

**MS4 Permit Stormwater Management Plan
for the
Surface Water Management Agency of Clackamas County
and the City of Rivergrove**

Updated 5/1/2006



The Surface Water Management Agency of Clackamas County and the City of Rivergrove

**NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4)
STORMWATER MANAGEMENT PLAN**

I, the undersigned, hereby submit this National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Stormwater Management Plan in accordance with NPDES Permit Number 108016. We certify under penalty of law that this document and all attachments were prepared under our direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on our inquiry of the person, or persons, who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of our knowledge and belief, true, accurate and complete. We are aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Michael S. Kuenzi, Director
Water Environment Services

PERMIT HOLDER INFORMATION

CO-PERMITTEE'S NAME: **Surface Water Mgmt. Agency of Clack. Co.**
(includes the City of Rivergrove)

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OTHER CO-PERMITTEES: Clackamas County Service District #1
(includes the City of Happy Valley)
Clackamas County
City of Gladstone
City of Johnson City
City of Lake Oswego
City of Milwaukie
City of Oregon City
City of West Linn
City of Wilsonville
Oak Lodge Sanitary District

MS4 PERMIT STORMWATER MANAGEMENT PLAN

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1. INTRODUCTION

Background

Clackamas County Service District No. 1 (CCSD#1), the Surface Water Management Agency of Clackamas County (SWMACC), the City of Happy Valley, and the City of Rivergrove are co-permittees on the same Municipal Separate Storm Sewer System (MS4) permit. The other co-permittees on this same MS4 permit are the Oak Lodge Sanitary District, Clackamas County, and the following cities: Gladstone, Johnson City, Lake Oswego, Milwaukie, Oregon City, West Linn, and Wilsonville. (Phase 1 communities are generally those with a population of 100,000 or more. Clackamas County co-permittees are classified as Phase 1 communities because they meet this threshold collectively, though not separately.) The Clackamas County MS4 permit was issued by DEQ on December 15, 1995, was renewed by DEQ on March 3, 2004, and was modified by DEQ on July, 27 2005. The recently modified MS4 permit requires an Interim Evaluation Report (IER) to evaluate the effectiveness of the permittees' Stormwater Management Plans in complying with the permit's water quality protection requirements. This Stormwater Management Plan proposed for SWMACC and the City of Rivergrove includes changes recommended by the IER.

A joint Stormwater Management Plan (SWMP) was developed in 1993 for CCSD#1 and SWMACC, pursuant to the (then pending) issuance of initial MS4 permits to Phase 1 communities in Oregon. The 1993 SWMP was updated in 2000. Further revisions are now proposed as part of this SWMP, which pertains only to SWMACC and the City of Rivergrove. (An IER and a revised SWMP are being submitted as separate documents for CCSD#1 and the City of Happy Valley.)

District Demographics

SWMACC is administered by Water Environment Services (WES), a department of Clackamas County.

The City of Rivergrove lies within SWMACC. Some urbanized, unincorporated lands are also within SWMACC. While SWMACC includes the City of Rivergrove and all of the unincorporated lands in Clackamas County that drain to the Tualatin River and Lake Oswego, only the urbanized portion of SWMACC within the Portland metro area's UGB is regulated by the MS4 permit.

Table 1 is a summary of current land use acreage and associated runoff coefficients (taken from Section 2.4.7.1 of the Oregon Department of Transportation *Hydraulics Manual*) in SWMACC-UGB. The runoff coefficient indicates the percentage of rainfall expected to leave a site as runoff during any given storm event.

Table 1

Land Use	Area (acres)	Runoff Coefficient
Agriculture	2.8	0.50
Commercial	3.6	0.70
Industrial	0.0	0.80
Undeveloped	0.0	0.20
Open Space	0.0	0.25
Other	0.0	0.35
Residential	743.0	0.60
Streets	120.0	0.90
Total	869.4	-

Detailed population data for SWMACC has not been compiled. However, the number of customer accounts for the entire District (including but not limited to the MS4 area) is available, currently estimated at 2800 households. New development in the District is relatively sparse and is generally confined to the City of Rivergrove. The total number of SWMACC customer accounts has actually decreased in recent years, due to annexations by the City of Lake Oswego and the City of West Linn. Properties annexed by these cities are no longer within SWMACC jurisdiction.

Appendix A shows the entire area of Clackamas County within the Portland UGB, which includes all MS4 co-permittees. Appendix B shows all of SWMACC, most of which is outside the UGB. Appendix B also sites with NPDES 1200C permits.

Program Goals and Objectives

The overall goals of the Stormwater Management Plan are to:

- reduce the discharge of pollutants from the MS4 to the maximum extent practicable (MEP)
- protect and/or enhance the natural function of the surface water bodies within SWMACC.

The specific objectives of the Stormwater Management Plan are to:

- Involve and educate the public regarding opportunities to improve surface water quality and aquatic habitat in riparian areas to minimize nonpoint source pollution
- Protect or improve the quality of the water in the District's rivers, streams, and wetlands through the cost-effective use of non-structural methods (i.e. Best Management Practices). These practices shall initially be focused on preventing point and nonpoint source water pollution. If stormwater pollution cannot be prevented, it will be controlled at the source.
- Integrate the need to manage stormwater for both water quality and drainage benefits by emphasizing the use of natural systems (i.e. infiltration of stormwater into soil) whenever possible
- Coordinate among government agencies, residents, trade associations and other ratepayers and groups to reduce the level of pollutants that enter the MS4.

2. RIVERS AND CREEKS

Rivers and creeks that receive discharges from the District's MS4-permitted areas, include but aren't limited to, the following:

- Tualatin River
 - Pecan Creek
 - Saum Creek
 - Wilson Creek
 - Carter Creek (a Fanno Creek tributary)
 - Rock Creek "South"
 - Tate Creek

3. STORM SEWER SYSTEMS

The Two Types of Separate Storm Sewer Systems

Surface-discharging storm sewer systems: In conjunction with Clackamas County's Department of Transportation and Development (DTD), the District owns or operates surface-discharging storm sewer systems in the MS4-permitted area. Most parts of the MS4-permitted surface-discharging storm sewer system are comprised of piped storm sewers, but some swales and open ditches are also present. It is important to note that there are many privately owned surface-discharging storm sewer systems present near the District's MS4-permitted systems. These privately-owned surface-discharging storm sewer systems are not regulated by the District's MS4 permit. As is required by the Schedule B(2)(b)(vi) of the MS4 permit, maps providing updated information [as described in 40 CFR §122.26(d)(1)(iii)(B)] on the location of all known components of the MS4 are being submitted to DEQ as an element of this SWMP. All new drainage systems and controls constructed through private development or public works projects are continually documented as-built drawings and GIS maps. Many archived drawings of older systems have also been compiled and added to county databases.

Injection-type storm sewer systems: DTD and the District jointly manage about 50 injection-type storm sewer systems near the District's MS4-permitted area. Discharges from injection-type storm sewer systems are not regulated by any MS4 permit, but they are regulated by the federal Safe Drinking Water Act and Oregon's OAR 340, Division 44. Although the operation of these stormwater injection devices is not regulated by the District's MS4 permit, the District and DTD jointly applied for an area-wide Water Pollution Control Facility (WPCF) permit from DEQ for these devices on December 19, 2001. As of June 2005, this WPCF permit had not been issued. Nearly all of the District/DTD-owned/operated stormwater injection devices are drywells. A separate stormwater management plan guides the District's and DTD's stormwater management programs in the geographic areas that are drained by drywells.

4. REQUIRED SWMP ELEMENTS

According to the MS4 permit's schedule D(2)(c), the following elements are required to be present within the District's SWMP. These elements, which rely upon the implementation of Best Management Practices (BMPs), reduce the discharge of pollutants to the maximum extent practicable (MEP).

4.1 Maintenance [Schedule D(2)(c)(i)(1) and (3); Replaces 2000 SWMP Sections 4.1.1 & 4.1.3]

This section is divided into three portions:

- a) Conveyance System Components
- b) Street Sweeping
- c) Other O & M for public streets

a. Conveyance System Components

Description:

The conveyance system components that are maintained by the District and DTD include culverts, storm sewer lines, ditches, and inlets that are located in the right-of-way of publicly owned roads or in a storm drainage easement. These facilities are regularly inspected and maintained on an as-needed basis. Maintenance records are kept by the both DTD and the District.

Implementation schedule:

This portion of our stormwater maintenance program is in a state of transition as the District accelerates its role in the overall stormwater program. DTD previously played a primary role in the District's maintenance efforts but will now be scaled back to a support role only. The District is directly responsible for maintenance agreement areas (all subdivisions constructed since 1998) and is phasing in the CCSD #1 road rights-of-way at this time.

Measurable performance indicators:

- miles of ditches maintained
- number of components inspected and/or cleaned, and/or
- mass or volume of material removed during cleaning

b. Street Sweeping

Description:

Major arterial curbed streets are swept on a regular basis. The frequency varies depending on a variety of factors (for example, traffic volumes).

Implementation schedule: Ongoing effort.

Measurable performance indicators:

- number of miles that were swept, and/or
- mass or volume of material removed during sweeping

c. Other O & M for public streets

Descriptions:

- Road repair activities: These are conducted by DTD in a manner that minimizes or prevents erosion. When possible, this work is scheduled during the dry season.
- Litter control: This involves 1) the removal of large dead animals from roadways, 2) preventing illegal solid waste dumping through signage and enforcement actions against offenders, 3) removal of illegal solid waste dumps, and 4) DTD's "Adopt A Road" program, which enlists the support for litter removal on specific road segments from individuals, families, community groups and businesses.
- Ice removal work: This is performed by DTD on certain paved streets on an as-needed basis. The frequency varies depending on a range of factors, including personnel availability, air temperature, road surface temperature, humidity, and precipitation.
- Road sanding: This enhances traction during ice/snow events. After the ice/snow event, when practical, the sand is removed from the roadway with mechanical sweeping machines.

Implementation schedule: Ongoing effort.

Measurable performance indicators:

- number of miles of road that are enrolled in the "Adopt A Road" program
- mass or volume of material removed by the "Adopt A Road" program
- number of illegal solid waste dumps that are removed
- mass or volume of material that is removed by the elimination of illegal solid waste dumping sites

4.2 Planning Procedures for New Development and Significant Redevelopment [Schedule D(2)(c)(i)(2); Replaces 2000 SWMP Section 4.1.2]

Description:

This section of the SWMP describes the planning procedures for developing, implementing, and enforcing controls to reduce the discharge of pollutants from storm sewers collecting runoff from areas of significant development or redevelopment. These controls include regulations requiring new stormwater treatment facilities with all new land development or redevelopment projects. All new developments are also required to infiltrate runoff from frequent low-intensity rain events to limit the increase in runoff

volume from urban development and provide groundwater recharge to maintain dry weather base flows.

Implementation schedule: For all new developments, implementation is ongoing.

Measurable performance indicator:

The number of treatment systems installed in accordance with District requirements. Between the year 2000 and 2005, it is estimated that 5 such systems have been installed.

4.3 Flood Management Projects and Water Quality [Schedule D(2)(c)(i)(4); Replaces 2000 SWMP Section 4.1.4]

There are no known flood management projects in SWMACC's MS4-permitted area.

4.4. Pollutants in Runoff From Closed Landfills [Schedule D(2)(c)(i)(5) and Schedule D(2)(c)(iii); Replaces 2000 SWMP Section 4.1.5]

There are no open or closed landfills in SWMACC's MS4-permitted area.

4.5 Program to Reduce Pollutants in Discharges Associated With the Application of Pesticides, Herbicides and Fertilizers [Schedule D(2)(c)(i)(6); Replaces 2000 SWMP Section 4.1.6]

Description:

WES' program to reduce pollutants to the MEP for discharges from the MS4 that are associated with the application of pesticides, herbicides and fertilizers is divided into these five sections:

- A. Public Education
- B. Disposal of Unwanted Quantities and Containers
- C. Road Maintenance
- D. Landscape Maintenance
- E. Scientific Research

A detailed description of each of these five programmatic areas is provided below.

A. Public Education Program

WES administers a public education program which provides information that motivates workers and residents to reduce stormwater pollution caused by the application of pesticides, herbicides, and fertilizers in the District. Educational information is shared with the public through the use of:

- Articles in WES newsletters (*Mainstream* in SWMACC). These newsletters are mailed to all customers along with billing statements.
- WES' website
- Through local public involvement campaigns. A recent example of a relevant public involvement campaign is one that has been launched annually over the past several years throughout the Portland Metro area by many municipal partners, including the District. This group is called the Regional Coalition for Clean Rivers and Streams. The most recent year's slogan is: "Is your lawn chemical free, Maybe it should be?"
- Brochures (disseminated at the WES booth at fairs, for example)

Common topics that are addressed by this program include:

- Less harmful alternatives to the use of pesticides, herbicides, and fertilizers are provided. For example, use of ladybugs to eat insect pests is encouraged as an alternative to pesticide application.
- Information about the potential hazards to water quality, public health, and aquatic life associated with the misuse of pesticides, herbicides, and fertilizers in the District.
- Users are reminded that the products need to be used in a manner consistent with the product's label.

Implementation schedule:

This has already been implemented. Public education/involvement campaigns that address ways to reduce stormwater pollution caused by the application of pesticides, herbicides, and fertilizers are underway and have been recently conducted. For a description of campaigns that are planned for the future, contact the WES Community Relations Specialist at 503-353-4567.

Measurable performance indicators:

The number of public education/involvement campaigns that are underway, are planned for the near future, or that have been recently conducted are the primary measurable performance indicators. Other measurable performance indicators that may be used include, but aren't limited to:

- The number of citizens who attend workshops, who visit the WES booth at fairs, or who attend presentations delivered (at the local school, for example) on ways to reduce stormwater pollution caused by the application of pesticides, herbicides, and fertilizers.
- The number of brochures distributed that address ways to reduce stormwater pollution caused by the application of pesticides, herbicides, and fertilizers.

B. Disposal of Unwanted Quantities and Containers

When the District receives inquiries from the public about the proper disposal method for empty containers that once held pesticide/herbicide or for disposal of unwanted

quantities of these products, citizens are promptly forwarded to Metro's informational phone number (503-234-3000).

Implementation schedule: This has already been implemented.

Measurable performance indicators:

The number of calls that Metro receives from the District in any given time period is the measurable performance indicator.

C. Road Maintenance

Herbicides are occasionally used by Clackamas County in road maintenance operations in the MS4-permitted area. There are very few instances where the Road Department conducts any roadside vegetation management work of any type in the MS4-permitted area. In fact, in many years, Clackamas County's Road Department applies no herbicides for roadside vegetation control in the District's permitted area. This is due to the facts that: a) most roads in the MS4-permitted area are paved, have curbs, and are served by piped storm sewer systems, and b) any vegetation that is present in the road right-of-way is usually part of a landscape maintained by the property's owner. In most of the instances that involve Road Department roadside vegetation management activity within the MS4-permitted area, mowing is the preferred vegetation control system. When herbicides are used, these products are always used in a manner that is consistent with the product's label.

Implementation schedule: This has already been implemented.

Measurable performance indicator:

The measurable performance indicator for this section is the quantity of herbicide products that are used per zip code. This is the same data that will be reported to Oregon's Department of Agriculture per the Pesticide Use Reporting System.

D. Landscape Maintenance

Herbicides, pesticides and fertilizers are used by Clackamas County in landscape maintenance applications around County-owned buildings and facilities. When herbicides and pesticides are used, these products are used in a manner that is consistent with the product's label.

Implementation schedule:

See the measurable performance indicators portion of this section. A list will be assembled and at least one meeting will be held prior to February 2009.

Measurable performance indicators:

The measurable performance indicators that apply to this section during the current MS4 permit cycle (current permit expires February 2009) are:

- To assemble a list of all County buildings and facilities that are in the District's MS4 permit area, and
- To meet with the proper County facilities and building maintenance personnel to inform them that herbicides, pesticides and fertilizers must be used with care in landscape maintenance applications around County-owned buildings and facilities in the District. They will also be encouraged to: a) substitute the use of these products for other, less harmful ones, b) to use less herbicide, pesticide, and fertilizer, if possible, when they are used, and c) to naturescape with native plants, which are likely to need less herbicides, pesticides and fertilizers, whenever possible.

E. Scientific Research

In the case of pesticides and herbicides, given the high cost of analysis, the District jointly funds research on a periodic basis that determines if pesticides and herbicides are present in the districts' stormwater and/or surface water bodies, and if present, the concentration of certain pesticides and herbicides are quantified by this research.

In the case of plant fertilizer, the District conducts research on the presence of certain common plant nutrients – many of the same ones that are in common fertilizers – in the District's stormwater and/or surface water bodies on a routine basis. Although the locations where this monitoring is conducted are subject to change over time, this data is generally collected from the MS4 and from surface water bodies that receive discharges from the MS4. Although the nutrients that were monitored are subject to change over time, in FY 2004-2005, those that were monitored were: ammonia, nitrate, orthophosphate and total phosphorus. Specific details about this type of scientific research are available in the District's stormwater monitoring plan in Appendix C.

Implementation schedule: This is already being implemented.

Measurable performance indicators:

In the case of pesticides and herbicides, the measurable performance indicator for this scientific research section is the number of studies funded and/or supported by the District during the current permit term. In the case of plant fertilizer, the measurable performance indicators for this scientific research section:

- Is the number of surface/stormwater samples from or near the District that are collected and analyzed, by either the District or one of its clean water partners, such as the USGS

4.6 Illicit Discharges and Spills [Schedule D(2)(c)(ii); Replaces 2000 SWMP Section 4.2]

Illicit Discharge Elimination Program (IDEP) – Description:

The District's Illicit Discharge Elimination Program (IDEP) detects, addresses, and if necessary, controls the discharge of certain wastewaters to the County's storm sewers within the MS4-permitted areas of SWMACC. In general, illicit discharges are improper, unauthorized "point sources" of wastewater which have been discharged to surface water bodies or public storm sewer systems. Rain and melted snow are "nonpoint sources" and cannot be illicit discharges, but food-processing wastewater from a bakery could be an illicit discharge. Other common types of illicit discharges include those generated by washing fleets of vehicles or from the cleaning of machinery in a parking lot. Illicit discharges can enter public storm sewer systems in a variety of ways, such as through a hard-piped connection, through a gardening hose, or from a bucket of waste dumped directly into a storm sewer catch basin in the street.

IDEP: Prevent Illicit Discharges into MS4 [Schedule D(2)(c)(ii)(1)]

As stated in the permit, this section provides "A description of a program, including inspections, to implement and enforce an ordinance, orders or similar means to prevent illicit discharges to the municipal separate storm sewer system..."

The Illicit Discharge Elimination Program improves water quality and protects the aquatic environment by detecting, evaluating, and if necessary, controlling these improper or illegal discharges to the District's injection-type and surface-discharging storm sewer systems. The Illicit Discharge Elimination Program:

- Is the District's primary tool for preventing, detecting, addressing, and if necessary, controlling illicit discharges.
- Receives, documents, and responds to reports (from citizens, for example) of illicit discharges which are, or have been, observed.

All wastewaters suspected of being an illicit discharge are investigated and documented by District staff. Copies of important documents pertaining to each investigation are referred to DEQ's Northwest Region for review, as DEQ reserves the right to assume a direct role in any case involving the discharge of waste to public water bodies.

Twenty-four (24) specific types of discharges, including uncontaminated pumped groundwater and those discharges resulting from individual residential car washing, are defined by DEQ as non-stormwater discharges. They're allowed to be present in the MS4 as long as certain basic control steps (if deemed appropriate by the District) are taken by the discharger.

When an illicit discharge is identified, control options may be required. Control options that may be applied or recommended by the District include, but are not limited to:

- The removal of certain pollutants from the wastewater prior to discharge to the storm sewer system (i.e. cease usage of soap when washing)

- Issuance of the proper discharge permit from the State of Oregon's Department of Environmental Quality (DEQ). A discharge that has been authorized and controlled by a DEQ water quality permit is not an illicit discharge.
- Application of the wastewater to dry land with no discharge to surface waters or storm sewers. This option is inappropriate for certain types of wastewaters, discharge rates, and soil types and may require the issuance of a WPCF permit from DEQ.
- Wastewater reuse without any discharge
- Hauling the wastewater off-site for proper disposal

IDEP: Prevent Non-Stormwater Discharges into MS4 [Schedule D(2)(c)(ii)(1)]

The MS4 permit also states that "...this program description must address all types of illicit discharges, however the following category of non-storm water discharges or flows must be addressed where such discharges are identified by the municipality as sources of pollutants to waters of the United States: water line flushing, landscape irrigation, diverted stream flows rising ground waters, uncontaminated ground water infiltration, uncontaminated pumped ground water, discharges from potable water sources, start up flushing of groundwater wells, aquifer storage and recovery (ASR) wells, potable groundwater monitoring wells, draining and flushing of municipal potable water storage reservoirs, foundation drains, air conditioning condensation, irrigation water, springs, water from crawl space pumps, footing drains, lawn watering, individual residential 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 the Department pursuant to Oregon Revised Statute (ORS) Chapter 465, the state's environmental cleanup law; and discharges or flows from emergency fire fighting activities where discharges or flows from fire fighting are identified as not significant sources of pollutants to the waters of the state." All of these 24 non-stormwater discharges are allowed by the District to be discharged into their and DTD's MS4, although this permission is frequently conditional. The control measures employed by the District – as well as the rationale for their selection – for each of those above-noted non-stormwater discharges is being included in section 4.13. The requirement to do so is found in Schedule B(2)(b)(iii).

IDEP: Dry-Weather Inspections [Schedule D(2)(c)(ii)(2) and (3)]

The MS4 permit requires "...A description of procedures to conduct on-going field screening activities during the life of the permit, including areas or locations that will be evaluated by such field screens; A description of procedures to be followed to investigate portions of the separate storm sewer system that, based on the results of the field screen, or other appropriate information, indicate a reasonable potential of containing illicit discharges or other sources of non-storm water...Such a description must include the location of storm sewers that have been identified for such evaluation."

This section is divided into two portions:

- a. Prohibition on cross-connections in new/re-development
- b. Regulation of onsite sewage disposal systems

a. Prohibition on cross-connections in new/re-development

The District prohibits cross-connections in new/redevelopments through the development and building permit review and issuance process. This system, which features plan review in the office and inspections by certified plumbing inspectors, ensures that fixtures which need to be plumbed into a sanitary sewer system or a private septic system are actually plumbed into those systems, preventing hundreds of illicit discharges per year.

b. Regulation of onsite sewage disposal systems

A potential source of pathogenic bacteria is septic systems that have been incorrectly installed and failing septic systems. In addition to managing CCSD#1 and SWMACC, Water Environment Services (WES) also administers the Onsite Sewage Treatment and Disposal Program in Clackamas County as an Agent of DEQ through a Memorandum of Understanding. WES regulates residential and commercial systems with a Residential Strength Waste of up to 2,500 gallons per day. Residential Strength Waste greater than 2,500 gallons per day requires a WPCF permit. The goal of the program is to reduce septic system failures, repair failing systems, permit new systems in compliance with State of Oregon Treatment rules and to have properly functioning systems throughout Clackamas County.

To achieve this goal, WES and the County have requirements for new or replacement septic systems to meet design standards for proper function, protection of water quality, the environment, and public health. The onsite program uses the same database as that used by the County Building division to closely coordinate new construction, repairs and violations with other building permit activities. Soil Scientists conduct the inspections for Authorization Notices and for Soil Feasibility studies (used for renovations, additions, new development or changes in use). WES also implements a process to address suspected failing systems. WES is notified in a variety of ways when septic systems are suspect. When systems are suspected of less than optimum function, owners or renters contact WES to identify options and potential problems. Adjacent property owners contact WES with reports of suspected systems that are based on problems with odors, discharge onto their properties, water bodies or roadside ditches. Other County departments or local agencies may also refer a suspected system to WES for investigation. Failing systems are both a health hazard and a potential environmental hazard and, as such, are a high priority for WES to address. One goal of the onsite program is to investigate the suspected problem or complaint the same day as receiving the notice of a potential problem. The complaint becomes a high priority in 3 days and urgent in a week. If a site visit has not been performed within one week, the activity has a higher priority than all of the other activities performed by the onsite staff.

For failing systems, once a site visit has been performed to assess the situation, if necessary, steps for needed correction are identified and a process for implementation is set forth. Time frames for repair are established with the property owners and the length of time allotted to repair is determined based on the severity of the problem. Discharges to the ground surface and into waterways are not allowed and are given as

short a time as feasible for construction of repairs or alternatives. Alternatives vary from limiting the usage of the septic system (timing of laundry, for example), installing a temporary holding tank, and proceed up to vacating the premises until the problem is resolved. WES has an agreement with the County's Code Compliance Section to bring violators into compliance if other efforts are unsuccessful. All failing septic systems are an enforcement priority for the County. In addition, Clackamas County implements an advanced code compliance process for failing systems. First efforts encourage voluntary compliance. In the event this is unsuccessful, the County has the ability to levy both fines and fees for code violations. A citation of \$500 and additional civil penalties of up to \$3,500 per violation can be issued for a high priority violation.

IDEP: Spills into the MS4 [Schedule D(2)(c)(ii)(4)]

The MS4 permit requires "...A description of procedures to prevent, contain, and respond to spills that may discharge into the municipal separate storm sewer."

The District's Spill Response Program prevents, contains, and responds to spills of dangerous, hazardous and other materials in the MS4-permitted areas of SWMACC. The District's Spill Response Program ensures that the actual or possible release of dangerous/hazardous materials to the MS4 is properly addressed. Except for minor incidents, the District's Spill Response Program personnel always coordinates closely with other agencies and departments, including Tualatin Valley Fire and Rescue, DEQ, Oregon State Police, Clackamas County's Road Department, and Oregon's Department of Transportation.

The District created a draft Standard Operating Procedure (SOP) in 1999 for addressing and responding to spills of dangerous and/or hazardous materials. This SOP was revised and finalized in 2004. The 2004 SOP provides guidance to District employees who administer the Spill Response Program. Specific guidance is provided by the SOP in the following areas:

- Determining if the incident needs to be reported to Oregon Emergency Response System (OERS - see the next paragraph in this section)
- Determining if a site visit needs to be performed by District personnel. If a site visit is not to be performed, guidance on providing a proper referral of the incident to another government agency is provided
- How to conduct a safe and effective site inspection as a first responder to an incident
- How to prioritize activities at the site of a release. Heavy emphasis is placed on maintaining the personal safety of all persons, including the District Spill Response Program representative. In addition, all District responders are obligated to call for support, if warranted, from agencies which may also have jurisdiction for the incident, including DEQ and Tualatin Valley Fire and Rescue.
- Protecting the environment through deployment of certain spill response tools, such as granular absorbents, absorbent booms and pads. Guidance on obtaining the assistance of environmental services companies which specialize in spill response support is also included.
- Documenting the release incident

- Incident follow-up activities

Certain incidents involving the release of pollutants in the State of Oregon must be promptly reported to the Oregon Emergency Response System (OERS) at 800-452-0311. Incidents that must be reported to OERS, as contained in OAR 340-108-0010(1), involve the release of materials in amounts greater than or equal to the following:

- If spilled into waters of the state, or escape into waters of the state is likely, any quantity of oil (or other petroleum-based fuel or lubricant) that would produce a visible oily slick, oily solids, or coat aquatic life, habitat or property with oil, but excluding normal discharges from properly operating marine engines
- If spilled on the surface of the land, any quantity of oil over one barrel (42 gallons)
- An amount equal to or greater than the quantity listed in 40 CFR Part 302-Table 302.4. This is a list of hazardous substances and their reportable quantities; see the District's 2004 SOP for this large and detailed document.
- One (1) pound of pesticide residue as defined by 340-101-0033(5)(a).
- Virtually any quantity of nerve agents (such as Sarin, VX, etc.)
- Any quantity of radioactive material, or radioactive waste

IDEP: Public Reporting [Schedule D(2)(c)(ii)(5)]

The District implements a program to promote, publicize, and facilitate public reporting of the presence of illicit discharges and other types of improper disposal of materials into the MS4. After District staff has received a report which relates to one these discharges, they investigate and, if appropriate, apply control measures.

Illicit Discharges and Spills: Through the periodic publication of articles in the District's newsletter, *Mainstream*, ratepayers are encouraged to promptly report these discharges. This newsletter is U.S. mailed to every ratepayer in the District along with each billing statement. In a recent article, ratepayers were:

- provided with guidance on determining what an illicit discharge is
- told to keep a safe distance in an upwind direction from all spills
- call 911 for certain high-priority incidents

After citizens become aware of an illicit discharge or spill, they can contact District staff in person, by phone, by US mail, or by email.

Other types of improper disposal of materials: Information on this is transmitted to the public through the District's newsletter, *Mainstream*. On a periodic basis, articles on various relevant topics (for examples, proper pet waste disposal and proper yard debris management) are published.

IDEP: Management of Used Oil and Toxic Materials [Schedule D(2)(c)(ii)(6)]

The MS4 permit requires "A description of educational activities, public information activities, and other appropriate activities to facilitate the proper management and disposal of used oil and toxic materials."

Through the periodic publication of articles in the District's newsletter, *Mainstream*, ratepayers are encouraged to:

- properly dispose of used oil, unused quantities of toxic materials, and toxic wastes, and
- use products that are not toxic or less toxic. This eliminates the generation of toxic waste or reduces the toxicity of the waste that is generated.

In these newsletter articles in the direct conversations with ratepayers that contact the District for guidance, citizens are encouraged to contact Metro for guidance on the proper disposal of used oil and toxic materials. Metro provides its services throughout the Portland metropolitan area, including all portions of the District. When customers do contact the District about disposal of these items, they're usually referred to Metro's hotline (503-234-3000) or they're encouraged to visit the nearest household hazardous waste facility, which is located at Metro's South Transfer Station in Oregon City. Metro implements a program that:

- Operates two household hazardous waste facilities. One of these is adjacent to the Metro South Transfer Station in Oregon City. Used oil and many types of toxic materials can be deposited here, and
- Operates Metro's hotline (503-234-3000). Callers to this number are provided with information about the various facilities that used oil and many toxic materials can be taken to, for the household hazardous waste facility is not able to accept all types of toxic materials from all types of District ratepayers, and
- In conjunction with Clackamas County's Community Environment Division, Metro mandates that curbside recycling services be available to all curbside solid waste customers in the District. Used oil can be recycled at the curbside by any curbside solid waste customer in the District.

On unusual occasions when certain customers contact the District about the proper disposal methods for certain specific toxics disposal guidance (i.e. large quantity of material from an industrial customer), they're not referred to Metro, but are referred to DEQ's Hazardous Waste group.

IDEP: Seepage from municipal sanitary sewers [Schedule D(2)(c)(ii)(7)]

There are no District-owned sanitary sewers in SWMACC. Municipal sanitary sewers within SWMACC's MS4-permitted area are owned by the City of Lake Oswego, which serves the City of Rivergrove.

The District is able to identify and control the exfiltration of flows from municipal sanitary sewers when it occurs by:

- Receiving and promptly responding to reports from citizens of unusual colors, odors and solids, and
- By performing monthly instream monitoring. This monitoring is performed at major creeks in SWMACC. This monthly monitoring can detect exfiltration of flows from municipal sanitary sewers to the MS4 in two ways: a) olfactory cues can allow a person who is collecting surface water samples to detect the presence of sewage, and b) E. coli is one of the parameters that the water

samples are analyzed for. High levels of E. coli over a significant time period could prompt a special, follow-up visit to the area by District staff to attempt to locate the source(s) of the bacteria.

Measurable performance indicators for all of 4.6:

- Number of dry-weather inspections conducted. In 2005, 6 dry-weather inspections were conducted.
- Number of active illicit discharges that were controlled. In the period from July 1, 2004 to June 30, 2005, one illicit discharge was responded to and one spill was controlled.
- The number of non-stormwater discharges that are addressed, and if necessary, controlled. In the period from July 1, 2004 to June 30, 2005, no non-stormwater discharges were addressed or controlled.

4.7 Industrial Stormwater Program [Schedule D(2)(c)(iii); Replaces 2000 SWMP Section 4.4]

The MS4 permit requires "A description of a program to monitor and control pollutants in storm water discharges to municipal systems from municipal landfills, 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 (SARA), and industrial facilities that the municipal permit applicant determines are contributing a substantial pollutant loading to the municipal storm sewer system." The District's program for chapter 4.7 is divided into these four sections:

- A. Municipal landfills
- B. Hazardous waste treatment, disposal and recovery facilities
- C. Industrial facilities that are subject to section 313 of SARA title III
- D. Other industrial facilities

Each of these above-noted four sections is addressed separately below. The MS4 permit also states that "The program must:

- Identify priorities and procedures for inspections, and establish and implement control measures for such discharges.
- Describe a monitoring program for storm water discharges associated with the industrial facilities identified in Schedule D(2)(c)(iii), to be implemented during the term of the permit, including, at a minimum, the submission of quantitative data on the pollutant parameters included in the Department's NPDES 1200-Z industrial general stormwater permit."

Within each of the following four sections of 4.7, both of those additional programmatic areas (inspections & control measures and monitoring program for stormwater discharges) are addressed separately.

A. Municipal Landfills

There are no municipal landfills in SWMACC.

B. Hazardous Waste Treatment, Disposal, and Recovery (TDR) Facilities

There is no TDR facility in SWMACC.

C. Industrial Facilities Subject to Section 313 of SARA Title III

There are no such facilities in SWMACC.

D. Other Industrial Facilities

Note: All known industrial facilities are presently outside of SWMACC's MS4 area, but some are near the current UGB and could eventually be covered by the MS4 permit.

Description:

This section's facilities are addressed directly by the District and are those that:

- are not required to obtain a 1200Z permit, and
- contribute a substantial load of pollutants to the MS4. This generally is determined by the District to have occurred if the facility's stormwater runoff exceeds (or is likely to exceed) the DEQ's surface water quality standards in OAR 340's Division 41.

Inspections and Control Measures:

Facilities will primarily be inspected on a complaint-driven basis, but it is possible that some inspections will be conducted by the District during source tracking activity if the District's storm event monitoring work or monthly monitoring work shows that excessive levels of one or more pollutants are present. All facilities that are the subject of a complaint will be inspected in a timely manner by District staff. The implementation of control measures for stormwater discharges from these facilities will be deemed necessary by the District if the presence of excess levels of pollution in stormwater can be confirmed by the District. For instances where the presence of excess levels of pollution in stormwater has been confirmed by the District, in the event that the discharger's initial attempts to improve stormwater quality do not produce the required improvement, District personnel will continue to provide guidance and technical assistance until the facility's stormwater quality improves.

Monitoring program for stormwater discharges:

The presence of excess levels of pollution in stormwater can generally be confirmed by two general methods: visual and analytical. Analytical methodologies include hand-held

meters, test strips (i.e. pH) and those performed by a water laboratory. The District will use visual or analytical methods at the District's discretion.

Measurable performance indicators:

- The number of inspections performed
- The number of letters, enforcement actions, or other contacts made
- If storm monitoring event monitoring work is conducted on the site's runoff, and if the laboratory data from that storm's water samples shows that improvement in the site's stormwater quality is needed, a 3rd measurable performance indicator will be for the District to notify the industry that additional stormwater quality improvement is needed.

4.8 Construction Site Runoff: Structural and Non-Structural BMPs [Schedule D(2)(c)(iv); Replaces 2000 SWMP Section 4.3]

A. Procedures for Site Planning

The District reviews all development plans for new construction or redevelopment projects in the District's service area through the building permit process. All reviews are done in accordance with the Surface Water Management Rules and Regulations for CCSD#1. These regulations require submittal of an erosion prevention and sediment control plan, which contains methods and/or interim facilities to be constructed or used concurrently with land development. Plan submittals are required to provide details of erosion control measures, schedules for construction, and a maintenance schedule for erosion control activities.

The *Erosion Prevention and Sediment Control Planning and Design Manual* (created in 2000, and currently being updated) is offered as a resource to the development community for preparation of plans for erosion prevention and sediment control.

B. Requirements for Structural and Non-Structural Best Management Practices

Structural and non-structural BMPs are required by the District's erosion control regulations. Erosion control plans require specific descriptions of erosion control measures, and implementation of control measures for any erosion identified prior to and concurrent with construction activities. Maintenance of all erosion control measures pursuant to an approved plan is the applicant's responsibility.

C. Procedures for Identifying Priorities for Inspecting Sites and Enforcement Actions

The District inspects all construction project sites for implementation of erosion control BMPs within the District's service area. Additionally, WES is an Agent of DEQ in the issuance and administration of NPDES 1200C permits for developments disturbing areas one acre or larger throughout unincorporated Clackamas County and, by agreement, within the Oak Lodge Sanitary District and the cities of Gladstone and Rivergrove. District staff inspects construction sites a minimum of twice during construction to verify proper implementation of required BMPs. Additional inspections are performed as necessary. Appendix B shows all known sites with 1200C permits in and around the District.

Priorities for inspection are based on site-specific characteristics (i.e., watershed, grade, percent of soil cover to be removed, construction practices, season, and proximity to sensitive areas.)

The District monitors compliance with the erosion control regulations and has the authority to issue deficiency notices, charge re-inspection fees, issue fines and stop land-disturbing development work at the site until provisions of the Regulation are met.

Recordkeeping:

Records of activities are maintained on file at WES. Erosion control plans are filed as well as inspection reports that describe non-compliance and enforcement actions.

D. Educational and Training Measures for Construction Site Operators

The *Erosion Prevention and Sediment Control Planning and Design Manual* (December 2000) was developed in coordination with the City of West Linn and Clean Water Services. It is available for contractors, citizens, or others involved with construction activities within the permit area. The handbook is in the process of being updated in cooperation with other jurisdictions in the Portland metro area, with Spring 2006 as the target date for completion.

The District provides information to contractors during the permit review process, including pre-construction review meetings. District staff meets with developers and contractors to discuss requirements and to visit sites to review specific requirements.

The District has initiated a voluntary certification program for erosion control through Clackamas Community College. The certification process and procedure are coordinated with other jurisdictions in Clackamas County.

In 2001, the District partnered with regional jurisdictions, the Oregon Association of General Contractors, the Homebuilders Association of Metropolitan Portland and vendors of erosion control products to create and promote the Annual Regional Erosion

Prevention Awards Program. Developed to provide recognition for contractors and developers with outstanding achievements in exceeding local erosion control requirements, the program provides recipients with media recognition, peer recognition and prizes donated by vendors of erosion prevention and sediment control products and services. The Annual Regional Erosion Prevention Awards Program provides the development community with incentives to seek education regarding erosion prevention BMPs, improve BMP selection and installation and to better monitor and maintain the BMPs used in their projects. Additional benefits of the program are to provide education for jurisdiction's inspection staff, help standardize erosion prevention requirements and reduce noncompliance with erosion control requirements. As of 2005, participants include over 25 jurisdictions in 5 counties in Oregon and southern Washington.

Measurable performance indicators for all of Section 4.8:

- Annual number of permitted, active construction projects
- Annual number of erosion control inspections
- Annual number of enforcement actions

4.9 TMDLs [Schedule D(2)(d)]

Introduction

Section 303(d) of the Clean Water Act (CWA) requires that a list of waterbodies be developed that are impaired or threatened and not meeting water quality standards or criteria. In Oregon, the Department of Environmental Quality is responsible for this work. Section 303(d) also requires that the state establish a Total Maximum Daily Loads (TMDLs) for any waterbody designated as water quality limited and when controls are not sufficient to bring them into compliance. TMDLs are written plans and analyses established to ensure that waterbodies will attain and maintain water quality standards. The TMDLs are designed to result in the water body meeting the water quality standards or criteria.

In 1998, TMDL requirements were established in the Tualatin Basin for ammonia and total phosphorus. In 2001, the United States Environmental Protection Agency (USEPA) approved the *Tualatin Subbasin Total Maximum Daily Load Report*, which established waste load allocations (WLAs) for urban stormwater and wastewater facilities in the Tualatin River Subbasin. The TMDLs included compliance requirements for SWMACC's MS4 area: total phosphorus, bacteria, and oxygen-demanding pollutants.

Purpose

The National Pollutant Discharge Elimination System (NPDES) stormwater discharge permit requires an analysis of current loadings of the TMDL pollutants compared to WLAs, and where necessary to provide an estimate of a benchmark (or target) for reduction of that pollutant loading.

According to the language in the MS4 permit, *it is the intent of schedule D (2)(d) to ensure that, if discharges from the MS4 in SWMACC contain pollutants for which a Tualatin Subbasin TMDL wasteload allocation (WLA) has been issued, the levels of those pollutants shall be reduced to the maximum extent practicable. A WLA is the amount of a pollutant that a point source, such as a MS4, can contribute to the receiving water's loading capacity. It is also the intent of schedule D (2)(d) to ensure that adequate progress toward achieving assigned WLAs will be demonstrated through the implementation of best management practices (BMPs) that are targeted at TMDL related pollutants.*

Progress towards reducing TMDL pollutant loads must be evaluated through the use of performance measures and pollutant load reduction benchmarks developed and listed in the Storm Water Management Plan (SWMP). Performance measures and benchmarks are defined in schedule D(2)(d) as follows:

Performance Measures

Performance measures are estimates of the effectiveness of various best management practices (BMPs) implemented by the co-permittee as per the SWMP; and they are not numeric effluent limits. Performance measures must, where appropriate, be pollutant reduction estimates.

Benchmarks

A benchmark is a total pollutant load reduction estimate for each parameter or surrogate, where applicable, for which a WLA is established at the time of permit issuance. A benchmark is used to measure the overall effectiveness of the storm water management plan in making progress toward the wasteload allocation (this estimate will be related to the statistical variability of the underlying data and may be stated as a range), and is intended to be a tool for guiding adaptive management activities. A benchmark is not a numeric effluent limit; rather it is a goal that is subject to the maximum extent practicable standard. The rationale for the proposed benchmark is required, including an explanation of the relationship between the benchmarks and the TMDL wasteload allocations. Any limiting factors related to the development of a benchmark, such as data availability and data quality, must also be included in the rationale.

Schedule D(2)(d) of the MS4 permit also states that *if, at the time of permit issuance, TMDL wasteload allocations have been established for pollutant parameters associated with the MS4's discharges, each co-permittee must, as appropriate, review their SWMP to determine its adequacy in reducing TMDL pollutant discharges to the maximum extent practicable and develop pollutant load reduction benchmark(s) and performance measures in the SWMP. As part of the SWMP review and benchmark and performance measure development process, the following must be documented and reported:*

(A) A description of the methodology and rationale used to develop and select pollutant reduction benchmarks and performance measures. The methodology must address current estimated discharge loadings and TMDL wasteload allocations.

(B) Any proposed modifications to the SWMP resulting from the adaptive management process [Schedule D(2)(a)] necessary to give reasonable assurance that the SWMP is designed to reduce TMDL pollutants to the maximum extent practicable. This must include selection of BMPs and any assumptions related to the proposed BMPs.

(C) Any proposed modifications to the monitoring component of the SWMP that are necessary to ensure adequate data and information are collected to assess SWMP implementation, BMP effectiveness, progress towards the pollutant load reduction benchmarks, discharge characterization, and impacts on receiving waters.

(D) A description of the public participation process, including a summary of material public comments and the responses to those comments.

To ensure that all these elements are addressed in this SWMP, the balance of this document is divided into sections A through D as referenced and noted above.

A. Methodology and Rationale Used to Develop Benchmarks

As was stated previously, a benchmark is defined as a pollutant load reduction estimate. For the pollutants that are associated with discharges from the MS4 in SWMACC for which WLAs have been established, the difference between the pollutant loads occurring without BMPs and the reduced pollutant loads as a result of BMPs in place is considered the premise behind the methodology used to develop benchmarks. For this SWMP, SWMACC has chosen not to develop benchmarks at this time for the very insignificant drainage areas that apply for the following reasons:

- 1) No current stormwater runoff sampling data exists for the applicable drainage areas.
- 2) The applicable areas are insignificant ranging from a few hundred lineal feet of roadway drainage in the Carter Creek subbasin to generally less than approximately 15 acres for four out of five stormwater outfall drainages located in the River Grove area (see Applicability discussion below and Figures 1 and 2 for stormwater outfall characteristics).
- 3) Pollutant reduction strategies and TMDL implementation and compliance activities will be coordinated (as necessary) via partnerships/agreements (if needed) through other local jurisdictional co-permittees and their TMDL implementation programs and activities.

- 4) Adequate Resources. The necessary funding is not available to address these WLA issues within this very minimal and applicable MS4 area (see Applicability section below) due to a perceived lack of public support for rate increases. Additionally, other enhancements would require resources beyond those currently available and there is a need to weigh the costs and benefits of additional water quality protections against other overall SWMACC needs and priorities in the lower Tualatin.

SWMACC will however, assess TMDL WLA compliance by monitoring the MS4 applicable stormwater outfalls (see SVS Benchmarks – Future discussion below). Additionally, these MS4 applicable TMDL areas and any ongoing adaptive management activities will be implemented via the TMDL Implementation Plan for the overall lower Tualatin and tributary drainages within SWMACC. This plan drafted in 2003 includes management measures to address the following potential sources of TMDL pollutants:

- Bacteria: septic systems; small farms; illegal dumping; and county roadside ditches.
- Total Phosphorus and Total Suspended Solids: soil erosion, and source analyses.
- Temperature: Shade (tree canopy).

It can be noted that very small drainages without ‘typical’ urban stormwater infrastructure and associated minimal flows and insignificant pollutant loadings - taken individually by subbasin, may not seem significant within a larger context of the overall Tualatin watershed. Taken or summed as a whole however, the cumulative loading impacts can be detrimental to any basin, and overall pollutant reductions are therefore important and necessary. To that end, SWMACC will pursue the following methodology and assessment to meet the TMDL wasteload allocations (if monitoring documents that WLAs are not currently being met) in the applicable and very minimal portions of the MS4.

Applicability

The Department of Environmental Quality’s (DEQ) January 2001 Tualatin Subbasin Total Maximum Daily Load (TMDL) document is addressed by schedule D(2)(d) of the Surface Water Management Agency of Clackamas County’s (SWMACC) MS4 permit. The requirements of that section of the MS4 permit apply to discharges from the MS4 in SWMACC, a service district which includes that portion of the Tualatin River watershed that is within Clackamas County, but is beyond the city limits of Tualatin, Lake Oswego, and West Linn. The city of Rivergrove is within SWMACC. Water Environment Services, a department of Clackamas County, administers SWMACC’s surface/stormwater quality protection-based programs.

Approximately 10,300 acres of the Tualatin River's 712 square mile watershed is within SWMACC, including the lowest 7¾ miles of the River's mainstem. Some of the lands within SWMACC are regulated by the MS4 permit, **but most of the lands are not**. The lands within SWMACC that are regulated by the MS4 permit fall into two general categories:

- Urban lands. The urbanized portion of SWMACC. Most of this land is in SWMACC's Rivergrove and Lake Grove subunits (see attached maps in TMDL Appendix). There are six known, Clackamas County-owned or City of Rivergrove-owned storm sewer outfalls in this portion of SWMACC. One outfall is located in the Carter Creek/Fanno Creek subbasin; and the other five are in the Rivergrove area and discharge directly or 'indirectly' to the Tualatin River. For more information on stormwater outfall descriptions, see Figures 1 and 2.

Although there are about 706 acres in the urbanized portion of SWMACC, **most lands in this portion of SWMACC do not drain into the MS4**. Drainage in the non-MS4 areas is provided by about 53 County and SWMACC-owned drywells (stormwater injection devices), by privately owned stormwater injection devices, by infiltration, and by privately owned pipes that discharge directly to the Tualatin River or Carter Creek, a Fanno Creek tributary. **None of these other stormwater discharge methods are regulated by the MS4 permit.**

- Rural lands. About 117 acres of rural, MS4-permitted land is in SWMACC at this time. About 114 acres (approximately 97 %) of this land is zoned either RRFF-5, R-20, or FU-10. These rural lands were subjected to an unusual MS4 permit requirement; the Portland metropolitan area's urban growth boundary (UGB) is the border for the area that is regulated by the MS4 permit in Clackamas County. **About 9,500 other rural acres in SWMACC are not within the UGB and are not regulated by the MS4 permit; these rural lands are not addressed in this SWMP.** The August 7, 2003 TMDL Implementation Plan guides the implementation of the surface/stormwater quality management program on SWMACC's rural, non-MS4-permitted lands.

For more detailed information about which lands are incorporated, unincorporated urban, rural MS4, and rural non-MS4, please see the attached maps in Appendices A and B and in Figures 1 and 2.

TMDL Pollutants

The TMDL pollutants that are associated with discharges from the MS4 in SWMACC for which WLAs have been established are:

1. Total Suspended Solids (TSS). This is a surrogate for "settleable volatile solids", which is itself a surrogate for Dissolved Oxygen
2. Total Phosphorus (TP); and
3. E. coli bacteria (E. coli).

TMDLs can be expressed in the form of mass per time, toxicity, or other appropriate measure that relates to a state's water quality criteria or standard. Stormwater runoff and its resultant pollutant concentrations can be utilized to assist in the analysis and assessment of monitoring data to provide targets for runoff quality. Pollutant loads, on the other hand, can be much more valuable in terms of guiding management strategies that are designed to reduce the quantity and/or improve the quality of stormwater runoff in a drainage basin.

These three pollutants are addressed separately in the remaining portion of this SWMP.

1. Settleable Volatile Solids (SVS) and Total Suspended Solids (TSS)

SVS WLA: Background

As was noted above, TSS is the DEQ-approved surrogate for "settleable volatile solids" (SVS), which is itself a surrogate for Dissolved Oxygen. TSS is used as a surrogate, for there is no known, reliable, cost-effective way to measure the amount of SVS in water samples. The purpose of the WLA that has been issued to SWMACC is to reduce the discharge of materials from the MS4 that may settle onto the bottom of the Tualatin River or surface water bodies that are tributary to the Tualatin River. This WLA only applies during the following season: May 1st to October 31st. According to the DEQ's TMDL document:

- These volatile materials, after they've settled onto the bottom of the Tualatin River or surface water bodies that are tributary to the Tualatin River, will cause dissolved oxygen to be removed from the water column as they decompose.
- Decreasing the amount of SVS that is discharged will yield higher levels of dissolved oxygen in the Tualatin River and in the surface water bodies that are tributary to the Tualatin River.

SVS WLAs: Defined

It is important to note here that while about 18 acres of SWMACC are in the Fanno Creek watershed, no more than about 4.7 of these 18 acres are drained by the MS4 in SWMACC. All of the land in SWMACC which drains to the Fanno Creek watershed lies in the Carter Creek sub-watershed. The remaining lands that are in SWMACC's portion of the Fanno/Carter Creek watershed, at least 13.3 acres and probably more, are drained by: stormwater infiltration; stormwater injection; overland flow to Carter Creek; or to Carter Creek via privately owned storm sewer lines.

Two separate WLAs for SVS have been issued for discharges from the MS4 in SWMACC. The DEQ allows these WLAs to be met by reducing TSS levels, for there is no known, reliable, cost-effective way to measure the amount of SVS in water samples.

- One WLA applies to a single storm sewer line. This outfall directs drainage from a very small area around a portion of SW Bonita Road to Carter Creek. This storm sewer system's outfall is eight inches in diameter. Although the basin is approximately 4.7 acres, only a very small amount (approximately < 200 lineal feet) of mainly roadway drainage consisting of both pipe and ditch actually drains to this outfall (see Figures 1 and 2 for more details).

Fanno Creek is estimated to contribute 10 and 20 percent of the TSS loadings to the lower mainstem Tualatin River during summer and non-summer periods respectively. The WLA which pertains in this instance to discharges to Fanno Creek and its tributaries calls for a 50% reduction of SVS levels.

- The second WLA applies to discharges from the MS4-permitted area in SWMACC that outfall to the Tualatin River or to any other surface water body if it is tributary to the Tualatin River. This would include the five outfalls in the Rivergrove area (see Figures 1 and 2 for additional details).

This WLA calls for a 20% reduction of SVS levels.

Performance Measures

Performance measures are estimates of the effectiveness of various BMPs, and where appropriate, are meant to be pollutant reduction estimates. The following general category of BMPs can be utilized to reduce TSS concentrations/loads to the maximum extent practicable in the applicable MS4 drainage areas within SWMACC:

- Structural controls used to treat stormwater runoff including but not limited to ponds, swales, etc. (very limited feasibility due to nature of drainage in SWMACC);
- Operations and maintenance practices including but are not limited to sweeping of curbed streets and catchbasin cleaning;
- Erosion prevention and sediment control; and
- Public education and community outreach.

No estimates of effectiveness for these BMPs are provided here for this SWMP. If future planned monitoring reveals the WLA are not being met in these minimal and applicable drainage basins, than benchmarks will be established, pollutant source identification and reduction strategies will be implemented, and performance measures will then be developed.

SVS Benchmarks: Defined

The difference between the pollutant loads that have been estimated to be present if no BMPs had ever been implemented and the reduced pollutant loads that are estimated to be present with the implementation of current BMPs are SWMACC's premise for benchmark development. No benchmarks are developed for this SWMP as noted

earlier. If future planned monitoring reveals WLA are not being met, benchmarks will be developed.

SVS Benchmarks: Rationale

Rationale is not provided because benchmarks are not proposed with this SWMP. Data availability was found to be a limiting factor in determining the overall effectiveness of SWMACC's program, for as of February 2006, stormwater quality data from SWMACC's small MS4-permitted area has not yet been collected.

SWMACC does acknowledge the following three monitoring data sets that could have been utilized to develop benchmarks.

Data Set "1":

Seasonal storm sewer system loading and storm event mean pollutant concentrations were analyzed in a June 1996 report to DEQ from SWMACC and the other Clackamas County MS4 permit's co-permittees. Storm event sampling for this report was conducted from November 1992 to October 1994 in the Clackamas County MS4 permitted area. This data was later combined with data that was collected in the other five phase I MS4 communities in Oregon between 1990 and 1996, then was published in a June 1997 report from the Oregon Association of Clean Water Agencies (ACWA) titled "Analysis of Oregon Urban Runoff Water Quality". The residential land use-based median event mean concentration (EMC) data from this ACWA report is provided in Table 2.

Table 2: Land Use Based Median EMCs (from ACWA Data 1990-1996)

Land Use Category	E.coli* (mpn/100)	Total Phosphate as Phosphorus (mg/L)	Total Suspended Solids (mg/L)
Residential	1,800	0.21	38

* E. coli values were calculated using the following relationship: E. coli = 0.81 fecal coliform

Data Set "2":

Monthly baseflow samples were collected by SWMACC in Carter Creek near its mouth at one or two locations during 1997 to 2003. The purpose for monitoring this creek and these locations during this period was to assess and determine the impacts of a strip-mall parking lot and a dense commercial area along the creek. Monthly sampling of 13 basins (instream) in the lower Tualatin basin began in 1996 in an effort to determine a water quality baseline for SWMACC.

Data Set "3":

The quality of the stormwater runoff from seven storm events was monitored by WES during Spring and Fall in 2005. Each storm was monitored at up to 10 locations in Clackamas, near the City of Milwaukie, and in the Cities of Happy Valley and Damascus. This monitoring was conducted to support computer model development as

a product of the Surface Water Management Program Master Plan for Clackamas County Service District No. 1 (CCSD#1). Table 3 lists these data for a residential land use area.

Table 3: Stormwater Quality Data Collected at the Monitoring Site on SE Kingston Ave

Date	E.coli (mpn/100)	Total Phosphate as Phosphorus (mg/L)	Total Suspended Solids (mg/L)
02/04/2005	308	0.07	10
03/19/2005	236	0.21	43
03/26/2005	345	0.14	23
04/16/2005	387	0.06	20
05/15/2005	411	0.12	39
09/30/2005	291	0.62	17
11/05/2005	228	0.12	13
Median	308	0.12	20

None of these three data sets were utilized to establish benchmarks for the MS4 drainages in SWMACC that are applicable to the TMDL and this SWMP for the following reasons:

- a) The stormwater runoff data collected by ACWA (Data set 1) is historical (10-15 years old); and stormwater runoff data (Data set 3) was obtained in a different basin; and not within the Lower Tualatin SWMACC area, and therefore, may not be representative of stormwater infrastructure or conveyance, 'landscape conditions' or land use.
- b) Data collected in Carter Creek (Data set 2) was obtained monthly and consisted of instream baseflow sampling, which is not representative of current runoff conditions discharging from outfalls. Additionally, the sampling sites are representative of and characterized a mix of land uses (especially commercial).

SVS Benchmarks: Comparison to WLAs

No comparison is made at this time for this SWMP. If future planned monitoring indicates WLAs are not being met, benchmarks and performance measures will be developed and ongoing monitoring will assess compliance comparison to WLAs.

SVS Benchmarks Forecast:

If low dissolved oxygen levels continue to be documented in the Fanno Creek watershed or in other MS4 permitted portions of the Tualatin River watershed in the future, SWMACC will: 1) work in cooperation with upstream and downstream co-permittees to assess TMDL WLA; and 2) implement enhanced or additional BMPs and adaptive management techniques as appropriate.

SWMACC will perform the following adaptive management implementation activities to assess options and modify, if required, controls on applicable stormwater discharges.

An iterative process will be utilized to routinely assess whether applicable stormwater discharges in the MS4 are meeting WLAs or need improvement, review BMPs and other source control practices, and review available technologies and resources available and needed to improve water quality. SWMACC will take an adaptive management approach that is summarized in the SWMP as part of the MS4 permit.

- For the 2006-2007, 2007-2008, and 2008-2009 MS4 permit reporting periods, stormwater samples will be collected during three storms within each MS4 permit reporting period at: a) one urban outfall, and b) in one rural area with at least some lands that are within the urban growth boundary, and thus regulated by the MS4 permit.
- If weather conditions provide sufficient rainfall, at least one of these three storms per site will be during the Summer TMDL season (May 1st to October 31st). Monitoring parameters will include total phosphate as phosphorus, total suspended solids, flow, and E. coli. This monitoring work will allow for further definition of the stormwater concentrations/loads that are washing off of SWMACC's MS4-permitted urban and rural lands. Other water quality constituents are listed here to address the reference back to this section from other future benchmark discussions below (see Total Phosphorus and E.coli bacteria).
- For July 1, 2009 and forward, WES will review the monitoring work that has been conducted to date in SWMACC and, if appropriate, will propose modifications to the storm event monitoring sites, the storm event monitoring frequency, the seasonal storm targeting system, and the monitoring parameters.
- Dependent upon monitoring results, SWMACC will then enhance, if needed, the implementation frequency of an existing BMP (e.g., increased maintenance) or implement one or more new BMPs – to obtain further reductions in TSS for discharges from the MS4 in SWMACC. Existing BMPs that are likely to be effective in helping to reduce TSS levels in discharges from the MS4 in SWMACC include, but aren't limited to, operations and maintenance, the erosion prevention and sediment control program, and the public education and community outreach program. Please see the relevant sections of SWMACC's IER and SWMP for more detailed information about these and other BMPs that are being implemented at this time.

Land use in the urbanized, MS4-permitted portion of SWMACC is expected to change very little in the future. Nearly every taxlot in this area is already developed to the maximum extent that the land's zoning allows. In addition, a large percentage – and quite possibly all – of the unincorporated, urbanized, MS4-permitted lands in SWMACC are expected to be annexed into the City of Lake Oswego and subsequently withdrawn from SWMACC in the future. For annexed lands, discharges from the MS4 would no longer be regulated by SWMACC's MS4 permit, but they would be regulated by the city that the lands are annexed into. If all of SWMACC's unincorporated, urbanized lands

were to be annexed into the City of Lake Oswego, SWMACC's MS4-permitted acreage would likely be reduced to only those lands that are in the City of Rivergrove, greatly reducing future pollutant loads within and regulated by SWMACC.

As was mentioned previously, about 117 acres of rural, MS4-permitted land is also present within SWMACC at this time. In most instances, the only public storm sewers that are present on these rural, MS4 permitted lands are roadside ditches and culverts. Some of the rural lands that are within the Urban Growth Boundary (UGB) in SWMACC are not served by an MS4. Drainage in these areas either consists of or is provided by, privately owned drainage systems, sheet flow, and infiltration. The rural, MS4-permitted lands of SWMACC tend to be those which were recently brought in to the UGB, have not been developed in an urbanized manner yet, and have not been annexed to a city. Land use in the rural, MS4-permitted lands of SWMACC is expected to change markedly in the future, with annexation by West Linn, Lake Oswego and/or Tualatin.

If low dissolved oxygen levels are documented in any part of the Tualatin River watershed in the longer-term future, WES believes that an integrated, watershed-based approach to improve dissolved oxygen levels may also be needed. Key components of an integrated strategy for improving instream levels of dissolved oxygen in the watershed will also entail the following elements:

- Flow enhancement.
- Riparian vegetation restoration in rural residential, agricultural, and forested areas, in addition to urban areas.
- Reducing the amount of oxygen-consuming material that enters the Tualatin River and tributaries from all sources, including agricultural land, rural residential land, and privately owned stormwater pipes.

2. Phosphorus

Total Phosphorus WLA: Background

The purpose of the WLA is to reduce the discharge of phosphorus loadings from the MS4 in SWMACC due to phosphorus' ability to contribute to algal blooms. Historical algal blooms in the Tualatin River have led to exceedences of the State's instream chlorophyll a standard. Chlorophyll is the green pigments of plants. There are seven known types of chlorophyll. Chlorophyll a is one of the more common forms. Chlorophyll is the major light gathering pigment of all photosynthetic organisms and is essential for the process of photosynthesis. The amount of chlorophyll present in water depends on the amount of algae and is therefore used as a common indicator of water quality. Algal blooms and subsequent die-offs can also contribute to low instream dissolved oxygen concentrations and elevated pH levels. This WLA only applies during the summer season, which the DEQ defines as the period from May 1st to October 31st.

Total Phosphorus WLA: Defined

Two separate WLAs for total phosphorus have been issued for discharges from the MS4 in SWMACC.

- One WLA applies to a single storm sewer line. This outfall directs drainage from a portion of SW Bonita Road to Carter Creek. Carter Creek is a Fanno Creek tributary. This storm sewer system's outfall has a diameter of eight inches and the basin drained by this outfall is no larger than 4.7 acres. Out of the entire 4.7 acre drainage basin, only a couple hundred feet of mainly roadside ditch actually drains to this outfall. The WLA which pertains to discharges to Fanno Creek and its tributaries states that no more than 0.13 mg/L of total phosphorus shall be present (expressed as a summer median value).
- The second WLA applies to discharges from the MS4-permitted area in SWMACC that outfall to the Tualatin River and other tributaries. This WLA states that no more than 0.14 mg/L of total phosphorus shall be present (expressed as a summer median value).

In addition, the Tualatin River Subbasin TMDL document lists a summary of Total Phosphorus Allocations for runoff associated with the 5th - Field Subbasin for the Lower Tualatin/Fanno Creek. Load and wasteload allocations are highlighted for each designated management agency and include 0.8 pounds of TP per TMDL season (or 0.004 pounds of TP per day), and 37.4 pounds of TP per TMDL season (or 0.203 pounds of TP per day) respectively for Clackamas County.

Performance Measures

See SVS performance measures discussion above.

Total Phosphorus Benchmark: Defined

See SVS Benchmark definition discussed above.

Total Phosphorus Benchmark: Rationale

See SVS Benchmark rationale discussed above.

Total Phosphorus Benchmarks: Comparison to WLAs

See SVS Benchmarks compared to WLAs discussion above.

Total Phosphorus Benchmarks: The Future

See SVS Future Benchmark discussion above.

3. E. coli Bacteria

E. coli WLA: Background

The WLAs that were issued to SWMACC are intended to ensure that the presences of human-induced E. coli, a common bacterium, in discharges from the MS4 are kept at low or moderate densities. E. coli is recognized by DEQ as an indicator organism for all of the organisms in the coliform group that are commonly associated with fecal sources. High instream levels of bacteria limit the use of the Tualatin River and its tributaries for swimming and other forms of water contact recreation.

E. coli can originate from many sources, including but not limited to mammals, birds and waterfowl, pets, livestock, and human waste. Recent studies in the Puyallup River watershed in Washington State and in the Tualatin River Basin indicate that nearly all (> 90%) of the E. coli in urban stormwater does not originate from humans. Other historical studies in selected watersheds have suggested failing septic systems can be a significant contributor. Most of the Tualatin River watershed lies within Washington County. Clean Water Services' (CWS) recent study of the Tualatin River watershed showed that the following sources of E. coli were present in stormwater:

- Birds 51%
- Rodents 16%
- Dogs 13%
- Other wildlife 6%
- All other sources - including humans 14%.

For additional information on this CWS study, see *DNA Fingerprinting of Bacteria Sources in the Tualatin Subbasin* (2006).

E. coli WLA: Defined

The following two WLAs have been issued for discharges from the MS4 in SWMACC:

- The Summer Season WLA applies from May 1st to October 31st. During runoff events during this season in SWMACC, the WLA is set at no more than 12,000 counts/100 mL. During all other times during this season, the WLA is set at no more than 406 counts/100 mL.
- The Winter Season WLA applies from November 1st to April 31st. During runoff events during this season in SWMACC, the WLA is set at no more

than 5,000 counts/100 mL. During all other times during this season, the WLA is set at no more than 406 counts/100 mL.

Performance Measures

See SVS Performance measures discussion above.

E. coli Benchmark: Defined

See SVS Benchmark defined discussion above.

E. coli Benchmark: Rationale

See SVS Benchmark rationale discussion above.

E. coli Benchmarks: Comparison to WLAs

See SVS Benchmark comparison to WLAs discussion above.

E. coli Benchmarks: The Future

See SVS Future Benchmarks discussion above.

Other TMDL Parameters

It is also important to note here that although the MS4 in SWMACC has not been assigned a WLA for water temperature, a temperature LA has been issued that applies to riparian lands in urban and rural SWMACC. Stormwater and dry-weather discharges from the MS4 have been generally shown to possess low temperatures. Given that the temperature LA seeks and is designed to increase shade quantity and quality for surface water bodies, the temperature LA does not pertain to discharges from the MS4, and it is not addressed in this SWMP.

MS4 Outfall Characteristics and Maps

As noted previously, there are six outfalls in SWMACC's MS4 area that are applicable to the Tualatin Subbasin TMDL. This includes one in the Carter/Fanno Creek area of Lake Oswego, and five outfalls ranging in size from an estimated 12 to 18" in diameter in the Rivergrove area. The following generally describes the outfall characteristics. See Figures 1 and 2 for locations. Drywells are shown in dark blue, outfalls in pink.

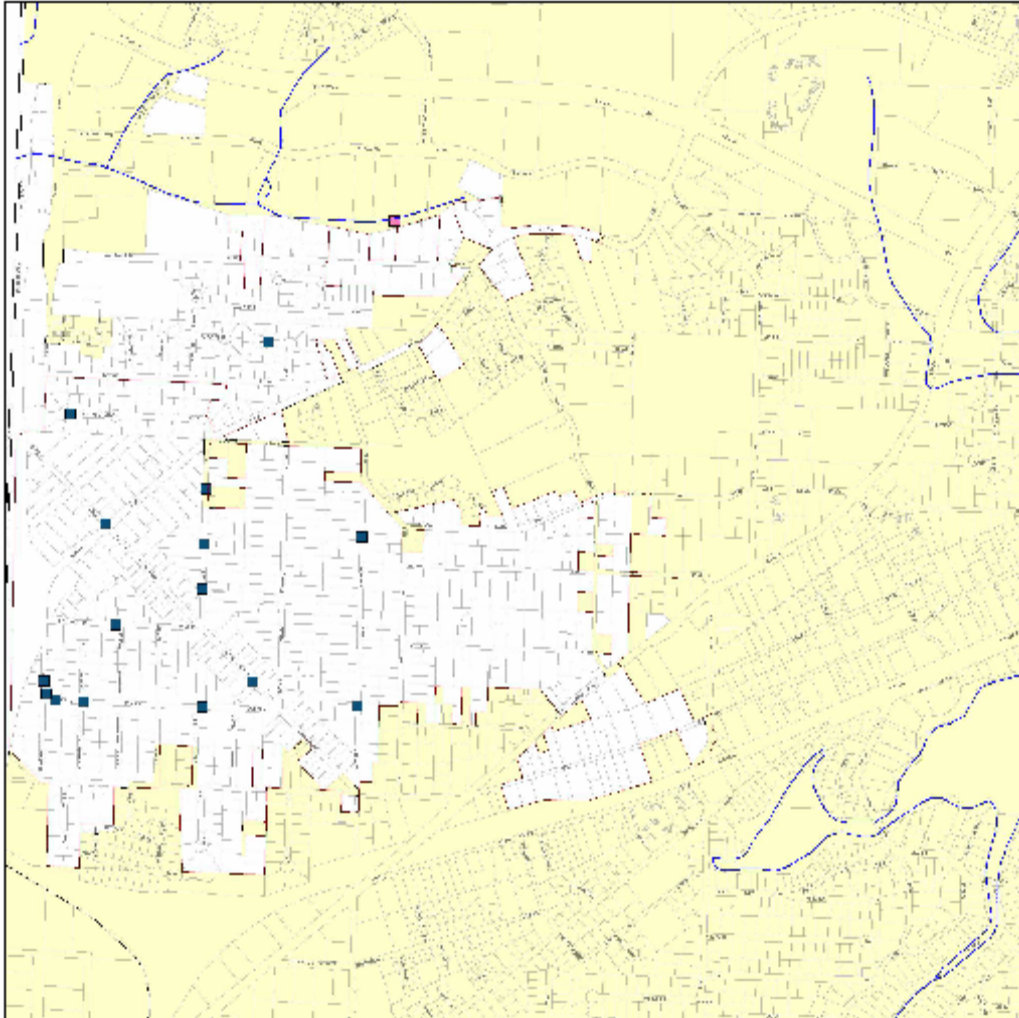


Figure 1. Carter/Fanno Creek Outfall and Drywells

Carter Creek/Fanno Creek Outfall

As noted earlier in the text, this 8" diameter outfall drains a very small roadside drainage area near 5431 SW Bonita Road. The 200-ft. of lineal roadway drainage is both piped and ditched. The pipe is open on the south side of SW Bonita Road and is piped through private property and discharges on the left bank of Carter Creek. There is good access to the pipe outlet at Carter Creek from the north side through a commercial development. There is potentially room at the inlet of the pipe on the south side of SW Bonita Road to install an appropriate BMP if needed (if monitoring data suggests WLA are not being met).

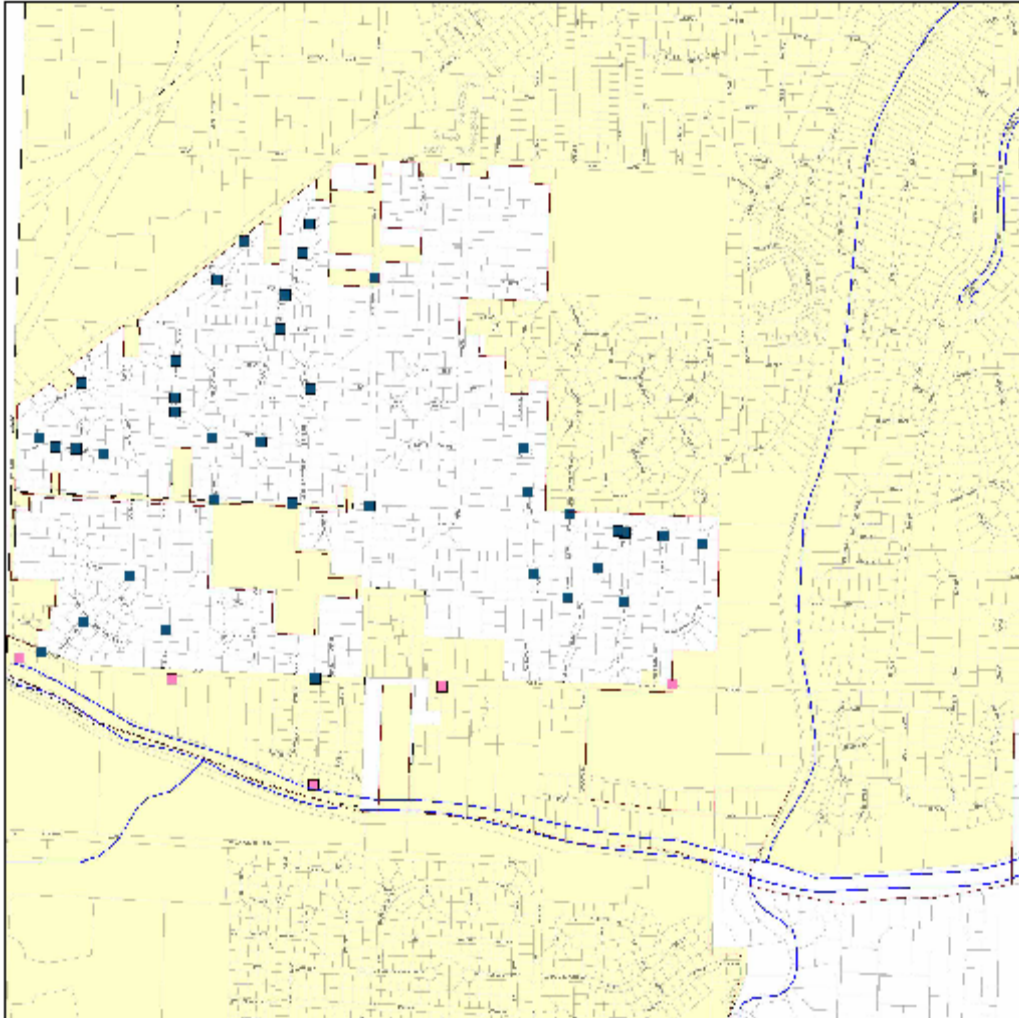


Figure 2. Rivergrove Outfalls and Drywells

Rivergrove Outfall 1 – 6280 SW Childs Road

This outfall is located on an empty private lot and drains residential neighborhoods and roadside drainage consisting mainly of pipe. The outfall is preceded by several large catchbasins and has good access. The outfall discharges to a drainage swale that is mainly composed of ivy and biobags. This swale could be retrofitted or enhanced to improve water quality if needed (if monitoring data suggests WLA are not being met).

Rivergrove Outfall 2 – 5910 SW Childs Road

This outfall is located on private property and drains residential neighborhoods and roadside drainage. There is good access to the outfall which daylights and becomes overland flow. There is room at the outlet of the outfall to install additional BMPs if necessary (if monitoring data suggests WLA are not being met) with approval from the landowner.

Rivergrove Outfall 3 – 5638 SW Dogwood Drive

This outfall was constructed beneath a day use boat ramp adjacent to 5638 SW Dogwood Drive. A catchbasin inlet to this outfall is located on Dogwood Drive. The outfall pipe is located below normal Tualatin River water surface elevations.

Rivergrove Outfall 4 – 5255 SW Childs Road

This outfall is located between a private residence and a large unfinished development – Whispering Oaks. The drainage basin consists of residential neighborhoods and roadside drainage consisting of both pipe and ditch. There is good access to the outfall. The outfall discharges to a natural biofilter drainageway. There is room to install additional BMPs or enhance the biofilter if needed (if monitoring data suggests WLA are not being met). This outfall discharges down through this unfinished development and enters wetland drainages prior to discharging to the Tualatin River.

Rivergrove Outfall 5 – near 19220 SW Indian Springs Road

This outfall is located near the corner of SW Indian Springs Road and Childs Road. This outfall drains residential neighborhoods and roadside drainage consisting of both pipe and ditch. This outfall has good access and discharges to a series of wetland complexes. The drainage continues to flow east towards the Lake Oswego Corporation's main canal and either discharges to this or flows south and enters additional wetland complexes before discharging to the Tualatin River.

B. Proposed Modifications to the SWMP

Proposed modifications to the SWMP that have resulted from BMP implementation activities are sufficient to currently reduce the discharge of pollutants. Over time, through an iterative process of adaptive management, these will provide reasonable assurance that the SWMP in SWMACC's MS4 permit area will reduce TMDL pollutants to the maximum extent practicable. The proposed modifications to the SWMP are listed separately in earlier sections of this document.

C. Proposed Modifications to the Monitoring Component of the SWMP

The proposed modifications to the monitoring component of the SWMP will ensure that:

- 1) Adequate data and information are collected to assess SWMP implementation;
- 2) BMP effectiveness is evaluated;
- 3) Progress towards the pollutant load reduction benchmarks are assessed; and
- 4) Discharge characterization is evaluated, and impacts on receiving waters are determined.

For more information on the monitoring component of the SWMP, please see the Surface/Stormwater Monitoring Plan for SWMACC in Appendix C.

D. A DESCRIPTION OF THE PUBLIC PARTICIPATION PROCESS

A description of the public participation process, including a summary of public comments and responses to those comments, is provided in Appendix F of the IER.

4.10 303(d) Parameters [Schedule D(2)(e)]

This section is not applicable, since TMDLs have already been established for the Tualatin River basin.

4.11 Public Involvement [Schedule D(2)(f); Replaces 2000 SWMP Section 4.2.6]

Introduction

A variety of communications strategies are implemented each year to increase citizen awareness of programs and services provided by the District, strengthen the department's identity within the community, and expand information-sharing efforts.

Throughout the year, the District creates awareness in both the public and the business sectors about the impact of stormwater pollution on the health of the region's rivers and streams. Awareness messages and involvement activities have been designed to educate area residents, students, and businesses about their personal link to water quality and healthy salmon runs. The goal through these social marketing activities and events is to build public awareness, foster understanding, and change daily behavior or business practices to help improve stormwater quality, which will ultimately affect the health of our rivers.

Through citizen and stakeholder involvement, business workshops and public education programs, the District continues to successfully engage the public and other jurisdictions in decision-making. The District continues to seek out opportunities to maintain an ongoing dialogue with customers, the public, and other utilities, businesses, and students in the region.

District Public Awareness Activities

Publications

The District continues to add and modify publications on natural gardening, groundwater protection, and surface water to its "Request for Publications" page on the Community Outreach website and to its information kiosk in the administration office.

Bill Inserts

Bill inserts or the appropriate service district newsletter is mailed with the customer's account statement. Recent bill inserts have included promotions such as the all-natural lawn care kit from the Regional Coalition for Clean Rivers and Streams.

District Customer Packets

Informative packets are sent to new customers or picked up at events. The District packet contains information on water quality and conservation tips, best management practices, as well as an insert reply card for those interested in tours, public speaking engagements and presentations.

Water Environment Services Website

Launched in 2003 for the purpose of posting all available information and data about the watersheds within Clackamas County, the site continues to grow with information and resources. The site includes, by watershed, links to watershed groups, education and outreach, events, research and data. Included are links to BMPs, permit requirements and information, Heritage Tree Program, Wildlife Habitat/Riparian Area incentive programs, and other resources. As a result of the 2004 Customer Values and Satisfaction Survey, the WES website will undergo a major revamp in 2006. The goal is to focus on information needs of users, improve ease of use and navigation, and improve and maintain a consistent District identity throughout the site.

News Releases and Media Coverage

The District continues to coordinate and enhance news sharing with the media, and increase citizen awareness and understanding of program issues. A variety of press releases are disseminated via the media listserv and interested parties listserv during the course of the year to inform citizens of public meetings, recruitment ads to serve on the surface water management citizens' advisory committee, volunteer opportunities for watershed restoration projects, and community outreach events.

Events and Volunteer Activities

The District sponsors and/or participates in events throughout the year that engage volunteers in activities and learning opportunities that help protect water quality, improve stream corridors and enhance wildlife habitat. Some of the major events are summarized below:

Adult & Youth Programs

The District continues to enhance its elementary school programs, which were developed and are presented by the Clackamas Community College's John Inskeep Environmental Learning Center and professional storyteller, Will Hornyak. In addition, the District supports community-wide adult and youth programs, including naturescaping workshops, watershed assistance programs, and high school scholarships.

Storm Drain Stenciling

The District provides this program to help reduce the improper disposal of pollutants from entering area streams. The program alerts individuals of the connection between streets and nearby waterways.

Intergovernmental Coordination

Clackamas County Hazardous Mitigation Committee

The District participates in countywide planning to address emergency management issues. This includes mapping of topography, floodplains, existing stormwater systems, and determining priorities for updating and creating FEMA maps.

Coordinating Council for Salmon and Steelhead Recovery

Provide Salmon Recovery Coordination on several levels, including in the recent past, a 10-county Lower Columbia ESU coordination effort, the Portland-area ESA Coordinators Meeting, and currently, internally at Clackamas County. The District serves as the County's department leads on the ESA and staff coordinates meetings for eight departments of the County.

Low Impact Development

Ongoing coordination with Clackamas County's Planning Division to allow development methods that reduce curbs and impervious areas. The District works closely with the Building, Engineering, and Planning Divisions of the County's Department of Transportation and Development to explore possible changes to development standards that would reduce surface water impacts.

Lower Tualatin Surface Water Management Citizens' Advisory Committee

The Lower Tualatin Citizens' Advisory Committee (LTCAC) meet quarterly to discuss surface and stormwater related items and provide input on projects they would like to see implemented in the SWMACC service area.

NPDES Clackamas County Co-Permittee Meetings

Establishes forum for discussion of Best Management Practices, coordination of the annual report, and stormwater issues of interest to each permittee.

Oregon Division of State Lands (DSL)

Staff schedules meetings as needed with the Oregon DSL to discuss coordination issues and specific projects.

Oregon Association of Clean Water Agencies (ACWA)

District staff serves on the Board of ACWA as the chair of the Finance Committee. Staff also attends regular meetings of the Groundwater, Stormwater and Public Education Committees.

Pollution Prevention Outreach (P2O) Team

Staff attends several Pollution Prevention Outreach (P2O) Team meetings during the year. The P2O Team is comprised of representatives from state and local government agencies in the greater Portland metropolitan area that works toward achieving a cleaner environment through cooperative efforts. Improving the water quality of discharges to and from storm sewer systems continues to be one of the P2O Team's highest priorities.

Regional Coalition for Clean Rivers and Streams

In response to shared needs to meet NPDES municipal stormwater permit requirements, the District joined with a number of other jurisdictions in 1994 to form the Regional Coalition for Clean Rivers and Streams to develop and implement a five-year coordinated pollution prevention awareness campaign. Members of the Regional Coalition of Clean Rivers and Streams (RCCRS) include the City of Portland, Clean Water Services, City of Gresham, and the Clean River Partners of Clackamas County (Milwaukie, Rivergrove, Gladstone, Happy Valley, Oak Lodge Sanitary District, Wilsonville, Lake Oswego, Oregon City and West Linn) to combine resources in developing an advertising campaign that addresses stormwater in the Metro area. Another 5-year agreement was signed with all participants in 2005.

Statewide Stormwater Summit

This event is sponsored by the Oregon Association of Clean Water Agencies (ACWA) to share water quality information between MS4 permit holders and among ACWA members.

Tualatin Designated Management Agencies Group

The District participates as a Designated Management Agency (DMA) in the Tualatin Watershed Group that meets to coordinate reports, responses, and implementation plans.

Tualatin River Public Awareness Committee

To comply with the DEQ regulations set by the Environmental Quality Commission in the Tualatin Subbasin Nonpoint Source Management Implementation Compliance Schedule and Order, the District is an active member of this public awareness committee. The group continues to develop materials and programs and increase activities that encourage individuals to protect water quality and endangered species in the Tualatin River Watershed.

Tualatin Riverkeepers

Staff works with the Tualatin Riverkeepers (TRK) by investigating "trouble ticket" complaints in SWMACC that were called in as possible water quality violations. The District is also a major sponsor at the yearly Discovery Day event in May.

Tualatin River Watershed Council

Staff serves as an alternate member of the Tualatin River Watershed Council.

Stop Oregon Litter & Vandalism (SOLV)

The District participates with Clean Water Services, City of Portland, and other parties to sponsor staff for SOLV to assist with volunteer projects for stream restoration work: TeamUp. In addition, the District staff works with SOLV to assist property owners with their projects.

USGS' Continuous Monitoring Stations

The District, in partnership with the cities of Gresham, Happy Valley, Milwaukie, Portland, Multnomah County and the U.S. Geological Survey, contributes funds towards the operation of five continuous monitoring stations in the Johnson Creek. Four stations provide real-time flow and temperature data while the fifth station provides only temperature data. In addition, two stations now provide continuous turbidity data.

Water Resources Policy Advisory Committee (WRPAC)

Staff provides membership and alternate membership to the Water Resources Policy Advisory Committee. The committee reviews issues related to improving water quality, preserving natural resources, buffer requirements, and sharing of environmentally relevant information around the region.

4.12 Monitoring Program [Schedule B(1)]

The District is currently evaluating a coordinated monitoring plan with many of the other MS4 phase 1 co-permittees. The evaluation is anticipated to be completed in the Spring of 2006. Final recommendations are not available at this time, but will be incorporated into the next annual report. If such an approach is deemed to be feasible by the interested co-permittees, then implementation would begin in July 2007. Until this evaluation process and resultant recommendations are completed, the District will continue to implement the monitoring plan included in Appendix C. A preliminary draft of the coordinated monitoring plan is also included, for informational purposes only.

The District has reviewed, and in some instances, updated its surface/stormwater monitoring plan to address the requirements in the MS4 permit, including but not limited to, the objectives in schedule B(1)(b). Updates that have been made include the addition of hardness as a monthly monitoring program parameter.

The revised surface/stormwater monitoring plan for the MS4-permitted areas in SWMACC:

- Meets the monitoring requirements that are within the current MS4 permit, issued July 27, 2005, and
- Allows the District to track the long-term progress of the SWMP towards achieving improvements in receiving water quality if improvements in receiving water quality are needed, and
- Explains how the proposed monitoring program fulfills each of the objectives in schedule B(1)(b), and

- Will yield information that can be used to support the adaptive management process that could lead to refinements of the SWMP.

4.13 Non-Stormwater Discharges [Schedule B(2)(b)(iii)]

The July 27, 2005 MS4 permit which was issued to SWMACC, The Cities of Rivergrove and Happy Valley, CCSD#1, and Clackamas County (hereafter referred to as “the co-permittees”) requires that an Interim Evaluation Report (IER) be submitted to the DEQ by May 1, 2006. One component of the IER is an identification of the “...appropriate control measures and the rationale for the selection of these BMPs, or the rationale for why BMPs are deemed not necessary” for each of the twenty-four (24) non-stormwater discharges that are listed in Schedule A(1)(3) of the permit if that discharge is expected to occur in a co-permittee’s area. According to Schedule A(1)(3) of the MS4 permit, the 24 non-stormwater discharges “...need not be addressed by the co-permittee’s illicit discharge program, provided appropriate BMPs, if needed, to minimize the impacts of such sources are developed under the SWMP...”. The 24 non-stormwater discharges are divided into the following ten (10) categories in this document:

1. Potable water sources

- water line flushing
- discharges from potable water sources
- start up flushing of groundwater wells
- aquifer storage and recovery (ASR) wells
- potable groundwater monitoring wells
- draining and flushing of municipal potable water storage reservoirs

2. Excess Irrigation flows

- landscape irrigation
- irrigation water
- lawn watering

3. Groundwater

- rising ground waters
- uncontaminated groundwater infiltration (i.e. infiltrating into the MS4)
- uncontaminated pumped ground water
- foundation drains
- springs
- water from crawl space pumps
- footing drains

4. Flows from surface water bodies

- diverted stream flows
- flows from riparian habitats and wetlands

5. Air conditioning condensate
6. Individual residential car washing
7. Dechlorinated swimming pool discharges
8. Street wash waters
9. Discharges of treated water from investigation, removal and remedial actions selected or approved by the Department pursuant to Oregon Revised Statute (ORS) Chapter 465, the state's environmental cleanup law
10. Discharges or flows from emergency fire fighting activities (where discharges or flows from fire fighting are identified as not a significant sources of pollutants to waters of the state).

The co-permittees currently allow, though often only with controls in place, the discharge of all 24 of these discharges to the co-permittees' MS4s. The 24 discharges will be addressed on a category-specific basis in the balance of this document.

Category 1: Flows from Potable Water Sources

This category's six discharge types are:

- water line flushing
- discharges from potable water sources
- start up flushing of groundwater wells
- aquifer storage and recovery wells
- potable groundwater monitoring wells
- draining and flushing of municipal potable water storage reservoirs

Do these discharge types occur in the co-permittees' MS4 area? Yes

The appropriate control measures which are applied: The Department of Environmental Quality's (DEQ) has already provided clear guidance on the appropriate control measures for this category of non-stormwater discharges. This guidance was provided in a document, dated May 19, 1997, titled "Management Practices for the Disposal of Chlorinated Water". The DEQ has also issued a Fact Sheet which addresses this same subject area. Titled "Management Practices for the Disposal of Chlorinated Water", the Fact Sheet was last updated on October 2, 2000. The Fact Sheet appears to contain similar or identical recommendations if compared to the May 1997 guidance.

The co-permittees have notified all of the public water districts that operate in the co-permittees' MS4 area that they expect the public water districts to fully implement this guidance at all times. Meetings were held where a photocopy of this guidance from DEQ, an informational letter from the District, and a copy of a map of the co-permittees'

MS4 were provided to one or more representatives from each public water district. Meetings or phone conversations were held with these districts on the following dates:

- Rivergrove Water District October 6, 1999
- Lake Grove Water District December 6, 2000 (phone conversation)

The rationale for the selection of these control measures (or the rationale for why control measures are deemed not necessary): The co-permittees believe that the DEQ's work in this area in 1996 and 1997, which culminated in the issuance of the May 1997 guidance titled "Management Practices for the Disposal of Chlorinated Water" and the issuance of the Fact Sheet titled "Management Practices for the Disposal of Chlorinated Water", last updated on October 2, 2000, constitute sufficient controls for releases of potable water into the co-permittees' MS4.

On a customer notification-driven or complaint-driven basis, the co-permittees will investigate – and if necessary, apply further controls to – any potable water discharges that are alleged to contain excessive pollutant levels. In these instances, the relevant co-permittee's Illicit Discharge Elimination Program will be mobilized to address the discharge. Flows which may not possess the required water quality will be investigated, and if necessary, controlled until the quality of the water improves to the appropriate level. Access to the MS4 will be denied to flows that do not achieve the appropriate water quality level.

Category 2: Excess Irrigation Flows

This category's three discharge types are:

- landscape irrigation
- irrigation water
- lawn watering

Do these discharge types occur in the co-permittees' MS4 area? Yes

The appropriate control measures which are applied: The appropriate control measures which are applied by the co-permittees are housed within the co-permittees' respective public involvement programs. Through these programs, dischargers of excess irrigation flows are encouraged to:

- Control their irrigation volume, timing and rate to conserve water, a precious resource, while providing the maximum benefit to the plants being watered. Ideally, dischargers would apply their controls in such a manner where they would cease to contribute any irrigation-related flows to the MS4. This message is also provided by most or all of the public water districts that operate in the co-permittees' service areas.
- Install "naturescaped" landscaping. Naturescaped spaces frequently utilize native, drought-tolerant, and disease-tolerant plants, reducing the need for water, as well as herbicides, insecticides, and fertilizer.

- Minimize or avoid the use of herbicides, insecticides, and fertilizer, which if implemented by tenants and property/business owners, will improve the quality of the water if excess irrigation flows are discharged into the MS4.

On a customer notification-driven or complaint-driven basis, the co-permittees will investigate – and if necessary, apply further controls to – any excess irrigation flows that are alleged to contain excessive pollutant levels. In these instances, the relevant co-permittee’s Illicit Discharge Elimination Program will be mobilized to address the discharge. For irrigation waters that were piped to the irrigation site as potable water from a public water supplier, chlorine may continue to be present in any excess irrigation flows that are discharged to the MS4. In these instances, the discharger will be expected to adhere to the potable water guidance and fact sheet from DEQ (see Nonstormwater Discharges Category 1).

The rationale for the selection of these control measures (or the rationale for why control measures are deemed not necessary): The quality of excess irrigation flows from urban lands is generally understood to be of good or high quality. Flows which may not possess the required water quality that are referred to the District via customer complaint and/or notification will be investigated, and if necessary, controlled until the quality of the water improves to the appropriate level. Access to the MS4 will be denied to excess irrigation flows that do not achieve the appropriate water quality level.

Category 3: Groundwater-Based Flows

This category’s seven discharge types are:

- rising ground waters
- uncontaminated groundwater infiltration (i.e. infiltrating into the MS4)
- uncontaminated pumped ground water
- foundation drains
- springs
- water from crawl space pumps
- footing drains

Do these discharge types occur in the co-permittees’ MS4 area? Yes

The appropriate control measures which are applied: None, unless the quality of the groundwater-based flow is suspected of being, is known to be, or is reasonably likely to become contaminated. If the quality of the groundwater-based flow is suspected of being, is known to be, or is reasonably likely to become contaminated, the relevant co-permittee’s Illicit Discharge Elimination Program (IDEP) will be mobilized to address the discharge. In nearly all of the instances where the IDEP is mobilized for a nonstormwater discharge within category 4, the flow type is expected to be uncontaminated pumped groundwater. The IDEP will ensure that if the pumped groundwater is discharged to the MS4, it will be uncontaminated by the time it enters the MS4. Contaminated pumped groundwater is not – and will not be – allowed to be

discharged to the co-permittees' MS4 unless an NPDES permit has been obtained by the discharger.

The rationale for the selection of these control measures (or the rationale for why control measures are deemed not necessary): The quality of groundwater discharged or infiltrated into the MS4 is generally understood to be of good or high quality. Flows which may not possess the required water quality that are referred to the District via customer complaint and/or notification will be investigated, and if necessary, controlled until the quality of the water improves to the appropriate level. Access to the MS4 will be denied to groundwater-based flows that do not achieve the appropriate water quality level.

Category 4: Flows from Surface Water Bodies

This category's two discharge types are:

- diverted stream flows
- flows from riparian habitats and wetlands

Do these discharge types occur in the co-permittees' MS4 area? Yes

The appropriate control measures which are applied: None.

The rationale for the selection of these control measures (or the rationale for why control measures are deemed not necessary): The quality of the water in the surface water bodies that lie within or flow through the co-permittees' service areas is generally very good. The co-permittees implement an extensive surface water monitoring program, and surface water quality generally ranges from satisfactory to good. In addition, one co-permittee, CCSD#1, has a substantial set of data on diverted stream flow quality in the SE 106th Avenue storm sewer basin. This diverted stream flow's water quality is generally good.

Category 5: Air Conditioning Condensate

This category's single discharge type is:

- Air conditioning condensate

Does this discharge type occur in the co-permittees' MS4 area? Yes

The appropriate control measures which are applied: None

The rationale for the selection of these control measures (or the rationale for why control measures are deemed not necessary): No adverse effects have been noted or observed by the co-permittees. The co-permittees are not aware of any adverse effects that have been noted or observed by others. Air conditioning condensate is

comprised of water that had been condensed from atmospheric water vapor onto the surface of the air conditioning unit, so the only pollutants that could reasonably be expected to be present in air conditioning condensate are those that came from the surrounding air – in trace quantities – along with the water molecules.

Category 6: Individual Residential Car Washing

This category's single discharge type is:

- Individual residential car washing

Does this discharge type occur in the co-permittees' MS4 area? Yes

The appropriate control measures which are applied: The appropriate control measures which are applied by the co-permittees are largely housed within the co-permittees' respective public involvement programs. Through these programs, citizens who engage in individual residential car washing are:

- First, encouraged to consider washing with mild, readily degradable soap on a porous surface (i.e. lawn, loose gravel) in an area with deep groundwater so that the washing-related wastewater fully soaks into – and is treated by – the earth without posing any threat to groundwater quality, and
- Second, if they cannot or will not wash on (or upgradient of) a porous surface, they're encouraged to consider having their vehicle washed at a commercial car washing facility. These facilities usually discharge treated wastewater to public sanitary sewer systems, eliminating any possible adverse impact to storm sewers, surface waters, or groundwater, and
- Lastly, if the wastewater is to be discharged to the MS4 they're asked to:
 - a) Wash only on an infrequent basis, if possible, and
 - b) To wash exteriors only (no undercarriages, transmissions, or engines), and
 - c) Use only mild, readily degradable soap, and
 - d) Use the minimum amount of soap possible during washing, and
 - e) Pour any excess quantities of soapy waters (in the wash bucket, for example) into their home's sink or toilet after they're done washing the vehicle.

On a customer notification-driven and/or complaint-driven basis, the co-permittees will investigate – and if necessary, apply further controls to – any individual residential car washing-related wastewaters that are alleged to contain excessive pollutant levels. In these instances, the relevant co-permittee's Illicit Discharge Elimination Program will be mobilized to address the discharge.

The rationale for the selection of these control measures (or the rationale for why control measures are deemed not necessary): Wastewaters generated by individual residential car washing that are discharged to the MS4 are expected to usually:

- Be discharged infrequently from any single source, and
- Be from the washing of exteriors only (no undercarriages, transmissions, or engines), and

- Not be discharged from a large number of locations in any given storm sewer basin on any given day, and
- Contain a small discharge volume, and
- Contain only mild, readily degradable soap, and
- Contain only modest levels of pollution that in many instances is treated by a downgradient storm sewer system structure (i.e. vegetated stormwater pond).

Category 7: Dechlorinated Swimming Pool Discharges

This category's single discharge type is:

- Dechlorinated swimming pool discharges

Does this discharge type occur in the co-permittees' MS4 area? Yes

The appropriate control measures which are applied: The appropriate control measures which are applied by the co-permittees are largely housed within the co-permittees' respective public involvement programs. Through these programs, citizens who wish to discharge waters from pools or hot tubs are:

- First, encouraged to consider discharging the wastewater to a public sanitary sewer line or septic system, if possible.
- Second, if they cannot or will not discharge to a public sanitary sewer line or septic system, they're encouraged to consider discharging to land or vegetation in a manner where 100% of the water infiltrates, evaporates, and/or transpires without causing a nuisance condition. If this option is selected, if the land to be watered is not owned by the discharger, the property owner's permission must first be obtained, and
- Lastly, if the wastewater is to be discharged to the MS4, the citizen is notified that the pool/spa water must be checked with a test kit and verified to have no detectable level of disinfectant – or a significant level of any other pollutant, such as chlorophyll from an algae bloom – prior to discharge. Spas that are disinfected with silver may not be discharged to the MS4 or to a co-permittee-owned/operated drywell.

The rationale for the selection of these control measures (or the rationale for why control measures are deemed not necessary): The controls which are utilized by the co-permittees are identical to those which are found within a DEQ fact sheet titled "Disposal of Chlorinated Water from Swimming Pools and Hot Tubs". Although this fact sheet is not dated and has no writer's initials, it was on the DEQ's website on November 22, 2005. This DEQ fact sheet can be found at this address:

<http://www.deq.state.or.us/wq/wqfact/ChlorinatedWaterPools.pdf>

Category 8: Street Wash Waters

This category's single discharge type is:

- Street wash waters

Does this discharge type occur in the co-permittees' MS4 area? Yes

The appropriate control measures which are applied: The co-permittees expect dischargers of street washing-related waters to their MS4 to adhere to the requirements which are contained within Schedule A(3)(a)(ii) of the DEQ's 1700A NPDES permit. This permit states the following: "The washing of roads, parking lots, sidewalks, and other paved surfaces is permitted (without needing to have a 1700A in the discharger's possession) provided (that) chemicals, soaps, detergents, steam, or heated water are not used, and surfaces are swept prior to washing." The 1700A permit which is currently in effect has been administratively extended; it was issued in March 1998 and expired in January 2003. In addition:

- On a customer notification-driven and/or complaint-driven basis, for sites where street washing is taking place that are not currently operating with a state or co-permittee-issued erosion control permit, the co-permittee's Illicit Discharge Elimination Program will investigate and apply further controls to any street washing-related wastewaters generated with: a) additives, or b) generated without a pre-wash sweep, or c) contain excessive levels of pollutants even if the washing was done with a pre-wash sweep and was generated without the use of additives.
- For sites that are currently operating with an erosion control permit (these are primarily limited to construction sites), the co-permittee's Erosion Control Program will ensure that additives are not used and that street surfaces are swept prior to washing. The Erosion Control Program will also ensure that additional pollution removal structures, such as filter sacks in catch basins, are deployed if deemed necessary. The Erosion Control Program will respond to any complaints and notifications that are received from the public. The Erosion Control Program will also investigate and apply further controls to any street washing-related wastewaters that contain excessive levels of pollutants even if the washing was done with a pre-wash sweep and was generated without the use of additives.

The rationale for the selection of these control measures (or the rationale for why control measures are deemed not necessary): The controls which are utilized by the co-permittees are identical to those which are found within the DEQ-issued 1700A NPDES permit, which regulates the discharge of street washwaters to surface water bodies.

Category 9: Discharges Pursuant to Oregon Revised Statute Chapter 465

This category's single discharge type is:

- Discharges of treated water from investigation, removal and remedial actions selected or approved by the Department pursuant to Oregon Revised Statute (ORS) Chapter 465, the state's environmental cleanup law

Does this discharge type occur in the co-permittees' MS4 area? Yes

The appropriate control measures which are applied: The DEQ actively regulates this type of discharge, and the co-permittees generally do not elect to apply any additional controls. Any given co-permittee may:

- Require that a proposed discharge of this type undergo advanced pre-treatment prior to discharge to the MS4, or
- State that the discharge is not allowed to enter the co-permittee's MS4. In the unusual instances where this type of discharge is not allowed to enter the co-permittee's MS4, CCSD#1's sanitary sewer system, if available in that geographic area, is generally offered as an alternative discharge option. If CCSD#1's sanitary sewer system is not available, but another public sanitary sewer system is (The City of Lake Oswego's system near SWMACC, for example), permission from that sanitary sewer provider to discharge to their system would need to be sought by the proposed discharger. If CCSD#1's sanitary sewer system is offered as an alternative discharge option by CCSD#1, all of the relevant regulations must be met and the appropriate discharge and connection fees must be paid.

The rationale for the selection of these control measures (or the rationale for why control measures are deemed not necessary): The controls are: a) for the flows to undergo advanced pre-treatment prior to discharge to the MS4, or b) to deny access to the co-permittee's MS4. If either of these controls were to be applied, the co-permittee would likely do so to protect one or more outstanding beneficial uses, such as a major public drinking water source or a significant run of native salmon or steelhead. Another instance where these controls may be applied could involve a proposed discharge containing significant quantities of a pollutant which, at the time of the discharge, while unregulated by DEQ, would be known to the co-permittee to be – or strongly suspected of being – harmful to aquatic life or to public health.

Category 10: Discharges or Flows from Emergency Fire Fighting Activities

This category's single discharge type is:

- Discharges or flows from emergency fire fighting activities where discharges or flows from fire fighting are identified as not significant sources of pollutants to waters of the state.

Does this discharge type occur in the co-permittees' MS4 area? Yes

The appropriate control measures which are applied: At this time, controls are only applied on a case-specific basis. Controls may include, but aren't limited to:

- If it is deemed to be safe to do so, fire department personnel may elect to use a smaller amount of water or foam while suppressing the fire during the final stage of fire suppression, minimizing the total volume of runoff generated, while not compromising their ability to protect public safety and health.
- Providing advanced pre-treatment to remove pollution from the flows: a) prior to entry to the MS4, or b) at the MS4 outfall and prior to the entry of the pollution into the environment. At this time, this control is only applied if fire department personnel or a co-permittee determines that the fire suppression flows contain excessive levels of pollution.
- Denial of access to the co-permittee's MS4. At this time, this control is only applied if fire department personnel or a co-permittee determines that the fire suppression flows contain excessive levels of pollution. In this instance, alternative discharge and/or disposal methods for the fire suppression flows may include, but aren't limited to:
 - a) land application (i.e. flows soak into ground)
 - b) evaporation (only works well when air and ground temperatures are relatively high)
 - c) irrigation
 - d) discharge to a public sanitary sewer system
 - e) transporting the wastewater offsite to a location where the flows can be processed and properly disposed of

The rationale for the selection of these control measures (or the rationale for why control measures are deemed not necessary): At this time, the co-permittees acknowledge that under certain circumstances, flows from fire suppression activities can be significant sources of pollutants to waters of the state. An example of this occurred on March 14, 2004 in the City of Portland, when a facility operated by Thermo Fluids caught fire. The resulting wastewater entered Johnson Creek, though apparently not through the City's MS4, killing about 2,600 fish and many other organisms.

As was stated previously, if it is deemed to be safe to do so, fire department personnel may elect to use a smaller amount of water or foam while fighting the fire during the final stage of fire suppression, minimizing the total volume of runoff that is generated. This practical approach to fire suppression flow management – which would lower the total load of pollutants that enter the MS4 – is already being implemented at certain incidents at this time, for it also saves water (and foam if it is being used on the incident).

The application of the other two controls – advanced treatment of the wastewater or denial of access to MS4 – is prohibitively expensive and impossible to implement in most instances, given the fact that:

- Fire departments in the co-permittees' service area do not appear to have the ability to access portable wastewater treatment systems that can be quickly and safely set up and operated at the scene of a fire, given their limited budgets.

These same fire departments' personnel do not have the training or the time to then operate a portable wastewater treatment system at or near the scene of the fire.

- Massive volumes of wastewater are generated during a typical fire suppression event and yards, streets, and other areas that are nearby and downgradient from a fire are rarely able to store any of the fire suppression flows. Baker-type tanks can be rented to store the wastewater, but fire departments in the co-permittees' service area do not appear to have the funds to be able to quickly mobilize many portable storage tanks. These same fire departments' personnel do not have the training or the time to then pump the fire suppression flow into tanks, to treat the flows from the tanks, and/or to drain the tanks and properly dispose of the wastewater.
- Vactor-type trucks can move some flows off-site, but they only hold small volumes (about 1,000 gallons) of wastewater, so a very large number of trips to an appropriate wastewater disposal point would be needed. It can take several hours (or possibly more than a day) just to get a vactor-type truck to the scene of a fire. Even if a vactor-type truck is available on short notice, the cost to operate the truck and to properly dispose of the wastewater is very high with this system.
- Fire suppression flows cannot be drained into a public sanitary sewer system on a "real time basis" (i.e. during the fire suppression activity), for the wastewater must be tested for the presence of various pollutants first. It can take several days for laboratory data to be made available, and as was already mentioned in this section, places to properly store significant volumes of fire suppression flows are rarely – if ever – present.

5. FUNDING, STAFF, AND EQUIPMENT [Replaces 2000 SWMP Section 4.5]

Funding

The Stormwater Management Program for SWMACC is funded through 2 primary sources: monthly stormwater utility fees and permit fees.

All SWMACC customers pay the monthly program fee of \$4 per Equivalent Service Unit (ESU) which is defined as one single family residence. In the July 2004 to June 2005 fiscal year, SWMACC collected approximately \$158,000 in program fees. Only a small portion of this revenue was collected within the MS4-permitted area.

Permit fees for stormwater and erosion control plan review and inspection are collected with every new development application. The current stormwater plan review fee is \$250 per subdivision and \$50 per single family residential building permit. The erosion control review and inspection fee is \$450 for the first acre, plus \$80 per additional acre for subdivisions, while new single family residences are charged a flat rate of \$300. In the July 2004 to June 2005 fiscal year, SWMACC collected approximately \$4600 in stormwater and erosion control permit fees.

Staff

In March 2004, WES implemented a department-wide reorganization to more effectively utilize staff and resources. The former Surface Water Management section was integrated with the other sections of WES (Planning and Engineering, Environmental Permitting and Laboratory Services, and Environmental Services.) The staffing levels listed below are dedicated to both CCSD#1 and SWMACC.

Environmental Services

Stormwater System Maintenance

- 0.2 FTE Program Manager
- 2.0 FTE Surface Water Technicians
- 1.0 FTE Collection System Technician
- 0.5 FTE Seasonal Employees
- Have also contracted with DTD for 1 FTE

Planning and Engineering Services

Planning, development review, capital projects, and erosion control.

- 0.2 FTE Program Manager
- 0.2 FTE Development Review Supervisor
- 1.0 FTE Administrative Support
- 0.5 FTE Senior Civil Engineer
- 0.5 FTE Civil Engineer
- 1.0 FTE Surface Water Technician
- 1.5 FTE Plan Reviewer
- 1.5 FTE Erosion Control Inspectors
- 0.5 FTE Single Family Plan Reviewer
- Additional staff through DTD for floodplain and miscellaneous land use issues.

Environmental Permitting and Laboratory Services

MS4 Permit compliance (Field Screening, Inspection of Illicit Connections, Management of Programs, Industrial Storm Water and Monitoring) within two service districts.

- 0.2 FTE Program Manager
- 0.6 FTE Surface Water Technician
- 0.2 FTE Sample Collection (through Compliance Services).
- 0.2 FTE Additional staff performs spill response, laboratory analysis on samples and continuous surface water monitoring

Public Involvement and Outreach

Development of brochures, public awareness materials, inter-jurisdictional coordination on public education, public meetings and workshops, etc.

- 0.6 FTE Community Relations Specialist
- 0.2 FTE Surface Water Technician

Environmental Policy Review and Implementation

- 1.0 FTE Environmental Policy Analyst

Equipment

Stormwater management activities require a range of equipment. This equipment is owned by the County Road department or by WES. Additional equipment is rented or contracted out. A partial list of equipment used for storm water management activities includes:

- Combination Vacuum/Hydrocleaner trucks
- Regenerative air sweepers
- 1/2 ton utility vehicles
- Dye testing and smoke testing equipment
- Sampling stations and sampling gear
- Volunteer stream restoration tool trailer

WES created specifications, purchased, and took delivery of an Aquatech® Series B-10 Combination Cleaner in the latter portion of the 2004-2005 reporting year. This will enhance WES' stormwater maintenance efforts and free DTD's combination cleaner to focus on roadway/transportation issues outside CCSD#1 and SWMACC.

APPENDIX A

Clackamas County MS4 Areas and Co-Permittees

APPENDIX B

SWMACC Service District

APPENDIX C

SWMACC Monitoring Plan