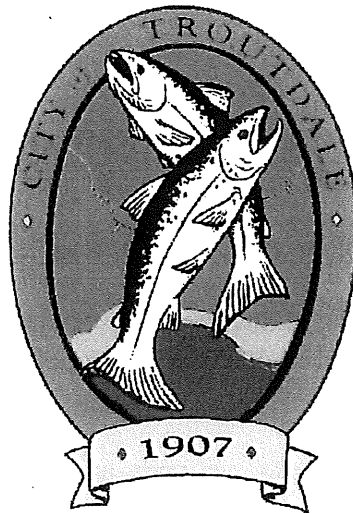


CITY OF TROUTDALE
Storm Water Management Plan
February 2004



STORM WATER MANAGEMENT PLAN

1. INTRODUCTION

1.1 City Demographics

The City of Troutdale covers approximately 5 square miles within the urban growth boundary of the Portland metropolitan area. The 2001 certified Census population figure for the City of Troutdale was 13,777. Land uses within the incorporated City limits of Troutdale are mixed and consist of residential, rural, commercial and industrial development.

1.2 Program Goals and Objectives

Goals

The goals of this management plan are to: 1) reduce the discharge of pollutants in storm water runoff to the maximum extent practicable (MEP); 2) protect and maintain the natural functions and values of the area's surface water, ground water, and natural resources; and, 3) protect, enhance and promote watershed health in the community. Development of this management plan involves a comprehensive planning process of which public participation is an integral part.

Objectives

Objectives of this management plan are to:

- Coordinate program activities with other agencies to best achieve the overall goals;
- Coordinate to develop consistent regional development standards, regulations, ordinances, erosion control standards and design criteria for pollution control facilities; and
- Protect ecological integrity of rivers, creeks, wetlands, and riparian corridors through the use of best management practices (i.e., BMPs) which focus on controlling runoff and pollution at the source;
- Coordinate City resources to focus efforts on reduction of pollutants associated with storm water runoff;
- Involve and educate the public regarding opportunities to improve surface and ground water quality and aquatic habitat in riparian areas to minimize impacts of non-point source pollution; and
- Ensure that costs of each program element are commensurate with their benefits.

2. WATERSHEDS

2.1 Description of Watersheds in Jurisdiction

The Sandy River watershed is the major watershed draining the City of Troutdale. The Sandy River watershed discharges directly to the Columbia River watershed on its way to the Pacific Ocean. Small tributaries/creeks of these watersheds are listed below:

- **Sandy River**
Beaver Creek
- **Columbia River**
Salmon Creek
Arata Creek

3. SOURCE IDENTIFICATION

3.1. Storm Water System

The City maintains a storm water system that drains approximately 38 road miles. The drainage system consists primarily of piped storm sewers with some natural drainage ways (open channels). One area drains primarily to dry wells. A storm water system map is presented in **Appendix A**. Additional maps of the existing storm sewer system are contained in the North Troutdale Storm Drainage Master Plan (1990) and on as-built drawings maintained by the City Public Works Department.

The City's existing storm water system mapping is maintained in GIS – ArcInfo. Facilities for new developments are entered into ArcInfo as projects are completed and accepted into the City's infrastructure by the City Council.

3.1.1. Major Outfalls

Eight (8) "Major" outfalls are located within the City. Publicly owned storm sewers which discharge to surface waters can be divided into two categories: Major and Minor. The Environmental Protection Agency defines a Major outfall as "one that is a single pipe 36" in diameter or greater, **or** is a single conveyance other than a circular pipe serving a drainage area of more than 50 acres, **or** is a single pipe 12" in diameter or greater if the outfall also receives any drainage from lands zoned for industrial activity, **or** is a single conveyance other than a circular pipe which receives drainage from more than two acres of land zoned for industrial activity." Minor outfalls are all other publicly-owned storm sewer outfalls which discharge to surface waters.

3.1.2. Drywells

One hundred and twenty-nine (129) City owned and operated drywells are located within the jurisdictional boundary of the City of Troutdale. A report submitted to Barb Priest (Department of Environmental Quality [DEQ] Underground Injection Control [UIC] Program Coordinator) in December 2001 titled City of Troutdale – Underground Injection Control Program lists the specific details of the City's UIC system. Due to similar requirements for development of a storm water management plan (SWMP) in both DEQ's UIC and Phase II NPDES rules; the City has combined efforts to produce one SWMP to address the storm water system in its entirety.

3.1.3. Major Structural Controls

The City maintains detention facilities, pollution control manholes, and other water quality facilities. A list of the facilities is kept on file at the Public Works Management office at the Troutdale City Hall.

4. STORM WATER MANAGEMENT PROGRAM

The storm water management program implemented by the City includes the incorporated limits of the City of Troutdale excluding Multnomah County and State of Oregon rights-of-ways as well as storm water facilities operated by the Sandy Drainage Improvement Company. The storm water management program is funded through storm water utility user fees and a system development charge. Best Management Practices (BMPs) are used to reduce discharge of pollutants to the maximum extent practicable (MEP).

The management program was developed in accordance with federal regulation 40 CFR 122.34. These regulations require BMPs be developed for the following groups:

- Public Education and Outreach
- Public Involvement and Participation
- Illicit Discharge Detection and Elimination
- Construction Site Storm Water Runoff Control
- Post Construction Storm Water Management
- Pollution Prevention / Good Housekeeping for Municipal Operations.

In February 2003 the City developed a Storm Water Task Force (Task Force) with the goal of developing a SWMP to address the six-minimum control measures noted above. The Task Force consists of the following five representatives of the City's Public Works Department:

1. Director
2. Chief Engineer
3. Environmental Specialist
4. Streets & Water Superintendent
5. Wastewater Services Superintendent.

The following sections describe the BMPs that were developed by the Task Force and will be implemented by the City over the NPDES permit term.

4.1. Public Education and Outreach

The City has selected six BMPs to reach out to the citizens of Troutdale to inform and educate them regarding human impacts on storm water quality. The six BMPs consist of informative pamphlets, catchbasin labeling, the Troutdale Champion newsletter, school-based education, the Spring Cleanup event, and hazardous waste disposal. The BMPs are described in better detail including their specific objectives, measurable goals, and choice rationale in **Table 4.1**. Copies of each of the three brochures are in **Appendix B**.

4.2. Public Involvement and Participation

The City has selected four BMPs to involve the citizens in the development and updates to the City's SWMP. The four BMPs consist of storm water open house events, earth day events, public meetings, and our City web site. The BMPs are described in better detail including their specific objectives, measurable goals, and choice rationale in **Table 4.2**.

4.3. Illicit Discharge Detection and Elimination

The City has selected four BMPs to detect and eliminate illicit discharges from the storm water system. The four BMPs consist of a storm water system map (**Appendix A**), code enforcement, dry weather flow operations, and informative pamphlets (**Appendix B**). The BMPs are described in better detail including their specific objectives, measurable goals, and choice rationale in **Table 4.3**.

4.4. Construction Site Storm Water Runoff Control

The City has selected three BMPs to address construction site storm water runoff control. The three BMPs consist of acting as the NPDES 1200-C permitting authority, enforcing Troutdale Development Code (TDC) Chapter 5.6, and code enforcement. The BMPs are described in better detail including their specific objectives, measurable goals, and choice rationale in **Table 4.4**.

4.5. Post Construction Runoff Control for New and Redevelopment

The City has selected five BMPs to address post construction storm water runoff control. The five BMPs consist of water quality design requirements, water quantity design requirements, TDC water quality provisions, UIC design requirements, and operations and maintenance requirements. The BMPs are described in better detail including their specific objectives, measurable goals, and choice rationale in **Table 4.5**.

4.6. Pollution Prevention/Good Housekeeping for Municipal Operations

The City has selected twelve BMPs that address pollution prevention/good housekeeping for municipal operations. The twelve BMPs consist of street sweeping, catchbasin cleaning, catchbasin labeling, spill response, stockpile management, debris disposal, drywell cleaning, vehicle maintenance, hazardous material storage, water quality facility maintenance, on-call sanitary sewer response, and herbicide application. The BMPs are described in better detail including their specific objectives, measurable goals, and choice rationale in **Table 4.6**.

TABLES

Table 4.1

Public Education and Outreach on Storm Water Impacts

BMP	Objective	Measurable Goal	Rationale for Chosen BMP
Informative Pamphlets • After the Storm • Stream-Friendly Home and Yard Care • Managing Concrete and Mortar	Inform residential, commercial, and industrial users about steps they can take to reduce storm water pollution.	After the Storm: Available to public at City Hall front desk. <u>Stream-Friendly Home and Yard Care</u>: Mail to all Troutdale mailing addresses. <u>Managing Concrete and Mortar</u>: Include with all applicable Public Works Permits that are issued.	These informative pamphlets were chosen because of the issues they address (e.g., car service, natural gardening, erosion control, concrete dumping) and the ability of the City to acquire existing pamphlet formats from other agencies.
Catchbasin Labeling • Thermoplastic Labeling	Inform and educate residents at the point of entry to the storm system (catch basin) as to where it drains. Discourage illegal dumping.	Ensure that 95% of catchbasins are labeled.	Storm sewer system inlets have historically proven to be locations for illegal dumping of all types of pollutants. Labeling catch basins should act to heighten general resident awareness of the problem. Thermoplastic labeling was chosen over painting due to the improved look and durability.
Newsletter • Troutdale Champion	Inform target audiences with educational messages regarding specific pollutant impacts to storm system.	Publish three editions annually of the Troutdale Champion with storm water issues addressed in articles.	The Troutdale Champion was chosen for a media outlet for several reasons. The newsletter is mailed to all residents of Troutdale. Using an existing publication cuts down on staff time and costs to generate, print, and deliver the publication.

BMP	Objective	Measurable Goal	Rationale for Chosen BMP
School-Based Education Point/non-point source overland flow model instruction.	Educate elementary school children about human impacts that cause storm water pollution.	% of requests filled with in-school educational presentation.	This method of school-based education was chosen primarily due to its effectiveness. Students from 4 th grade on can visualize point and non-point source pollution with this model. The City of Gresham owns the model and allows the City of Troutdale its use whenever it is needed thus combining resources.
Spring Cleanup	Sponsor an annual free yard debris drop-off event for Troutdale citizens in the Spring.	Tons of yard debris collected and processed for reuse at this event. Records of Spring Cleanup debris tonnage are kept at the City's Public Works Management Department.	Yard debris can become a source of storm water contamination when not handled correctly. This annual yard debris drop-off event ensures that citizens have a free event where they can drop off yard debris for processing for reuse.
Hazardous Waste Disposal	Coordinate with our Metro Regional Government to hold a local hazardous waste collection event or to provide citizens a reduced disposal fee for drop-off of hazardous wastes at Metro facilities.	Number of customers serviced at either a hazardous waste roundup event or at a Metro facility annually. Number of vehicles serviced and the volume or weight of material accepted will be documented and kept at the Metro Solid Waste and Recycling Offices.	Hazardous wastes can become a source of storm water contamination when not handled correctly. Providing citizens with an affordable and easy option for correct disposal of hazardous wastes prevents these materials from being illegally dumped into the storm water system.

Table 4.2

Public Involvement & Participation

Operational BMP	Objective	Measurable Goal	Rationale for Chosen BMP
Storm Water Open House Events	Provide a public forum to discuss and accept comments from the public regarding the City's approach to storm water management.	Hold two open house events (Sept 2003 & February 2004) to present to the public the City's efforts in regard to development of a storm water management program.	Providing a forum to accept public comments regarding the City's storm water management program helps direct City staff and at the same time provides an educational opportunity for the public.
Earth Day Event	Organize and hold an Earth Day event within the Troutdale Greenway system annually aimed at restoring riparian habitat through the removal of invasive species and planting of native species.	Ensure that an Earth Day event is held annually that involves volunteer organizations such as The Friends of Beaver Creek and the Boy Scouts of America.	Public riparian restoration events such as this are a great way to get the public involved in environmental stewardship while giving the public a sense of ownership for their local natural areas. This event provides an opportunity for City staff to educate the public about human impacts to watershed health via storm water quality while physically improving the habitat they are learning about.
Public Meetings	Provide the public a chance to comment regarding changes to the City's storm water ordinance.	Ensure that all changes made to the storm water ordinance are presented in public hearings that meet the State of Oregon open public meetings law requirements.	Public involvement in crafting the City's storm water ordinance is important to program success. Conducting public meetings to discuss proposed changes to the storm water ordinance ensures that the public has a chance to be involved in program development.
Web Site	Provide an ongoing question/comments section(s) on the City's website to accept public feedback.	Ensure that 100% of public feedback is addressed promptly and incorporated where appropriate into the storm water management program.	Public feedback regarding the City's storm water management program is important to program success. Providing an open forum to accept public feedback ensures that the public has a chance to be involved in the storm water management program.

Table 4.3

Illicit Discharge Detection & Elimination

Operational BMP	Objective	Measurable Goal	Rationale for Chosen BMP
Storm Water System Map	Maintain an up to date storm water system map that denotes the location of all City owned outfalls and receiving waters.	Incorporate 100% of the storm water collection and conveyance system into the City's GIS.	Operating a storm water system without knowledge of all outfall locations can lead to illicit discharges going undetected. Maintaining an up to date storm water system map ensures that City staff can locate and monitor outfalls.
Code Enforcement	Enforce chapter 12.06 of the Troutdale Municipal Code (TMC) to effectively prohibit illicit discharges.	Enforce TMC on all observed and reported violations of this code section. Records of violations of 12.06 and enforcement actions taken are kept at the City's Community Development Department.	Negligent or deliberate actions that cause pollution of storm water are prohibited in TMC 12.06, which provides the legal authority that allows the City to hold responsible parties accountable for actions that harm storm water quality.
Dry Weather Flow Observations	Observe storm water system outfall locations for evidence of dry weather flows.	Inspect 100% of City owned storm water system outfalls annually during dry weather conditions. Records of annual dry weather flow observations will be kept at the City's Public Works Management Department.	Dry weather flows are a potential indication of illicit discharges. Observation of each outfall location for evidence of discharge during dry weather will help City staff find and remove illicit discharges to the storm water system.

Operational BMP	Objective	Measurable Goal	Rationale for Chosen BMP
Informative Pamphlets • After the Storm • Stream-Friendly Home and Yard Care • Managing Concrete and Mortar	Inform residential, commercial, and industrial users about steps they can take to reduce storm water pollution.	<u>After the Storm</u>: Available to public at City Hall front desk. <u>Stream-Friendly Home and Yard Care</u>: Mail to all Troutdale mailing addresses. <u>Managing Concrete and Mortar</u>: Include with all applicable Public Works Permits that are issued.	These informative pamphlets were chosen because of the issues they address (e.g., car service, natural gardening, erosion control, concrete dumping) and the ability of the City to acquire existing pamphlet formats from other agencies.

Table 4.4

Construction Site Storm Water Runoff Control

Operational BMP	Objective	Measurable Goal	Rationale for Chosen BMP
NPDES 1200-C Permitting Authority	Implement State of Oregon NPDES 1200-C program for construction sites ≥ 1 acre in size.	Ensure that 100% of construction projects ≥ 1 acre in size meet the requirements of the NPDES 1200-C permit program. Records of erosion control permits are kept at the City's Community Development Department.	The City of Troutdale has acted as the NPDES permitting authority for the State DEQ for many years and this local administration of the program benefits all parties involved (i.e., applicant, State DEQ, City). The 1200-C program helps to protect water quality by requiring on-site erosion control measures for active construction sites.
Troutdale Development Code (TDC) Chapter 5.6	Enforce chapter 5.6 of the TDC to effectively prohibit erosion of active construction sites < 1 acre in size.	Ensure that 100% of construction projects < 1 acre in size meet the requirements of TDC 5.6. Records of site development permits (which include erosion control requirements) are kept at the City's Community Development Department.	TDC 5.6 has been in effect for sites smaller than 5 acres (previous cutoff for NPDES 1200-C coverage) for many years. Using this framework, the City can enforce construction site erosion control requirements on sites that are < 1 acre in size. Requiring erosion control measures to be in place and functioning prevents the contamination of storm water by soil erosion.
Code Enforcement	Implement Chapter 17 of the TDC for all construction sites.	100% of construction sites will be inspected and erosion control violations will be addressed utilizing enforcement procedures provided in TDC Chapter 17. Records of erosion control code enforcement activities are kept at the City's Community Development Department.	Enforcement is needed to ensure that construction site operators are required to correct and cleanup violations of erosion control regulations that threaten storm water quality. This TDC chapter provides the legal mechanism to enforce requirements presented in the two BMPs listed above.

Table 4.5

Post Construction Runoff Control for New and Redevelopment

Operational BMP	Objective	Measurable Goal*	Rationale for Chosen BMP
Water Quality Design Requirements	Ensure that new and redevelopment projects, which create new impervious areas of substantial impact, provide water quality treatment for storm water.	100% of new or redeveloped property, which create new impervious area of substantial impact, will include water quality treatment.	Storm water is a potential source of contamination to surface or groundwater. Installing water quality treatment into a storm water system helps to remove pollutants.
Water Quantity Design Requirements	Ensure that new and redevelopment projects, which create new impervious areas of substantial impact, provide water quantity treatment for storm water.	100% of new or redeveloped property, which create new impervious areas of substantial impact, will be designed such that the post development storm water discharge does not exceed the predevelopment flow rate for design storm events.	The quantity of storm water discharged from a new or redeveloped property in excess of the predevelopment rate can create problems in the downstream conveyance system. Controlling post development flows to mirror predevelopment flows helps to mitigate any problems associated with increased storm water discharge.
Troutdale Development Code Water Quality Provisions	Ensure that water quality provisions listed in the Troutdale Development Code (TDC) are met by all new and redevelopment projects.	100% of new and redeveloped property will be designed in accordance with TDC water quality provisions.	Designing projects in accordance with the water quality provisions listed in the TDC helps to protect water quality by preventing development plans that have the potential to harm water quality.

Operational BMP	Objective	Measurable Goal*	Rationale for Chosen BMP
UIC Design Requirements	Ensure that new and redevelopment projects that propose the use of UICs for storm water disposal will meet the requirements of the DEQ's UIC Rules.	100% of new or redevelopment projects that propose UICs for disposal of storm water will be approved by the DEQ UIC Program prior to construction.	The DEQ has drafted UIC Rules that are protective of groundwater resources. New or redevelopment projects that propose to dispose of storm water via UICs should be designed to protect against potential contamination of groundwater resources. Designing projects in accordance with UIC Rules ensures that groundwater resources will be protected from storm water contamination.
Operations and Maintenance Requirements	Ensure that all newly constructed privately owned storm water systems meet the operations and maintenance requirements presented in the Portland Storm Water Management Manual.	100 % of new privately owned storm water systems are required to administer an operations and maintenance plan to ensure adequate system performance.	Storm water systems when not operated and maintained properly can be sources of contamination to storm water. Properly operated and maintained storm water systems are less likely to fail or result in the addition of pollutants to storm water.

* Records pertaining to post construction runoff control are kept in the City's Community Development Department.

Table 4.6

Pollution Prevention/Good Housekeeping for Municipal Operations

Operational BMP	Objective	Measurable Goal	Rationale for Chosen BMP
Street Sweeping	Routine removal of debris prior to entry into the storm water collection system.	All streets will be swept 6 times per year. Records of street sweeping operations will be kept at Multnomah County's Transportation Division.	Street sweeping is an effective way to remove debris prior to it entering the storm water collection system. The City contracts with Multnomah County for street sweeping operations.
Catchbasin Cleaning	Routine removal of accumulated debris from catchbasin sumps.	All storm water catchbasin sumps will be cleaned one time per year. Records of catchbasin cleaning will be kept at the City's Wastewater Services Division.	Storm water catchbasin sumps only function to remove debris if adequate space is available in the sump portion of the catchbasin. Routine removal of debris from the sump area insures that adequate sump space is available for collection of debris carried by storm water.
Catchbasin Labeling	Inform and educate residents at the most common point of entry to the storm water collection system as to where it drains. Discourage illegal dumping.	Ensure that 95% of catchbasins are labeled with either "No Dumping Drains to Groundwater" or "No Dumping Drains to Stream".	Catchbasins have historically proven to be locations for illegal dumping of all types of pollutants. Labeling catchbasins should act to heighten awareness of the problem. Thermoplastic labeling was chosen over painting due to the improved look and durability.

Operational BMP	Objective	Measurable Goal	Rationale for Chosen BMP
Spill Response	Intercept and clean up spills prior to entry to the storm water collection system.	Respond to 100% of reported or observed spills within 15-minutes. Records of reported spills and response activities will be kept at either the City of Troutdale's Public Works Management Department or the Gresham Fire and Emergency Services office.	Intercepting and cleaning up spills prior to entry to the storm water collection system prevents the discharge of these materials to the environment. Troutdale public works street crews currently carry spill response equipment to intercept, contain, and clean up spills of pollutants during City business hours. Additionally, Gresham Fire/HAZMAT crews are currently under contract to perform spill response activities during non-business hours including weekends.
Stockpile Management	Stockpile materials (i.e., sand, bark mulch) without allowing any loss to the storm water collection system.	All stockpiles and immediate downstream catchbasins will be inspected twice a month to ensure that stockpiled material is not contributing sediments to the storm water collection system. Records of stockpile observations will be kept at the City's Public Works Streets Division and Parks & Facilities Division.	Loss of stockpiled material to the storm water collection system creates a source of sediment contamination to storm water. Preventing the loss of sediment from stockpiles to storm water ensures that the City's stockpiles do not contribute to the degradation of storm water.
Debris Disposal	Dispose of collected debris (i.e., street sweepings, catchbasin sediments) without allowing discharge into the storm water collection system.	Collected debris will be disposed of in accordance with applicable solid waste regulations. Records of debris disposal will be kept at the City's Public Works Streets Division.	Routine maintenance BMPs collect debris that need to be disposed of without being reintroduced to the storm water collection system. Disposing of collected debris in accordance with applicable solid waste regulations will ensure that debris are disposed of correctly.

Operational BMP	Objective	Measurable Goal	Rationale for Chosen BMP
Drywell Cleaning	Routinely remove accumulated debris so that drywells have adequate space to collect storm water.	100% of drywells will be inspected annually and all drywells that are more than 25% filled with debris will be cleaned. Records of drywell cleaning are kept at the City's Wastewater Services Division.	Drywells function to remove solids from storm water prior to infiltrating the liquid portion of the influent. Routine removal of accumulated debris from drywells ensures that adequate space is available for collected storm water to be temporarily stored during infiltration.
Vehicle Maintenance	Routine maintenance of City vehicles to prolong life and prevent leaks of hazardous fluids.	100 % of observed leaks will be repaired promptly. Records of vehicle maintenance are kept at the Public Works Shop, the Parks/Facilities Maintenance Shop, and the Police Department.	Regular maintenance of City vehicles not only prolongs the life of the City's assets; it also prevents the leaking of hazardous fluids commonly associated with the normal wear and tear of vehicles.
Hazardous Material Storage	Use of covered and/or secondarily contained storage areas for hazardous materials to eliminate the inadvertent discharge of these materials.	100% of hazardous materials will be covered and/or secondarily contained.	The proper storage of hazardous materials is a standard maintenance practice that is part of the City's daily activities. Proper storage of collected hazardous wastes eliminates the potential discharge of hazardous wastes into the storm water collection system.
Water Quality Facility Maintenance	Routine inspections and maintenance of water quality facilities to ensure proper function.	100% of the City's water quality facilities will be inspected annually and corrective actions will be taken as needed. Records of water quality facility inspections and maintenance will be kept at the City's Wastewater Services Division.	Water quality facilities need routine maintenance to function properly. Annual inspections and as needed maintenance will ensure that all water quality facilities are working effectively to remove storm water pollutants.

Operational BMP	Objective	Measurable Goal	Rationale for Chosen BMP
On-call Sanitary Sewer Response	Promptly respond to sanitary sewer system alarms to prevent failure of any part of the system.	Personnel respond within 30 minutes after being notified. Records of alarm and associated response activities are kept at the City's Wastewater Services Division.	Back ups in the sanitary sewer system that go unattended have the potential to contaminate the storm water collection system. On call staff are available to respond to system failures that have the potential to contaminate the storm water collection system.
Herbicide Application	Apply herbicides in a manner that does not contaminate storm water.	100% of herbicide application will be done in accordance with specific product labeling by licensed applicators.	Herbicides applied incorrectly to foliage have the chance to leach into and contaminate storm water. Limiting and applying herbicides in accordance with product label directions ensures that leaching of herbicides to storm water does not occur.

APPENDIX A

StormSever Sub Map not included in this copy.

APPENDIX B

