. The strategy must identify targeted pollutants of concern, the targeted audience, specific education activities, and the entity or individual responsible for implementation. The public education and outreach strategy may incorporate cooperative efforts. The cooperative efforts conducted within the MS4 jurisdictional area must be tracked, documented, and the results reported annually.

B. Provide educational materials or activities to the public that describe the impacts of stormwater discharges on water bodies and the steps or actions the public can take to reduce pollutants in stormwater runoff.

The District's public education and outreach strategy is documented in its Strategic Communications Plan. Through this plan the District commits to programs that meet the permit requirements for public education and outreach. -Examples of these programs include the following:

Public Awareness Campaigns

The District will continue to conduct its Public Awareness Campaigns on a three-year cycle. These campaigns focus on a targeted audience, targeted behaviors and targeted

pollutants. The District will use results from the customer surveys (see below) and feedback from other customer interactions (e.g., social media, District events, etc.) to adapt and refine the public awareness campaigns as necessary. As an example, the District sponsors the "Canines for Clean Water" campaign to encourage proper disposal of pet waste. Dog owners are asked to pledge that they will pick up and properly dispose of pet waste, and in return they receive a colorful bandana for their pet and have the opportunity to have their dog's photo posted on the District website. The purpose of this program is to reduce the discharge of bacteria to surface waters. This popular program puts heart and humor into water quality education.

Public Education

The District developed the Tualatin River Rangers classroom presentation to teach elementary students the impact of daily activities on water quality. The District will continue to present this program. Schools throughout the Tualatin watershed host the Tualatin River Rangers, and District staff teach children how to protect water quality by reducing the use and properly disposing of toxic materials including fertilizers and herbicides, and reporting illicit discharges. The students are encouraged to share this information with their parents through a take-home exercise that engages parents in identifying toxic household materials and putting a sticker on them for proper disposal. This award-winning program has been marketed throughout the U.S.

Outreach Program to Diverse and Underserved Residents

The District will continue to seek opportunities to collaborate with diverse and underserved communities through educational programs and outreach materials that address water quality protection practices.

Community Events

District staff will continue its presence at community events including the Washington County Fair, Public Works Fair, Earth Day events, and Children's Clean Water Festival. At these events District staff talk~~s~~ with individuals about water quality protection and provides brochures, magnets, temporary tattoos, River Ranger handouts, and many other giveaways that help reinforce water quality messages.

Streamside Education

The District will continue building relationships with streamside homeowners who can have the greatest impact on surface water quality. The District will maintain its website, which provides specific educational information for streamside property owners, including contact information for technical assistance and information regarding use of native plants to protect water quality. The District will also provide up to five~~20~~ -free native plants to streamside residents annually to reduce erosion and encourage stewardship activities.

Commented [A19]: Changing to five plants to better match the scope of the need for plants and District resources and to reduce inequities between residents..

Financial Support

The District has provided organizational, financial and technical support to stream and wetland "friends" groups in the Tualatin Basin for more than a decade. These groups use newsletters, websites, tours and activities to convey water quality messages to larger audiences. The District intends to continue this effort as budgetary constraints allow.

Certification

The District will continue to sponsor the Eco-Logical Business certification program, which encourages residents to patronize certified businesses. The Eco-Logical Business certification program includes auto repair shops and other businesses that have met rigorous standards that ensure their policies and procedures protect water resources.

BMP 1, Education and Outreach Strategy, BMP 2, Pesticides/Herbicides/Fertilizers, and BMP 5, Education Regarding Illicit Discharges, describe the goals and tracking measures associated with meeting this requirement.

4.2 Pesticide, Herbicide and Fertilizer Educational Activities

C. Provide public education on the proper use and disposal of pesticides, herbicides, fertilizers and other household chemicals.

The District will continue its public education and outreach programs that address issues associated with the application and disposal of pesticides, herbicides, and fertilizers. Key program activities include:

- Educating the public on alternatives to pesticides, herbicides and fertilizers via the annual public awareness campaign with newspaper, cable TV, radio, billing inserts and online advertisements (www.cleanwaterservices.org/)
- Educating the public on the use of native plants by distributing the *Gardening with Native Plants* brochure.

BMP 2, Pesticides/Herbicides/Fertilizers, describes the goals and tracking measures associated with meeting this requirement.

4.3 Education Regarding Private Stormwater Facility Maintenance

D. As appropriate, provide education on the proper operation and maintenance of privately-owned or operated stormwater quality management facilities to owners and/or operators of private WQ facilities.

See Section 8.3, Privately Owned Stormwater Structural Facilities, for information on how this requirement is addressed.

4.4 Training for Construction Site Operators

F. Notify construction site operators where education and training to meet erosion prevention and sediment control requirements can be obtained.

See Section 3.3 for information on how this requirement is addressed.

4.5 Conduct or Participate in an Effectiveness Evaluation

G. Conduct or participate in an effectiveness evaluation to measure the success of public education activities during the term of this permit by assessing changes in targeted behaviors. The results of the effectiveness evaluation must be used in the adaptive management of the education and outreach program, and reported to DEQ no later than November 1, 2019~~[insert date]~~.

An integral component of the District's Strategic Communications Plan is to conduct biennial customer surveys. These surveys are conducted by a professional research

firm that provides statistically valid and reliable results of customer attitudes and behaviors related to water quality. The surveys include questions related to the current public awareness campaign. The District uses the survey results to measure the effectiveness of the public awareness campaigns in changing behaviors related to water quality and to establish trends over time. Programs that prove to be ineffective in encouraging water quality-behavior changes are modified as necessary to result in a greater level of responsible behavior from those who live and work in the Tualatin River Basin.

BMP 3, Effectiveness Evaluation and Adaptive Management, describes the goals and tracking measures associated with meeting this requirement.

4.6 Employee Training

H. Provide training for permittee employees involved in MS4-related activities, as appropriate. The permittee must also provide the opportunity for ~~co-implementers~~jurisdictions within the MS4 service area to attend such trainings, as appropriate. At a minimum, the training must be tailored for the targeted audience, and include information related to stormwater pollution prevention and reduction BMPs associated with the following municipal operations or activities: parks and open space maintenance, fleet and building maintenance, new municipal facility construction, erosion and sediment control associated with land disturbances, design and construction of street and storm drain systems, discharges from non-emergency fire fighting-related training activities, and stormwater system maintenance.

The District and co-implementers train their employees involved in MS4-related activities through a combination of on-the job-training, informal workgroup sessions, and formal classes. -Training opportunities are available through agencies, trade associations and educational groups.

BMP 4, Employee Training, describes the goals and tracking measures associated with meeting this requirement.

4.7 Illicit Discharges

E. Promote, publicize, and facilitate public reporting of illicit discharges.

The District promotes, publicizes, and facilitates public reporting of illicit discharges and water quality impacts. Key program activities include:

- Brochures, billing inserts and electronic newsletters that include regular articles on watershed protection and enhancement, proper disposal practices, and reporting information for illicit discharges and water quality impacts.
- Brochures with contact information and the "Report a problem" page on the District's website (www.cleanwaterservices.org) facilitate public reporting of illicit discharges and water quality problems. In addition, the District's and co-implementers' main phone numbers and websites are the entry points for reporting problems.
- Many of the District's public education and outreach programs also address the proper management and disposal of used oil and toxic materials. Key program activities include:

- Regular articles on proper disposal of oil, household hazardous waste and litter and yard debris in billing inserts, print and electronic newsletters, and websites.
- Storm drain marking program and distribution of educational door hangers regarding the proper disposal of yard debris and toxic materials.

BMP 5, Education Regarding Illicit Discharges, describes the goals and tracking measures associated with meeting this requirement.

BMP CATEGORY: EDUCATION AND OUTREACH

Introduction: The purpose of this BMP category is to inform and educate the public, business, industry, and government about the causes of stormwater pollution, the effects on local streams and rivers, and to promote stream healthy behavior. These BMPs encourage behavior change and participation that will reduce stormwater pollution and promote the health of the Tualatin River Watershed.

Measurable goals and tracking measures:

1. Education and Outreach Strategy

a. Goal: Following the District's *Strategic Communications Plan*, educate the public on stormwater quality issues including the impacts of stormwater discharges and the actions the public can take to reduce pollutants in stormwater, the proper use and disposal of pesticides, and information for reporting illicit discharges. The District will publish 12 monthly electronic newsletters per year and place inserts in customer bills five times per year covering one or more of these topics.

***Tracking measure**: Summarize activities and participation on an annual basis, including the number of electronic newsletters published and billing inserts mailed during the year.*

b. Goal: Following the District's *Strategic Communications Plan*, carry out campaigns designed to change the behavior of the intended audience relevant to reducing stormwater pollution.

***Tracking measure**: Annually track outreach campaigns being conducted, and the intended audiences and behaviors targeted through those campaigns.*

2. Pesticides/Herbicides/Fertilizers

a. Goal: Educate the public on the use of alternatives to pesticides, herbicides and fertilizers through the annual public awareness campaign.

***Tracking measure**: Summarize awareness campaign activities and participation regarding the use of alternatives to pesticides, herbicides and fertilizers on an annual basis.*

b. Goal: Educate the public on the use of native plants by distributing 500 copies of the *Gardening with Native Plants* brochure.

***Tracking measure**: Summarize outreach efforts and participation regarding the use of native plants on an annual basis, including the number of* Gardening with Native Plants *brochures distributed.*

3. Effectiveness Evaluation and Adaptive Management

Goal: Assess and improve the effectiveness of the District's *Strategic Communications Plan* by collecting data on program effectiveness, analyzing the data to determine the effectiveness of the District's educational and behavioral change efforts, identifying programmatic changes to improve outcomes, and implementing those improvements. Conduct a customer survey every two years. Annually use the Logic Model (or other appropriate process) to evaluate the effectiveness of at least one program in the District's *Strategic Communications Plan*, identify and implement needed revisions.

***Tracking measure**: Report on status of biannual customer survey and the application of the Logic Model.*

***Tracking measure**: Track changes made to the public education program as a result of customer surveys and the Logic Model.*

4. Employee Training

a. Goal: Conduct training for District and co-implementer employees associated with stormwater management.

b. Goal: Include training in recognition and reporting of illicit discharges.

c. Goal: Conduct annual training session for District and co-implementer personnel—on water quality facility design.

***Tracking measure**: List of annual training sessions on stormwater management, recognizing and reporting illicit discharges, and design of water quality facilities, participating agencies, and number of staff attending training sessions.*

5. Education Regarding Illicit Discharges

a. Goal: Ensure that District and co-implementer websites facilitate public reporting of illicit discharges and water quality problems.

***Tracking measure**: Summarize annual progress on developing user-friendly web-based methods for facilitating public reporting of illicit discharges and water quality problems.*

b. Goal: Use a variety of outreach mechanisms (i.e., print, electronic, and other media) to promote proper disposal of oil, household hazardous waste and litter, and yard debris in billing inserts, print and electronic newsletters, and websites.

***Tracking measure**: Summarize outreach related to disposal activities on an annual basis.*

c. Goal: Conduct the storm drain marking program and distribute educational door hangers regarding the proper disposal of yard debris and toxic materials.

***Tracking measure**: Number of drains marked and door hangers distributed.*

Relationship to TMDLs

Phosphorus. Public education regarding the proper application and usage of phosphorus-containing products is critical to the overall reduction in phosphorus in the watershed.

Bacteria. Public education about pet waste management and feeding waterfowl, such as ducks and geese, and other wildlife is important to reducing the concentration of bacteria in stormwater discharges. The District's strategy to reduce bacteria is greatly dependent on this BMP.

Settleable Volatile Solids. Public education and awareness is very important to reducing the loading of settleable volatile solids from the MS4. These include education about the proper use of landscaping materials, leaf disposal, etc.

Related documents:

– *Clean Water Services Strategic Communications Plan* (Clean Water Services, 2015~~0~~)

5. Public Involvement and Participation

The permittee must provide opportunities for the public to effectively participate in the development, implementation and modification of the permittee's stormwater management program. The permittee must document and implement provisions for receiving and considering public comments on the monitoring plan, annual reports, SWMP revisions, the retrofit strategy, and the TMDL pollutant load reduction benchmark development.

The District will provide the monitoring plan to the public for review and comment on the District's website prior to submission to DEQ. The District will post its annual report on its website for public review and comment within five business days after November 1st of each year. The District will consider comments regarding the annual report in its adaptive management program.

SWMP revisions and pollutant load reduction benchmarks are required for submittal to DEQ at the permit renewal submittal (180 days prior to permit expiration). Prior to submittal of these items, the District will provide the public with an opportunity to comment on the revisions to the SWMP and proposed pollutant load reduction benchmarks for a minimum of 30 days. Comments on the documents will be collected and considered and the response to comments will be publicly provided.

The District provides opportunities for the public to participate in implementing the SWMP through:

- Enlisting pet owners in reducing the discharge of bacteria-laden pet wastes through Canines for Clean Water;
- Facilitating public reporting of illicit discharges;
- Providing the opportunity for businesses to reduce their discharges through the EcoBiz certification program;
- ~~Involving school personnel and students in planning, designing, constructing and maintaining LIDA facilities at public and private schools through the School LIDA program (*see* section 6.2;~~ and
- Offering free on-site technical assistance in stormwater-friendly landscaping to reduce polluted runoff through the Clean Water Heroes program.

Commented [A20]: The District is sunsetting the School LIDA program.

6. Post-Construction Site Runoff and Retrofit Programs

To address these requirements, this section of the SWMP is divided into six subsections covering: 1) Post-construction stormwater runoff quality; 2) Low Impact Development Approaches ~~(including the School LIDA program)~~; 3) Post-construction stormwater runoff quantity and hydromodification; 4) Retrofit strategy development and implementation; 5) Site plan review, inspection, and enforcement; 6) Site limitations; and 7) Recordkeeping.

The permittee must continue to implement and enforce its post-construction stormwater runoff control and retrofit programs.

In accordance with the compliance dates listed below, t~~T~~he post-construction site runoff program must apply to new development and redevelopment projects that create or replace 1000 ft^2 or greater of impervious surface and must capture and treat 80% of the annual average runoff volume based on the documented local or regional rainfall frequency and intensity. The permittee must include a defined water quality design storm or an acceptable continuous simulation method to address the capture and treatment of 80% of the annual average runoff.

~~The objective of T~~the post-construction and retrofit ~~section~~ program must be designed is ~~to~~ to reduce site specific post-development stormwater runoff volume, duration, and rates of discharge to the MS4 to minimize hydrological and water quality impacts to waters of the State from impervious surfaces.

The District implements a post-construction stormwater pollutant and runoff control program through development requirements that are incorporated in the District's *D&C Standards*. Legal authority for the implementation and enforcement of the requirements referenced in this document is provided in the District's Ordinance 27. The *D&C Standards* require water quality treatment and water quantity control for specified thresholds of new and re-development.

The District actively pursues opportunities to retrofit existing areas that lack adequate stormwater controls. These areas include those that were developed in the decades prior to current stormwater management requirements. ~~These areas are~~ and are typified by roadside ditches, flow-through catch basins, and direct discharges of untreated stormwater to surface waters. To address these areas, the District uses a formal outfall prioritization process that considers land use, pollutant load (including traffic), and the availability of open space for constructing system elements. Retrofit projects are often carried out in partnership with other public agencies as part of other public projects (road improvements, park expansion, etc.), allowing the District to leverage public resources.

BMP 1, Development Services, and BMP 2, Low Impact Development Approaches (LIDA), under this section describe the goals and tracking measures associated with implementing the post-construction site runoff program. BMP 5, Outfall Retrofits, and BMP 6, Catch Basin Retrofits, under section 7, Pollution Prevention for Municipal Operations, describe the goals and tracking measures associated with implementing the retrofit program.

6.1 Post-Construction Stormwater Runoff Quality

A. Stormwater Runoff Quality. 1. By the first anniversary of permit issuance, April 22, 2017, the permittee must implement and enforce a program to control post-construction stormwater runoff quality. The permittee must include the following requirements in its program:

2. Incorporate BMPs that maximize pollutant removal, as identified in pollutant removal efficiency performance goals. The performance goals specify the design requirements and are not intended to be used as a basis for performance evaluation or compliance determination of the practices that are implemented pursuant to this section. The Design and Construction Standards must include a description of the following for each BMP:

1. Site-specific design requirements, including estimated removal efficiency performance goals;
2. Design requirements that do not inhibit maintenance; and,
3. Conditions where the BMP applies or conditions where BMP implementation is impracticable.

The District controls post-construction water quality by implementing and enforcing the *D&C Standards*. The District's Board of Directors approved Resolution and Order 17-05 on March 28, 2017, revising the District's *D&C Standards* to control post-construction runoff water quality. The District will review those standards and revise them as necessary to meet these permit requirements.

6.2 Low-Impact Development Approaches

B. Low Impact Development Approaches. 1. By the second anniversary of permit issuance April 22, 2018, the permittee s must:

post-construction runoff control program must 1. Eevaluate, prioritize and include implementation of Low-Impact Development (LID), Green Infrastructure (GI), or an equivalent design and construction approach in its post construction runoff control program.

2. The permittee's Design and Construction Standards must linclude a description of the conditions where implementation of LID, GI, or an equivalent approach may be impracticable in its Design and Construction Standards.

The District's *D&C Standards* include implementation of Low Impact Development Approaches (LIDA) to meet the runoff treatment and control requirements. The *D&C Standards* include approvable LIDA and the process for evaluating and approving other LIDA proposed by the applicant. The District's Board of Directors approved Resolution and Order 17-5 on March 28, 2017, revising the District's *D&C Standards* to prioritize the use of LIDA, including a description of conditions where implementation of LIDA may be impracticable. The District will review its LIDA standards and revise them as necessary to meet these permit requirements.

32. The permittee must, where practicable and within its legal authority, Mminimize or eliminate ordinance, code and development standard barriers that inhibit design and implementation techniques intended to minimize impervious surfaces and reduce stormwater runoff (e.g., Low Impact Development, Green Infrastructure) where practicable and within its legal authority. Such modifications to ordinance, code and development standards are only required to the extent they are permitted under federal and state laws.

~~*The permittee must appropriately modify ordinance, code or development standards within three years of the ordinance, code or development standard being identified as a barrier by the permittee or the permittee is notified by DEQ of the need for modification.*~~

The District developed the *Low Impact Development Approaches Handbook, July 2009* (*LIDA Handbook*) and updated it in June 2016~~.~~ The *LIDA Handbook* promotes and encourages LIDA. The District's code is consistent with guidance provided in the handbook. The *LIDA Handbook* addresses concerns about integration with building, plumbing, and maintenance departments.

~~*School LIDA Program*~~

~~To educate and involve students and to increase the use of LIDA, the District actively solicits participation in the School LIDA program. Schools (public and private) that elect to participate in the program engage in project planning, design, installation and maintenance of a LIDA facility at their site. District engineering staff provide professional advice and guidance, enhancing school curriculum and involving students in the "hands on" work of creating a LIDA facility. The resulting facility not only provides water quality treatment, but includes a valuable educational component for the participating students.~~

~~BMP 2a, Low Impact Development Approaches (LIDA), describes the goals and tracking measures associated with implementing the School LIDA program.~~

Commented [A21]: Under CWS Design and Construction Standards, LIDA is now prioritized throughout the District with the result that over 100 LIDA facilities are installed annually. The substantial effort required to attempt to add one more LIDA facility every year through the School LIDA Program is no longer warranted and the District is sunsetting the program. The District will continue its nationally recognized school educational program, and will work with individual schools that are interested in LIDA facilities on their sites as opportunities present themselves.

6.3 Post-Construction Stormwater Runoff Quantity and Hydromodification

C. *Hydromodification and Stormwater Runoff Quantity. The permittee must implement and enforce a program to control post-construction stormwater runoff quantity.*

1. *The permittee must complete ~~by developing~~ a hydromodification assessment~~. The permittee must implement the strategies and priorities for preventing or reducing hydromodification impacts related to the permittee's MS4 discharges identified in a scope of work, schedule and the final assessment. The assessment will~~ examin~~ing~~ ~~the hydromodification~~ impacts related to the permittee's MS4 discharges, including erosion, sedimentation, and/or alteration to stormwater flow, volume and duration that may cause or contribute to water quality degradation. The permittee must implement the strategies and priorities for preventing or reducing hydromodification impacts ~~related to the permittee's MS4 discharges~~ identified in the assessment as part of its post-construction stormwater quantity control program. ~~in a scope of work, schedule and the final assessment~~The permittee must comply with the following requirements in performing the hydromodification assessment and implementing its strategies and priorities~~. The permittee must include the following requirements in its program~~:*

   a. *By ~~the second anniversary of the permit issuance~~April 22, 2018, the permittee must develop and submit a scope of work and schedule for performing the hydromodification assessment. The scope of work and schedule are subject to DEQ's review and ~~response~~approval. The ~~submittal~~ scope and schedule for performing the assessment must include the following ~~requirements and describe how the strategies identified below will be incorporated into the assessment~~:*

      i. *D~~A d~~escription of planned coordination and involvement of stakeholders focused on the permittee's proposed approach to performing the assessment and implementing its findings and mechanisms for public review and feedback.*

      ii. *~~A description of where the proposed approach will be implemented and the timing of implementation (implementation plan~~Examination and assessment of the*

hydromodification impacts related to the permittee's MS4 discharges, including erosion, sedimentation, and/or alteration to stormwater flow, volume and duration that may cause or contribute to water quality degradation).

iii. *D~~A d~~escription and justification of decision-making approaches and tools that will be used to develop the program.*

iv. *An implementation plan, describing where the proposed approach will be implemented sand a timeline for implementation.*

v. *A description of the information that will be c~~C~~ollecte~~d~~ and maintaine~~d~~ to ~~information that will~~ inform future stormwater management decisions related to hydromodification based on local conditions and needs.*

vi. *Identifi~~cationy~~ or develop~~ment~~ of strategies to address hydromodification information or data gaps related to waterbodies within the permittee's jurisdiction.*

vii. *Identify strategies and priorities for preventing or reducing hydromodification impacts related to the permittee's MS4 discharges. The strategies and priorities must include performance standards equivalent to or more stringent than the following:*

a. *~~Incorporate s~~Site-specific post-construction management practices that, at a minimum, target predevelopment site hydrologic functions, and where practicable, natural surface hydrology. The site-specific post-construction management practices must optimize on-site retention based on the site conditions of the project.*

b. *E~~Identify e~~ffective decision-making approaches and tools to address hydromodification.*

2. *No less than 60 days before the third anniversary of permit issuance (February 20, 2019), permittee shall submit a draft~~.~~ report of the hydromodification assessment based on the submitted scope and schedule to~~. The report is subject to~~ DEQ for~~'s~~ review and approval.*

3. *~~By the third anniversary of permit issuance,~~No more than 60 days after receipt of DEQ's comments on the draft report, the permittee must submit the final hydromodification assessment report to DEQ and within 30 days begin implement~~ing the timelines contained in the report for implementing~~ the strategies and priorities identified in the final report.*

4. *By April 22, 2019, the permittee must develop and implement the post-construction stormwater runoff quantity program applicable to new development and redevelopment projects. The permittee must implement the strategies and priorities for preventing or reducing hydromodification impacts identified in the hydromodification assessment as part of its post-construction stormwater quantity control program.*

~~The District will perform the hydromodification assessment and implement its findings as specified in this permit term.~~In February 2019 the District submitted a draft Hydromodification Assessment Report to DEQ. On April 2, 2019, the District's Board of Directors approved Resolution and Order 19-5 revising the District's *D&C Standards* to incorporate the findings, strategies, and priorities of the hydromodification assessment. The District began implementing the revisions on April 22, 2019, when they went into effect. The District completed the final Hydromodification Assessment Report in June 2019.

Commented [A22]: This added text updates the SWMP to describe the District's compliance with the hydromodification requirements in the permit.

6.4 Retrofit Strategy Development and Implementation

D. *Retrofit Strategy. By ~~the third anniversary of permit issuance~~April 22, 2019, permittee must ~~develop~~ implement a stormwater retrofit ~~strategy~~ program that applies to developed areas identified by the permittee as impacting water quality and that are insufficient ~~underserved~~ or lacking stormwater quality and flow controls. The permittee must document its stormwater retrofit ~~strategy~~ program in a plan, and submit its plan to DEQ by ~~_____.~~ April 22, 2019. The*

permittee must use this plan to guide the implementation of its stormwater retrofit ~~strategy~~program. ~~The permittee must include the following requirements in its program~~The program must meet the following requirements:

1. *The stormwater retrofit ~~strategy~~ program must be ~~based~~ designed to implement ~~on~~ a permittee-defined set of stormwater retrofit objectives and a comprehensive evaluation of a range of stormwater retrofit control measures and their appropriate use. The permittee-defined objectives must be designed assure~~incorporate~~ progress towards applicable TMDL wasteload allocations. The permittee must provide opportunity ~~Development of the stormwater retrofit strategy must allow~~ for public comment and consider public input for the development of the stormwater retrofit program.*

2. *The permittee must include the following components in its stormwater retrofit plan ~~must, at a minimum, describe or reference the following~~:*

   a. *A stormwater retrofit strategy statement and summary, including objectives and rationale.*
   b. *Summary of current stormwater retrofit control measures implemented within the permittee's jurisdiction, and a current estimate of annual program resources directed towards stormwater retrofits.*
   c. *Identification of high priority retrofit areas.*
   d. *The examination of new or additional stormwater retrofit control measures.*
   e. *The preferred retrofit structural control measures, including rationale.*
   f. *A retrofit project or approach priority list, including rationale, identification and map of potential stormwater retrofit locations, where appropriate, and an estimated timeline and cost for implementation of each project or approach.*

3. *The permittee must identify, at a minimum, five stormwater quality improvement retrofit projects. The identified projects must be designed, and constructed or implemented, to effectively reduce applicable TMDL pollutant parameters by ~~the fifth anniversary of permit issuance~~ April 22, 2021.*

4. *~~The permittee must include A~~a summary report describing the status of retrofit program ~~must be included~~ in each annual report.*

As described above, the District actively pursues opportunities to retrofit areas that impact water quality due to lack of stormwater controls. ~~The District will review and revise its retrofit program as necessary to meet this permit requirement.~~ The District included its Stormwater Retrofit Program Plan with the final Hydromodification Assessment and Report in June 2019. Outfall and catch basin retrofits are covered under subsection 7.6 of this SWMP.

6.5 Site Plan Review, Inspection, and Enforcement

E. The permittee must require submittal of post-construction runoff management site plans and/or other documentation for all new development and redevelopment projects subject to the conditions of this section. The site plans and/or other documents must show or describe the stormwater practices that will be installed or implemented as part of the development project to ensure compliance with the post-construction stormwater runoff control program requirements. The permittee must review, approve, and verify proper implementation of the post-construction site plans.

G. The permittee must document and implement inspection and escalating enforcement response procedures to ensure new development and redevelopment projects are compliant with the applicable post-construction stormwater management requirements.

A site development permit is required for all new and re-development projects. A site development plan application requires detailed engineering plans for sufficient sanitary and stormwater infrastructures for the site. As related to the MS4 system, all site development plan applications must include:

- A plan for water quality and quantity management
- Erosion Prevention and Sediment Control Plans
- Drainage Reports, including the basis for the stormwater facilities design
- A maintenance plan to address long-term functionality of private stormwater facilities

A site development permit (including the requirement for an erosion prevention and sediment control plan) is issued after the plans are reviewed and all issues are addressed. Per *D&C Standards*, all new stormwater facilities that provide treatment to multiple properties are designated "public" facilities and are maintained by the District and co-implementers that implement the Operations and Maintenance BMPs (see Section 8). All facilities, public or private, are designed and constructed to meet the *D&C Standards.*

Inspection of development projects by District or co-implementer staff during construction ensures that stormwater facilities are constructed in compliance with approved plans. See Section 8.3 regarding the inspection and enforcement procedures related to private stormwater quality facilities.

6.6 Site Limitations

F. Where a new development or redevelopment project site is characterized by factors limiting use of on-site stormwater management methods to achieve the post-construction site runoff requirements, such as high water table, shallow bedrock, poorly-drained or low permeable soils, contaminated soils, steep slopes or other constraints, the permittee must require equivalent pollutant reduction and runoff management measures, such as off-site stormwater quality and quantity management. Off-site stormwater quality and quantity management may include, but ~~are~~ is not limited to, off-site mitigation, such as construction of a structural stormwater facility within the sub-watershed, a stormwater quality or quantity structural facility mitigation bank or a payment-in-lieu program.

~~A~~ A water quality treatment ~~facility~~ approach is required by the District for the creation of new impervious surface unless~~,~~: 1) due to topography~~, or~~ soils, or other site conditions ~~make it~~ implementation of an on-site approach is impractical~~, or~~ ineffective or results in the inefficient use of District or city resources for long-term operations or maintenance; or 2) ~~the site is small and loss of area for the on-site facility would preclude effective development;~~ there is a more efficient and effective regional ~~site~~ approach within the sub-basin that was designed to incorporate the development or there is an approach in the sub-basin ~~is in the near vicinity with~~ which is demonstrated to have the capacity to treat the site. In these situations, an in-lieu of fee is required. ~~or with District approval, a facility may be designed to treat runoff from an equivalent area of adjacent untreated impervious surfaces.~~

Commented [A23]: This text is revised to reflect the language of the current Design and Construction Standards.

6.7 Recordkeeping

H. The permittee must maintain a record-keeping system or approach to document and track post-construction site runoff program activities.

The District and co-implementers maintain records of standards development, site plan review and permitting, construction inspection, and private water quality facility inspections.

BMP CATEGORY: POST CONSTRUCTION SITE RUNOFF AND RETROFIT PROGRAMS

Introduction: The purpose of this BMP category is to improve water quality by developing and applying appropriate design and construction standards to development.

Measurable Goals and Tracking Measures

1. Development Services

a. Goal: Implement D&C Standards that require water quality facilities to be built as part of new development and redevelopment with a goal to provide treatment for 100 percent of impervious areas from new and re-development areas (that meet impervious area thresholds) with the exception of the fee-in-lieu projects.

***Tracking measure**: New development area (in acres) added annually within the service area.*

***Tracking measure**: New re-development area (in acres) added annually within the service area.*

***Tracking measure**: New development area (in acres) added annually with structural controls within the service area.*

***Tracking measure**: New re-development area (in acres) added annually with structural controls within the service area.*

***Tracking measure**: Percentage of the service area served by structural controls.*

***Tracking measure**: Percentage of all areas developed or re-developed annually that is served by structural controls.*

***Tracking measure**: Track all structural controls implemented annually by location, type and drainage area served.*

2. Low Impact Development Approaches (LIDA)

a. Goal: ~~Increase~~ Prioritize the use of LIDA through implementation of D&C Standards. ~~entering into two public/private partnerships on LIDA projects each year, including one under the School LIDA program.. (The District seeks to complete one project each year through the School LIDA program. Since a school or school district must decide to participate in the program, the goal for this program is to actively seek and develop appropriate projects rather than complete a specified number.)~~

***Tracking measure**: Annual number of LIDA facilities implemented and the type of facility.*

~~***Tracking measure**: Annual number of public/private partnerships formed to perform LIDA projects.*~~

~~***Tracking measure:** Description of School LIDA outreach and project development efforts during the year.*~~

b. Goal: Provide technical assistance through the *LIDA Guidance Manual.*

***Tracking measure**: ~~Revision of~~Provide the* LIDA Guidance Manual ~~*within two years of permit issuance*~~*on the District's public website*.

Commented [A24]: This Goal and the associated Tracking Measures are being revised to reflect the prioritization of LIDA and the sunsetting of the School LIDA and public/private partnerships programs.

Commented [A25]: This Tracking Measure is being updated to reflect the revision of the LIDA Guidance Manual in June 2016, and replacing the revision with a requirement to "Provide the LIDA Handbook via the District's website."

Relationship to TMDLs

Phosphorus. The District's *D&C Standards* for water quality facilities are designed for phosphorus removal from 100 percent of the impervious area from newly constructed impervious surfaces that meet the thresholds for requiring treatment.

Settleable Volatile Solids. Structural controls can reduce the discharge of settleable volatile solids through various detention and retention processes.

Related documents:

- *Clean Water Services Design and Construction Standards for Sanitary Sewer and Surface Water Management, ~~June, 2007~~December 2019*
- *LIDA Guidance Manual, June 2016*

7. Pollution Prevention for Municipal Operations

The overall program requirement from the permit is as follows:

The permittee must continue to implement a program to reduce the discharge of pollutants to the MS4 from properties owned or operated by the permittee for which the permittee has authority, including, but not limited to, parks and open spaces, fleet and building maintenance facilities, transportation systems and fire-fighting training facilities. The permittee must conduct, at a minimum, the following program activities:

The permit goes on to describe the six specific components of the program. This section applies to properties owned or operated by the District and co-implementers, regardless of whether they are owned or operated by the permittee. The SWMP elements for each of these specific components are described according to the permit requirements in the following subsections:

7.1 Street Operations and Maintenance

A. Operate and maintain public streets, roads and highways over which the permittee has authority in a manner designed to minimize the discharge of stormwater pollutants to the MS4, including pollutants discharged as a result of anti-icing or deicing activities.;

Public streets, roads, highways, and other transportation corridors within the service boundary are maintained by several jurisdictions, including Washington County, the individual cities, the District, and the Oregon Department of Transportation (ODOT). Among these, ODOT holds its own MS4 NPDES permit for the discharge of stormwater and manages street operations and maintenance in accordance with its MS4 NPDES permit and local land use laws, while the District, cities, and Washington County are co-implementers of this permit.

The key operation and maintenance (O&M) program activities for roadways include street sweeping, fall leaf collection ~~pickup~~, and deicing. Each of these activities is discussed below. A complete list of these~~s~~ O&M activities, frequencies, and performance standards ~~are~~ is presented in the *Sanitary, Storm ~~Sewer~~ and Surface Water Management ~~Work Programs,~~ Performance and Reporting Standards ~~, Priorities and Policies~~ (R&O 1~~8</u>1~~-1~~10</u>7~~) (Performance Standards),* which is ~~frequently~~ updated as needed.

Commented [A26]: The description is revised to match the scope of the program

The maintenance frequencies for street sweeping were initially based on an analysis for coordinated, on-going, and efficient delivery of storm sewer system maintenance services for the entire service area conducted in 1998. Maintenance frequencies were established to enhance stormwater quality, and retain the function and capacity of the storm sewer system. The District has updated the frequencies since that time on an on-going basis.

- **Street Sweeping**

Public curbed streets within the service area are swept 12 times per year. Sweepers are used that effectively remove fine sediment (regenerative air sweepers or equivalent water quality sweepers). Sweepers are run at optimum speeds, and a recording device documents speed while sweeping, miles swept, and hours swept.

BMP 1, Street Sweeping, describes the goals and tracking measures associated with meeting this requirement.

- **Fall Leaf Collection ~~Pickup~~**

The fall leaf ~~pickup~~ collection program may include~~s~~ one or more of the following components, which may vary by jurisdiction: a curbside leaf pickup program, increased recycling, and leaf drop off day(s).

Commented [A27]: This description was revised to better describe the scope of the program.

- **Deicing/Anti-icing**

A number of jurisdictions apply anti-skid/anti-icing materials to roadways within the service area, including the co-implementer cities, Washington County, ODOT, and Tri-Met. Typically, crushed, graded aggregate (i.e., sanding rock) is applied to highways, arterials, collectors, and other roadways with steep grade. In addition, anti-icing materials such as magnesium chloride are also applied—mostly at bridges and overpasses. Sanding rock is picked up no later than at the next regularly scheduled monthly sweeping.

7.2 Control the Use of Pesticides, Herbicides, and Fertilizers

B. Implement a management program to control the use and application of pesticides, herbicides and fertilizers on permittee-owned properties.~~:~~

A pesticide is any substance or mixture intended to prevent, destroy, repel, or mitigate any pest. Pesticides include insecticides, herbicides, fungicides, and other substances such as a plant regulator, defoliant, or desiccant. Pesticide use is regulated primarily by the Federal Insecticide, Fungicide and Rodenticide Act, the Oregon Pesticide Control Law (Oregon Revised Statutes - Chapter 634), or the Oregon Pesticide Regulations (Oregon Administrative Rules [OAR], Chapter 603, Division 57).

The District and co-implementers employ an integrated pest management (IPM) program to reduce stormwater pollutants stemming from the use of pesticides, herbicides, and fertilizers in landscaping, water quality facility maintenance, and public facility maintenance. *MS4 Provisions of the District Integrated Pest Management Program* describes the basic aspects of the IPM program. Co-implementers must either adopt this program or develop and implement their own equivalent program. The program contains best practices, including knowing the pest, setting appropriate thresholds, use of appropriate control techniques (starting with the least toxic), following label instructions, maintaining equipment and handling materials safely, and requiring appropriate licensure for all applicators.

The District's *Integrated Pest Management Plan* focuses on ~~careful~~ avoidance of pests through cultural practices, prevention, and early detection, then evaluation of pests before a chemical option is selected. District operations generally focus on management of invasive plants and animals as they impinge upon the establishment of geographically appropriate, local native plant communities where applicable, including as part of stormwater quality facilities, and in riparian vegetative corridors. In its facilities, the District also applies the Plan to ~~and~~ cultivated landscapes.

The District implements specific practices for stormwater quality facilities, public right-of-ways, and cultivated landscapes:

- Pesticides are not applied when water quality facilities are wetted or within three feet of the wetted perimeter.
- Pesticides are evaluated for use in water quality facilities by their persistence and active breakdown products; the most persistent categories avoided.
- Pesticide applications are limited within a zone of three feet from a waterbody. If possible, they are not applied unless a chemical control and the severity of pest warrants treatment as identified in the IPM strategy.
- Pesticides will only be applied during dry weather windows appropriate to the period when the ingredients are active and have time to break down to their more benign byproducts.
- Pesticides and surfactants will be evaluated on an annual basis for efficacy and potential ecological effects. This evaluation will be shared with District employees, contractors and co-implementers.
- Pests and best pest control measures will be evaluated on an annual basis. This evaluation will be shared with District employees, contractors and co-implementers.
- District vegetation management contractors participate in a pesticide closed container program that limits spills, mixing errors, and rinseate issues.
-

BMP 2, Integrated Pest Management, describes the goals and tracking measures associated with meeting this requirement.

7.3 Reduce the Impact of Runoff From Municipal Facilities

C. Inventory, assess, and implement a strategy to reduce the impact of stormwater runoff from municipal facilities that treat, store or transport municipal waste, such as yard waste or other municipal waste and are not covered under a 1200 series NPDES permit, a DEQ solid waste permit, or other permit designed to reduce the discharge of pollutants;

~~This requirement is new with this permit. As a first step, the District will identify relevant facilities. The District will review identified facilities to evaluate exposure to runoff. Then, the District will develop strategies to reduce the impact of runoff where impacts are identified.~~The only municipal facilities that treat, store, or transport municipal waste are municipal maintenance yards that store green wastes generated in maintaining public facilities (parks, etc.) and small amounts of other wastes generated during maintenance activities (used oil, etc.). All District and co-implementer maintenance yards implement Storm Water Pollution Control Plans to reduce the discharge of pollutants to stormwater from these facilities.

Commented [A28]: This text updates the SWMP to reflect the findings of the required inventory and assessment.

BMP 3, Stormwater Management at Municipal Facilities, describes the goals and tracking measures associated with meeting this requirement.

7.4 Limit Infiltration from the Sanitary Sewer System to the MS4

D. Limit infiltration of seepage from the municipal sanitary sewer system to the MS4.;

The District has an Infiltration/Inflow (I/I) abatement program that addresses the soundness of the sanitary conveyance system. By detecting and abating points of I/I, the program also prevents seepage from the sanitary sewer to the MS4.

7.5 Fire-Fighting Training Activities

E. Implement a program to prevent or control the release of materials related to fire-fighting training activities.

There are no identified firefighting training facilities that discharge to the District's MS4. So-called "burn to learn" activities are conducted outside the urban area so do not discharge to the MS4. Working with the District, the Fire Defense Board approved a list of BMPs that are included in firefighting training materials.

~~This requirement is new with this permit. The District will inventory and contact Fire Departments of the cities that are co-implementers to determine what activities are conducted to minimize pollutant discharges associated with fire-fighting training activities. As a result of these contacts, and as applicable, the District will work towards the development of educational materials or training as necessary.~~

Commented [A29]: This text updates the SWMP to reflect compliance with the permit requirement.

~~BMP 4, Fire-Fighting Training, describes the goals and tracking measures associated with meeting this requirement.~~

7.6 Retrofit Projects

F. Assess flood control projects to identify potential impacts on the water quality of receiving water bodies and determine the feasibility of retrofitting structural flood control devices for additional stormwater pollutant removal. The permittee must consider and incorporate the results of this assessment as part of the Stormwater Retrofit Strategy Development required in Schedule A.2.d.vi.D.

The District conducts activities to retrofit the existing storm system in order to further reduce pollutants. As explained in Section 5, *Stormwater Pollutant Loads, TMDLs, and Benchmarks*, of the permit renewal application, the District identifies and prioritizes retrofit opportunities and projects through its capital improvements plan. Retrofit projects may include re-vegetation and outlet modifications at water quality facilities, retrofit or reconstruction of existing manholes and catch basins, conversion or upgrade of water quantity detention facilities to provide water quality treatment, and installation of outfall pretreatment. These categories overlap and a project may include one or more of these attributes. The District's retrofit strategy, required in Schedule A, 2.d.vi.D~~f~~ of the permit will guide the District's future retrofit activities.

Commented [A30]: Corrected cite.

Outfall Retrofits

The District and co-implementers' outfall retrofit program includes modifying existing facilities and constructing new treatment facilities where none exist. These projects may include outlet modification and re-vegetation at water quality facilities, installation of water quality manholes for outfall pretreatment, and providing water quality treatment on existing water quantity facilities. An inventory identified more than 205 major outfalls, which were prioritized for retrofitting based on the ability to obtain easements, land use, receiving water quality, contributing drainage area, percentage of drainage area not currently treated, and ability to coordinate with other planned infrastructure projects. The District and co-implementers ~~are committed to~~

~~moving forward with these projects by~~ complet~~ed~~ed~~ing~~ ~~five~~ nine retrofit projects during the 2016-2021 permit term.

Un-sumped Catch Basin Retrofits

The District and co-implementers also retrofit or reconstruct un-sumped catch basins to improve the removal of pollutants. The District and co-implementers ~~will continue to maximize the~~ retrofitt~~ed~~ed~~ing,~~ or reconstruct~~ed 584~~ed ~~ion of~~ un-sumped catch basins ~~as feasible with a goal of 375 per five year~~ during the 2016-2021 permit term. ~~(~~If the permit is administratively extended, retrofitting/reconstruction will continue at a rate of 75 catch basins per year until a new ~~permit~~ SWMP is approved~~issued~~.~~)~~ Note that as the District and co-implementers continue to implement this program, the number of catch basins that will need to be retrofitted may change since the District may choose not to sump catch basins that are upstream of water quality manholes or water quality facilities; thus, the measurable goals for this program will be updated periodically.

BMP 4~~5~~, ~~Outfall Retrofits, and BMP 6,~~ Catch Basin Retrofits, describe~~s~~ the goal~~s~~ and tracking measure~~s~~ associated with meeting this requirement.

Commented [A31]: This text updates the SWMP to reflect compliance with the requirement to complete five retrofits during the permit term. The District will continue its retrofit program after permit expiration, but due to long lead times and uncertainties in identification, planning and execution of retrofit projects, and the unknown time until a new SWMP will be in place, the District is not committing to complete a specific number of retrofits under this SWMP.

Commented [A32]: This text updates the SWMP to reflect compliance with the SWMP requirement to retrofit 375 catch basins during the permit term..

BMP CATEGORY: POLLUTION PREVENTION FOR MUNICIPAL OPERATIONS

Introduction: The purpose of this BMP category is to improve water quality and reduce impacts associated with municipal operations.

Measurable goals and tracking measures:

1. Street Sweeping

a. Goal: Sweep public curbed streets 12 times per year.

Tracking measure*: Curbed street miles swept and total number of curbed street miles; and amount of material collected.*

2. Integrated Pest Management

a. Goal: Conduct one annual training session related to the District's Integrated Pest Management program.

Tracking measure*: Report date of IPM training.*

b. Goal: All pesticide applicators employed by co-implementers in positions potentially impacting the MS4 will be licensed as required.

Tracking measure: *Report number of state licensed applicators employed by each co-implementer.*

c. Goal: Keep the District's IPM program current by annually evaluating pesticides and surfactants for efficacy and potential ecological effects and evaluating pests and pest control measures.

Tracking measure: *Documentation of annual evaluation.*

3. Stormwater Management at Municipal Facilities

a. Goal: ~~Within one year of the permit issuance date, develop an inventory of municipal facilities that treat, store, or transport municipal waste.~~ Inspect municipal facilities that store wastes as required in their SWPCPs.

~~b. Goal: Within two years of the permit issuance date, develop a strategy to reduce the impact of stormwater runoff from these facilities.~~

Tracking measure*:* Number of facility inspections performed~~: Status of the municipal facility inventory and stormwater management strategy development.~~

~~**4. Fire-Fighting Training**~~

~~a. Goal: Within one year of permit issuance develop a list of fire department contacts, make initial contact, establish working groups and identify fire-fighting training facilities and practices with the potential to discharge pollutants to the MS4.~~

~~b. Goal: Within two years of permit issuance, in collaboration with fire department personnel, develop best practices to reduce the discharge of pollutants from fire-fighting training and develop a plan for implementing these practices, including methods to confirm their implementation.~~

~~c. Goal: Within three years of permit issuance, implement the identified best practices.~~

~~***Tracking measure****: Annual update of the status of fire-fighting training pollutant reduction strategy.*~~

4~~5~~.Outfall Retrofits

a. Goal: ~~Complete five outfall retrofit projects during the five-year permit term.~~Continue to implement the District's Retrofit Plan

Tracking measure*: Identify the number of outfall retrofit projects in planning, design, construction or completed, the phase of each project during the year, and the treatment BMP used, including locations and area treated by the retrofit.* ~~*Report the cumulative number completed during the permit term.*~~

5~~6~~.Catch Basin Retrofits

a. Goal: Retrofit or reconstruct ~~3~~75 existing catch basins annually between May 31, 2021, and the issuance of the new permit ~~during the five-year permit term~~ to include improvements for water quality.

Tracking measure*: Number of existing catch basins that were retrofitted or reconstructed to include improvements for water quality during the year and cumulatively during the permit term.*

Relationship to TMDLs

Phosphorus. Street sweeping, outfall retrofits, and catch basin retrofits remove phosphorus-bearing sediments.

Bacteria. Addressing discharges from municipal waste sites will reduce the discharge of bacteria from these sites.

Commented [A33]: This Goal and Tracking Measure are revised to reflect completion of the inventory and implementation of the findings.

Commented [A34]: These Goals and the associated Tracking Measure were completed as required.

Settleable Volatile Solids. Street sweeping, outfall retrofit, catch basin retrofits and addressing discharges from municipal waste sites will reduce the discharge of settleable volatile solids.

Related documents:

- *Sanitary, Storm and Surface Water Management Performance and Reporting Standards (R&O 18-11)* ~~*Sanitary Sewer and Surface Water Management Work Programs, Performance Standards, Priorities and Policies (R&O 07-46)*~~ or as amended
- Integrated Pest Management Plan

8. Stormwater Management Facilities Operations and Maintenance Activities

A. By ~~[insert date]~~ April 22, 2018, the permittee must inventory and map stormwater structural facilities and controls, and implement a program to verify that stormwater management facilities and controls are inspected, operated and maintained to function as designed for effective pollutant removal, infiltration and/or flow control. At a minimum, the program must include the following:

1. Legal authority to inspect and require effective operation and maintenance;

2. A program to inventory and map public and private stormwater management facilities as provided under Schedule A.2.d.viii.B; and,

3. Public and private stormwater facility inspection and maintenance requirements for stormwater management facilities that have been inventoried and mapped as provided under Schedule A.2.d.viii.B.

To address these requirements, this section of the SWMP is divided into three subsections for: 1) facility inventory; 2) public stormwater structural facilities; and 3) privately-owned stormwater structural facilities.

The following terms, as defined, are used in this section:

Water Quality Facility (WQF): a part of the stormwater system engineered to meet the water quality treatment design efficiency as defined in the District's ~~*Design*~~ *D&*~~*and*~~ C~~*onstruction Standards*~~ section 4.0~~5~~.3 (December~~June~~ 201~~907~~ version). ~~-~~Examples of WQFs include vegetated surface facilities (i.e., swales), constructed water quality wetlands, Low Impact Development Approaches (LIDA or green infrastructure), and proprietary treatment systems (typically an underground vault with filter media).

Public WQF: a WQF constructed to serve multiple tax lots and intended to be maintained by the District. ~~-~~Public WQFs are often constructed to provide water quality treatment as part of a residential subdivision project where a larger tax lot is divided into many smaller tax lots and public right of way.

Private WQF: a WQF constructed to serve larger single lots, often commercial or industrial properties, where the property owner owns and maintains the facility. ~~-~~Private WQFs are inspected by the District, but maintained by the property owner.

Proprietary treatment system: an engineered device approved for use in accordance with District's *D&*~~*esign and C*~~*onstruction Standards* section 4.0~~7~~5.8 (~~June 2007~~December 2019 version) and used to fulfill the District's water quality treatment requirement. ~~-~~A device is considered proprietary if system components (e.g., a filter or cartridge) are only available for purchase

through the original ~~m~~manufacturer. ~~P~~Proprietary treatment systems are typically underground vaults with filters or cartridges filled with media that is used to treat stormwater by removing contaminants.

8.1 Facility Inventory

The District maintains an inventory of the public stormwater system using the District's GIS database.

8.2 Public Stormwater Structural Facilities

B. As part of the Stormwater Management Facilities Inspection and Maintenance program, the permittee must document and implement a strategy that guides the long-term maintenance and management of all permittee-owned and identified privately-owned stormwater structural facilities and controls. At a minimum, the permittee's strategy must address the following:

1. For publicly-owned or operated stormwater management facilities

a. Inventory and mapping process.
b. Inspection and maintenance schedule.
c. Inspection, operation and maintenance criteria, priorities, and procedures.
d. Description of inspector type and staff position or title.
e. Inspection and maintenance tracking mechanisms.

Public Water Quality Facility Maintenance

Routine maintenance activities for vegetated water quality facilities includes: mowing, trimming, maintaining levee/bank, maintaining inlet/outlet, removing debris, performing visual inspections during the wet season to ensure functionality, watering, fertilizing, and applying herbicide. Non-routine maintenance activities include planting vegetation, reshaping/reconstructing, and removing silt and sediment.

The District ~~intends to progress from activity-based to~~uses an outcome-based ~~goals and tracking measures~~ approach for maintaining public vegetated water quality facilities. ~~BMP 1.b describes the process the District will use in making this transition.~~The District or co-implementer inspects, assesses, and documents the condition of all vegetated water quality facilities in their jurisdiction to identify necessary maintenance activities at least twice per year, once during the winter and once during the growing season. The inspector assesses whether the vegetated facility requires routine or non-routine maintenance. If non-routine maintenance is required, the inspector describes the maintenance activities necessary to address the conditions. For any vegetated facility with non-routine maintenance activities identified, the District or co-implementer develops a plan and schedule to perform those activities. The District and co-implementers document all assessments, plans, and schedules.

Commented [A35]: This text updates the SWMP to reflect the change to an outcome based approach to Public Water Quality Facility maintenance. This language is from the Performance Standard.

The District and co-implementers also maintain proprietary systems such as filter structures. Filter structures are inspected once per year and filter canisters are replaced as determined necessary by inspections.

Water Quality Manhole Cleaning

Public water quality manholes are cleaned twice per year.

Catch Basin Cleaning

Sumped catch basin cleaning consists of removing sediment, gravel and other debris from the inlet grate and the sumped areas of the catch basin. The District and co-implementers strive to clean all public sumped catch basins within the service area once per year. However, issues such as cars parked over catch basins, road construction, etc., lower the actual rate to approximately 95 percent of sumped catch basins being cleaned per year. Cleaning of un-sumped catch basins occurs in conjunction with storm line cleaning.

BMP 1, Public Water Quality Facility Inspections and Maintenance, describes the goals and tracking measures associated with meeting this requirement.

8.3 Privately-Owned Stormwater Structural Facilities

2. For privately-owned or operated stormwater management facilities

a. Procedures for and types of stormwater facilities that will be inventoried and mapped, including the rationale and criteria used. At a minimum, the inventory and mapping must include the following:

i. Private stormwater management facilities for new development and redevelopment projects constructed under the permittee's post-construction management manual or equivalent document.

ii. Private stormwater management facilities identified by the permittee and used to estimate the pollutant load reduction as part of the TMDL benchmark evaluation.

iii. Any major private stormwater management facilities or structural controls.

b. Inspection criteria, rationale, priorities, frequency and procedures for inspection of private stormwater facilities that have been inventoried and mapped;

c. Required training or qualifications to inspect private stormwater facilities;

d. Reporting requirements.

e. Inspection and maintenance tracking mechanism.

Private water quality facilities are generally located on single lot commercial and industrial sites, and on multi-family residential sites. The majority of single family residential water quality facilities constructed after 1993 are publicly maintained. However, some older and a few newer facilities serving residential lots are maintained by homeowners' associations. To address new and existing private water quality facility maintenance, the District and co-implementers have developed a Private Water Quality Facilities Management Program. The Private Water Quality Facilities Management Program, as documented in the *Performance Standards*, consists of:

- Inventory
- Active outreach and education
- Inspection
- Enforcement

The inventory consists of locating facilities, estimating the drainage area served by the facility and inspecting and rating the facility based on specified criteria for functionality. An electronic database is maintained for program management. For each facility, attributes such as inspection dates, location, owner information, condition assessment rating, and follow-up actions are included. Documentation regarding correspondence with owners and follow-up inspections is also maintained.

With respect to outreach and education, District inspectors work closely with owners and operators of private water quality facilities to ensure that they have the information needed to manage their facilities. On first contact, they are provided a packet containing information specific to the design, function, operation and maintenance of their type of facility, the results of the District's inspection, and a log for tracking facility maintenance. In addition, the packet includes information on controlling invasives and selecting native plants. The District provides the owner/operator with the results of regular (every four years) inspections and mails annual reminders regarding operation, maintenance and inspection. District staff follows up with owner/operators (including on-site visits) at their request to answer questions about their facilities. The District maintains a page on its website with information on private water quality facilities.

Maintenance requirements for on-site LIDAs differ from more traditional ponds and swales; therefore, education is a key element of the Private Water Quality Facilities Management Program. Owner/operators are informed about proper facility maintenance to maximize water quality benefits cost effectively. Maintenance agreements are required for new facilities prior to issuance of a Site Development Permit and are recorded with the property deed.

The District inspects 25 percent of the private water quality facilities per year and applies rating criteria during the inspections to guide follow-up actions. For facilities with an excellent, good, or fair ranking, inspection occurs on the regular rotation (i.e., 25 percent per year). For facilities with a poor or very poor ranking, the District works with the owner or operator to develop a plan and schedule to bring the facility to an acceptable level. The District then conducts inspections ~~occur~~ as frequently as needed to monitor progress on the plan and schedule, until the condition of the facility is deemed to be acceptable.

Commented [A36]: This text clarifies existing practice and was added in response to public comment.

Details regarding enforcement are documented in the Private Water Quality Facilities Management Program.

BMP 2, Private Structural Water Quality Facility Maintenance, describes the goals and tracking measures associated with meeting this requirement.

8.4 Adaptive Management of Stormwater Facility O&M Activities

The District may apply its Adaptive Management program to improving its operation and maintenance activities by conducting investigational studies or pilot projects. These approaches may require temporarily altering established activities within a defined area in order to evaluate the effectiveness of alternatives. Therefore, when necessary, the program descriptions, BMPs, Measurable Goals, and Tracking Measures in this section will not apply to the area or facilities covered by any study or pilot project carried out under the District's Adaptive Management program.

BMP CATEGORY: STORMWATER MANAGEMENT FACILITIES O&M ACTIVITIES

Introduction: The purpose of this BMP category is to improve water quality by implementing appropriate operations and maintenance practices for both public and private stormwater management facilities.

Measurable goals and tracking measures:

1. **Public Water Quality Facility Inspections and Maintenance:**

a. ~~Goal: Maintain public vegetated water quality facilities to ensure functionality of facilities through an average of four annual maintenance visits per facility.~~

~~***Tracking measure**: Number of water quality facility maintenance visits; total number of water quality facilities; total maintenance hours spent.*~~

b. Goal: ~~Ensure the continued efficient maintenance of the functionality of public vegetated water quality facilities by developing and implementing an outcome-based performance standard~~ Inspect, assess and document the condition of all vegetated water quality facilities to identify necessary maintenance activities at least twice per year, once during the winter and once during the growing season. Assess whether the vegetated facility requires routine or non-routine maintenance. If non-routine maintenance is required, describe the maintenance activities necessary to address conditions/issues. For any vegetated facility with non-routine maintenance activities identified, develop a plan and schedule to perform those activities.~~:~~

~~i. By the end of the first complete annual reporting period, evaluate all public water quality facilities to determine their need for routine or non-routine maintenance.~~

~~ii. By the end of the second annual reporting period, complete development of an outcome-based performance standard for inspecting and maintaining public water quality facilities. The performance standard will include criteria and methods for evaluating the status of public water quality facilities and will require facilities to be characterized as needing either continued routine maintenance or requiring non-routine maintenance. The performance standard will require facilities needing non-routine maintenance to be assessed for their specific needs, prioritized and scheduled for corrective measures.~~

~~iii. Begin implementing the performance standard in the third annual reporting period.~~

***Tracking measure~~s~~**:

~~i. *Report the status of program development and implementation* .~~

~~ii.~~ *Number of public water quality facilities; number of public water quality facilities assessed for maintenance needs; number found to need non-routine maintenance.*

~~Beginning with the third annual reporting period, Goal 1.a will be replaced by Goal 1.b.iii. and Tracking Measure 1.a will be replaced by Tracking Measure 1.b.ii~~

b~~c~~. Goal: Inspect annually and maintain all public proprietary water quality facilities ~~once per year~~ per manufacturer's specifications to ensure functionality.

***Tracking measure**: Total number of public proprietary water quality facility maintenance visits and the total number of public proprietary water quality facilities within the service area.*

Goal: Replace filters in public proprietary filter treatment systems as needed.

***Tracking measure:** Number of systems renewed.*

c~~d~~. Goal: Clean all public water quality manholes twice per year.

***Tracking measure**: Number of public water quality manholes cleaned; and total number of public water quality manholes within the service area.*

d~~e~~. Goal: Clean 95 percent of public sumped catch basins per year.

***Tracking measure**: Number of sumped catch basins cleaned; and total number of sumped catch basins within the service area.*

2. **Private Structural Water Quality Facility Maintenance:**

a. Goal: Annually inspect 25 percent of privately maintained structural water quality facilities to ensure system functionality.

Commented [A37]: The Goals and Tracking Measures in this section were revised to reflect the change to an outcome based performance standard. The new Goal is the text from the Performance Standard.

Commented [A38]: This revision clarifies the inspection and maintenance frequency.

Commented [A39]: This revision clarifies that this Goal only applies to public systems.

***Tracking measure**: Total number of facilities and number of facilities inspected.*

b. Goal: Conduct annual training for District and co-implementer inspection staff on proper water quality facility maintenance:

***Tracking measure**: Training sessions conducted and staff/co-implementer attendance.*

Relationship to TMDLs

Phosphorus. The District's *D&C Standards* are developed to remove phosphorus. Efficiency is contingent on maintaining the constructed systems to operate as designed.

Bacteria. Through appropriate maintenance and inspection of both the sanitary and storm sewer systems, cross connections and other illicit sources of bacterial contamination will be identified and corrected. This will result in lower bacteria concentrations in stormwater.

Settleable Volatile Solids. Adequate maintenance of the stormwater system will reduce the discharge of settleable volatile solids that accumulate in the system.

Related Documents:

- Private Water Quality Facilities Management Program
- *Performance Standards*

ATTACHMENT C
RESPONSE TO PUBLIC COMMENTS

RESPONSE TO COMMENTS
ON
PROPOSED STORMWATER MANAGEMENT PLAN

The District's current Stormwater Management Plan (SWMP) includes a Public Involvement and Participation Best Management Practice (BMP). This BMP requires the District to provide the public an opportunity to comment on proposed revisions to the SWMP that is submitted with the MS4 permit renewal. The BMP further requires the District to collect and consider the comments and to provide the District's response to comments to the public. The District posted the proposed SWMP on its public website from September 8 through October 9, 2020. This document summarizes (or quotes) and responds to the comments received from the Tualatin Riverkeepers; it will be posted to the District's public website.

Illicit Discharge Detection and Elimination

1. Are the concentrations in the Action Level Table protective of fish and wildlife?

Response: The pollutant parameter action levels in the table are intended to serve as one set of indicators for the narrow purpose of identifying the presence of discharges from industrial sources to the stormwater conveyance system. They are not applied to surface waters and do not take the place of water quality criteria. These parameters were obtained from U.S. EPA's *Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assistance*, October 2004. In addition to applying the pollutant parameter action levels, the staff investigating a suspicious discharge would note its timing, nature and location to determine if it is likely from an industrial source. Using all these indictors to detect and eliminate illicit discharges protects fish and wildlife from the impacts of industrial stormwater pollution.

2. What was DEQ's response to the submittal of the pollutant parameter action levels in 2017?

Response: The District submitted the pollutant parameter action levels to DEQ in April 2017 as required by the District's NPDES permit. The permit does not require DEQ approval of the parameters and the District has no record of a DEQ response.

3. Clarify the location of discharge sampling; it should be before any "mixing zone."

Response: For safety and ease of access, dry weather screening of stormwater outfalls is done at the manhole immediately prior to the outfall, which is prior to discharge to the receiving water. If a potentially illicit discharge is suspected based on the nature of the discharge, investigators trace the source up through the system and take samples from the manhole closest to the suspected source.

4. The District should add suspended solids or turbidity to the pollutant parameters to detect erosion on urban creeks.

Response: The pollutant parameters are applied only to samples taken from the stormwater conveyance system for investigation of illicit discharges and are not applied to surface waters.

Pollutant parameters are applied where the presence of pollutants or their potential source is unknown; visual identification of erosion is sufficient to establish its existence and source.

5. The action level for conductivity is too high. Lower levels have been observed in streams with illicit discharges.

Response: The level of 2,000 µS was taken from the EPA guidance document referenced above. The purpose of these levels is to aid in the identification of potential illicit discharges to the stormwater conveyance system from industrial sources. They are not applicable to surface waters.

6. The pH action level should also have an upper level.

Response: Although not in the table, a discharge to the stormwater system with a high pH would be unusual and the District would respond appropriately. The District will add an upper bound to the pH parameter action level.

Industrial and Commercial Facilities

7. CWS should inspect industrial facilities more often than once every five years.

Response: The District inspects facilities that are covered by the DEQ 1200-Z Industrial Stormwater General Permit at a frequency based on an assessment of risk. No less than annually the District reviews the potential risk for discharge of pollutants from all 1200-Z permitted facilities. The risk assessment considers the complexity and nature of the facility, its history of compliance and any benchmark exceedances. Based on the risk assessment, the District then prioritizes facilities for inspection. The highest priority facilities may be inspected as frequently as annually. Regardless of risk, every facility is inspected no less frequently than every five years.

Construction Site Runoff Control

8. CWS should inspect inactive sites during wet weather.

Response: Inactive site development and single-lot projects are inspected at a frequency based on site conditions; they are inspected at least monthly, including during wet weather. The District has revised the SWMP to include text clarifying existing practice.

9. Is unpermitted construction an on-going problem?

Response: In the previous fiscal year, the District issued six Stop Work Orders to unpermitted construction sites. During this time there were approximately 50 active site development projects (subdivisions) underway and several hundred active single lot construction sites. While the District and co-implementers take enforcement action against unpermitted development work to prevent environmental impacts, the scale of unpermitted work is limited.

Education and Outreach

10. "TRK urges to CWS to make it a requirement that educational materials be available in Spanish. Not only do other similarly sized municipalities in Oregon, Washington, and California already require this, the demographics of the region necessitate it. The self-identifying Hispanic population of Washington County is 17%. While CWS may already have some materials available in Spanish, including language requiring the materials in Spanish ensures this significant demographic of Washington County are accounted for and proactively given more resources. This would also further CWS' goal of reaching diverse and underserved communities."

Response

The District is actively expanding the amount of education and outreach materials, as well as digital media (social media posts, websites) that are available in Spanish. In all its education and outreach materials the District strives to provide messaging that uses images and minimal text for greater understanding across many audiences. Information from both the Growing Up Survey and recent Washington County Urban Market Research Findings Report will help the District target diverse audiences more effectively in the future.

11. "CWS should tailor specific education topics to target audiences. A boilerplate plan is not effective across all groups. CA Region 1 splits groups up by children, residential, industrial when discussing the target audience for a specific topic which CWS seems to do to some extent. However, CWS needs to tailor all programs more specifically to applicable target audiences. For example, the Pesticide, Herbicide and Fertilizer Educational Activities section on page 23 is too general and instead should have more tangible language about how outreach would differ across the different audiences. This would even be a great section to make "Spanish Speakers" a target audience, as many farm workers could benefit from multi-language outreach."

Response

The District has a targeted social media plan with a strategy that connects to all of its content media (website Newsroom, Clean Water Connection newsletter, and billing inserts). The District also has fact sheets for targeted audiences along with a speakers bureau to address community groups in-person (Optimist International, farmers, Community Participation Organizations, etc.). The District addresses its targeted outreach through a biannual Customer Awareness & Satisfaction Survey. The District is open to further comments regarding groups other than Spanish speakers, children (River Rangers) and businesses (EcoBiz) the commenters identify as requiring specifically tailored educational topics. The District notes that its service area includes only the urbanized areas of Washington County, so farmworkers are not a target group, but landscape contractors and laborers could be.

12. "Audiences should even be further categorized in order to ensure measures are working effectively. CA Region 6 and Region 1 direct permittees to identify and maintain an inventory of "high priority" or "critical" commercial and residential sources. For example, CA Region 6's residential high priority sources include automobile repair and maintenance, off-pavement automobile parking, home and garden care activities and product use (pesticides, herbicides, and fertilizers), disposal of household hazardous wastes, and snow removal activities. CA Region 1's industrial critical sources include restaurants, auto services, retail gas stations, nurseries, and

landscape retailers. The sources in CA Region 1's critical list must be inspected and receive some type of tailored education materials. Implementing measures like this would ensure programs actually accomplish the goal of educating in a more efficient manner."

Response
The District is expanding its commercial and residential programs. The District's permit requires development and implementation of a commercial stormwater program. The District actively works with two sectors, automotive and landscaping, through the EcoBiz program (www.ecobiz.org). This multi-media (stormwater, wastewater, hazardous waste, etc.) technical assistance is aimed at these small businesses. In addition, outreach is done to promote these businesses to the general public.

Next steps for the commercial stormwater program include adding new sectors, looking at site-specific work based on such factors as impacted streams, zoning, and areas that lack enhanced stormwater treatment. The District's Environmental Services program also staffs a complaint phone number and is able to respond to many stormwater issues originating from commercial and residential facilities.

13. "CWS should consider making its online presence more effective by utilizing social media more and making its website more user friendly. The BMPs themselves do not mention social media at all as a means of finding information or as a tool for reaching certain audiences. Additionally, CWS should ensure that all sources aimed at increasing public stormwater literacy, such as pamphlets, guides, instruction manuals, are available on their website. These resources should be clearly marked, easy to find, and preferably all available in Spanish as well. Right now, the CWS website is not particularly intuitive or inviting to the everyday citizen."

Response
The District routinely uses social media strategically to amplify existing messages such as those on the website, in newsletters and at the heart of the District's behavior change campaigns. The MS4 Annual Report describes the District's use of social media (Twitter, Facebook, Instagram). Including specific social media in the SWMP is not well advised given social media's dynamic nature.

The items listed are available on the District's public website. Specific examples of missing, incomplete or hard to locate information would be helpful and timely, as the District is in the planning stages of a website redesign. The District considers website analytic data on what content visitors view most, as well as what messages and information the District would like to prioritize to inform where content resides on the website. The District uses social media and printed content (billing inserts, etc.) to drive traffic to specific website content and extend the reach of prioritized messages.

14. "TRK would like more information regarding the Logic Model, which is used to evaluate the effectiveness of educational programs. Is the Logic Model's evaluation based solely on customer survey responses or does it actually compare pollution data to see if any of CWS' education and outreach programs are working effectively? For example, is there a comparison for paint or other household hazard trends year to year, and if not, would it be feasible to make that comparison?

The data from this system should inform what CWS' priorities are, so it is important that all possible relevant analyses are done."

Response
The Logic Model is applied to the District's student education programs (specifically River Rangers), not all education and outreach. Participating students take a pre- and post-program quiz to help the District evaluate the program's effectiveness and adapt delivery, content and other aspects of the program. The District is open to further discussion of its educational programs with the commenters.

Public Involvement and Participation
15. "Since there are such few ways members of the public can be involved in decision making processes, the avenues that are available for public involvement and participation should be clear and easy to find. As mentioned above in section "D," [refers to comments on *Education and Outreach*] CWS' website can be seen as difficult for the average person to navigate. Even finding this SWMP was not intuitive, as it is located in the "About Us" section of the website. Items out for public comment should be available on the home page, as well as also alerted to members of the public in an email, newsletter or other easy way.

Additionally, while it is slightly easier for a member of the public to find contact information about reporting a violation, there is not an option to report this violation online. DEQ allows online reporting on its website. CWS should consider creating this online reporting option to reflect the industry norm and make it easier for public involvement."

Response
The District's Public Involvement staff work with project teams to reach out to the public and receive feedback. In some cases, this involves creating content on the District's website, as was the case with the SWMP page. The District creates a friendly URL (cleanwaterservices.org/SWMP) to make it easier for the public to find and review content, and typically offers one email contact point for community engagement. While not everything is on the home page, the District reaches out to targeted audiences for specific issues and promotes the direct link to information and the opportunity to comment. The District periodically revises its website and will consider these comments in the next revision.

Currently, community members can report a violation online by sending an email to Contact Us. Out of 228,945 page views so far this year, 766 visited the Report a Problem page. Visitors to this page may want to report violations or may need information about another issue. A third of those page visitors went to the Contact Us form. Creating an online form for reporting violations is an idea the District may include in the revised website. The District will explore other methods for people to report a problem in the future. This could be a dedicated email or a different method that comes with the future website redesign.

Post-Construction Site Runoff and Retrofit Programs
16. CWS should consider legacy erosion sites created by hydromodification in prioritizing retrofit projects.

Response
The District's retrofit program addresses areas of the District that were developed in the decades before standards began to be put in place that required water quality facilities in the conveyance system prior to discharge. In these areas, stormwater may discharge directly to a stream without any removal of pollutants. The District implements its retrofit program to add pollutant removal facilities such as sumped catch basins, water quality manholes, and vegetated facilities to the conveyance system. The permit requires that the retrofit program be designed to assure progress toward applicable TMDL wasteload allocations, which focus on removing pollutants from stormwater before discharge to surface waters.

The retrofit program also addresses flow controls in areas where they are absent or insufficient, which may include areas of hydromodification. Severe stream incision is one of the factors used in the District's *Stormwater Retrofit Program Plan* to identify areas for potential retrofit projects. Retrofit opportunities to address hydromodification are typically coordinated with stream corridor enhancement projects to address legacy impacts as well as prevent future ones. Through its integrated watershed-based approach, the District addresses in-stream erosion as a source of oxygen depleting components by improving hydrologic and ecological functions in areas impacted by hydromodification.

17. The summary of the hydromodification program should be improved.

Response
The District's hydromodification program, including the application of "fee in lieu," is fully described in its *Design and Construction Standards.*

18. The hydromodification standards in the *Design and Construction Standards* should emphasize infiltration first.

Response
The comment is not directed at the SWMP. The District notes that application of Low Impact Development Approaches is preferable to prioritizing detention and infiltration due to the low permeability of Tualatin Basin soils, which differ from those in western Washington. In addition, addressing hydromodification through an integrated approach that includes in-stream improvements yields additional environmental and community benefits.

Pollution Prevention for Municipal Operations
19. CWS should consider sweeping streets more often than 12 times per year.

Response
The District and co-implementer cities sweep all curbed paved streets within their respective jurisdictions 12 times per year, covering just over 31,000 miles and removing over 6,000 cubic yards of material in the process. In addition, the water quality infrastructure, including street-side vegetated facilities, sumped catch basins, water quality manholes, and vegetated water quality facilities, captures sediment and other pollutants before they reach surface waters. These integrated approaches of street sweeping and sediment capture work together to reduce the amount of pollutants in stormwater reaching surface waters. With these approaches in place in

an established system it is not clear whether increasing sweeping frequency would increase overall pollutant capture or would merely shift it from the infrastructure to street sweeping at an increased cost and fuel use.

20. How does CWS track success of its Integrated Pest Management program? Does CWS look at the science surrounding the pesticides or does it test for pesticides in surface waters?

Response
The District's science-based Integrated Pest Management (IPM) program annually evaluates pesticides for their efficacy and potential ecological effects and adjusts the list of approved products accordingly. Since Oregon law limits the regulation of pesticides to the Oregon Department of Agriculture, the IPM applies only to the management of pests (including the use of pesticides) on District and co-implementer owned properties. With the small area of these properties relative to the entire watershed, monitoring of surface water would not be an effective means of evaluating the IPM program. The District monitors pesticides in stormwater as required by its permit.

Stormwater Management Facilities Operation and Maintenance Activities
21. CWS should improve the tracking of water quality facility inspections.

Response
The District assumes that this comment relates to the private water quality facility inspection program, since it mentions 25 per cent annual inspection. (Public water quality facilities are inspected at least twice yearly.) The District applies an outcome-based approach to ensure that private water quality facilities are maintained to function as designed. Once the District identifies a private water quality facility as being in poor or very poor condition, the District works with the owner or operator to develop a plan and schedule to bring the facility to an acceptable level. The District then conducts inspections as frequently as needed to monitor progress on the plan and schedule, until the condition of the facility is deemed to be acceptable. There is no set schedule or formula for determining inspection frequency; each inspection schedule is tailored to the individual circumstances at the site. The District has revised the text of the SWMP to reflect current practices.

22. The District should consider providing on-going assistance to private homeowners to ensure that stormwater structural features are functioning properly.

Response
The District provides educational materials and offers technical assistance to property owners through its website and by on-site consultation. A myriad of education and outreach material on inspection and maintenance practices is also provided to private homeowners if stormwater management approaches are located on their lot.

Climate Change
23. CWS should recognize the effects of climate change and address it through BMPs, including public education and prioritizing stormwater reuse.

Response: Climate change is an important factor that the District considers in its stormwater planning efforts. The District's innovative efforts to evaluate its stormwater control options using a combination of stream and riparian enhancement, upland controls and low impact approaches will be important to the District's success. The District also recognizes that understanding how rainfall patterns may change will be important for understanding what stormwater controls will be effective.

The District closely monitors regional and local evaluations of climate change impacts through Oregon Association of Clean Water Agencies, the Annual Northwest Climate Conferences, and academic studies such as Willamette Water 2100. Regional climate models predict that the mean annual precipitation will remain similar to current amounts through 2100. However, these models suggest that this rainfall will occur over a shorter period of time and, therefore, at higher intensity. The District will incorporate this information into its MS4 planning by integrating it into the adaptive management approach. Within adaptive management, climate change will be considered along with changes in land use, stormwater technology and facility implementation considerations, stream corridor enhancement design and management approaches, and regional water infrastructure.

Regarding water reuse, the District's *Design and Construction Standards* designate stormwater reuse as an approvable Low Impact Development Approach for meeting District requirements to reduce hydrologic impact. The geology of the Tualatin Basin differs from that of the region of California that commenters reference, precluding the use of stormwater for aquifer recharge as a viable strategy.

ATTACHMENT D
PROPOSED MONITORING PLAN

NPDES MS4 Stormwater Monitoring Plan

December 2020

Table of Contents

List of Tables

List of Abbreviations

2016 Permit	Clean Water Services' NPDES Watershed-Based Waste Discharge Permit
BMP	best management practice
CFR	Code of Federal Regulations
cfs	cubic foot/feet per second
District	Clean Water Services
DEQ	Oregon Department of Environmental Quality
DO	dissolved oxygen
EMC	event mean concentration
EPA	U.S. Environmental Protection Agency
LIMS	Laboratory Information Management System
LOQ	level of quantitation
MS4	municipal separate storm sewer system
NELAP	National Environmental Laboratory Accreditation Program
NPDES	National Pollutant Discharge Elimination System
ODFW	Oregon Department of Fish and Wildlife
Plan	Stormwater Monitoring Plan
QA/QC	quality assurance/quality control
SWMP	Stormwater Management Plan
TMDL	total maximum daily load
USGS	U.S. Geological Survey

Section 1
Introduction

The Clean Water Services (District) National Pollutant Discharge Elimination System (NPDES) Watershed-Based Waste Discharge Permit (numbers 101141, 101142, 101143, 101144 and MS4), issued April 22, 2016 (2016 Permit) requires the District to include proposed monitoring program objectives matrix and a proposed monitoring plan as part of the MS4 permit renewal application. Although required as part of the MS4 permit renewal and titled a stormwater monitoring plan, this monitoring plan is also required to address in-stream water quality monitoring, including biological and physical monitoring. Specific requirements pertaining to watershed monitoring and municipal separate storm sewer system (MS4) monitoring are included in Schedules B.1 and B.15 , respectively, of the 2016 Permit.

The stormwater monitoring program includes two components. The first component is *programmatic monitoring*, which involves the tracking and assessment of programmatic activities, as described in the District's Stormwater Management Plan (SWMP). Tracking and assessment are conducted through the use of measurable goals and tracking measures that are defined in the SWMP for individual activities (best management practices [BMPs]). The second component is *environmental monitoring,* which includes the collection and analysis of stormwater and surface water samples.

Programmatic monitoring allows the District to evaluate whether the program elements are being implemented as set forth in the SWMP. Environmental monitoring information allows for the iterative management of the District's stormwater program. Continual programmatic and environmental monitoring are conducted to provide information that will support the monitoring objectives.

For the most part, the purpose of this Stormwater Monitoring Plan (Plan) is to address environmental monitoring. However, with respect to monitoring objectives and the District's adaptive management strategy (Sections 2-3), the role of programmatic monitoring is also discussed. This Plan is organized into the following sections:

Section 2. Stormwater Monitoring Objectives

Identifies how each monitoring objective is addressed and how the sources of information are used.

Section 3. Adaptive Management Approach

Describes the role and specific uses of monitoring program efforts in implementing the District's adaptive management approach.

Section 4. Long-Term Monitoring Strategy

Describes the relationship between environmental monitoring and the District's long-term monitoring program strategy.

Section 5. Environmental Monitoring Activities

Describes the various environmental monitoring tasks/activities including monitoring process/study design, monitoring locations, storm selection criteria, monitoring frequency, sample collection methods, analytical methods, and responsible sampling coordinator.

Section 6. Quality Assurance and Control

Summarizes quality control procedures.

Section 7. Documentation and Data Management

Summarizes the documentation, record-keeping, data management, review, validation, and verification procedures.

Section 2

Stormwater Monitoring Objectives

This Monitoring Plan addresses the following objectives:

A. *Evaluate the source(s) of the pollutants in the 2018/2020 Integrated Report/303(d) list associated with stormwater discharges and applicable to the permittee's jurisdictional area.*

B. *Evaluate the effectiveness of Best Management Practices (BMPs) in order to inform BMP implementation priorities.*

C. *Characterize stormwater based on land use type, seasonality, geography or other catchment characteristics.*

D. *Evaluate status and long-term trends in receiving waters associated with MS4 stormwater discharges.*

E. *Assess the chemical, biological, and physical effects of MS4 stormwater discharges on receiving waters.*

F. *Assess progress towards meeting total maximum daily load (TMDL) pollutant load reduction benchmarks.*

The District meets the monitoring objectives through a combination of programmatic monitoring, environmental monitoring, and data review and evaluation. The matrix provided in Table 2-1, below, provides an overview of the monitoring activities conducted to meet each objective. Each of the environmental monitoring activities is further described in Section 5, including a narrative description of how the monitoring objectives will be met.

Table 2-1. MS4 Monitoring Objectives

Activity/Program	Description	Objective					
		1	2	3	4	5	6
		Evaluate the source of 303(d) pollutants	Evaluate the effectiveness of BMPs	Characterize stormwater	Evaluate receiving water trends associated with MS4 discharges	Assess chemical, biological, and physical effects on receiving waters	Assess progress toward meeting TMDL pollutant load reduction benchmarks
Environmental Monitoring							
Stormwater monitoring	5 land use sites/ 3 storm events per year	✓	✓	✓	N/A	✓	✓
Instream monitoring	15 sites/6 times per year (quarterly hardness, Cu, Pb & Zn; twice yearly for Hg)	N/A	✓	N/A	✓	✓	✓
Biological monitoring	15 sites per permit term	N/A	✓	N/A	✓	✓	N/A
Physical conditions monitoring	15 sites per permit term	N/A	✓	N/A	✓	✓	N/A
Pesticide monitoring	5 land use sites/1 storm event per permit term	N/A	✓	✓	N/A	✓	N/A
Additional Monitoring Activity							
Data evaluation	Review and evaluate data	✓	✓	✓	✓	✓	✓
Adaptive management	Use information gathered to inform assessment of District activities	✓	✓	✓	✓	✓	✓

✓= supports objective, N/A = not applicable

Section 3
Adaptive Management Approach

This section summarizes the District's adaptive management approach and includes the following:

- A routine assessment of the need to further improve water quality and protection of beneficial uses
- A review of available technologies and practices
- A review of monitoring data and analyses required in Schedule B of the Permit
- A review of measurable goals and tracking measures
- An evaluation of resources available to implement the technologies and practices

Generally, the District's adaptive management activities include an annual review process associated with MS4 annual reporting, and a five-year review process associated with permit renewal.

Both programmatic monitoring and environmental monitoring data are reviewed annually. Program monitoring includes a review of the SWMP BMP tracking measures as indicators of adequate program implementation. All tracking measures are reviewed to assess whether measurable goals and tracking measures were met during the reporting year and to determine whether programmatic changes should be considered. For example, tracking measures could indicate patterns regarding the detection of illicit discharges, erosion control violations, retrofit implementation, etc. Difficulty in meeting tracking measures may also indicate a need for additional program resources. Environmental monitoring data are reviewed for anomalies and/or water quality criteria exceedances. If deemed necessary, adjustments may be made to management activities to address issues.

For the five-year assessment, environmental monitoring data are reviewed with respect to trends when compared to historical data. If results are encountered that indicate a potential problem, possible sources will be evaluated and modifications to BMPs will be considered. As an example, pesticide monitoring data may be used to identify targeted outreach activities related to pesticide usage and possible refinement of appropriate outreach/education BMPs.

In these ways, monitoring data will be used both annually and during the permit renewal process to support adaptive management and ongoing improvements of stormwater management activities. In addition, monitoring results may lead to adaptive management of this Plan.

Section 4
Long-Term Monitoring Strategy

The District is committed to protecting water resources in the Tualatin River watershed. Protection of these resources is aided by environmental monitoring data to identify and describe the status of the resources and to provide an understanding of the factors that affect them. As a result, the District developed an integrated, watershed-wide monitoring program intended to meet watershed-wide objectives. The intent of the overall monitoring program is to take a watershed-wide look at all monitoring needs and develop a scientifically sound monitoring program to address them as effectively as possible. A total of 39 monitoring objectives were originally defined by the District relating to physical habitat, riparian function, water quantity, watershed health, and water quality. The District consolidated those objectives into the following six overall and watershed-wide monitoring objectives:

1. Define status and trends
2. Document effectiveness of District actions
3. Perform regulatory monitoring for wastewater treatment plants and MS4 sources
4. Perform regulatory programmatic monitoring for MS4 sources
5. Implement trading program/determine assimilative capacity
6. Consider emerging issues

This Plan specifically addresses stormwater and surface water monitoring and represents a subset of the District's overall watershed monitoring program and associated watershed monitoring plan. This Plan supports watershed-wide objectives 1, 2, and 3 with respect to stormwater runoff. Data are collected as part of this Plan to evaluate receiving water trends with respect to MS4 discharges, to evaluate the effectiveness of stormwater management BMPs, and to evaluate MS4 sources of pollutants.

Section 5
Environmental Monitoring Activities

The District conducts stormwater, instream, biological, physical, and pesticide monitoring in accordance with Table 5-1 to address the established monitoring objectives described in Section 2. While the number of monitoring locations in this Plan is anticipated to remain consistent throughout the permit term, monitoring locations may change as a result of adaptive management. Therefore, a map of monitoring locations is not provided with this Plan. Each year, in the Stormwater Annual Report, a map or site list will be provided to DEQ of the locations where monitoring was conducted during the year. Data gathered from environmental monitoring, including stormwater monitoring, instream monitoring, biological monitoring, physical monitoring, and pesticide monitoring, along with program monitoring, are evaluated and considered in the District's adaptive management of its MS4 program, as described in Section 3.

Table 5-1. Summary of District Environmental Monitoring Activities

Sampling Type	Location(s)	Minimum Sample Frequency
Stormwater monitoring	5 land use-based sites	3 times per year
Instream monitoring (Field parameters, Conventional, Nutrients)	15 sites	6 times per year (3 during the dry season and 3 during the wet season)
Instream monitoring (Copper, lead and zinc (total and dissolved); hardness)	15 sites	4 times per year
Instream monitoring Mercury (total and dissolved	15 sites	2 times per year
Biological monitoring	15 sites	1 time per permit term
Physical conditions monitoring	15 sites	1 time per permit term
Pesticide monitoring	5 land use-based sites	1 time per permit term

This section is organized according to the following monitoring activities:

- Stormwater monitoring
- Instream monitoring
- Biological monitoring
- Physical monitoring
- Pesticide monitoring

For each of the five monitoring activities listed above, the following information is provided:

- A description as to how the activity meets the required monitoring objectives
- A description of monitoring activities
- Monitoring study design
- Sample collection methods
- Parameters analyzed

5.1 Stormwater Monitoring

Identification of Monitoring Objectives

Stormwater sampling conducted by the District addresses objectives A, B, C, E and F:

A. *Evaluate the source(s) of pollutants in the 2018/2020 Integrated Report/303(d) list applicable to the permittees jurisdictional area;*
B. *Evaluate the effectiveness of Best Management Practices (BMPs) in order to help determine BMP implementation priorities;*
C. *Characterize stormwater based on land use type, seasonality, geography or other catchment characteristics;*
E. *Assess the chemical, biological, and physical effects of MS4 discharges on receiving waters; and,*
F. *Assess progress towards meeting TMDL pollutant load reduction benchmarks.*

5.1.1 Description of Stormwater Monitoring Activities

The District conducts stormwater monitoring at five locations. Currently, the land use-based sites represent older residential, newer residential, high-density development, industrial office park, and commercial land uses. As a result of adaptive management and continual refinements to address monitoring objectives, these site locations may change during the permit period. However, site locations will continue to target a distribution of land use categories. The actual site locations will be reported each year in the Stormwater Annual Report.

5.1.2 Monitoring Study Design

The study design for stormwater monitoring was developed for the May 2006 *Interim Evaluation Report* submittal to DEQ. Previously, the study design was based on stormwater monitoring data that were collected for the permit application (1993–95) and to meet monitoring requirements for the first permit term (1995–2000). Stormwater sampling stations were selected in 2006 with the objective of adding to the robustness of the local land use-related stormwater characterization database.

In terms of the study design for this Plan, sampling will continue to build on historical data. Sampling will be conducted at five land use sites to evaluate and compare water quality characteristics from different land uses and eventually to evaluate trends when sufficient data have been gathered. Results may also potentially be used to assist in source identification efforts, especially for 303(d)-listed pollutants. In addition, it is anticipated that the results would be used to refine total maximum daily load (TMDL) wasteload allocation attainment analysis and benchmark evaluations.

5.1.3 Sample Collection Methods

Sampling will be conducted at each of the five locations during three storm events per year. Characteristics associated with the monitored storm events include the following:

- The monitored storm event is greater than 0.1 inch
- The monitored storm event has a minimum of a 24-hour antecedent dry period with a goal of 48 hours
- If rainfall discontinues during sample collection, the maximum intra-event dry period is 6 hours to still be considered a valid storm event for monitoring
- The rainfall depth will be estimated for each monitored event

All sample parameters that need to be analyzed in the field will be analyzed using field sampling methods. All samples analyzed in the laboratory will be collected as flow-proportioned composites, except samples collected for the analysis of *E. coli* and total and dissolved mercury. For *E. coli*, grab samples will be collected because of potential changes in bacteria populations over time. For mercury, grab samples will be collected because of the need to follow specialized procedures for trace metals sampling and the contamination risk associated with compositing samples. Flow-proportioned samples are collected using automated samplers.

The District's lab manager is the sampling coordinator and is generally responsible for managing staff who perform sample collection, field sampling activities, and transfer of samples to the appropriate analytical testing location.

5.1.4 Sampling Parameters

Parameters analyzed in stormwater samples are summarized in Table 5-2. For each parameter, the type of analysis and the analytical method are also provided. Other approved methods may be used when appropriate.

Table 5-2. Pollutant Parameters and Analytical Methods for Stormwater Samples

Type of Analysis (field or laboratory)	Analyte	Sample Type	Analytical Method
Field	Specific conductivity	Grab[a]	SM 2510 B
Field	Temperature	Grab[a]	SM 2550 B
Field	Turbidity	Grab[a]	SM 2130 B
Lab	E. coli	Grab	SM 9223 B (Colilert Quanti-Tray)
Lab	Total hardness	Composite	SM 2340 B
Lab	Total organic carbon	Composite	SM 5310 C
Lab	Solids: total suspended	Composite	SM 2540 D
Lab	Total phosphorus as P	Composite	EPA 365.4
Lab	Ortho-phosphorus as P	Composite	SM 4500-P F
Lab	Ammonia as N	Composite	SM 4500-NH_3 G
Lab	Nitrite and nitrate as N	Composite	EPA 300.0
Lab	Copper, total	Composite	EPA 200.8
Lab	Copper, dissolved	Composite	EPA 200.8
Lab	Lead, total	Composite	EPA 200.8
Lab	Lead, dissolved	Composite	EPA 200.8
Lab	Zinc, total	Composite	EPA 200.8
Lab	Zinc, dissolved	Composite	EPA 200.8
Lab	Mercury, total	Grab	EPA 1631 E
Lab	Mercury, dissolved	Grab	EPA 1631 E

a. *For these parameters, the lab instrument/probe is immersed into the flow (if there is sufficient depth) and a reading is recorded after the meter has stabilized. If depth is insufficient, a sample is collected in a container and the reading is taken from the container.*

In addition to pollutant parameters, flow or rainfall data are collected or estimated for each monitored event. Hourly rainfall data are collected from around the District on an ongoing basis through a system of rain gages owned and operated by the District. For reporting purposes, rainfall

depth associated with the most representative rain gage will be reported for each stormwater monitoring location.

5.2 Instream Monitoring

Identification of Monitoring Objectives

Instream sampling conducted by the District addresses the following monitoring objectives B, D, E, and F:

B. Evaluate the effectiveness of Best Management Practices (BMPs) in order to help determine BMP implementation priorities;

D. Evaluate status and long-term trends in receiving waters associated with MS4 stormwater discharges.

E. Assess the chemical, biological, and physical effects of MS4 discharges on receiving waters.

F. Assess progress towards meeting TMDL pollutant load reduction benchmarks.

5.2.1 Description of Instream Monitoring Activities

The District conducts instream monitoring at 15 locations. All locations are either on the Tualatin River main stem, or on tributaries to the Tualatin River.

While the District will collect samples annually from 15 sites, the site locations may change during the permit period based on adaptive management decisions. The sampling locations will be provided to DEQ on a list or map each year in the Stormwater Annual Report.

5.2.2 Monitoring Study Design

The study design for instream monitoring was developed for the May 2006 *Interim Evaluation Report* submittal to DEQ. At that time, the study design was based on the primary objective of collecting ambient water quality data to assess overall program effectiveness. To meet this objective, 15 locations were monitored. Some of these sampling locations have changed over the years and some have remained the same. Sampling locations are selected and maintained based on the following objectives:

- Describe changes in instream water quality along the length of the Tualatin
- Obtain information at specific locations (e.g., tributary confluence, urban growth boundary, etc.) along receiving waters
- Describe water quality conditions for a variety of contributing land use
- Describe conditions throughout the watershed
- Compare instream results to water quality criteria and assess progress related to TMDL benchmarks

The District will continue to sample at 15 instream locations. Over the years, instream sampling data have been used to assess water quality status and evaluate trends. Instream data collected under this Plan will continue to be used for that purpose. Instream data will also provide information regarding the chemical composition of receiving waters during the dry and wet weather seasons, and it will be used to assess progress toward meeting TMDL pollutant load reduction benchmarks.

5.2.3 Sample Collection Methods

Samples will be collected six times per year for field parameters, conventional pollutants and nutrients. Three of the sampling events will occur during the dry weather season (May 1 to October 31), and three of the sampling events will occur during the wet weather season (November 1 to April 30). Sampling for the six events will be separated by a minimum of 14 days. Samples will be collected quarterly for hardness, total and dissolved copper, lead, and zinc. Samples will be collected twice yearly for total and dissolved mercury.

All instream samples are collected as either grab samples or by field sampling. In grab sampling, a clean bottle/container is used to retrieve the sample from the sample stream. In shallow streams, bottles may be filled by hand. In deeper streams, a rope or bottle holder is used to lower bottles into the stream to collect samples. In field sampling, a probe or other instrument is immersed directly in the flow and measurement taken.

The District maintains a document that provides further details regarding health and safety procedures, sample collection and storage methods, and materials and apparatus used for sampling. This document is referred to as the *Clean Water Services, Laboratory Services Division Water Quality Lab, Sample Collection and Receipt Procedures*. The document is updated on a regular basis as a result of adaptive management.

The District's lab manager is the sampling coordinator and is responsible supervising staff who perform sample collection, field sampling activities, and transfer of samples to the appropriate analytical testing location.

5.2.4 Sample Parameters

Parameters to be analyzed on instream samples are summarized in Table 5-3. For each parameter, the type of analysis and the analytical method are also provided. Other approved methods may be used when appropriate.

Table 5-3. Pollutant Parameters and Analytical Methods for Instream Samples

Type of Analysis (field or laboratory)	Analyte	Analytical Method
Field	Specific conductivity	SM 2510 B
Field	pH	SM 4500-H+ B
Field	Temperature	SM 2550 B
Field	DO	SM 4500-O H
Field	Turbidity	SM 2130 B
Lab	E. coli	SM 9223 B (Colilert Quanti-Tray)
Lab	Total hardness	SM 2340 B
Lab	Total organic carbon	SM 5310 C
Lab	Solids: total suspended	SM 2540 D
Lab	Total phosphorus as P	EPA 365.4
Lab	Ortho-phosphorus as P	SM 4500-P F
Lab	Ammonia as N	SM 4500-NH3 G
Lab	Nitrite and nitrate as N	EPA 300.0
Lab	Copper, total	EPA 200.8
Lab	Copper, dissolved	EPA 200.8

Table 5-3. Pollutant Parameters and Analytical Methods for Instream Samples		
Type of Analysis (field or laboratory)	Analyte	Analytical Method
Lab	Lead, total	EPA 200.8
Lab	Lead, dissolved	EPA 200.8
Lab	Zinc, total	EPA 200.8
Lab	Zinc, dissolved	EPA 200.8
Lab	Mercury, total	EPA 1631E
Lab	Mercury, dissolved	EPA 1631E

5.3 Biological Monitoring

Identification of Monitoring Objectives

Biological sampling conducted by the District addresses the monitoring objectives B, D, and E:

B. Evaluate the effectiveness of Best Management Practices (BMPs) in order to help determine BMP implementation priorities;

D. Evaluate status and long-term trends in receiving waters associated with MS4 stormwater discharges.

E. Assess the chemical, biological, and physical effects of MS4 discharges on receiving waters.

5.3.1 Description of Biological Monitoring Activities

The District performed biological (macroinvertebrate) monitoring in 2000, 2001, 2005, 2007, 2009, 2010, 2013, 2015, and 2018. The objective and number of sites monitored during each of the monitoring events is presented in the table below. The locations included a mix of both high-gradient and low-gradient sites and were coordinated with some of the District's instream monitoring locations.

Table 5-4. Macroinvertebrate Monitoring Summary		
Year	Objective	Number of Sites
2000	Assess biological conditions of area streams	44
2001	Assess biological conditions of area streams and identify relationships between environmental gradients and biological conditions	63
2005	Assess current biological conditions of area streams	63
2007	Assess current biological conditions of area streams	20
2009	Identify least disturbed low gradient streams and characterize benthic communities in these reaches	13
2009	Quantify differences in benthic assemblages between riffles and glides, and determine effects of instream and land use conditions in these differences.	17
2010	Assess current biological conditions of area streams and ascertain longer-term trends (2000-10)	33
2013	Assess current biological conditions of area streams and ascertain longer-term trends (2000-13)	13
2015	Assess current biological conditions of area streams and ascertain longer-term trends (2000-15)	13

Table 5-4. Macroinvertebrate Monitoring Summary		
Year	Objective	Number of Sites
2018	Assess current biological conditions of area streams and ascertain longer-term trends (2000-18)	15

The District will submit the results of the 2018 macroinvertebrate monitoring to DEQ with the NPDES permit renewal application.

The District will conduct macroinvertebrate monitoring at 15 locations during the permit term. Monitoring will focus on wadeable stream sections of the main stem Tualatin River and its tributaries. The sampling locations will be provided to DEQ on a map or list during the permit term in one of the Stormwater annual reports.

5.3.2 Monitoring Study Design

Macroinvertebrate monitoring will be conducted to build on previous efforts. It will be conducted to assess the current condition of biological communities in streams throughout the Tualatin River basin and to evaluate longer-term trends in these stream systems. The monitoring locations may also be selected to assess the effects of riparian restoration and stream flow enhancement projects on biological communities.

5.3.3 Sample Collection Methods

Sampling will be conducted at each of the 15 locations once during the permit term. To evaluate changes over time, the macroinvertebrate sampling will be conducted during September/October, when previous samples were collected. Macroinvertebrates will be collected using DEQ's *Benthic Macroinvertebrate Protocol for Wadeable Rivers and Streams*.

5.3.4 Sampling Parameters

Biological sampling will focus on macroinvertebrates (instead of fish) because there are a sufficient number of macroinvertebrate species to provide information and their response times to disturbance/restoration are faster.

In addition to macroinvertebrates, physical condition and water chemistry data will be collected at each site during the sampling event. Physical condition data will include channel dimensions and other environmental variables used to characterize the physical condition of stream reaches (see Section 5.4). Water chemistry data will include field measurements of temperature, dissolved oxygen (DO) saturation (percent), DO concentration (milligrams per liter) and specific conductance.

5.4 Physical Monitoring

Identification of Monitoring Objectives

Physical monitoring conducted by the District addresses the objectives B, D, and E:

B. Evaluate the effectiveness of Best Management Practices (BMPs) in order to help determine BMP implementation priorities;

D. Evaluate status and trends in receiving waters associated with MS4 stormwater discharges; and

E. Assess the chemical, biological, and physical effects of MS4 discharges on receiving waters.

5.4.1 Description of Physical Monitoring Activities

The District will conduct physical monitoring at 15 locations once during the permit term in conjunction with the biological monitoring activities described in Section 5.3. Physical monitoring activities include assessment of instream physical habitat and riparian habitat conditions. Data collection efforts include the assessment of the channel cross section and the adjacent riparian zone using direct measurements or visual estimation.

5.4.2 Monitoring Study Design

The physical monitoring will be conducted at each of the 15 locations once during the permit term, concurrently with macroinvertebrate sampling. Monitoring will focus on wadeable stream sections of the main stem Tualatin River and its tributaries. The sampling locations will be provided to DEQ on a map or list during the permit term in one of the Stormwater Annual Reports. The physical monitoring will support the assessment of the effectiveness of District actions.

5.4.3 Sample Collection Methods and Parameters

Instream physical habitat and riparian assessment efforts will use the modified Rapid Stream Assessment Technique, which includes data collection from channel habitat units (a sample reach equal to 20 times the wetted width or 75 meters, whichever is greater), channel cross sections, and the adjacent riparian zone.

Data will be collected as part of the habitat unit survey in accordance with the definitions outlined in the Oregon Department of Fish and Wildlife's (ODFW) *Methods for Stream Habitat Survey*s. Methods for assessing substrate composition are adapted from the U.S. Environmental Protection Agency's (EPA) environmental monitoring and assessment protocols for wadeable streams (Cole 2014).

The parameters to be established through physical monitoring are: channel dimensions, substrate conditions, bank condition, habitat types, riparian condition, percent canopy cover, and large wood rating.

5.5 Pesticide Monitoring

Identification of Monitoring Objectives

Pesticide monitoring efforts conducted by the District will be used to address monitoring objectives B, C, and E:

B. Evaluate the effectiveness of Best Management Practices (BMPs) in order to help determine BMP implementation priorities;

C. Characterize stormwater based on land use type, seasonality, geography or other catchment characteristics.

E. Assess the chemical, biological, and physical effects of MS4 discharges on receiving waters.

5.5.1 Description of Pesticide Monitoring Activities

The District conducted pesticide stormwater characterization monitoring as required by the 2016 Permit. During the next permit term, the District plans to analyze stormwater samples for pesticides collected during one storm event from the five land use sites described in Section 5.1.

5.5.2 Monitoring Study Design

Pesticide monitoring activities were selected to build on previous efforts conducted by the District and will also consider the efforts of other Phase I communities that recently completed pesticide monitoring requirements for NPDES MS4 permit compliance.

The District has a long history of working collaboratively with DEQ, the U.S. Geological Survey (USGS), and other parties coordinating pesticide sampling efforts in the Tualatin watershed[1,2]. Sample collection has historically occurred in a variety of media including surface waters, bed sediment, and fish tissue and has focused on the presence of legacy pesticides.

Pesticide monitoring conducted for this permit term will instead focus on the current-use pesticides identified by the District and those pesticides identified in the 2016 Permit. Analyses will be conducted to characterize concentrations of current-use pesticides in stormwater runoff from the five land use-based stormwater monitoring sites. Analyses will be contracted to a laboratory with experience in current-use pesticide analysis.

5.5.3 Sample Collection Methods

Sampling will be conducted at each of the five land use-based stormwater monitoring locations once during the permit term. As with the stormwater monitoring, characteristics associated with the monitored storm event include the following:

- The monitored storm event is greater than 0.1 inch
- The monitored storm event has a minimum of a 24-hour antecedent dry period with a goal of 48 hours
- If rainfall discontinues during sample collection, the maximum intra-event dry period is 6 hours to still be considered a valid storm event for monitoring
- The rainfall depth will be estimated for each monitored event consistent with the process outlined in Section 5.1

Additionally, , sample collection will be targeted during the spring season to coincide with typical pesticide application schedules, when application is expected to be highest.

Best efforts will be made to collect samples from all five locations during the same storm event, to better compare pesticide concentrations amongst locations. All samples will be collected as single grab samples to help ensure uniformity and consistency in the sample collection process and better target collection of all samples during the same storm event.

The District's lab manager is the sampling coordinator and is responsible for supervising staff who perform sample collection, field sampling activities, and transfer of samples to the appropriate analytical testing location.

5.5.4 Sampling Parameters

Current-use pesticides to be analyzed are provided in Table 5-5 below. For each parameter, a brief description and the analytical method are provided. The analytical methods are based on literature published by a local laboratory (testing location) equipped to perform the analysis. Table 5-5 also includes the rationale for including the pesticide for analysis (whether referenced in the 2016 Permit or identified by the District as a current-use pesticide). The specific parameters were selected on the

[1] USGS Water Resources Investigations Report 99-4107, *Selected Elements and Organic Chemicals in Bed Sediment and Fish Tissue of the Tualatin River Basin, Oregon*, 1992–96, 1999.

[2] USGS Scientific Investigations Report 2006-5101-D, *Effects of Urbanization on Stream Ecosystems in the Willamette River Basin and Surrounding Area, Oregon and Washington*, 2006.

basis of toxicity, frequency of detection in other local investigations, and the potential for their use to be addressed through public education programs.

Table 5-5 Pollutant Parameters and Analytical Methods for Pesticide Monitoring

Rationale	Analyte	Description	Analytical Method
2016 Permit	Bifenthrin	Pyrethroid insecticide	EPA 8270D
2016 Permit	Cypermethrin	Pyrethroid insecticide	EPA 8270D
2016 Permit	Permethrin	Pyrethroid insecticide	EPA 8270D
2016 Permit District product list	Triclopyr	Chlorinated herbicide	Modified EPA 8151A
2016 Permit	2,4-D	Chlorinated herbicide	Modified EPA 8151A
2016 Permit District product list	Glyphosate	Herbicide	EPA 8321B

Section 6
Quality Assurance and Control

The District uses three documents to guide its quality assurance/quality control (QA/QC) program. The documents are:

- *Sample Collection and Receipt*: This document includes the procedures and principles that are applicable to sample collection. It summarizes: health and safety procedures, materials and apparatus, reagents, and sampling procedures. The sampling procedures provide detail regarding: the containers used, sampling equipment used, calibration procedures, site setup, field testing, sample collection, sample storage, sample transport, chain of custody, and sample receipt. This is an evolving document and the most recent version is available on request. Collection of blanks and duplicates is decided on a case-by-case basis, taking into account the analytes involved, level of concern, past history, risk of contamination, and cost.
- *Bacteriological Sample Collection*: This document includes the same categories of information as those provided in the *Sample Collection and Receipt* document. However, the information in this document is specific to the collection of samples for microbiological analysis. This is an evolving document and the most recent version is available on request.
- *Quality Assurance/Quality Control Program Document*: The purpose of this document is to identify and document practices and standard operating procedures for those activities in the laboratory that affect the quality of the data. The quality control practices that are summarized in this document specify how samples are received, stored, and analyzed in the lab. This is an evolving document and the most recent version is available on request.

The District operates its own water quality lab for analyzing samples. The lab is a National Environmental Laboratory Accreditation Program (NELAP)-accredited laboratory and, as such, is subject to and follows current NELAP guidelines in administration, quality systems, and analyses.

Section 7
Documentation and Data Management

This section summarizes the District's data management procedures.

7.1 Data Review, Validation, and Verification

The District is responsible for the quality control of its samples prior to delivery at the laboratory. As noted in Section 6, field sample collection procedures are described in a District document summarizing sample collection and receipt procedures. For each monitoring event (instream and stormwater), data affiliated with each sampling activity are generated including: site, date, time of sample collection or field measurement, antecedent dry period (when applicable), calibration data, and field measurement results. Samples are collected under the general supervision of the District's lab manager.

Sample validation and verification are conducted at the laboratory and, following analysis, the monitoring results are provided to data review staff to validate and assess if the findings are consistent with expectations. Questionable monitoring results will be flagged for further review and possible follow-up in the field. If data quality indicators suggest that contamination or corruption of the sample occurred, data may be qualified, re-sampling may occur, and corrective action will be taken when indicated. If monitoring results are invalidated due to equipment failure, installation, calibration and/or maintenance procedures will be assessed and improved as necessary. If monitoring results are invalidated due to failures in the sample collection process, field techniques will be assessed and revised as necessary and staff trained as appropriate.

7.2 Data Management and Plan Modifications

The lab utilizes a commercial Laboratory Information Management System (LIMS) software program to manage, automate and document its sample collection and analysis activities, allowing for highly automated data analysis. The LIMS program maintains a permanent record of all laboratory data, and almost all instruments are connected to import data directly into the LIMS, eliminating the need for hand data entry.

The LIMS stores sample schedules and collection dates and methods in accordance with information initially entered into the system. The LIMS also provides a platform to record information applicable to the sample analysis including the following:

- Sample ID and date received,
- Preservation and preparation procedures including analyses to be run and associated holding times,
- Analyst name and qualifications,
- Reagents used and reagent logs,
- Instrumentation information including calibration data,
- QA/QC associated with the analysis, and
- Raw data and analytical results including detection levels, qualifiers, and analytical notes.

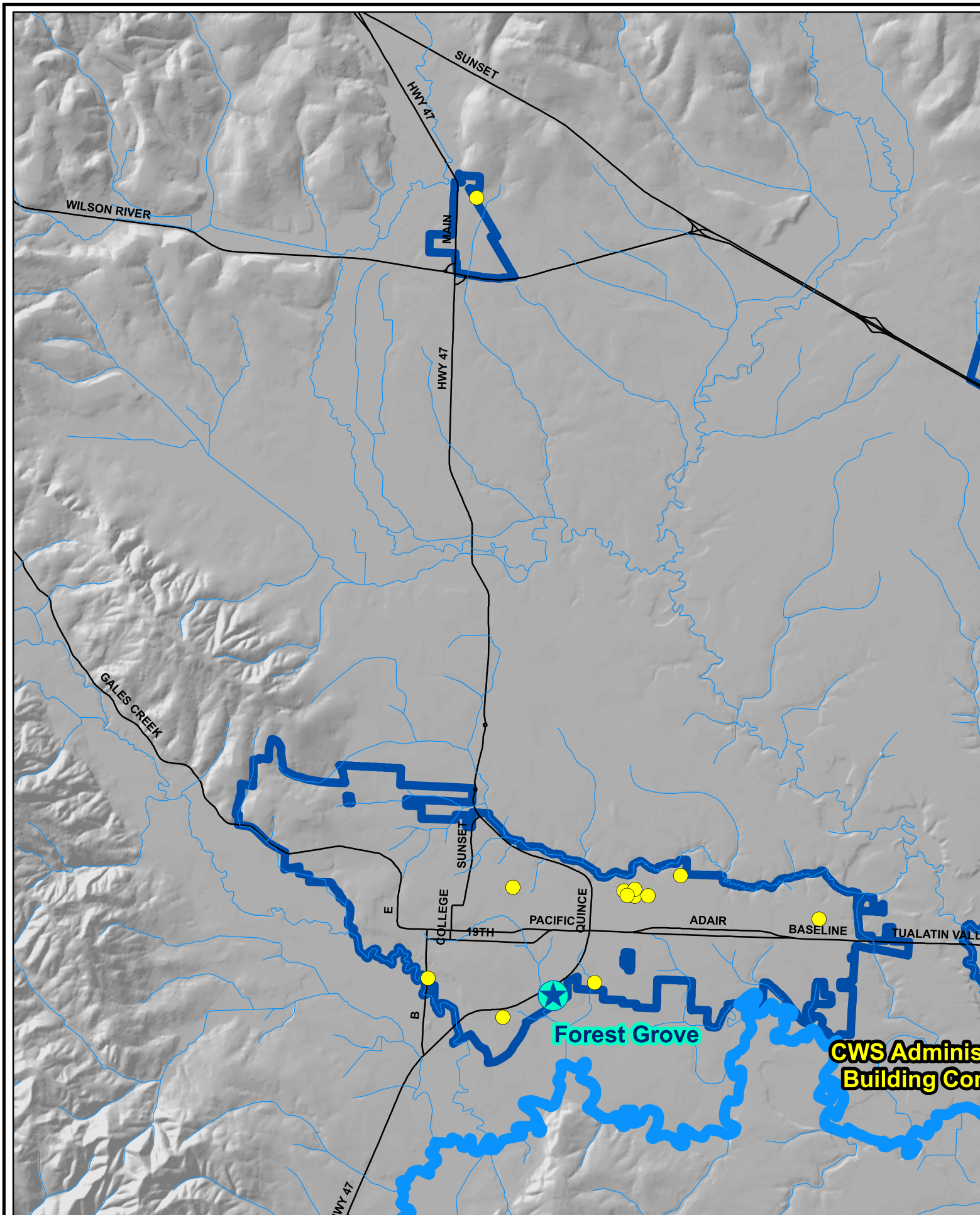
The District is responsible for compiling monitoring data. Monitoring data may be compiled by monitoring location and monitoring event. Data include dates, times, analytical results, and an

indication as to whether the sample represents a grab or flow composite sample. Monitoring data provided to DEQ annually are available in a usable digital format.

Modifications to monitoring locations and frequency as outlined in this Plan are permissible as long as the required number of monitoring data points (the product of monitoring location, parameter, frequency, and permit term) is maintained. Additionally, if on an annual basis the District is not able to collect the required samples because of climatic conditions, sampling conditions, equipment malfunction, monitoring location inaccessibility, etc., such inability is not directly reflective of a need to modify the Plan.

If a modification is required to the Plan, 30-day notice must be provided to DEQ in the form of a proposed Plan modification. As provided in Schedule B.15.b.v, written approval must be received from DEQ before such modification can be implemented. If DEQ does not respond within 30 days, the District may implement the proposed modification without written approval.

ATTACHMENT E
MS4 MAPS


SUNSET
HWY 47
WILSON RIVER
MAIN
HWY 47
GALES CREEK
SUNSET
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PACIFIC
QUINCE
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Forest Grove
CWS Adminis
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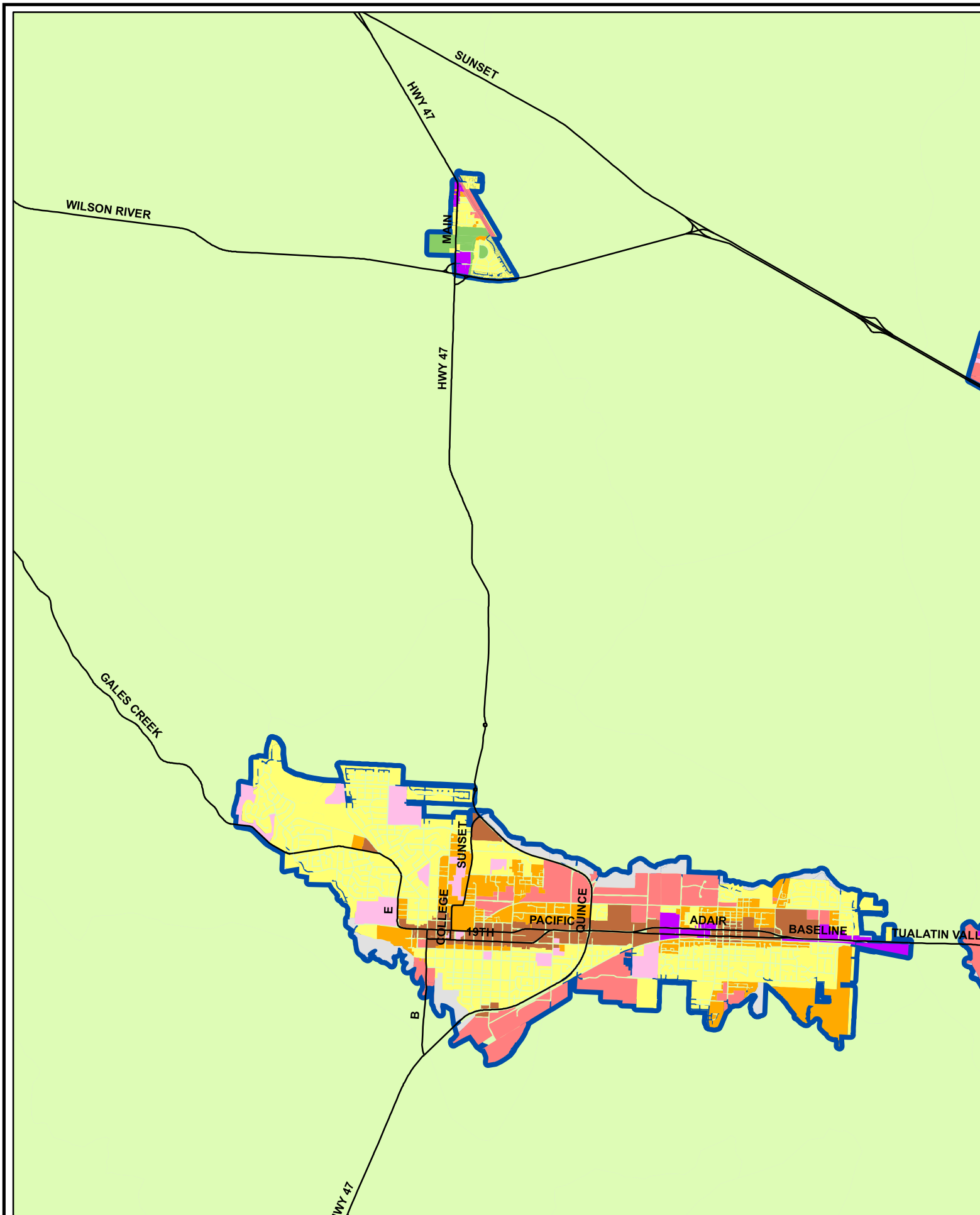
SUNSET
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COLLEGE
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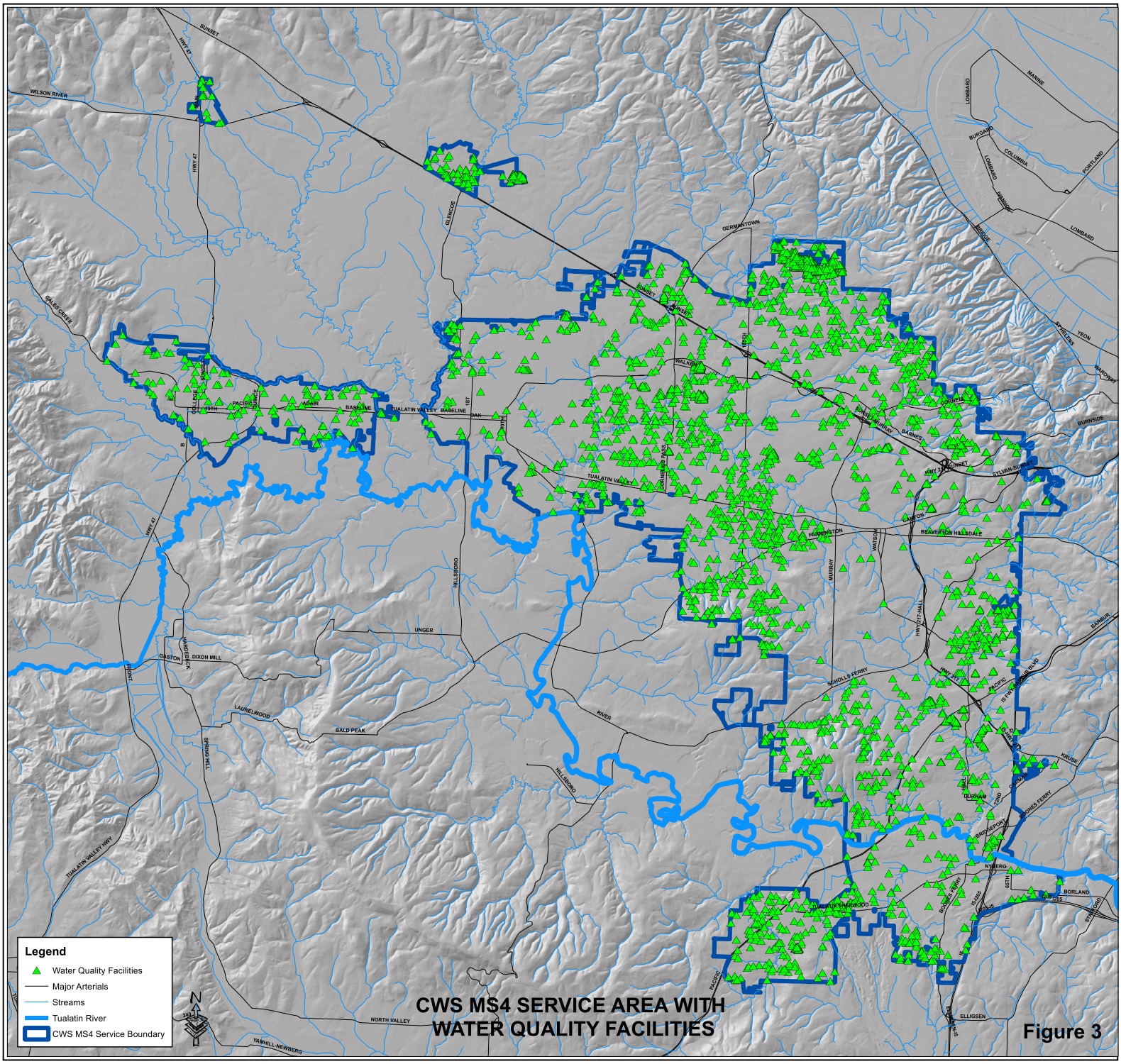
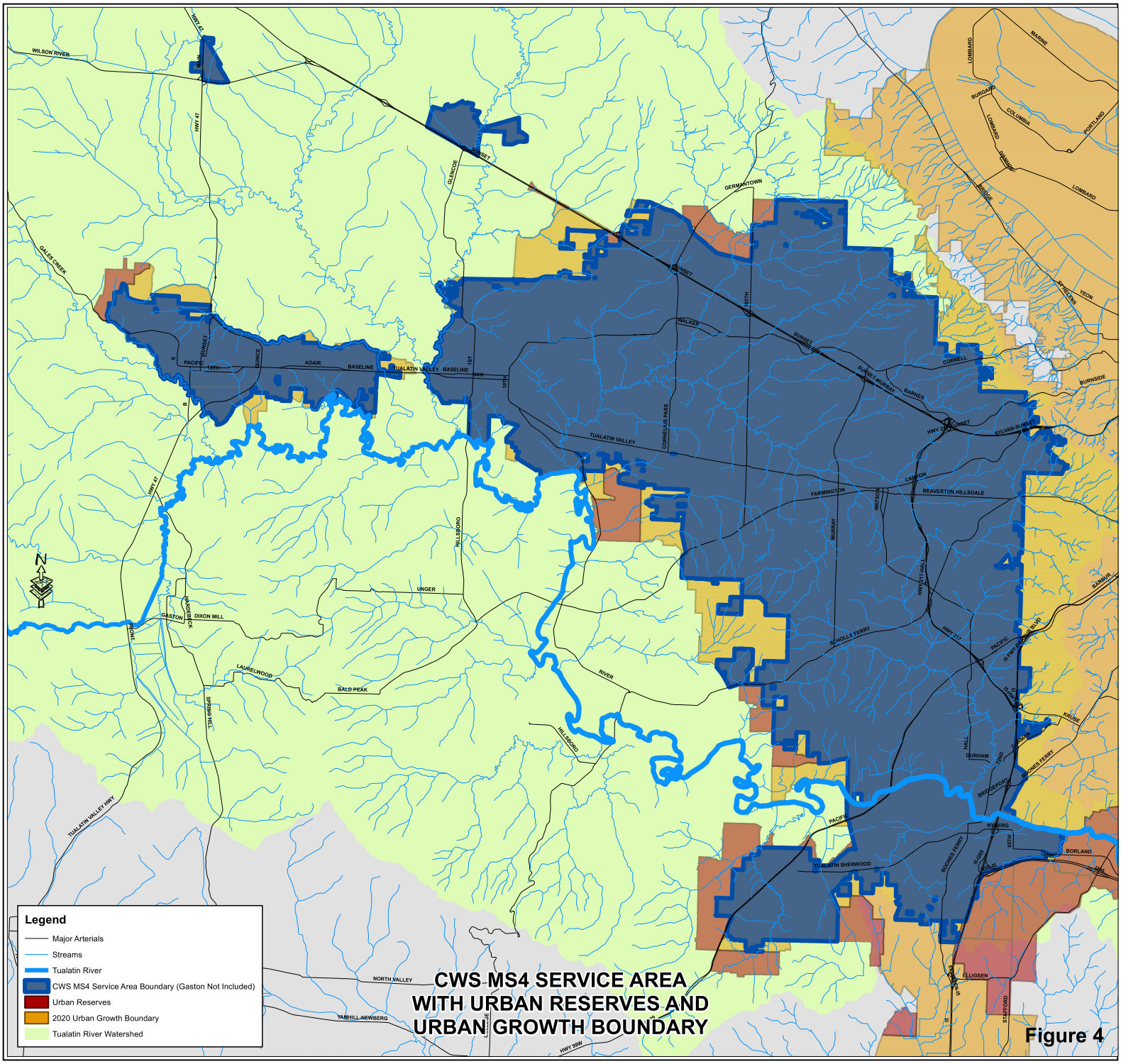
QUINCE
19TH
ADAIR
BASELINE
B


Legend
Water Quality Facilities
Major Arterials
Streams
Tualatin River
CWS MS4 Service Boundary
N
CWS MS4 SERVICE AREA WITH
WATER QUALITY FACILITIES
Figure 3


Legend
Major Arterials
Streams
Tualatin River
CWS MS4 Service Area Boundary (Gaston Not Included)
Urban Reserves
2020 Urban Growth Boundary
Tualatin River Watershed
CWS MS4 SERVICE AREA
WITH URBAN RESERVES AND
URBAN GROWTH BOUNDARY
Figure 4