City of Portland, Oregon

National Pollutant Discharge Elimination System (NPDES)
Municipal Separate Storm Sewer System (MS4) Discharge Permit

Permit Number: 101314

ANNUAL COMPLIANCE REPORT NO. 18

Fiscal Year 2012-2013
(July 1, 2012 – June 30, 2013)

Prepared for:

Oregon Department of Environmental Quality

November 1, 2013

Submitted by:

City of Portland
Port of Portland

CITY OF PORTLAND
ENVIRONMENTAL SERVICES
1120 SW Fifth Avenue, Room 1000, Portland, Oregon 97204 ▪ Dan Saltzman, Commissioner ▪ Dean Marriott, Director

November 1, 2013

Benjamin Benninghoff
Municipal (MS4) Stormwater Coordinator
Oregon Department of Environmental Quality
811 SW Fourth Avenue
Portland, OR 97204

Dear Mr. Benninghoff:

On behalf of the City of Portland and the Port of Portland, I am pleased to submit the enclosed *NPDES Annual Compliance Report No. 18*. This report fulfills reporting requirements for the Portland NPDES Municipal Separate Storm Sewer System (MS4) Discharge Permit. It identifies accomplishments for the 18th fiscal year of the permit program (July 1, 2012 through June 30, 2013).

The report demonstrates the co-permittees' progress toward meeting the permit requirements and stormwater program goals for the past year. Each co-permittee's section of the report (Section II for the City of Portland and Section III for the Port of Portland) details the activities implemented, program status, and any initiated or proposed program changes. A Monitoring Compliance Report that summarizes monitoring activities and results is included as Section IV. The raw monitoring data are available upon request on CD-ROM.

Please call me at 503-823-5275 if you have any questions concerning this report.

Sincerely,

Patrice Mango
Stormwater Program Manager

cc: Susan Aha, Port of Portland

Portland, Oregon
National Pollutant Discharge Elimination System
Municipal Separate Storm Sewer System Discharge Permit
Permit Number: 101314

ANNUAL COMPLIANCE REPORT
Fiscal Year 2012-13
(July 1, 2012 – June 30, 2013)

We, the undersigned, hereby submit this annual compliance report for the Municipal Separate Storm Sewer System Discharge Permit No. 101314, in accordance with Schedule B, Section 5 of that permit. We certify, as required by 40 CFR Section 122.22, under penalty of law, that this document was prepared under our direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated 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.

Dean Marriott
Director, Bureau of Environmental Services
City of Portland

Vince Granato
Chief Operating Officer
Port of Portland

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REPORT CONTENTS

EXECUTIVE SUMMARY

I.	**GENERAL INTRODUCTION**	**I-1**
II.	**CITY OF PORTLAND**	**II-1**
III.	**PORT OF PORTLAND**	**III-1**
IV.	**MONITORING COMPLIANCE REPORT**	**IV-1**

EXECUTIVE SUMMARY

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INTRODUCTION

This 18th *Annual Compliance Report* is submitted to the Oregon Department of Environmental Quality (DEQ) to fulfill reporting requirements for the National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Discharge Permit (hereinafter referred to as the stormwater permit or permit) issued to the City of Portland and the Port of Portland (the co-permittees) by DEQ on January 31, 2011. The report provides information about activities that have been accomplished in accordance with the co-permittees' *Stormwater Management Plans* (SWMPs) during fiscal year (FY) 2012-13 (July 1, 2012 through June 30, 2013). It also includes a monitoring compliance report that summarizes monitoring activities conducted during FY2012-13.

CITY OF PORTLAND

Key activities and accomplishments for permit year 18 are summarized below and further described in Section II of this annual report.

- Conducted public involvement/education activities as a significant element of the Stormwater Program. Key activities included providing Clean Rivers Education Programs to students, awarding community stewardship grants, involving community participants in events and activities, and participating in the Regional Coalition for Clean Rivers and Streams.

- Conducted ongoing assessment, cleaning, maintenance, and repair of MS4 components.

- Continued to follow the best management practices outlined in ODOT's *Routine Road Maintenance Water Quality and Habitat Guide Best Management Practices* as guidance for transportation-related maintenance activities.

- Inspected, and maintained as necessary, all stormwater and stormwater containment and pollution prevention facilities in City maintenance yards annually.

- Inspected and administered NPDES industrial stormwater permits for industries (and associated tenants) with stormwater discharge to the MS4.

- Continued to identify, investigate, control, and/or eliminate illicit discharges through the Illicit Discharges Elimination Program, Industrial Stormwater Management Program, and Spill Response Section.

- Conducted 3,854 erosion control-related inspections of private construction sites (citywide). Inspected 541 active public construction projects (citywide) with erosion control components.

- Continued to implement the City's *Stormwater Management Manual* for new development and redevelopment. Permitted approximately 27 public works projects and 1,000 private projects subject to SWMM requirements.

- In accordance with *Stormwater Management Manual* requirements, signed off on permits for approximately 1,099 source control measures at sites with high-risk characteristics or activities.

- Continued to implement the Stormwater Management Facility Maintenance Inspection Program (MIP) for private stormwater management facilities. Inspected 510 properties (tax lots) with 1,203 associated stormwater management facilities.

- Continued the design and construction of multiple structural stormwater management facilities.

- Completed conversion of 836 linear feet of roadside ditches to swales or porous shoulder.

- Continued to provide technical assistance and grant funding for projects that incorporate green building principles, including stormwater pollution prevention and management.

- Continued Clean River Rewards to promote private stormwater management. At the end of FY12-13, a total of 35,795 utility ratepayers with active accounts have registered for stormwater discounts: 34,480 single-family residential ratepayers (accounting for a total of 76,581,296 square feet of impervious area managed for stormwater) and 1,315 multifamily, commercial, and industrial ratepayers (accounting for a total of 58,503,366 square feet of impervious area managed for stormwater).

- Acquired 87 acres of natural area through the Grey to Green Land Acquisition Program.

- Under the Watershed Revegetation Program, planted 33,782 trees on 247 acres. The program currently manages 1,748 project acres on both public and private property.

PORT OF PORTLAND

The Port's MS4 Annual Report for permit year 18 fulfills the requirements of Section B.5 in the current permit (dated January 31, 2011). Section 7.0 of the Port's annual report describes the Port's specific stormwater management efforts during this permit year in accordance with implementation tasks, tracking measures, and measureable goals outlined in its December 28, 2012 SWMP. Key accomplishments are summarized below.

- The Port continues to conduct annual maintenance of the storm sewer system components, structural controls, and regular street sweeping on specific Port-managed properties.
  - This effort included maintaining over 1,448 catch basins, inspection and maintenance of Port-owned water quality treatment facilities, cleaning 37,468 feet of storm line, and 3,592 hours of street sweeping. Together these tasks diverted 1,180 tons (2,360,000 pounds) of potential pollutants from Port receiving waters.
- Port staff continued to implement the Illicit Discharge Detection and Elimination Program. The program involves field screening of priority outfalls and investigation of potential illicit discharges.
  - Dry-weather field screening inspections were conducted at 77 outfalls Port-wide. As a result of these and other reports, 4 potential illicit discharges were investigated and resolved.
- Port staff continued to implement the Industrial Facility Inspection Program, inspecting a total of 22 priority industrial facilities Port-wide in fiscal year 2012. Staff provided technical assistance during these visits, while also setting timelines for correction of any deficiencies where appropriate.
- Port operating area staff received training on a variety of stormwater-related subjects, including pesticide application (16), stormwater pollution prevention (210), spill response (199), and erosion prevention (14). In addition, 44 new employees are trained on the importance of preventing pollutants from entering stormwater in the Port's new employee orientation program.
- The Port continued its support of organizations which work to promote watershed health including the Columbia Slough Watershed Council, the Regional Coalition for Clean Rivers and Streams, and Friends of Trees.
- The Port continues to coordinate with the Portland co-permittees, particularly the City of Portland, with regards to monitoring and compliance with MS4 deliverables in addition to the annual report.

Section I
GENERAL INTRODUCTION

Section I
GENERAL INTRODUCTION

This 18th *Annual Compliance Report* is submitted to the Oregon Department of Environmental Quality (DEQ) to fulfill reporting requirements for the National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Discharge Permit (hereinafter referred to as the stormwater permit or permit) issued to the City of Portland and the Port of Portland (the co-permittees). The report provides information about activities that have been accomplished in accordance with the co-permittees' *Stormwater Management Plans* (SWMPs) during the fiscal year (FY) 2012-13 (July 1, 2012 through June 30, 2013). It also includes a monitoring compliance report that summarizes monitoring activities conducted during FY2012-13.

DEQ issued the current (third-term) NPDES MS4 permit on January 31, 2011. The City and Port submitted final SWMPs, which are consistent with the permit requirements and are adopted by reference into the permit, to DEQ on April 1, 2011. This annual report reports on the best management practices (BMPs) and measurable goals contained in the April 2011 SWMPs.

The monitoring requirements in the current permit came into effect on July 1, 2011, when DEQ gave conditional approval to Portland's monitoring plan (which the City submitted to DEQ June 1, 2011). The monitoring compliance report included in this *Annual Compliance Report* reports on monitoring activities conducted in accordance with the July 1, 2011 monitoring requirements.

PERMIT AREAS

The permit areas for the two co-permittees are described below.

- City of Portland: Approximately 15,464 acres within the City of Portland's urban services boundary drain to a separate storm sewer system Portland's MS4 permit does not cover:
  - Stormwater areas that flow to sumps
  - Stormwater areas that flow to combined sewers
  - Natural stream systems
  - Direct stormwater discharges from private property to natural stream systems (without entering the MS4)
  - Areas with no public stormwater infrastructure
  - Areas with individual, general, or industrial stormwater permits

- **Port of Portland:** The Port owns approximately 5,505 acres within the City of Portland's urban services boundary. Much of this property drains to the Port's municipal separate storm sewer system and is regulated by the MS4 permit. This acreage includes Portland International Airport (PDX), four marine terminals, several industrial parks occupied by commercial tenants, mitigation sites, and undeveloped land.

PERMIT BACKGROUND

DEQ issued the first stormwater permit for the MS4 within the Portland urban services boundary on September 7, 1995. DEQ renewed the permit for a second permit term in March 2004 and subsequently revised and reissued that permit on July 27, 2005. The co-permittees submitted a permit renewal package for the third permit term to DEQ on September 2, 2008, and DEQ issued the third-term permit on January 31, 2011.

PROGRAM COORDINATION

The co-permittees share information about program development and implementation, BMP effectiveness, monitoring, public involvement through the Regional Coalition for Clean Rivers and Streams, and other issues related to the permit. This coordination avoids duplication and promotes cost-effective use of resources. To further ensure ongoing collaboration and efficiency, the City and Port have an Intergovernmental Agreement that allocates responsibilities and resources.

The co-permittees coordinate and address stormwater permit implementation issues with other jurisdictions in the state through the Oregon Association of Clean Water Agencies (ACWA). Co-permittee representatives participate in ACWA's water quality, stormwater, and groundwater committees.

REPORT ORGANIZATION

This 18th annual report covers implementation actions and accomplishments that occurred during FY 2012-13 alone (i.e., it is not cumulative), unless otherwise noted. The report is organized as follows:

- **Executive Summary:** A summary of significant program activities and program status for both of the co-permittees
- **Section I: General Introduction:** An overview of the permit areas, permit background, program coordination, and report organization
- **Section II: City of Portland Compliance Report**
- **Section III: Port of Portland Compliance Report**
- **Section IV: Monitoring Compliance Report**

The report's goal is to convey clear, succinct program information that complies with the annual reporting requirements of the NPDES permit. The report also provides other interested parties with a status overview of the co-permittees' stormwater programs.

Section II
CITY OF PORTLAND

Section II
CITY OF PORTLAND

CONTENTS

	Page
INTRODUCTION	II-1
Program Organization and Coordination	II-1
Adaptive Management	II-1
Permit-Required Actions	II-2
Urban Growth Boundary Expansion Areas	II-3
Separated Stormwater Outfalls	II-3
City Budget and Funding	II-4
BMP PI-1	II-5
BMP OM-1	II-13
BMP OM-2	II-15
BMP OM-3	II-17
BMP IND-1	II-20
BMP IND-2	II-22
BMP ILL-1	II-25
BMP ND-1	II-28
BMP ND-2	II-30
BMP STR-1	II-33
BMP NS-I	II-39
BMP PM-1	II-43

INTRODUCTION

This annual report fulfills reporting requirements of the City of Portland's National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Discharge Permit No. 101314. It identifies the activities the City has conducted to implement the City's April 1, 2011, *Stormwater Management Plan* (SWMP) during the 18th fiscal year (July 1, 2012 through June 30, 2013) of the permit program.

The SWMP does not include monitoring BMPs; rather, the City has a separate monitoring plan, as required by the permit. The monitoring compliance report is provided separately in Section IV of this *Annual Compliance Report*.

PROGRAM ORGANIZATION AND COORDINATION

Program Authorization

The Portland City Council passed a resolution supporting the NPDES MS4 permit application in June 1995. In that resolution, the Council designated the Bureau of Environmental Services (BES) as the lead for the City's implementation of the stormwater program.

Legal Authority

The City of Portland continues to maintain and update legal authority to implement the programs outlined in the SWMP, as initially demonstrated in Part 1 of the City's original 1991 NPDES MS4 permit application.

City Management and Coordination

BES's Stormwater Program Manager is responsible for overall project management, compliance reporting, policy development, and coordination within the City of Portland, as well as for co-permittee coordination. BES staff members serve as leads for the BMPs contained in the SWMP. Because the permit is citywide, many City staff members outside BES are also involved with stormwater program development, implementation, and reporting.

ADAPTIVE MANAGEMENT

The City submitted its adaptive management approach to DEQ on November 1, 2011. The City's approach includes two elements:

- An **annual process** to determine if the City's stormwater program is being implemented in accordance with the SWMP; determine if measurable goals are being met or progress is being made toward them (as applicable); and identify whether any program adjustments are needed.

- A more comprehensive process to identify proposed program modifications submitted as part of the City's **permit renewal** package (due to DEQ on July 30, 2015), including the modification, addition, or removal of best management practices (BMPs) incorporated into the SWMP and associated measurable goals.

As part of the annual adaptive management process, the City reviewed permit requirements and assessed program implementation. During reporting year 18, the City met or made progress toward all of the measurable goals.

PERMIT-REQUIRED ACTIONS

The 2011 permit identifies activities that must be implemented by specified dates. The City completed the following activities in FY12-13 to meet these requirements:

- In accordance with Schedule A.4.a.iv of the permit (due by July 1, 2012), the City completed its revised list of priority outfalls (as reported in the City's November 1, 2012 NPDES MS4 Annual Compliance Report No. 17) and continued to conduct dry-weather inspections and field screening of identified and mapped priority locations. Activities are reported under ILL-1.

- In accordance with Schedule A.4.h.i and ii of the permit (due January 1, 2013), the City inventories and maps City-owned stormwater management facilities and controls, and implemented a program to verify that these facilities and controls are inspected, operated, and maintained for effective pollutant removal, infiltration and flow control. Activities are reported under OM-1.

- In accordance with Schedule A.4.h.i and ii of the permit (due January 1, 2013), the City inventories and maps privately owned stormwater management facilities and controls, and implemented a program to verify that these facilities and controls are inspected, operated, and maintained for effective pollutant removal, infiltration and flow control. Activities are reported under ND-2.

- In accordance with Schedule A.4.b.iii of the permit (due January 1, 2013), the City implemented an updated strategy to reduce pollutants in discharges from industrial/ commercial facilities where site-specific information identifies the discharges as a source that contributes a significant pollutant load to the MS4. Activities are reported under IND-1.

- Schedule A.4.g.iii of the permit (due January 1, 2013) requires the permittee to inventory, assess, and implement a strategy to reduce impacts from municipal facilities that treat, store, or transport municipal waste that are not already covered by a 1200 series NPDES, a DEQ solid waste, or other permit. This permit requirement is not applicable to the City because Sutherland Yard is the only such City facility and has a separate solid waste permit.

- In accordance with Schedule D.6.f of the permit (due January 1, 2013), the City has identified, evaluated and prioritized stormwater pollution prevention opportunities and improvements to reduce potential impacts at City-owned and operated properties. Activities are reported under OM-3.

- In accordance with Schedule D.6.j of the permit (due January 1, 2013), the City expanded the Eco-Logical Business Program into the car washing business sector in FY10-11, as reported in the City's November 1, 2011 NPDES MS4 Annual Compliance Report No. 16. Activities are reported under OM-2.

- In accordance with Schedule A.6.c of the permit (due November 1, 2013), the City identified one stormwater quality improvement project, as reported under STR-1 of this annual report.

URBAN GROWTH BOUNDARY EXPANSION AREAS

There were no expansions to Portland's urban growth boundary in FY12-13, and no expansions are expected in FY13-14.

SEPARATED STORMWATER OUTFALLS

In FY12-13, no combined sewer outfalls were converted to stormwater-only outfalls.

CITY BUDGET AND FUNDING

The City of Portland has invested more than $1.01 billion in stormwater management services and facilities during permit years 1 through 18. The revenue requirements for permit year 18 totaled approximately $101 million, allocated as follows:

Major Program Category	Requirements	Percentage Share
Enforcement and Development Review	$ 11.2 million	11%
Watershed Program & Habitat Restoration	13.9 million	14%
Facilities Operations and Maintenance	29.0 million	29%
Capital Improvements*	46.0 million	46%
Total Revenue Requirements	**$ 101.0 million**	
* Includes debt service, facilities planning and engineering, construction engineering, and construction contracts.		

Eighty-six percent of these revenue requirements are financed through direct monthly user fees. The remaining revenue sources include direct charges for new private development (system development charges), service charges, permit fees, and regulatory charges and penalties. More details on City revenues are provided below.

In permit year 19, the City plans to invest $105.6 million in stormwater management services and facilities. Direct monthly user fees will pay for 89 percent of these investments.

Stormwater Management Charges

City Council approves revised stormwater monthly user fees and stormwater system development charges (SDCs) at the start of each fiscal year. Monthly user fees are adjusted to reflect operating, maintenance, and capital costs of the City's sanitary sewer and drainage system. The rate adjustments are based upon cost of service principles, ensuring equity by charging ratepayers according to the amount of sewer and drainage service they use.

The following table reports the monthly single-family stormwater management charge and the monthly stormwater rate per 1,000 square feet of impervious area for the last five permit years:

	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013
Single-Family Residential Charge	$18.55	$19.80	$21.79	$22.36	$23.90
Residential rate per 1,000 square feet of impervious area	$7.73	$8.25	$9.08	$9.32	$9.96
Non-residential rate per 1,000 square feet of impervious area	$8.43	$8.86	$9.66	$9.97	$10.55

At the close of permit year 18 (FY 2012-2013), City Council increased the monthly stormwater management charge for single-family residences from $23.90 to $24.88. The residential rate increased from $9.96 to $10.37 per 1,000 square feet of impervious surface per month, and the commercial rate increased from $10.55 to $10.97 per 1,000 square feet of impervious area per month.

Stormwater System Development Charges

The methodology for assessing system development charges (SDCs) for new development and significant redevelopment includes two components. One component represents the charge for stormwater facilities that handle runoff from individual properties. For permit year 18, this onsite portion was assessed based on $164.00 per 1,000 square feet of impervious area. Riparian properties that drain directly to the Columbia Slough, Columbia River, or Willamette River are exempt from this portion of the SDC. The other portion represents the cost of stormwater facilities that handle runoff from public rights-of-way. This portion was assessed based on the use of the transportation system, using road frontage and vehicle trips to allocate the costs. For permit year 18, the rates were $5.12 per linear foot and $2.68 per vehicle trip. At the end of permit year 18, City Council increased the rates for stormwater system development charges to $169.00 per 1,000 square feet of impervious area, $5.50 per linear foot of frontage, and $2.91 per daily vehicle trip.

Discounts may be granted only for the “onsite” part of the charge for facilities constructed as part of new development. Discounts range from 80 percent for retention of the 100-year event to no discount for control of the 10-year storm.

PI-1: Implement public information, education, involvement, and stewardship activities that will raise awareness, foster community stewardship, and promote pollution prevention and stormwater management.

KEY BMP ACCOMPLISHMENTS, PERMIT YEAR 18 (FY 12-13)

Clean Rivers Education Programs

- Reached 7,777 students (grades K-12) with classroom programs that provide hands-on, interactive science education about stormwater and other environmental issues.

Columbia Slough:	1,175
Fanno/Tryon Creek:	90
Johnson Creek:	1,526
Willamette River:	4,986
Total:	**7,777**

- Involved 5,371 students (K-12) in education field programs that offer watershed investigations and field assessments, stormwater tours, boat tours, and restoration experiences. Of these, 2,065 students combined education with natural area restoration service projects.

Columbia Slough:	1,644
Fanno/Tryon Creek:	0
Johnson Creek:	1,710
Willamette River:	2,017
Total:	**5,371**

- Provided canoe trips to 474 students in the Columbia Slough and Willamette River watersheds. These trips were preceded by classroom studies and stewardship projects related to stormwater pollution.

- Checked out stormwater and watershed curriculum kits and field equipment to eight Portland elementary and middle school teachers.

- Presented Stormwater - Soak It Up, a 75-minute classroom program for grades 4-12 and special interest groups, totaling 1,332 students and teachers.

Columbia Slough	323
Fanno/Tryon Creek:	0
Johnson Creek:	75
Willamette River:	934
Total	**1,332**

- Presented Tours of Stormwater Solutions to 208 students. Students visited swales, stormwater planters, ecoroofs, porous pavement, and creative downspout disconnections.

- Presented Watershed Awareness to 471 students, grades 3-6. This program focuses on common non-point sources of pollution and pollution prevention.

Columbia Slough:	0
Fanno/Tryon Creek:	0
Johnson Creek:	154
Willamette River:	317
Total:	**471**

- Continued the permanent storm drain curb marker program. Participating community and school volunteers also distributed doorhangers with stormwater pollution prevention messages and clean river tips to nearby residences. Number of participants: 72.

- Targeted schools with onsite stormwater facilities for extended outreach. Students learned about stormwater pollution prevention and their school's sustainable stormwater facilities and participated in maintenance activities for their facilities.

- Presented *Futures Working for Clean Rivers* career education classroom and field programs to 42 students in the Columbia Slough watershed.

- Continued quarterly Education Advisory Committee meetings to provide input and feedback for public education approaches and activities.

Community Stewardship Grants Program

- BES's Community Watershed Stewardship Program awarded 11 stewardship grants, totaling $88,629, as shown below. The program's outreach strategy for 2013-2014 focused on making the program more accessible to underrepresented communities, with a new emphasis placed on promoting the grants as a way to fund projects that address community needs while also advancing environmental stewardship.

Columbia Slough Watershed	
At-Risk Youth/Columbia Children's Arboretum	$ 9,819
Fanno and Tryon Creek Watersheds	
PCC-Sylvania Habitat Team	$ 6,700
Tryon Creek Watershed Council Restoration Mentors	$ 10,000
Johnson Creek Watershed	
Pilgrim Lutheran Church	$ 6,500
Gilbert Park Outdoor Learning Area	$ 10,000
Montessori Earth School –Wetland Education	$ 3,900
Groundwork Portland Green Team	$ 8,000

Willamette River Watershed

Franklin HS Nature Trail – Taggart Creek	$ 7,450
Tabor Commons Stormwater Shelter	$ 8,100
Beach School Stormwater Gardens	$ 8,160
Depave – Word & Spirit Church Parking Lot	$ 10,000

- The program also awarded 16 mini grants, totaling $6,450, for native plants to help start or maintain projects beneficial to Portland watersheds, including stormwater management.

Watershed-specific Education and Stewardship Activities

Columbia Slough Watershed

- Co-sponsored and participated in numerous community events, including Slough 101, Groundwater 101, Explorando El Columbia Slough, three Canoe the Slough events, the Columbia Slough Regatta, Aquifer Adventure, the Columbia Slough Corps of Rediscovery, Soup on the Slough event, one Great Blue Heron Week Event, and three Sunday Parkways events, where stormwater was a topic of instruction. The City was a co-sponsor of the Columbia Slough Watershed Awards program. The total participation was approximately 2,300 persons.

- Participated in Friends of Force Lake, Friends of Smith and Bybee Lakes, Let's Build Cully Park Committee, Columbia Biogas Community Advisory Committee, and Harbor Oil Superfund community advisory groups, providing stormwater, watershed, surface water, and pollution prevention education and professional guidance.

Willamette Watershed

- Participated in over 20 community events, reaching over 800 citizens.

- Distributed over 100 copies of "Be a Partner for Watershed Health" brochure through citywide mailings and community events.

- Through a BES/Parks and Recreation partnership, involved citizens in their local natural areas, where 4,879 volunteers spent 14,837 volunteer hours on restoration activities; facilitated 15 Friends group meetings and six education events, reaching 300 people.

Johnson Creek Watershed

- Continued working with the Johnson Creek Watershed Council and streamside property owners to encourage watershed stewardship.

- Through the Johnson Creek Watershed Interjurisdictional Committee, continued to work with multiple agencies and jurisdictions throughout the Johnson Creek Watershed to conduct watershed-wide water quality and macroinvertebrate monitoring.

- Supported the Johnson Creek Watershed Council's 15th annual Johnson Creek Watershed-wide Restoration Event, where 470 volunteers participated in watershed improvement activities.

- Gave a presentation to a subcommittee of the SMILE Neighborhood Association about culvert replacement projects, restoration projects, and stewardship along Crystal Springs Creek, with approximately 30 people attending.

- Participated in a workshop hosted by Portland State University and SMILE Neighborhood Association to discuss issues related to community health, natural resources, and public investments.

- Cosponsored with the Army Corps of Engineers an open house about the Tacoma Street culvert replacement project, with approximately 10 people attending.

- Supported the Crystal Springs Partnership's Walking Tour event, with participation by 55 people, including 10 volunteers. The partnership is an organization of community members, agency and civic partners, and local experts working to engage, inspire, and educate the Crystal Springs community in long-term stewardship and advocacy for restoration in the Crystal Springs watershed.

- Worked with the Army Corps of Engineers to implement a public outreach plan for the Westmoreland Park restoration project. Activities included tabling at multiple community events and in the park itself (reaching approximately 200 people), email construction updates, informational signage, web updates, press release, and advertisements at the Moreland Theater.

- Hosted two major public events at the Foster Floodplain Natural Area in September 2012 and May 2013, with about 3,000 people attending the two events. Provided information about City efforts to improve water quality, mitigate flooding and enhance wildlife habitat at the site.

- Hosted the launch of Portland's World Environment Day celebrations through a public ceremony at the Foster Floodplain, with over 150 people attending.

- Supported environmentally friendly farming and wetland education programs at Zenger Farm, which is the site of a renovated farmhouse with a zero net energy design and sustainable stormwater features. Over 5,000 student visits were made from 201 schools and youth community organizations, and 206 students participated in the summer camps. Adult education classes were given in sustainable/environmental farming practices for a total of 570 adult visits.

- Co-hosted four public open houses, with about 325 people attending, for the Foster Lents Integration Partnership, which was formed to develop a plan and strategies for improving conditions along Foster Road, a major transportation corridor. The open houses generated ideas for improving green infrastructure, planting trees, and considering major future investments in floodplain restoration to mitigate flooding (and associated stormwater and water quality issues) in the Lents and Powellhurst Gilbert neighborhood.

Fanno and Tryon Creek Watersheds

- Conducted public involvement and information activities for Fanno and Tryon Creek watershed projects, including Boones Ferry Road culvert replacement, Lower Tryon Canyon sewer repair, Tryon and Fanno outfall replacement project, Beaverton Hillsdale Highway stormwater retrofits, Multnomah Village green streets, Spring Garden stream daylighting, Multnomah Art Center lower parking lot retrofit, South Ash Creek sewer repair and enhancement, roadside drainage improvements, garlic mustard control, and stormwater management at SW 26th and Interstate 5.

- Worked with Southwest Neighborhoods Inc. (SWNI) to provide public information about watershed improvement and pollution prevention work conducted by the City and partner organizations. In FY 12-13, SWNI maintained a public involvement database of 9,677 records, attended or hosted 46 meetings and events, and published 54 articles in its monthly newsletter, which is sent to over 9,300 homes.

- Worked with the Tualatin Basin Public Awareness Committee (TB-PAC), a partnership of agencies and non-profits working to educate and involve Tualatin Basin residents. Activities included:
  - 23 Will Hornyak “Living Stream” presentations (4,480 students)
  - Three Naturescaping for Clean Rivers workshops (73 attendees)
  - Discovery Day sponsorship
  - Rumba al Rio sponsorship
  - Student Watershed Research Project sponsorship
  - Bus funding for watershed field trips
  - Canines for Clean Water scarves and bag dispensers
  - Don’t Feed the Waterfowl park signage
  - Nature-friendly home and yard care brochure reprint

- Hosted citizens at the SW Watershed Resource Center (WRC), located in the SW Community Center (SWCC) at Gabriel Park. Provided technical assistance and project support to neighborhood and Friends groups in the Willamette River and Fanno and Tryon Creek watersheds, including:
  - WRC room open 1,051 hours, with 427 visitors
  - 51 stewardship and outreach meetings, with 350 community partner and volunteer attendees
  - 19 educational presentations and trainings, with 316 attendees
  - 16 community events, with outreach to 858 people
  - 53 landowner technical consultations
  - 30 equipment checkouts

- Through a BES/Parks and Recreation partnership, involved citizens in their local natural areas. In the Fanno Creek Watershed, 275 volunteers spent 759 volunteer hours at 20 restoration events. Youth Conservation Corps spend 169 hours working in the Fanno Creek parks. In the Tryon Creek Watershed, 79 volunteers spent 346 volunteer hours at four restoration events. Youth Conservation Corps spent 135 hours working in the Tryon Creek Watershed parks.

Citywide

- Provided staff support and resources through a contract with Friends of Trees (FOT) to foster recruitment, retention, and education of volunteers, with the purpose of maximizing tree planting, community involvement, and long-term survival of FOT-planted trees.

- Provided support for outreach staff through an interagency agreement with Portland Parks and Recreation, City Nature to foster recruitment, retention, and education of Neighborhood Tree Stewards, with the purpose of maximizing urban forest education and outreach, community involvement and awareness, and long-term stewardship of the urban forest.

- Through an invitation from the United Nations Environment Programme, the City of Portland hosted World Environment Day 2013, a citywide series of events celebrating the environment from Earth Day to World Environment Day on June 5. Produced four factsheets; collaborated with partners to hold over 300 events; received over 15,000 hits to website and social media site; had a presence at the Rose Festival Parade and hosted over 200 attendees at a Rose Festival Rozone event; developed and expanded multiple partnerships with public and private entities.

- Participated in public outreach for the City's *Comprehensive Plan* update, which will guide public investment and private development over the next 25 years. Provided technical analyses and policy advice to numerous policy expert groups (public committees) on topics related to green infrastructure, water quality, hydrology, urban forestry, brownfield remediation, and natural area enhancement and protection. Participated in public policy workshops, including a workshop specifically focused on watershed health and the environment, with about 75 attending.

Stormwater-related Information

- Mailed Riverviews newsletter to over 300,000 residential ratepayers. Focus of newsletter was stormwater management, with an emphasis on green infrastructure.

- Included inserts in City water/sewer bills mailed to more than 200,000 customers:

  - December 2012/January and February 2013: "Living in a Floodplain" provided information about flooding caused by fall and winter storms and included information on incentive programs to help residents and businesses manage stormwater on their property.

  - March/April/May 2013: "What is Stormwater Runoff?" provided an overview of stormwater runoff; explained how the City manages stormwater through green infrastructure; and included information on incentive programs to help residents and businesses manage stormwater on their property.

  - June/July/August 2013: "Summer Sewer Construction" provided an overview of large sewer construction projects planned for summer 2013 that will help manage stormwater, improve water quality, and protect public health.

- Updated and posted fact sheets, brochures, and educational materials on the BES website about the Sustainable Stormwater Program (396,951 page views); Treebate Incentive for planting yard trees (13,973 page views); Green Street Stewards Program (6,187 page views); Ecoroof Incentive Program (18,365 page views); Native Plant Resources (4,579 page views); and Brownfield Program (16,292 page views).

- Launched the City Green blog and Facebook page to highlight BES' green infrastructure work and the work of partner organizations, including watershed councils, Friends of Trees, stewardship groups, soil and water conservation districts, and local governments. In FY 12-13, posted 112 articles and received over 240,000 hits.

- The Green Street Steward Program continued to educate and recruit volunteer Green Street Stewards, with help from a full-time AmeriCorps service member. Through June 2013, the program has reached 1,800 individuals through tabling events, knock-and-talks, and trainings. Thirty-six people have volunteered to become Green Street Stewards and adopt 66 Green Street facilities.

- Developed and distributed a variety of educational materials at community meetings and events.

Regional Coalition for Clean Rivers and Streams

- In FY 2012-13, the coalition engaged in the following activities:
  - Distributed key messages about stormwater pollution prevention across the region through a variety of media (television, radio, billboards, transit, online and social media).
  - Increased the reach of its messages 35 percent over the previous fiscal year, creating a total of 30,226,431 impressions during its active campaign.
  - Increased traffic to the Coalition website by 10 percent from the previous year.
  - Broadcast radio commercials in Spanish for first time.

MEASURABLE GOALS [1]

Measurable Goal	Status as of 6/30/2013
Provide outreach to approximately 15,500 K-12 students annually (classroom programs, education field programs).	Provided outreach to approximately 15,750 students.
Award at least $50,000 in community stewardship grants annually.	Awarded 11 stewardship grants totaling $88,629 in FY12-13.
Involve approximately 10,000 participants in community events, workshops, stewardship projects, and restoration events annually.	Involved over 20,000 participants citywide.
By May 2011, develop and distribute a public education bill insert to over 200,000 water and sewer customers.	Done (as reported in Annual Compliance Report No. 16). Inserts were also distributed in FY 11-12 (as reported in Annual Compliance Report No. 17) and FY 12-13 (as reported in this annual report).

[1] As defined in the MS4 permit, measurable goals are BMP objectives or targets used to identify progress of SWMP implementation.

OM-1: Operate and maintain components of the municipal separate storm sewer system (MS4) to remove and prevent pollutants in discharges from the MS4.

KEY BMP ACCOMPLISHMENTS, PERMIT YEAR 18 (FY 12-13)

- Made debris screen/inlet inspection/maintenance visits to 352 locations citywide (multiple visits to some locations after major rain events).

- Inspected all public stormwater management facilities (SMFs) at least once during the year. These include:
  - 152 proprietary BMPs (StormFilter, Vortechnics, Stormceptor, etc.)
  - 203 surface SMFs (swales, wetlands, ponds, sand filters, etc.)
  - 1,639 Green Streets

- Cleaned:
  - 179 SMFs
  - Approximately 13,066 catch basins and inlets
  - Approximately 52,854 linear feet of ditch and 30,663 linear feet of culvert

- Repaired 16 SMFs.

- Repaired or constructed 278 inlets and inlet leads and 2,163 linear feet of culvert.

- Completed comprehensive update of "Stormwater Operations and Maintenance Manual," including inspection and maintenance protocol, criteria, triggers, and prioritization information for each facility type.

- Continued to incorporate newly constructed stormwater system components into the City's inspection and maintenance database (Hansen), as well as maintenance information about existing components.

- Portland Bureau of Transportation-Maintenance Operations (PBOT-MO) continued to pilot new materials and applications to protect water quality.

- 16 PBOT-MO staff members attended the Water Environment School at Clackamas Community College and were trained on best practices for maintaining the MS4 system.

- Continued to develop a training handbook PBOT-MO staff that will include guidance for maintenance procedural steps, preferred seasonality of work, and materials management.

MEASURABLE GOALS

Measurable Goal	Status as of 6/30/2013
Develop a training handbook for PBOT-MO staff during the permit term.	Continued to develop the training handbook; in process of drafting various standard operating procedures. (The materials management section of the handbook was completed in FY10-11.)
Provide the following maintenance actions over the five-year permit cycle: – Clean 31,000 lineal feet of culverts. – Repair 10,000 lineal feet of culverts. – Clean 250,000 lineal feet of ditches. – Clean 38,000 inlets and catch basins. – Repair 1,500 inlets and inlet leads. – Clean 135 major stormwater management facilities/pollution reduction facilities. – Repair 40 pollution reduction facilities.	– Cleaned 30,663, lineal feet of culverts. [70,042 lineal feet]* – Repaired 2,163 lineal feet of culverts. [8,398 lineal feet] – Cleaned 52,854 lineal feet of ditches. [166,730 lineal feet] – Cleaned 13,066 inlets and catch basins. [37,536 inlets and catch basins] – Repaired 278 inlets and inlet leads. [652 inlets and inlet leads] – Cleaned 179 major stormwater management facilities/pollution reduction facilities. [423 facilities] – Repaired 16 pollution reduction facilities. [33 facilities] * Bracketed numbers show cumulative total to date during this permit term.

OM-2: Operate and maintain components of public rights-of-way, including streets, to remove and prevent pollutants in discharges from the municipal separate storm sewer system.

KEY BMP ACCOMPLISHMENTS, PERMIT YEAR 18 (FY 12-13)

- Continued to implement BMPs within the right-of-way to protect water quality, including:
  - Following ODOT's *Routine Road Maintenance Water Quality and Habitat Guide Best Management Practices.*
  - Using the trenchless liner repair system.
  - Using bio-pillows for sediment control on impervious surfaces to trap sediment during all sediment-disturbing activities.
  - Using low-disturbance sign installation methods to avoid or minimize digging.
  - Using mild cleaners, with no solvents, to clean signs.
  - Monitoring weather conditions during asphalt grinding
  - Hand-applying asphalt where necessary to prevent these materials from entering the storm drain system
  - Using water-based asphalt emulsions and biodegradable asphalt release agents.

- Continued to pilot test alternative methods, products, and practices to reduce pollutant discharges to the MS4.

- All licensed pesticide applicators at PBOT Maintenance Operations must receive 40 hours of training over their five-year licensing period. In this reporting year, one applicator needed and received training.

- Continued to develop a training handbook PBOT-MO staff that will include guidance for maintenance procedural steps, preferred seasonality of work, and materials management.

- The Bureau of Transportation continues to implement a leaf removal program in 30 leaf service areas (areas that have streets lined with large, mature trees). Under the program, PBOT schedules and implements one or two leaf collection days per zone.

- Swept major arterials six times during the year.

MEASURABLE GOALS

Measurable Goal	Status as of 6/30/2013
Sweep arterials six times/year.	Done.
Develop a training handbook for PBOT-MO staff during the permit term.	Continued to develop the training handbook; in process of drafting various standard operating procedures. (The materials management section of the handbook was completed in FY10-11.)

OM-3: Operate and maintain other City facilities and infrastructure (not included in OM-1 or OM-2) to remove and prevent pollutants in discharges from the municipal separate storm sewer system.

KEY BMP ACCOMPLISHMENTS, PERMIT YEAR 18 (FY12-13)

- Continued to implement a program that requires the Water Bureau to submit requests to the Bureau of Environmental Services (BES) for discharges of potable water from flow tests of hydrants and tank and reservoir drains. Discharges are approved on a case-by-case basis with a letter of authorization. The authorization requires BMPs to reduce the impacts of flow rate, volume, and suspended solids from these activities, in addition to the state guidelines for chlorinated discharges. A report is required for each discharge in order to track volume and respond to any complaints.

- Continued to inventory discharges at various Water Bureau facilities. Engineering is developing a Basis of Design Report that will identify facilities that need discharge piping modification, site work, and improvements in order to have zero to acceptable impact to the MS4.

- The City engages in green purchasing best practices in order to spend public funds on goods and services that minimize negative impacts on human health and the environment. In FY12-13, Procurement Services continued to include environmentally preferable product and service specifications in City solicitations and resulting contracts. Procurement Services also continues to support City bureaus in selecting environmentally preferable goods and services. In September 2012, the City implemented the pilot Healthy Purchasing Initiative, which aims to promote the purchase of least-toxic product options. These actions contribute to the City's ongoing efforts to prevent pollution by buying less toxic, safer, and environmentally sound products and services.

- Continued to control discharges from non-emergency fire-fighting training by routing the discharges to the sanitary sewer system.

- Continued to investigate projects to reduce stormwater runoff from PBOT-MO yards, including diverting stormwater runoff from an employee parking lot (almost two acres) to vegetated planters, collecting and treating rainwater off the roof of a building at Albina Yard, and creating an ecoroof on the Kerby Building.

- Continued to investigate a recycling facility for sweeper debris.

- Pollution Prevention (P2) teams met as needed to evaluate and track maintenance procedures, pilot test new products and techniques, evaluate work processes, and monitor developments in related fields. Topics relevant to stormwater quality protection included:
  - Water quality protection needs associated with vehicle and equipment washing.
  - Evaluation of spill kit usage and appropriate absorbents.
  - Management of vehicle and equipment leaks in maintenance yards and parking lots.
  - Spill reporting requirements.
  - Ecoroofs

- Continued to research modifications of the facility where street sweepers are rinsed to accommodate new sweepers and improve treatment of rinse water.

- Monitored the continued use of approved wash facilities at Albina Yard.

- Inspected, and cleaned as necessary, all stormwater and water quality facilities in maintenance yards and lots. Continued to implement Phase I stormwater controls, which encompasses installation, inspection, and maintenance of filtration and absorbent media at selected stormwater inlets. Specific activities include:
  - Maintain the stormwater collection system in equipment parking areas and other selected inlets vulnerable to leaks and spills.
  - Store most collection bins for recycled materials indoors under cover.
  - Clean out subsurface vaults below the sweeper debris pile approximately two times per year.
  - Clean out debris from sweeper wash facility vaults as needed.
  - Clean debris vaults at the truck bed washout facility as needed.

- Continued to empty (monthly) the sump at Mt. Tabor Yard that captures the grass and dirt of Parks mowers when they clean off at the end of shift, helping to prevent that material from entering the storm system.

- Continued to comply with practices required for Salmon Safe certification, including Integrated Pest Management and using alternatives to pesticides.

- Continued to maintain the drip irrigation system in Mt. Tabor Nursery, as well as turf strips to prevent erosion from watering and harvesting equipment. Increased the use of coarse wood chip mulches in the growing area. These practices have reduced water usage, erosion, and the reliance on herbicides.

- Continued program with vendors to provide pesticides at individual golf course sites on an as-needed basis to reduce pesticide storage.

- Continued testing nutrient levels and the presence of pesticides in surface waters for all City golf courses on a twice-yearly basis. Results from testing continue to show that pest management and fertilization activities are not negatively impacting water quality.

- Continued the use of a specially formulated slow-release fertilizer on park turf, which possesses an ideal formulation of components that reduces leaching and waste elements in runoff. Water quality testing results confirm the efficacy of this formulation.

- Continued the standard use of special equipment for precise application amounts, timing, and distribution of fertilizer on all five City golf course fairways and greens.

- Maintained pesticide-free parks management at five parks.

- Continued a public/private partnership to fund new practices at key park sites to renovate athletic fields. These practices include aeration and overseeding to reduce fertilizer use and increase water infiltration.

- Continued to perform aeration, topdress, and overseed activities on 28 highly used sports fields at 20 different sites to achieve structural soil changes that improve plant health and optimize use of water and fertilizers.

- Continued to implement activities to reduce water usage on park sites. These included connecting parks irrigation to the Maxicom system; testing of two central irrigation control systems; and using a soil moisture sensing control system.

- Conducted a bureau-wide consultation with each Portland Parks & Recreation service zone to address challenges and assess adherence to park standards.

- Continued to use Mt. Tabor Yard as a Parks Bureau's recycling collection point for used oil, used antifreeze, waste paper, scrap metal, dry cell batteries, and fluorescent lamps.

MEASURABLE GOALS

Measurable Goal	Status as of 6/30/2013
Inspect, and maintain as necessary, all stormwater and stormwater containment and pollution prevention facilities in City maintenance yards annually.	Done

IND-1: Implement the Industrial Stormwater Management Program to control the discharge of pollutants from industrial and commercial facilities (both existing and those undergoing changes in operations) to the municipal separate storm sewer system.

KEY BMP ACCOMPLISHMENTS, PERMIT YEAR 18 (FY 12-13)

- Administered NPDES industrial stormwater permits for 129 industries (and associated tenants) that discharge stormwater to the MS4. Four of these permits were terminated midway through the fiscal year, leaving a total of 125. Continued to perform annual compliance inspections and additional inspections, if warranted, to provide technical assistance or assess BMP implementation.

- Under an intergovernmental agreement with DEQ, administered 85 additional permits for facilities not discharging to the MS4. Two of these were terminated midway through the fiscal year. Most are permits for direct dischargers, although some facilities discharge to the Port of Portland's system or Multnomah County Drainage District managed waters.

- Continued to perform inspections and evaluate the need for stormwater permits for non-permitted industries (both those that do and do not discharge to the MS4). Performed 374 inspections of permitted and non-permitted facilities during permit year 18. Identified BMPs at these industries to minimize or remove exposure of industrial activities to stormwater. Required five facilities to apply for a stormwater permit.

- Collected and analyzed three samples from two non-permitted facilities for investigative purposes.

- Issued seven discharge authorizations under City Code to non-permitted sites that address concerns regarding potential spills and release of pollutants from industrial activities.

- Prompted three sites to remove stormwater exposure of industrial activities and other pollutant sources; as a result, these facilities were able to either terminate their permit or qualify for a no exposure certification (NEC).

- Continued to locate and map non-City outfalls (industrial and business) located in the riparian area that discharge directly to receiving streams and to identify the sources that drain to these outfalls.

- Continued to re-inspect industries that were previously identified as having no exposure and were not required to apply for a permit. Of the 21 industries that had a "no exposure certification" (NEC) expiring in FY 12-13, three were either no longer in business or had moved; two had stormwater flows redirected to the combined sewer; and two were required to obtain permit coverage due to increased exposure. The City reissued NECs to 14 facilities and issued new NECs to another 17 facilities.

- Continued to implement activities in the following categories of industrial controls: wastewater discharge permits, accidental spill prevention plans, Pollution Complaint Program, Buildings Plan Review Section, and Fire Bureau's SARA Title III facility review.

- Continued to conduct "sweeps" of industrial facilities in the Whitaker Slough Target Area and Portland Harbor Superfund Area. Issued permits and no exposure certifications where applicable.

MEASURABLE GOALS

Measurable Goal	Status as of 6/30/2013
Inspect all permitted (1200Z, 1200COLS) facilities once per year.	Inspected all of the 125 facilities that discharge stormwater to the MS4 and have active industrial stormwater permits.
Review each permitted facility's monitoring and annual report each year.	Done.
Survey 100 percent of newly identified facilities to determine the need for NPDES permits.	Done.
Every 5 years, inspect industries (individual sites) previously identified as having no exposure and not required to obtain a permit.	Done.
Complete revision of City Code Title 17.39 by 2012.	Done. City Council adopted code revisions in September 2011.

IND-2: Provide educational programs and materials and technical assistance to reduce industrial and commercial pollutant discharges to the municipal separate storm sewer system.

KEY BMP ACCOMPLISHMENTS, PERMIT YEAR 18 (FY12-13)

- Over 20 BMP fact sheets are posted on BES's Pollution Prevention Services website, which is frequently visited by commercial and industrial site operators. During FY12-13, the most-viewed BMP materials related to catch basin maintenance (over 800 views), sand-blasting and painting operations (over 700 views), and loading and unloading materials (over 100 views). Other BMP materials distributed include information on dewatering activities, developing emergency spill response and cleanup plans, and outside container storage and waste disposal.

- Continued to work with the Regional Pollution Prevention Outreach Team (P2O Team), Automotive Eco-Logical Advisory Subcommittee, and Landscape Eco-Logical Advisory Subcommittee for the Portland metropolitan region to certify businesses under the Eco-Logical Business Program. Eco-Logical Business Program activities in FY2012-13 included:

  - Two landscape service businesses were newly certified and five were recertified, bringing the total number of certified landscapers to 22.

  - The Eco-Logical Business Program completed a final BMP field guide and draft BMP manuals and certification checklists for the stormwater facility maintenance sector. The program made a presentation at the Portland chapter of the Oregon Landscape Contractor Association, with over 40 contractors in attendance.

  - Continued to participate in local environmental events, including the annual sustainability fair, to promote the use of certified businesses.

  - Provided an informational table at the annual Oregon Landscape Contractors Association conference.

  - Completed a grant with partner Portland State University using students to develop pollution reduction measurement tools related to Eco-Logical Business Program certification.

  - Continued to distribute EcoBiz newsletters every three months to more than 200 certified firms and program partners. The newsletters provide program updates, highlight pollution prevention success stories, and collect information about materials use.

- Sustainability at Work (formerly the BEST Business Center) continued to assist Portland businesses with resources and information to help them green their operations. The center is run by the Bureau of Planning and Sustainability, in partnership with the Portland Water Bureau, Bureau of Environmental Services, Bureau of Transportation, Metro, Pacific Power, and the Energy Trust of Oregon. The program conducted the following activities in FY12-13:

  - Conducted on-site assessments for 166 businesses and assisted a total of 941 businesses. Assisted over 200 businesses with water and stormwater-related topics, resulting in 12 referrals to the Bureau of Environmental Services.

  - Collaborated with Sustainable Business Oregon to implement the statewide Innovation in Sustainability Awards, which replaces the BEST Awards in recognizing Portland's most sustainable businesses. Five awards were presented in recognition of reduced waste and toxics, energy conservation, development of green products and services, and promotion of sustainable food systems.

  - Administered Sustainability at Work Certification, recognizing businesses that have taken measurable steps to reduce their greenhouse gas emissions through energy efficiency, renewable power, transportation incentives, water conservation, recycling and waste prevention. To date, 111 businesses have been certified.

- Completed the tenth year of providing education and outreach to affected residents and businesses and one-on-one technical assistance to businesses to help them comply with requirements of the Columbia South Shore Well Field Wellhead Protection Program. Program requirements include structural and operational BMPs to reduce the occurrence of spills and minimize spill impacts. Technical assistance and outreach by the Portland Water Bureau, Columbia Corridor Association (CCA), and Columbia Slough Watershed Council during permit year 18 included:
  - Provided technical assistance to 77 businesses.
  - Published newsletter articles on the protection program.
  - Distributed free spill kits, required signs, secondary containment pallets, and stormdrain covers.
  - Maintained the CCA and PortlandOnline webpage on the protection program and requirements.

MEASURABLE GOALS

Measurable Goal	Status as of 6/30/2013
Under the Eco-Logical Business Program, certify 10 additional auto shops and 20 additional landscape firms that provide services within the City Portland by 2015.	Certified two additional landscape firms, for a total of 15 firms that have been newly certified to date during this permit term. Two additional automotive firms have been newly certified to date during this permit term.
Evaluate one new business sector for implementation of the Eco-Logical Business Program.	Expanded the program into the car washing sector in FY10-11 (as reported in *Annual Compliance Report No. 16*).

ILL-1: Identify, investigate, control, and/or eliminate illicit discharges (illicit connections, illegal dumping, and spills) to the municipal separate storm sewer system. Evaluate and, if appropriate, control non-stormwater discharges to the municipal separate storm sewer system.

KEY BMP ACCOMPLISHMENTS, PERMIT YEAR 18 (FY12-13)

- BES's Illicit Discharges Elimination Program (IDEP) conducted 189 dry-weather inspections of 150 City-owned outfalls.

- BES's Industrial Stormwater Program continued to address illicit discharges and connections as they were identified during stormwater inspections and as referred by other parties. During FY 12-13, seven illicit discharges were identified and subsequently corrected and/or mitigated. Follow-up and/or enforcement letters were issued to responsible parties as appropriate, and penalties totaling $1,862 were assessed. The program continues to address prohibited discharges and other non-stormwater discharges to the storm sewer system. Policies and appropriate control measures, if needed, are developed and implemented.

- The Regional Spill Response Committee continued its coordination meetings, holding one quarterly meeting during permit year 18. The committee includes representatives from the Oregon Emergency Response System, Environmental Protection Agency Criminal Investigations (EPA CID), United States Coast Guard (USCG), Oregon Department of Environmental Quality (DEQ), Oregon Department of Transportation (ODOT), Clean Water Services (CWS), Water Environment Services (WES), Port of Portland, Portland Fire Bureau (PFB) Hazmat, City of Gresham, City of Milwaukie, City of Portland Water Bureau, and BES. BES chairs and attends all meetings.

- Completed the *Duty Officer Procedures* manual (February 2013) for the Spill Protection and Citizen Response (SPCR) section. The manual describes the procedures SPCR follows to investigate and respond to illicit discharges that enter, threaten, or leave Portland's sewer system.

- Continued to operate the BES Spill Response Hotline. Activities in FY 12-13 included:

  - Received and responded to approximately 1,500 daytime calls (citywide) regarding pollution complaints, spills, sanitary sewer overflows, and dye tests.
  - Received and responded to 498 after-hours complaint calls (citywide).
  - Received approximately 2,000 additional daytime information-only calls (citywide) and responded by providing agency referrals, industrial information, technical assistance, and regulatory information.

- BES and the Water Bureau continue to implement Columbia South Shore Well Field (CSSW) Protection Area signage. The signs list the BES spill response hotline number and read: "TO REPORT SPILLS CALL (503) 823-7180."

- Continued a communication protocol with the Portland Fire Bureau that automatically pages the BES duty officer for a two-alarm event. Upon receiving the page, the duty officer contacts the Fire Bureau to identify if the duty officer is needed by the fire responders. In FY 12-13, no two-alarm events resulted in pages to the duty officer.

- Continued a communication protocol with the towing companies on the City of Portland towing contract. This notification ensures that BES will be contacted for auto fluid clean-up actions and for events that threaten to impact a stormwater facility (catch basin and downstream stormwater system). The duty officer may respond to events, depending on the reported information. In FY 12-13, 10 after-hours calls were received by the duty officer from towing companies. No enforcement actions were taken.

- Continued activities related to the Spill Response Program, Accidental Spill Prevention Program, tank farm policy, Hazardous Materials Response Team, hazardous substances, and Buildings Plan Review.

- Conducted training for new duty officer staff on the BES spill response hotline and staff response duties.

- The Industrial Stormwater Management Program administered 212 general NPDES stormwater industrial permits with requirements to maintain spill prevention and response procedures. The program evaluates permit compliance of industrial facilities to ensure that best management practices relating to spill prevention and reporting are properly implemented.

- The Industrial Stormwater Management Program required seven stormwater and/or spill prevention plans from non-permitted sites that address concerns regarding potential spills or other exposure-based releases from industrial activities.

- To help prevent illegal dumping, continued to implement curbside collection services (residential garbage, recycling, yard debris and food scrap collection). Continued the City's partnership with Neighborhood Coalition Offices and Metro to administer neighborhood cleanup collection events.

MEASURABLE GOALS

Measurable Goal	Status as of 6/30/2013
Conduct dry weather sampling at all major City-owned outfalls at least once annually.	Done.
Inspect the priority outfalls a minimum of three times a year.	Done.
Expand the IDEP program to include the CSO system below diversion structures, where the outfalls discharge stormwater only and should have no dry-weather flows. Currently, the program addresses all of the westside outfalls and 25 percent of the eastside outfalls. Expand the program to all eastside outfalls by December 2013.	Continued to update eastside storm system and outfall maps to reflect system changes resulting from the East Side Combined Sewer System Tunnel Project.
Maintain the spill response hotline 24 hours a day.	Done.

ND-1: Control erosion, sediment, and pollutant discharges from active construction sites.

KEY BMP ACCOMPLISHMENTS, PERMIT YEAR 18 (FY 12-13)

- There were 4,741 active private construction permits subject to erosion control inspection (citywide). The Bureau of Development Services (BDS) conducted 3,854 erosion control-related inspections of private construction sites (citywide). (Even though a permit is active, there may be times when no activities that require erosion control inspection are occurring.) This number includes only approved inspections.

- All private development sites with qualifying ground disturbance areas were inspected for temporary and permanent erosion control measures at the beginning and near or at completion of the project. At interim checks conducted during the course of regular building inspections, the inspector notes any identified erosion control deficiencies, and the site operator is required to implement corrective action.

- There were 541 active public construction projects (citywide) with erosion control components. In general, public sites are inspected daily during construction.

- Continued the pre-permit-issuance site meeting program, where the applicant's team can choose to meet with staff onsite to discuss erosion control and other sensitive site issues. No applicants requested a pre-permit-issuance site visit this fiscal year.

- Provided annual construction inspector training to BES and BDS staff.

- Tracked erosion control complaints (received through the complaint hotline or staff referrals) through the City's building permit tracking program, TRACS. A total of 14 cases were opened and responded to, with 12 cases closed (citywide).

MEASURABLE GOALS

Measurable Goal	Status as of 6/30/2013
Evaluate the *Erosion and Sediment Control Manual* and update as needed (at least once during the 2011-2016 permit cycle); conduct public involvement on updates.	No activity this fiscal year.
Inspect public sites with erosion control permits daily during construction.	Done.
Inspect 100 percent of active private development construction sites subject to erosion control requirements. At a minimum, inspections will occur (1) after initial temporary erosion control measures are installed, and (2) near completion of development after permanent erosion control measures are in place. Conduct interim checks as part of routine building permit inspections.	All private development sites with qualifying ground disturbance areas are inspected for temporary and permanent erosion control measures at the beginning and near or at completion of the project. Interim checks are conducted during the course of regular building inspections.

ND-2: Implement and refine stormwater management requirements for new development and redevelopment projects to minimize pollutant discharges and erosive stormwater flows.

KEY BMP ACCOMPLISHMENTS, PERMIT YEAR 18 (FY12-13)

- Continued to implement the 2008 *Stormwater Management Manual* (SWMM):
  - Conducted 373 land use reviews to determine compliance with SWMM requirements.
  - Responded to 179 early assistance requests, including pre-application conferences.
  - Permitted approximately 27 public works projects and approximately 1,000 private projects subject to SWMM requirements.
  - O&M agreements were signed for 51 new private stormwater management facilities on 32 private properties (tax lots).

- Redevelopment and new development projects during the fiscal year resulted in a total of 55.5 acres of replaced impervious area and 69.5 acres of new impervious area. Because stormwater from the replaced and new impervious areas is managed in accordance with SWMM requirements, there is no increase in effective impervious area.

- Conducted 159 land use reviews for source control measures at sites subject to SWMM requirements. Signed off on permits for approximately 1,099 source control measures at sites with high-risk characteristics or activities.

- Continued review of Chapter 4 of the SWMM to identify potential source control requirement updates.

- Worked on minor revisions to the SWMM, scheduled to be implemented in 2014.

- Continued review of Chapter 3 of the SWMM to clarify submittal requirements (e.g., when an O&M form is required) and revise forms to improve data collection (e.g., legal description on O&M form) for tracking purposes and responsible party awareness.

- Conducted the following monitoring and evaluation activities:

  - Conducted stormwater monitoring of infiltration facilities (called Green Streets when managing the public right-of-way), flow-through (lined) facilities, and ecoroofs. The evaluated facilities are located throughout the City and represent a variety of facility types, configurations, ages, and land uses. The monitoring report covering data through 2012 will be published in fall 2013.

  - Continued trials of different mulches to determine which provide the best performance in Green Streets facilities and which can be incorporated into general maintenance practices.

- Continued to monitor sediment accumulation in a group of Green Streets facilities to document impacts on facility performance and refine maintenance requirements.

- Continued to test and evaluate plants and trees for use in Green Streets facilities.

- Tested soil blends with slightly more silt and clay to improve water retention and plant health in vegetated stormwater management facilities.

- Continued to provide training and technical assistance on the SWMM to City staff and the development community.

- Inspected 805 private stormwater management facilities to ensure construction was consistent with development permit requirements.

- The Maintenance Inspection Program (MIP) ensures that property owners follow site-specific, BES-approved operation and maintenance (O&M) agreements. The program also collects information on stormwater management facility deficiencies and corrective actions taken to address deficiencies. MIP activities in FY 12-13 included:

  - Inspected 510 properties (tax lots) with 1,203 associated private stormwater management facilities. This represents approximately 9.1 percent of the properties in the program.
  - During inspections, provided technical assistance to help owners properly operate and maintain stormwater management facilities. Also provided guidance when needed on pollution prevention best management practices (BMPs) for site activities.
  - Mapped MIP data, including MIP properties, facilities, inspections, and O&M plan and facility maintenance deficiencies.

MEASURABLE GOALS

Measurable Goal	Status as of 6/30/2013
Inspect 1,500 private stormwater facilities or 450 properties annually. Use education and enforcement tools to ensure that stormwater management operations and maintenance plans are followed.	Under the Maintenance Inspection Program (MIP), inspected 510 properties with1,203 associated private stormwater management facilities. Provided technical assistance and education to ensure facilities are sufficiently operated and maintained.
Revise the SWMM during the 2011-2016 permit term.	Continued review of Chapter 4 of the manual to identify potential source control requirement updates; worked on minor revisions to other chapters of the SWMM.
Track number, type, size, drainage area[2] and location of private facilities constructed annually.	Done.

[2] Drainage area is tracked for all private stormwater management facilities subject to the SWMM (under an O&M plan).

STR-1: Structurally modify components of the storm drainage system to reduce pollutant discharges. Implement structural improvements on existing development to reduce pollutants in discharges from the municipal separate storm sewer system.

KEY BMP ACCOMPLISHMENTS, PERMIT YEAR 18 (FY 12-13)

Citywide

- Continued to implement retrofits to the existing storm drainage system, as identified during routine operations and maintenance activities. Completed conversion of a total of 836 linear feet of roadside ditches to swales or porous shoulder (all within the Fanno Creek Watershed).

Columbia Slough Watershed

- Completed design for the NE 148th Water Quality Facility, which will receive stormwater runoff from 180 acres in northeast Portland. Put out to bid for summer 2014 construction. This facility is the retrofit project identified by the City in accordance with permit Schedule A.6.c (see page II-3).

- Completed construction of the 9-acre Mason Flats project, which will improve in-stream, riparian, and wetland habitat; protect and improve water quality by providing additional stormwater treatment; and provide other groundwater, stream, and habitat benefits.

- Continued predesign to treat stormwater runoff from City rights-of-way that currently discharge to the Slough. This will focus on commercial/industrial zones, high traffic, and unimproved roadways.

Johnson Creek Watershed

- Continued work on the Luther Road Habitat Restoration project to address an exposed combined sewer/stormwater interceptor. The project will bury the sewer pipe crossing, restore a portion of Johnson Creek and its floodplain, improve stream habitat, provide stormwater treatment, and protect natural areas.

- Completed phase II construction of the East Lents Floodplain Restoration Project, which will reduce nuisance flooding while improving water quality.

- Continued to monitor existing floodplain restoration projects to ensure effectiveness at Brookside, Kelley Creek, Tideman Johnson, Errol Creek, East Lents, and Schweitzer.

- Began the Foster Lents Integration Partnership (FLIP) process, working with the Portland Development Commission (PDC) to develop concepts to integrate floodplain management and economic development in the Foster corridor 100-year floodplain.

Willamette Watershed

- Completed predesign and began design of the Stephens Creek water quality treatment facility, which will detain and treat runoff from I-5 and SW Barbur Blvd. The project will also address erosion on the hill slope from the I-5 outfall.

- Replaced four failing culverts along Leif Erikson Drive in Forest Park.

- Began predesign of the Centennial Oaks Stormwater Project in Willamette Park.

Fanno and Tryon Creek Watersheds

- Completed the Multnomah Arts Center Parking Lot Stormwater Retrofit. Three vegetated stormwater management facilities detain and treat stormwater runoff from approximately 28,650 square feet of impervious area.

- Completed construction of vegetated stormwater facilities to treat 2.75 acres of existing impervious area at the Tri-Met Park and Ride on SW Barbur Boulevard (in partnership with ODOT and TriMet).

- Completed 90 percent design for Interstate 5 at SW 26th Avenue Water Quality Facility to treat 26 acres of existing impervious area (in partnership with ODOT). Construction is scheduled for 2014.

- Completed 60 percent design for roadside drainage (ditch) and shoulder improvements on SW Stephenson between SW 35th and SW Boones Ferry Road and on SW Hamilton between SW Shattuck and SW 40th. About 4,700 feet of ditches are to be improved. Construction is scheduled for 2014.

- Completed design and began construction of two green street curb extensions and 12 tree wells along SW Capitol Hwy between SW 35th and SW 36th in Multnomah Village. The project will detain and treat stormwater from a busy commercial parking area and street. The project was completed in July 2013.

- Completed design for a storm pipe daylighting project in Spring Garden Park in the upper Tryon Creek Watershed. Construction is scheduled for fall 2013.

- Secured funding for a Green Street curb extension along SW Huber. Design started in summer 2013. Construction is planned for 2014.

- Began design of stormwater management improvements for 2.6 miles of SW Beaverton Hillsdale Highway, between Southwest Sunset Boulevard to the Portland City limits at SW 65th Avenue. Construction is planned for 2014-2015.

- Completed design of six vegetated stormwater management facilities along SW Multnomah Boulevard between SW 34th and SW 40th. Construction is planned for 2013-2014.

Stormwater System Plan

- Continued work on the *Stormwater System Plan*, a multi-year project to fully define and plan for the City's stormwater system needs.
  - Completed the *Stephens Creek Stormwater System Plan* (final report January 2013).
  - Submitted top-priority projects from the Stephens Creek report for CIP funding.
  - In late 2012, reorganized staff and budget to form the Stormwater System Program. This new program is responsible for integrating stormwater system planning with the policies and guidelines of the *Stormwater Management Manual*. The program will assess the stormwater system risk, propose capital and operating investments, and inform policies and development standards for stormwater management and conveyance on private property and public right-of-way.

Green Streets

- Completed construction of the following Green Street projects:

  - One green street planter to manage 14,000 square feet of runoff from N Ballast, south of Lagoon, that would otherwise drain directly to the Swan Island Lagoon.

  - One green street planter to manage 22,000 square feet of runoff from NE 136th south of Whitaker, that would otherwise drain directly to the Columbia Slough.

  - One green street planter to manage 16,000 square feet of runoff from SE Ramona east of 92nd that was flowing into ODOT's I-205 drainage and eventually to Johnson Creek.

Technical Assistance, Incentives, and Grants Programs

- Continued to provide technical assistance for projects that incorporate green building principles, including stormwater pollution prevention and management. In total 11 building construction and EcoDistrict development projects were served by the Bureau of Planning and Sustainability's Green Building and Development program in FY 12-13. Additional green building events and activities related to stormwater management included:
  - Sponsored the Build it Green! Tour of Homes, attended by about 1,000 people. The tour demonstrated green building techniques, including ecoroofs, bioswales, pervious paving, rainwater harvesting and other sustainable stormwater management strategies in new development, redevelopment, and remodeling projects.
  - Delivered 57 presentations and tours to a variety of sustainability and building-related organizations. Audience numbers ranged from 1 to 200 people per event, reaching a total of approximately 1,565 people.

- Continued to coordinate and offer Fix-It Fairs, a free neighborhood-oriented event that offers workshops and exhibits on home and garden topics. At each fair, over 100 workshops and exhibits provided residents with self-help information and resources on topics including stormwater management, Naturescaping, and water conservation. During permit year 18, 1,923 people attended three fairs.

- Continued to implement the Ecoroof Incentive Program (which offers a financial incentive to property owners and developers to construct ecoroofs, one of only a few U.S. cities to do so). During FY12-13, program accomplishments included:

Total projects completed	47
Total square feet completed	108,799
Total acres completed	2.49
Total amount paid out	$ 543,995

- Conducted the 2013 Ecoroof Symposium to create awareness of ecoroofs as a cost-effective tool for sustainable stormwater management and to promote the Ecoroof Incentive Program. This year's event continued the ongoing dialogue between the City of Portland, municipal and non-profit partners, and the private sector, focusing on the business case for ecoroof development in the City of Portland. The program featured 18 vendors and 10 speakers, whose presentations focused on the return on investment for green roofs. Over 150 people attended, representing over 90 companies and organizations working in the fields of architecture, development, and green roofs.

- Through the Sustainable Stormwater Management Program, fielded public requests for information and technical assistance and provided technical assistance to a variety of projects:
  - Received over 30 requests for tours and speaking engagements. Conducted tours for professional planners, designers, developers, politicians, and staff from national and international jurisdictions.
  - Received 37 requests for a green street.
  - Received more than 40 requests for assistance from non-profit groups, students, and other jurisdictions in the form of design review and information sharing.
  - Presented information at 11 local, regional, and national seminars and conferences.
  - Received over 389,000 visits to the Sustainable Stormwater Management Program website and more than 240,000 on the City Green blog that provides relevant information, examples, and announcements for citywide green infrastructure approaches.
  - Updated the web page for the Green Street Steward Program, adding a Facebook link and more educational and reference materials for volunteers. The website received over 6,750 visits..
  - Developed fact sheets, educational materials, tour information, and monitoring reports for web publication for the Sustainable Stormwater Management program. Examples include a green infrastructure monitoring report, an ecoroof construction guide, and energy monitoring reports for ecoroofs.

- Through Clean River Rewards, the City's stormwater discount program, provided information about stormwater management and eligibility for reductions in customers' monthly utility bills for managing stormwater onsite:

  - Attended 19 public events on stormwater retrofits of existing development for residential, commercial and multifamily properties, contacting approximately 1,563 people.
  - Managed the Clean River Rewards website to provide information and technical assistance. The website registered approximately 201,500 external hits during FY12-13.
  - Provided technical stormwater retrofit and registration assistance to 142 people.
  - Verified stormwater discount registration at 221 active utility accounts, providing stormwater technical assistance on maintenance and stormwater facility improvements.

  At the end of the fiscal year, a total of 35,795 utility ratepayers with active accounts have registered for stormwater discounts:
  - 34,480 single-family residential ratepayers account for a total of 76,581,296 square feet of impervious area managed for stormwater.
  - 1,315 multifamily, commercial, and industrial ratepayers account for a total of 58,503,366 square feet of impervious area managed for stormwater.

MEASURABLE GOALS

Measurable Goal	Status as of 6/30/2013
Construct the following public facilities to provide treatment for stormwater runoff from approximately 336 acres:	
• Construct the NE 148th Avenue stormwater management facility by FY 2014-15.	• Completed design for NE 148th Avenue Water Quality Facility
• Construct stormwater management facilities in the NE 122nd Ave subbasin by December 2012 (Columbia Slough Watershed).	• Completed. This project included construction of eight water quality planters along NE 122nd Avenue between NE Fremont and NE Shaver, designed to treat stormwater runoff from 2.89 acres.
• Convert 5,000 linear feet of roadside ditches to swales or porous shoulder (Tryon Creek and Fanno Creek watersheds) during the permit term.	• Converted 836 linear feet of roadside ditches to swales or porous shoulder in the Fanno Creek watershed, managing approximately 0.4 acre of road runoff. [Total conversion to date during this permit term is approximately 4,671 linear feet, managing approximately 2.15 acres of road runoff, in the Tryon Creek and Fanno Creek watersheds.]
• Construct stormwater management facilities along SW Beaverton-Hillsdale Highway and SW Barbur Blvd. and in commercial and multi-family residential areas (Tryon Creek and Fanno Creek watersheds) during the permit term.	• Constructed vegetated stormwater facilities to treat 2.75 acres of existing impervious area at the Tri-Met Park and Ride on SW Barbur Boulevard (in partnership with ODOT and Tri-Met). [Total facilities constructed to date during this permit term treat a total of 15.55 acres.)
Track the number, type, drainage area, and location of public facilities constructed annually.	Done (using GIS to track this information).

NS-1: Protect and enhance natural areas and vegetation that help prevent pollutants from entering into the municipal separate storm sewer system.

KEY BMP ACCOMPLISHMENTS, PERMIT YEAR 18 (FY 12-13)

Land Acquisition and Protection

- Acquired 87 acres of natural area through the Grey to Green Land Acquisition Program.

Planning

Continued planning processes that include goals and policies focusing on watershed health and the environment. Work in FY12-13 included:

- Continued work on the *River Plan/Central Reach.*
- Completed a draft *Natural Resources Inventory* for the Central Reach.
- Adopted the *Central City 2035 Concept Plan* (policy framework), which includes Willamette River goals and Health and the Environment goals.
- Adopted the *Central City 2035 N/NE Quadrant Plan.*
- Began work on the *Central City 2035 West Quadrant Plan.*
- Began work on the *Central City 2035 Inner Southeast Station Area Plan.*
- Released the *Comprehensive Plan Working Draft Part 1* for public review; began work on *Part 2*.

Metro Title 13, Nature in Neighborhoods

In April 2013, Metro found the City of Portland to be in compliance with Metro Title 13, Nature in Neighborhoods, which establishes baseline regional requirements to protect and restore significant fish and wildlife habitat and to protect and improve water quality. The City also entered into a voluntary, 10-year agreement to continue collaborating on natural resource policy issues and activities.

Tree Code

- Continued activities to prepare for full implementation of the Tree Policy Review and Regulatory Improvement Project, which was adopted in April 2011. A consolidated Portland City Code title (Title 11: Trees) establishes new tree preservation and planting requirements on development sites and standardizes the City's tree removal permit system. Adopted amendments to the Zoning Code will strengthen and clarify tree-related requirements on land division sites and in environmentally sensitive resource areas, including along stream corridors. When fully implemented (January 2015), the new regulations will help protect, expand, and improve the quality of Portland's tree canopy.

Watershed Revegetation Program

- Under the Watershed Revegetation Program, many public agencies, businesses, and other landowners participated in and helped fund revegetation projects on their properties and neighboring properties. The program is currently managing 1,748 project acres on both public and private property. Activities in FY12-13 included:

  Willamette River
  - Planted 30,497 plants on 200 linear feet of riverbank and 22.4 acres. This included 5,237 deciduous trees, 1,658 coniferous trees, and 23,602 shrubs.

  Columbia Slough
  - Planted 29,400 plants on 12,206 linear feet of riverbanks and 71.3 acres. This included 6,661 deciduous trees, 1,194 coniferous trees, and 21,545 shrubs.

  Johnson Creek
  - Planted 50,227 plants on 11,995 linear feet of streambank and 126.7 acres. This included 11,127 deciduous trees, 3,355 coniferous trees, and 35,745 shrubs.

  Tryon Creek
  - Planted 12,075 plants on 22.4 acres. This included 2,200 deciduous trees, 1,825 coniferous trees, and 8,050 shrubs.

  Fanno Creek
  - Planted 1,185 plants on 4.2 acres. This included 225 deciduous trees, 300 coniferous trees, and 660 shrubs.

Partnerships with Other Organizations

- BES supported SOLV's Team Up for Watershed Health to engage community volunteers in riparian area restoration. The program conducted stream restoration projects (erosion reduction, invasive plant control, and native plantings) at three sites on private property. FY 12-13 accomplishments included:

  Willamette River Watershed—Baltimore Woods
  – Cleared 60,000 square feet of invasive vegetation at Eads site.

  Johnson Creek Watershed—Stonebridge Apartments
  – Planted 722 native trees and shrubs, removed 20,000 square feet of invasive vegetation and 1,500 pounds of trash.

  Tryon Creek Watershed
  – Planted 110 trees, removed 20,000 square feet of invasive vegetation, treated knotweed, and educated youth about restoration.

- In partnership with Friends of Trees, planted 5,504 street trees and 1,188 yard trees in City of Portland right-of-way, on school properties, and in private yards.

- Through a BES/Parks and Recreation partnership, involved citizens in their local natural areas. Activities included invasive plant species removal and native plant installation.

Fanno Parks Project Summary	
Restoration	
# Restoration Events	20
# Plants	120

Tryon Creek Parks Project Summary	
Restoration	
# Restoration Events	4
# of Plants	None (other restoration activities were done)

Willamette Watershed Parks Projects	
Restoration	
# Restoration events	129
# Plants planted	8,880
Area of invasive removal	120,000 sq. ft.

- Supported the Johnson Creek Watershed Council's 15th annual Johnson Creek Watershed-wide Restoration Event, where 470 volunteers planted 8,950 native plants, removed 20 cubic yards of invasive plants, picked up 50 bags of garbage, and placed seven cubic yards of mulch.

Technical Assistance, Incentives, and Grants Programs

- Under BES's Community Stewardship Grants Program, awarded 11 stewardship grants totaling $88,629 for projects that included planting native vegetation. (See PI-1 for project names and watershed location.) The grants program also awarded 16 mini-grants totaling $6,450 in fiscal year 2012-2013. Mini-grants provided a variety of community groups and private property owners with native plant gift certificates for riparian and upland restoration and revegetation projects in all Portland watersheds.

Urban Forest Management Plan

- Completed the *Urban Forest Action Plan, 2012 Implementation Update,* in February 2013 to meet the goals of the *Urban Forest Management Plan*.

MEASURABLE GOALS

Measurable Goal	Status as of 6/30/2013
Plant 20,000 trees and initiate revegetation work on 70 acres by the end of the permit cycle.	• Planted 33,782 trees (25,450 deciduous and 8,332 coniferous) on 247 acres. [Total to date during this permit term: Planted 111,983 trees (88,743deciduous and 23,240 coniferous) on 636.5 acres]
Acquire 50 acres of land by the end of the permit cycle.	• Acquired 87 acres of land. [Total to date during this permit term: 503.4 acres]
Update the *Portland Plan* (an update to the City's *Comprehensive Plan*) by December 2013.	Completed. City Council adopted the P*ortland Plan* on April 25, 2012.

PM-1: Conduct program management, coordination, and reporting activities.

KEY BMP ACCOMPLISHMENTS, PERMIT YEAR 18 (FY 12-13)

- Coordinated with numerous other City bureaus and jurisdictions to continue implementation of the *Stormwater Management Plan* (as reported under the individual BMPs).
- Coordinated permit implementation activities with the Port of Portland.
- Submitted the NPDES MS4 annual compliance report 17 for FY11-12 on November 1, 2012.

MEASURABLE GOALS

Measurable Goal	Status as of 6/30/2013
Submit annual reports by November 1 of each year.	Submitted the FY11-12 annual report on November 1, 2012.

Section III
PORT OF PORTLAND

PORT OF PORTLAND

National Pollutant Discharge Elimination System (NPDES)
Municipal Separate Storm Sewer System Permit
Permit Number 101314

ANNUAL REPORT NO. EIGHTEEN

Fiscal Year 2012-13
(July 1, 2012 – June 30, 2013)

Prepared for:
Oregon Department of Environmental Quality

November 1, 2013

TABLE OF CONTENTS

1.0 INTRODUCTION 1

2.0 PORT OF PORTLAND PERMIT AREA AND RESPONSIBILITIES 1

2.1 MS4 Permit Area 5
- **2.1.1 Portland International Airport 4**
- **2.1.2 Marine Terminals 6**
- **2.1.3 Industrial Parks 6**
- **2.1.4 Undeveloped Properties 6**

2.2 MS4 Permit Responsibilities 6

3.0 PORT OF PORTLAND ORGANIZATIONAL STRUCTURE 13

4.0 STORMWATER EXPENDITURES 13

5.0 DEMONSTRATION OF CONTINUED LEGAL AUTHORITY TO IMPLEMENT THE PROGRAMS OUTLINED IN THE SWMP 14

6.0 STORMWATER MONITORING 15

6.1 Environmental Monitoring 15

6.2 Best Management Practice (BMP) Monitoring 15

6.3 Additional Stormwater Monitoring Activities 15

7.0 ACCOMPLISHMENTS FOR PERMIT YEAR SIXTEEN (2012-13) 16

7.1 SWMP Implementation 16
- **7.1.1 Element #1: Illicit Discharge Detection and Elimination 16**
- **7.1.2 Element #2: Industrial and Commercial Facilities 19**
- **7.1.3 Element #3: Construction Site Runoff Control 20**
- **7.1.4 Element #4: Education and Outreach 21**
- **7.1.5 Element #5: Public Involvement and Participation 26**
- **7.1.6 Element #6: Post-Construction Site Runoff Control 27**
- **7.1.7 Element #7: Pollution Prevention for Municipal Operations 28**
- **7.1.8 Element #8: Structural Stormwater Controls Operations and Maintenance 32**

8.0 ADAPTIVE MANAGEMENT PROCESS IMPLEMENTATION AND PROPOSED SWMP CHANGES 35

LIST OF FIGURES AND TABLES

Figure 1-1 Port of Portland MS4 Permit Area
Table 2-1 Port of Portland MS4 Permit Requirements and Responsibilities
Table 4-1 Summary of Port of Portland Stormwater Expenditures
Table 6-1 Monitoring Objective Matrix (Appendix A)
Table 7-1 Port of Portland Pesticide/Herbicide/Fertilizer Use in 2012-13

ACRONYMS

BMP – Best Management Practice

DEQ – Department of Environmental Quality

EMS – Environmental Management System

FOG – Fats, Oil, and Grease

HAZWOPER – Hazardous Waste Operations and Emergency Response

IDDE – Illicit Discharge Detection and Elimination

IGA – Intergovernmental Agreement

IPM – Integrated Pest Management

MEP – Maximum Extent Practicable

MFM – Marine Facilities Maintenance (Marine's general maintenance group)

MS4 – Municipal Separate Storm Sewer System

NOAA – National Oceanic and Atmospheric Administration

NPDES – National Pollutant Discharge Elimination System

PDX – Portland International Airport

PIC – Portland International Center

SPCC – Spill Prevention Control and Countermeasure

SWMP – Stormwater Management Plan

SWPCP – Stormwater Pollution Control Plan

TMDL – Total Maximum Daily Load

USB – Urban Services Boundary

USCG – United States Coast Guard

1.0 INTRODUCTION

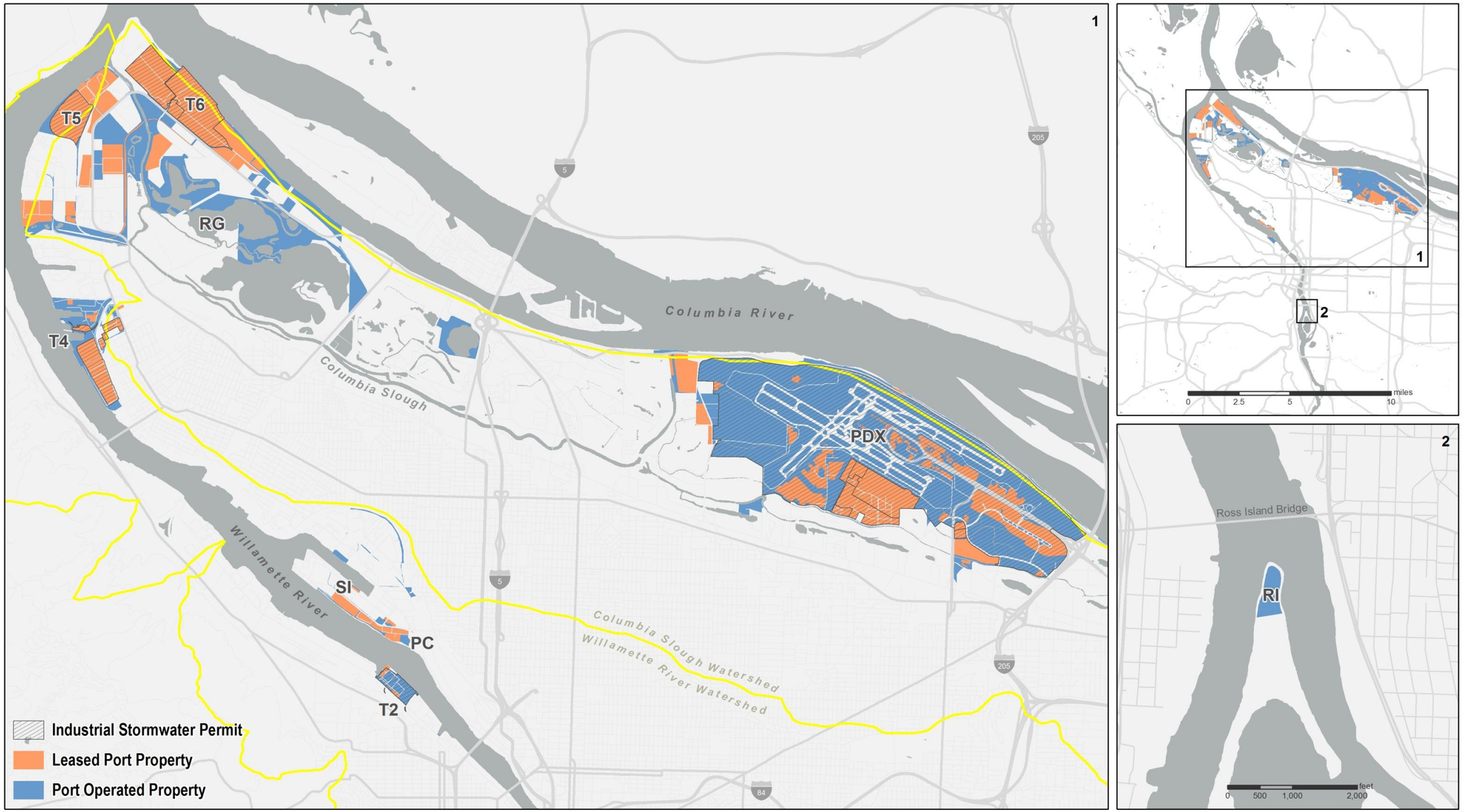
The Oregon Department of Environmental Quality (DEQ) regulates stormwater runoff from Port of Portland (Port) property through the Municipal Separate Storm Sewer System Discharge Permit No. 101314 (MS4 permit) and other National Pollutant Discharge Elimination System (NPDES) stormwater permits, including the 1200-Z, 1200-COLS and 1200-CA permits. This annual report describes activities specifically related to implementation of the Port's MS4 permit.

The Port and City of Portland are co-permittees on MS4 permit #101314. As required under Schedule B.5of the permit, each co-permittee must submit an annual report. This report documents activity from July 1, 2012 to June 30, 2013 related to the Port's stormwater management efforts under the permit and associated December 28, 2012 Stormwater Management Plan (SWMP). The report emphasizes efforts and activities associated with individual best management practices (BMPs) from the Port's SWMP (as summarized in Section 7.0). Schedule B.5.a-i of the permit states the specific annual reporting requirements. These requirements are addressed within the report as follows:

1. **Status of SWMP implementation:** Section 7.1.1 through 7.1.8
2. **Status of the public education evaluation**: Section 7.1.4
3. **Summary of the adaptive management process for FY2012:**Section 8
4. **Proposed changes to the SWMP:** Section 8
5. **Summary of stormwater program expenditures:** Section 4.0
6. **Summary of monitoring results:** *See Section IV Monitoring Compliance Report of the combined report. Section 6.1 of this document explains the Port's monitoring coordination with the City.
7. **Proposed changes to the monitoring plan:** *See Section IV Monitoring Compliance Report of the combined report. Section 6.1 of this report explains the Port's monitoring coordination with the City.
8. **Summary describing Port's Illicit Discharge Program:** Section 7.1.1
9. **Overview of planning, land use changes, and new development:** Section 2.1

2.0 PORT OF PORTLAND PERMIT AREA AND RESPONSIBILITIES

The Port of Portland owns approximately 5,505 acres within the City of Portland (City) Urban Services Boundary (USB). Port property is divided into three primary Business Lines under the Operations Division: 1) Aviation, 2) Marine, and 3) Industrial Development. Within the City USB, the Aviation Business Line consists of Portland International Airport (PDX), the Marine Business Line includes Marine Terminals 2, 4, 5 and 6, and the Industrial Development Business Line consists of the following industrial parks: Swan Island, Mocks Landing, Rivergate, Cascade Station, and Portland International Center (PIC). Figure 1-1 (pg. 2) shows the Port's permit area, breaking out leased property and facilities with Industrial Stormwater General Permits.



Port of Portland geospatial data is gathered, maintained and primarily used for internal reference and analysis, and is only updated as resources permit. Geospatial data refers to data and information referenced to a location on the Earth's surface such as maps, charts, air photos, satellite images, cadastre and land and water surveys, in digital or hard copy form. Geospatial data may be gathered and maintained by more than one person or Department within the Port, and data distributed by one person or department may not reflect the most recent data available from the Port or from other sources. Port geospatial data is not intended for survey or engineering purposes or to describe the authoritative or precise location of boundaries, fixed human works, or the shape and contour of the earth. The Port makes no warranty of any kind, expressed or implied, including any warranty of merchantability, fitness for a particular purpose, or any other matter with respect to its geospatial data. The Port is not responsible for possible errors, omissions, misuse, or misrepresentation of its geospatial data. Port geospatial data is not intended as a final determination of such features as existing or proposed infrastructure, conservation areas, or the boundaries of regulated areas such as wetlands, all of which are subject to surveying or delineation and may change over time. No representation is made concerning the legal status of any apparent route of access identified in geospatial data.

PORT OF PORTLAND
Portland, Oregon

0 0.5 1 2 miles

N

Geographic Data Standards

Projected Coordinate System:
NAD 1983 HARN State Plane, Oregon North, Intl Feet
Map Projection Name:
Lambert Conformal Conic

Figure 1-1
Port of Portland MS4 Permit Area
Port Property within City of Portland Urban Services Boundary

PJ Houser | GIS Program | September 2013
Prepared for Jamey Berg, Environmental Affairs

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The Port also owns a number of undeveloped properties within the USB including wetland mitigation sites, natural areas, and vacant tax lots. The Port is in a unique situation with regard to the typical municipal planning, permitting, and land use modification processes. The City of Portland is responsible for these activities and the Port complies with their process. For the purposes of this report, all reporting on these activities contained in section B.5.iwill be satisfied in the City's section. With respect to the other requirements of B.5.ithe Port estimates during the 2012-13 reporting period it had 2,102 acres of impervious surface. This represents 38% of total Port property within the City of Portland USB.

PDX, the marine terminals, and the industrial parks are partially occupied by tenants. The Port manages those tenant properties through lease agreements. Leased property represents approximately 31% of Port property within the USB. A more detailed description of Port operating areas is included in Section 2.1.

Property owned by the Port is primarily zoned for commercial and industrial use. Many of these areas accommodate industrial activities that require DEQ-issued NPDES industrial stormwater general permits (1200-Z and 1200-COLS permits) or individual permits addressing stormwater discharge. Sixty-six percent of the Port's holdings within the USB are regulated under these permits. PDX and portions of Terminal 2 are operated by the Port under DEQ-issued industrial stormwater discharge permits. In addition, some tenants occupying leased property on Terminals 2, 4, 5, 6, and the industrial parks also operate under 1200-Z or 1200-COLS permits. For Port operations within these areas, several of the MS4 permit requirements are satisfied through implementation of industrial stormwater permit requirements, addressed in their Stormwater Pollution Control Plans (SWPCPs). Section 2.2 addresses how these activities are coordinated with the Port's MS4 permit responsibilities.

2.1 MS4 Permit Area

2.1.1 Portland International Airport

PDX comprises an area of approximately 2803 acres and is located in Northeast Portland between the Columbia River and the Columbia Slough. The facility is owned and operated by the Port. However, numerous aviation-related tenants also conduct operations at PDX.

Stormwater runoff from PDX property discharges into the Columbia Slough through a series of pipes, open channels, and 9 major outfalls. These stormwater discharges are permitted under PDX's NPDES 1200-COLS Industrial Stormwater General Permit issued and administered by DEQ. The 1200-COLS permit is structured to specifically address Columbia Slough Total Maximum Daily Load (TMDL) parameters, including dissolved oxygen, pH, nutrients, bacteria, and toxics. With the exception of the Oregon Air National Guard and Yoshida Foods international (who have their own 1200-COLS permits), PDX tenants whose operations trigger the need for a stormwater permit are required to be a co-permittee under PDX's 1200-COLS permit.

In addition to the 1200-COLS permit, PDX also holds an NPDES Construction Dewatering Waste Discharge Permit, a 1200-CA Construction Discharge Permit, a Water Pollution Control Facility (WPCF) 1700-B Wastewater Permit, a NPDES Anti-icing/Deicing Waste Discharge

Permit, and a pre-treatment permit issued by the City of Portland for deicing discharges to the sanitary system.

2.1.2 Marine Terminals

The Port has four active shipping terminals that are managed by the Port's Marine Business Line. The terminals collectively occupy approximately 1012 acres along the Willamette River (Terminals 2, 4, and 5) and Columbia River/Slough (Terminal 6). They handle the shipping, receiving, and temporary storage of finished goods, agricultural products, and raw materials.

The industrial stormwater discharge permits required for Terminal 6 discharges into the Columbia River and the Columbia Slough are covered by corresponding 1200-Z and 1200-COLS permits held by the new tenant. The Port continues to hold a 1200-Z permit for the Port-managed area of Terminal 2. A number of properties located at Terminals 2, 4, and 5 are also leased to tenants. Several of these tenants hold 1200-Z or individual permits that are issued by DEQ and administered by the City.

2.1.3 Industrial Parks

The Port's Industrial Development Business Line manages the Port-owned industrial parks, Swan Island, Mocks Landing, Rivergate, Cascade Station, and Portland International Center (PIC), totaling approximately 1524 acres. Several industrial park tenants also hold 1200-COLS or 1200-Z permits that are issued by DEQ and administered by the City.

2.1.4 Undeveloped Properties

The Industrial Development Business Line also manages approximately 1510 acres of undeveloped property within the City's USB. This does not include West Hayden Island, which is within the unincorporated USB and does not receive city services at this time. Stormwater management activities for undeveloped properties discharging into the Port's MS4 are conducted under the MS4 permit.

2.2 MS4 Permit Responsibilities

Many of the requirements of the industrial stormwater general discharge permits overlap with requirements of the MS4 permit. A large proportion (66%) of the area included in the Port's MS4 permit area is also regulated under industrial stormwater permits, which have been issued to either the Port or its tenants.

The City of Portland and Port are co-permittees on MS4 Permit #101314. The City regulates stormwater on a city-wide basis with some implementation overlapping the Port's MS4 area. The Port and City coordinate permit management activities through an intergovernmental agreement (IGA).

Table 2-1 (Permit Requirements and Responsibilities) was developed to explain the complex relationship between the Port's management of stormwater through its MS4 permit, the City's overlapping stormwater management activities through its MS4 permit, and DEQ's regulation of industrial stormwater on some Port property through other NPDES permits. This tool was included in the Port's 2012 SWMP to show specific program coverage for each MS4 permit requirement. Table 2-1 lists the SWMP requirements from the Port's MS4 permit along the left

hand column. Responsibility descriptions for each SWMP requirement are split according to the following two categories: (1) Port MS4 permit areas that do not have industrial stormwater permits (1200-Z or 1200-COLS permits), and (2) Port MS4 permit areas where the Port or its tenant has a general industrial stormwater permit (1200-Z or 1200-COLS permits). The two responsibility categories are further split between tenants and Port operations. For some tenants and Port operating areas (Terminals 2 and PDX) with an industrial stormwater permit, several of the MS4 permit requirements related to specific activities are addressed through implementation of the industrial stormwater permits. These requirements are shown shaded in gray on Table 2-1. In addition, permit requirements within the Port's jurisdiction covered by the City's stormwater management activities are also shaded in gray on Table 2-1. Areas left unshaded on Table 2-1 are addressed by BMPs in the Port's 2012 SWMP. These unshaded areas list the specific BMPs that meet each corresponding permit requirement.

Section 7.0 of this annual report outlines the BMPs listed in the Port's 2012 SWMP and specifies responsible parties for each BMP implementation task. In addition, Section 7.0 describes the Port's SWMP implementation during the permit year to address tracking measures and progress toward meeting measurable goals under each BMP.

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Table 2-1. Port of Portland MS4 Permit Requirements and Responsibilities (Areas shaded in gray are MS4 permit requirements that are not addressed by BMPs in the Port's SWMP because the requirements are either covered by the City of Portland, or are covered under an industrial stormwater permit. Unshaded Areas are covered by the Port's SWMP BMPs listed below.**)**

MS4 Permit SWMP Requirements	MS4 Service Areas Not Covered Under Industrial Stormwater Permits		MS4 Service Areas With Industrial Stormwater Permits	
	Tenants	**Port Operations**	**Tenants**	**Port Operations**
Schedule A.4.a Illicit Discharge Detection and Elimination.				
i. Prohibit, through ordinance or other regulatory mechanism, illicit discharges	BMP: Implement the Illicit Discharge Detection and Elimination Program			
ii. Describe enforcement response procedures	BMP: Implement the Illicit Discharge Detection and Elimination Program			
iii. Develop pollutant parameter action levels	BMP: Conduct Dry-Weather Field Screening			
iv. Conduct annual dry weather inspection activities including field screening	BMP: Conduct Dry-Weather Field Screening			
v. Identify response procedures to investigate portions of the MS4 where relevant information indicates the likely presence of illicit discharges	BMP: Conduct Dry-Weather Field Screening			
vi. Maintain a system for documenting and procedures for responding to illicit discharges	BMP: Conduct Dry-Weather Field Screening			
vii. Appropriate action for illicit discharge removal	BMP: Implement the Illicit Discharge Detection and Elimination Program		Spill response activities address employee reporting and are covered under 1200-Z and 1200-COLS permits[1]	
			BMP: Implement the Illicit Discharge Detection and Elimination Program	
viii. Spill prevention and response	BMP: Implement a Spill Response Program for Port Operated Property		Covered under 1200-Z and 1200-COLS permits[2]	
ix. Notify affected municipality of illicit discharge originating within the permittee's permit area	BMP: Implement the Illicit Discharge Detection and Elimination Program			
x. Notify responsible municipality of illicit discharge affecting the permittee, originating outside of the permittee's permit area	BMP: Implement the Illicit Discharge Detection and Elimination Program			
xi. Maintain maps showing major MS4 outfalls	BMP: Conduct Dry-Weather Field Screening			
xii. Unless identified as a significant source of pollutants, the following non-stormwater discharges are not considered illicit discharges (see Schedule A.4.a.xii)	BMP: Implement a Water Line Flushing Procedure			
Schedule A.4.b Industrial and Commercial Facilities				
i. Screen existing and new industrial facilities	BMP: Screen Existing and New Industrial Facilities		These areas are already covered by an industrial stormwater NPDES permit	
ii. Notify DEQ and facility if subject to an industrial NPDES permit	BMP: Screen Existing and New Industrial Facilities		These areas are already covered by an industrial stormwater NPDES permit	
iii. Inspection of industrial or commercial areas identified as significant sources of pollutants	BMP: Implement an Inspection Program for Significant Pollutant Source Areas			
Schedule A.4.c Construction Site Runoff Control				
i. Ordinance that requires erosion and sediment controls	Implemented through the City of Portland's erosion control ordinance; may also be covered under a 1200-C permit	Implemented through the Port's 1200-CA Permit, the City of Portland's erosion control program and related contract specifications.	Implemented through the City of Portland's erosion control ordinance; may also be covered under a 1200-C permit	Implemented through the Port's 1200-CA Permit and related contract specifications
ii. Require construction site operators to develop site plans and implement erosion and sediment control BMPs				
iii. Require construction site operators to prevent/ control non-stormwater waste				
iv. Erosion control site plan review				

MS4 Permit SWMP Requirements	MS4 Service Areas Not Covered Under Industrial Stormwater Permits		MS4 Service Areas With Industrial Stormwater Permits	
	Tenants	Port Operations	Tenants	Port Operations
v. Perform on-site inspections				
vi. Maintain enforcement response procedures				
Schedule A.4.d Education and Outreach				
i. Implement a documented public education and outreach strategy	BMP: Implement Public Education Measures to Protect Stormwater Quality.			
ii. Provide educational material to the community or conduct equivalent outreach activities	BMP: Implement a Tenant Stormwater BMP Program	N/A	BMP: Implement a Tenant Stormwater BMP Program	N/A
	BMP: Implement Public Education Measures to Protect Stormwater Quality			
iii. Provide public education on pesticide, herbicide, fertilizer, and other chemicals	BMP: Require Training and Licensing for Staff Conducting Pest Management Activities BMP: Implement a Tenant Stormwater BMP Program			
iv. Provide public education on proper operation and maintenance of privately-owned/ operated stormwater quality facilities	BMP: Implement a Tenant Stormwater BMP Program BMP: Implement a Program for the Tracking and Maintenance of Private Structural Controls			
v. Provide notice to construction site operators regarding training for erosion and sediment control	BMP: Provide Erosion Prevention and Sediment Control Training for Construction Inspectors			
vi. Conduct/ participate in a public education effectiveness evaluation	BMP: Participate in a Public Education Effectiveness Evaluation			
vii. Include training for municipal employees involved in MS4 activities	BMP: Implement a Spill Response Training Program. BMP: Implement a Municipal Staff Training Program for Stormwater Pollution Prevention BMP: Require Training and Licensing for Staff Conducting Pest Management Activities		Covered under 1200-Z and 1200-COLS permits[3]	
viii. Promote, publicize, and facilitate public reporting of illicit discharges	BMP: Implement the Illicit Discharge Detection and Elimination Program			
Schedule A.4.e Public Involvement and Participation				
e. Implement a public participation process for receiving and considering comments on the SWMP and TMDL benchmarks	BMP: Provide for Public Participation with SWMP and Benchmark Submittals			
e. Implement a public participation approach that provides opportunities for the public to effectively participate in the implementation of the co-permittee's stormwater management program	BMP: Implement a Public Participation Approach that Provides Opportunities for the Public to Effectively Participate in the Implementation of the Stormwater Management Program			
Schedule A.4.f Post-Construction Site Runoff				
i. Implement a post-construction stormwater pollutant and runoff control program	BMP: Develop, Adopt, and Implement New Port-Specific Post-Construction Runoff Control Standards			
ii. Identify, and where practicable, minimize or eliminate ordinance, code and development standard barriers	BMP: Develop, Adopt, and Implement New Port-Specific Post-Construction Runoff Control Standards			
iii. Develop or reference an enforceable post-construction stormwater management manual	BMP: Develop, Adopt, and Implement New Port-Specific Post-Construction Runoff Control Standards			

MS4 Permit SWMP Requirements	MS4 Service Areas Not Covered Under Industrial Stormwater Permits		MS4 Service Areas With Industrial Stormwater Permits	
	Tenants	Port Operations	Tenants	Port Operations
vi. Review, approve, and verify proper implementation of post-construction site plans	BMP: Develop, Adopt, and Implement New Port-Specific Post-Construction Runoff Control Standards			
v. Require off-site stormwater management for locations limited in their ability for on-site stormwater capture and treatment or flow reduction	BMP: Develop, Adopt, and Implement New Port-Specific Post-Construction Runoff Control Standards			
vi. Describe inspection and enforcement response procedures to address compliance issues with post-construction stormwater management performance standards	BMP: Develop, Adopt, and Implement New Port-Specific Post-Construction Runoff Control Standards			
Schedule A.4.g Pollution Prevention for Municipal Operations				
i. Operate and maintain public streets, roads, and highways	The City of Portland is responsible for operation and maintenance of the public right-of-way			
	BMP: Implement a Street and Vehicle Maneuvering Area Cleaning and Maintenance Program			
ii. Implement a program to control the use and application of pesticides	BMP: Limit Landscape Maintenance Activities Impact on Stormwater BMP: Require Appropriate Training and Licensing for Pest Management Activities BMP: Implement a Tenant Stormwater BMP Program			
iii. Inventory, assess, and implement a strategy to reduce the impact of stormwater runoff from facilities that treat, store, or transport municipal waste, not already covered by a 1200 series permit	No tenant properties currently accommodate municipal facility waste	The Port does not operate any facilities that fall under this requirement and are not covered under a 1200 series permit.	N/A	N/A
iv. Implement controls to limit infiltration of seepage from the municipal sanitary system	BMP: Implement a Program to limit infiltration from Port-owned sanitary sewer system to the MS4			
v. Implement a strategy to prevent or control the pollutant discharge from firefighting training activities	The only firefighting training facility is located at PDX, which is covered by a 1200-COLS permit			
vi. Retrofitting flood control facilities	The City of Portland manages water quality improvements on a master planning level. Any potential flood control retrofits will be considered as part of the Retrofit Analysis			
Schedule A.4. h Structural Stormwater Controls Operations and Maintenance				
i. Implement a program to verify structural control facilities and controls are inventoried, mapped, inspected, operated and maintained	BMP: Implement a Stormwater System Cleaning and Maintenance Program BMP: Implement a Program for Tracking and Maintenance of Private Structural Controls		Covered under 1200-Z and 1200-COLS permits[4]	Covered under 1200-Z and 1200-COLS permits[4]
ii. Develop and implement a plan or approach to guide the long-term maintenance and management of all publically-owned and privately owned stormwater facilities	BMP: Implement a Stormwater System Cleaning and Maintenance Program BMP: Implement a Tenant Stormwater BMP Program.		Covered under 1200-Z and 1200-COLS permits[4]	Covered under 1200-Z and 1200-COLS permits[4]
Schedule A.6.c Stormwater Retrofit Project				
ii. Identify one stormwater quality improvement project, at a minimum, to be initiated constructed and/or implemented during the permit term	BMP: Develop, Adopt, and Implement New Port-Specific Post-Construction Runoff Control Standards			
Schedule B1-B4 Monitoring Component Requirements				
The Port must assist with monitoring efforts in conjunction with requirements as stated in Table B-1, Schedule B.1.b	Pursuant to an IGA, the Port of Portland and the City of Portland have a joint monitoring program conducted by the City to meet the requirements specified under Schedule B			

Notes:

[1]The 1200-Z and 1200-COLS cover this requirement in Schedule A under “Non-Stormwater Discharges.”
[2]The 1200-Z and 1200-COLS cover this requirement in Schedule A under “Spill Prevention and Response Procedure.”
[3]The 1200-Z and 1200-COLS cover this requirement in Schedule A under “Spill Prevention and Response Procedure” and “Employee Education.”
[4]The 1200-Z and 1200-COLS cover this requirement in Schedule A under “Preventative Maintenance”, “Control Measures for Technology Based Effluent Limits” and “Required (SWPCP) Elements”

3.0 PORT OF PORTLAND ORGANIZATIONAL STRUCTURE

The Port's Environmental Operations is responsible for administering the MS4 permit and the SWMP. The Environmental Affairs Manager serves as the MS4 permit manager. Staff from Environmental Operations and each of the three business lines is responsible for implementing Port environmental programs to ensure permit compliance. As a means of coordinating Port-wide programs and policies, environmental program managers regularly meet with cross-functional teams that include Port operating area staff. One means of coordination between Port staff is through the Water Resources Coordination Group (WRCG). This group includes staff from Environmental Affairs, Legal, Aviation, Marine, Industrial Development, Public Affairs, and Engineering. The WRCG meets monthly and is responsible for providing input on Port-wide stormwater policy issues, water quality, and permit implementation. The Environmental Affairs Manager serves as the lead for the WRCG.

With respect to implementation of the Port's industrial stormwater discharge permits, Environmental Operations staff prepares, updates, and ensures implementation of the PDX SWPCP in coordination with the co-permittees. They are now also responsible for the preparation, revision, and implementation the Terminal 2 SWPCP as well. Tenants with industrial stormwater discharge permits are also required to prepare, maintain and implement SWPCPs. The City (DEQ's agent) coordinates directly with Port tenants holding these permits.

4.0 STORMWATER EXPENDITURES

The Port's state-mandated mission is to enhance the region's economy and quality of life by providing efficient cargo and air passenger access to global and national markets. In support of this mission, the Port annually undertakes budget and business planning to identify areas of focus and actions needed to address them.

The Port derives almost all revenue from business transactions with the users and tenants of Port facilities. A small proportion (approximately three to four percent) of the Port's overall revenue is from property tax. Business transactions generally occur between the Marine Business Line, the Aviation Business Line (Commercial Aviation and General Aviation), the Industrial Development Business Line, and associated users and tenants of those properties. Industrial Development Business Line revenue sources can also include sales of property. The Port also receives revenue from the U.S. Army Corps of Engineers for dredging services.

Commercial Aviation (PDX) resources are derived primarily from charges to airline passengers and air cargo customers, airport parking, rental car revenue, passenger facility charges, Federal grants, and tenant fees. PDX resources cannot be comingled with any other resources of the Port and are restricted for use at Aviation facilities by bond ordinances and Federal Aviation Administration (FAA) regulations.

The Port annually budgets resources to fund projects and programs identified in the Strategic and Business Line Plans. Program expenses are allocated among Business Lines and departments involved in implementation of the program. Specifically, stormwater resources are allocated among the three Port Business Lines, Environmental Affairs Department, Information Technology (IT) Department, Legal Department, and Engineering Department. Stormwater

program expenditures include the cost of staff salary (including fringe costs), permit fees, contractor and consultant fees, stormwater infrastructure, City of Portland stormwater fees, disposal of collected material, sample analysis, stormwater training, and outreach materials.

Table 4-1, shows estimated stormwater program expenditures broken out by area and in total for fiscal year 2012-13 and 2013-2014. Marine and Industrial Development Business Lines are shown together.

Table 4-1. Summary of Port of Portland Stormwater Expenditures

Department	Estimated 2012-13 Stormwater Expenditures	Projected 2013-14 Stormwater Expenditures
Marine, and Industrial Development Business Lines	$646,419	$650,460
Aviation Business Line (including deicing)	$5,431,616	$5,071,800
Engineering	$851,120	$851,500
IT	$28,020	$28,020
Legal	$16,640	$16,640
Environmental Affairs	$142,937	$167,600
Totals	$7,116,751	$6,786,000

5.0 DEMONSTRATION OF CONTINUED LEGAL AUTHORITY TO IMPLEMENT THE PROGRAMS OUTLINED IN THE SWMP

The Port has authority to implement programs outlined in the SWMP through ordinance, permits, and contracts.

The Port has statutory authority to enact ordinances to regulate stormwater sewers that it owns, operates, maintains, or controls. The Port Commission adopted Ordinance No. 361 in 1992, which asserts the Port's regulatory authority over its stormwater system and discharges into that system. Section 3 prohibits any person from making, causing, or allowing an illicit discharge into a storm sewer owned or operated by the Port. Section 4 requires written permission from the Port in order to make a connection to a Port storm sewer. Section 5 authorizes the Port to inspect Port-owned property for violations of the Ordinance or applicable law that governs the conveyance or disposal of stormwater. In addition, the Ordinance provides the Port with authority to control the contribution of pollutants to storm sewers owned or operated by the Port; the quality of stormwater discharged from the sites of industrial activity on land owned by the Port; and the discharge to storm sewers owned or operated by the Port of pollutants from spills, dumping, or the disposal of materials other than stormwater.

In addition to the Ordinance, the Port has legal authority to control the contribution of pollutants to the municipal storm sewer through contracts with Port tenants. Lease agreements require the lessees to comply with the Port's MS4 permit. Through these regulatory and contractual mechanisms, the Port works with tenants and users of Port facilities to implement BMPs that control the contribution of pollutants to Port storm sewers.

6.0 STORMWATER MONITORING

The Port's monitoring program consists of environmental and BMP monitoring elements. Activities within these groups are in place to meet Schedule B monitoring requirements, including the following MS4 monitoring objectives:

1. Evaluate the source(s) of the 2004/2006 303(d) listed pollutants applicable to the co-permittee's permit area;
2. Evaluate the effectiveness of BMPs in order to help determine BMP implementation priorities;
3. Characterize stormwater based on land use type, seasonality, geography, or other catchment characteristics;
4. Evaluate long-term trends in receiving water quality associated with storm water discharges;
5. Assess the chemical, biological, and physical effects of MS4 runoff on receiving waters;
6. Assess progress towards meeting TMDL pollutant load reduction benchmarks.

Table 6-1 (shown in Appendix A) explains how each monitoring program activity within the two elements relates to these objectives. A description of each monitoring program element is provided below.

6.1 Environmental Monitoring

The Port satisfies the MS4 environmental monitoring requirements through an IGA with the City of Portland. The IGA specifies the terms and conditions regarding how the Port shares costs with the City for environmental monitoring efforts. The City's Quality Assurance Monitoring Plan (QAMP) consists of in-stream (event), in-stream (continuous), stormwater, pesticide, mercury, and macroinvertebrate monitoring elements. The plan can be downloaded at http://www.portlandonline.com/bes/index.cfm?a=349082&c=37485. A discussion of this program and its operations during FY2012 is included in City of Portland's Monitoring Compliance Report (Section IV of the Annual Report).

6.2 Best Management Practice (BMP) Monitoring

The Port's BMP monitoring activities are described as tracking measures and measureable goals in the most recently approved SWMP, submitted to DEQ on December 28, 2012. These monitoring activities are specific indicator metrics that help document the completion of tasks and assess the relative effectiveness of BMPs. The implementation tasks, tracking measures, and measurable goals associated with each Port BMP are provided in Sections 7.1.1 through 7.1.8.

6.3 Additional Stormwater Monitoring Activities

The Port collects and submits additional stormwater monitoring data to DEQ as required by the Port's various NPDES Stormwater permits. Data collected for these permits is not included in the MS4 permit annual report, but is available through DEQ upon request.
This monitoring provides useful data about stormwater discharges from Port industrial properties. Information resulting from these sampling events has been used to manage the stormwater programs at these facilities and may continue to be useful for understanding water quality impacts from different types of industrial sources.

The Port submitted stormwater monitoring data to DEQ for the following industrial stormwater discharge permits in FY2012:

- NPDES 1200-COLS Industrial Stormwater Discharge Permits, DEQ File No. 107220 (PDX)
- NPDES 1200-Z Industrial Stormwater Discharge Permit, DEQ File No. 114024 (Terminal 2)
- NPDES Deicing Permit No. 101647

7.0 ACCOMPLISHMENTS FOR PERMIT YEAR Seventeen (2012-13)

7.1 SWMP Implementation

The annual report content and format is based on the SWMP submitted to DEQ in December 28th, 2012. The SWMP is structured into eight major elements. These elements contain the necessary BMPs to address MS4 permit requirements included in Schedule A(4)(a-h). Reporting on tracking measures and progress towards associated measurable goals are shown in italics for each BMP below. Reporting regarding any task not addressed by the corresponding tracking measures or measurable goal response is addressed in italics directly under the task.

7.1.1 Element #1: Illicit Discharge Detection and Elimination

BMP: Implement the Illicit Discharge Detection and Elimination (IDDE) Program

Implementation Tasks:

1. Continue to implement documented illicit discharge detection and elimination procedures (Responsibility: Operations Environmental).
2. Update the illicit discharge detection and elimination procedures by November 1, 2011 per provisions consistent with the MS4 NPDES permit language (Responsibility: Environmental Affairs).
3. Implement a reporting program for potential illicit discharges by maintaining spill notification signs throughout Port property (Responsibility: Operations Environmental, Marine Properties Maintenance, Marine Facilities Maintenance (MFM), and PDX Maintenance).
   - ✓ *Operations staff continues to be trained on spill notification annually. Notification signage is maintained on both Marine and Aviation properties.*

Tracking Measures:

1. Track the status of updating the illicit discharge detection and elimination procedures.
   - ✓ *Previously completed (FY2011).*
2. Track the number, type, location, and resolution of any illicit discharge investigations conducted.
   - ✓ *Aviation investigated three potential illicit discharges in FY2012. Two were associated with dry-weather field screening conducted on 8/29/12 (*See summary under BMP: Conduct Dry-Weather Field Screening tracking measures.) The last was in response to an illicit discharge to the Columbia Slough by Boeing on September 12, 2012. The Port responded by issuing a Notice of Violation on October 1, 2012.*

- ✓ *Marine investigated one potential illicit discharge in FY2012. (*See summary under BMP: Conduct Dry-Weather Field Screening tracking measures.)*

Measureable Goals:

1. Update the illicit discharge detection and elimination procedures by November 1, 2011.
   - ✓ *Previously completed (FY2011)*

BMP: Conduct Dry-Weather Field Screening

Implementation Tasks:

1. Conduct annual dry-weather field screening activities at all priority outfall locations (Responsibility: Environmental Operations).
2. Annually, as necessary, update Port data files related to outfall locations, in accordance with dry-weather field screening activities (Responsibility: Environmental Operations).
3. Update the dry-weather field screening procedures by June 30, 2012 to be in accordance with MS4 permit requirements (Responsibility: Environmental Affairs).

Tracking Measures:

1. Track the number and location of priority outfalls inspected during dry-weather field screening activities.
   - ✓ *Aviation inspected 15 outfalls.*
   - ✓ *Marine inspected 62 outfalls.*
   - ✓ *The location of Port "Priority Outfalls" for dry-weather field screening is mapped in the Port's GIS system.*
2. Summarize dry-weather field screening inspection results and indicate outfalls requiring sampling or follow up activities.
   - ✓ *Aviation screening was conducted on 8/29/12.*
     - ***Summary:*** *Fifteen outfalls were inspected. Outfalls for PDX basins 1E, 1C, 3, 4, 6, 8, SP2 and 9B displayed visible flow. Six of the outfalls with flow have been investigated in previous years and the source has been determined to be groundwater infiltration and/or landscape irrigation water (both allowable discharges). This year each basin was inspected, visual observations were similar to those in the past, and no other potential source of the flow could be identified to indicate an illicit discharge. PDX has an extremely high water table; studies performed for the Port have documented significant groundwater infiltration into the Port's stormwater system. Outfalls 3 and 9B involved further investigation. However, no source was identified.*
   - ✓ *Marine screening was conducted on 8/28/12, 8/29/12, 8/30/12, 9/4/12, and 9/5/12.*
     - ***Summary:*** *Sixty-two Port outfalls were inspected. One outfall displayed visible flow requiring Port follow up. Additionally, 9 observed were referred to the City of Portland. The City followed up on outfalls (STSOUT 173 [M-1], STSOUT 258, STSOUT 264, BPA Pond Culvert [STSOUT 311], STSOUT 166, STSOUT 167, STSOUT 278, S&B-1, and STSOUT 164).*

3. Indicate the outcome and resolution of inspection activities conducted.

   ✓ ***Aviation:***
   - ***Outfall 3:*** *A very small flow was observed on 8/29/12. The flow did not have any distinguishing characteristics that would indicate it was illicit. The basin was driven to identify any potential sources. None were noted. This outfall has historically had groundwater flows during previous dry weather field inspections. Flow attributed to groundwater.*
   - ***Outfall 9B:*** *Low flow was noted on 9/29/13. No physical characteristics of an illicit discharge were apparent. This outfall has historically had groundwater flows during previous dry weather field inspections. Flow attributed to groundwater.*

   ✓ ***Marine:***
   - ***STSOUT 268****: a slow steady discharge was observed from this outfall on 9/4/12. A sample was taken and environmental parameters were field analyzed. Temperature was 16.6° C (61.8° F), pH was 6.88, and conductivity was 480 µS. High conductivity may be due to method of analysis (i.e., collecting the slow flow into a sample container for multi-meter testing). Catch basins that feed this outfall were inspected and all appeared dry. In the Marine and Properties Illicit Discharge Inspection Summary Report, dated October 5, 2011, sampling and analytical analysis of discharge waters from STSOUT 268 determined it to be groundwater flow. It was determined that upstream was a holding pond that has historically discharged to the outfall due to groundwater infiltration. Based on field analysis of water parameters, investigation of catch basins, and historical precedent of slow discharging groundwater from outfall, the investigators determined this was not an illicit discharge.*

Measureable Goals:

1. Update dry-weather field screening procedures, in accordance with permit requirements by July 1, 2012.

   ✓ *Previously completed (FY2011)*

2. Inspect priority outfalls annually.

   ✓ *A total of 77 priority outfalls were inspected Port-wide as part of dry-weather field screening activities in 2012-13.*

BMP: Implement a Spill Response Program for Port Operated Property

Implementation Tasks:

1. Implement the Port's spill response procedure and update as necessary (Responsibility: Environmental Operations).
2. Participate in the City's Spill Response Committee (Responsibility: Environmental Operations).

   ✓ *Staff from Environmental Operations continues to be active on the City of Portland's Regional Spill Committee and attend quarterly meetings when they are held.*

3. Ensure trained Port staff members are available for on-call spill response, in addition to ensuring current contracts with on-call spill response contractors (Responsibility: Environmental Operations).

Tracking Measures:

1. Track the number of spills of a reportable quantity in which a spill response was conducted.
   - ✓ *Two reportable quantity spills were responded to at Aviation facilities in FY2012.*
   - ✓ *Two reportable quantity spills were responded to at Marine facilities in FY2012.*

Measureable Goals:

1. Implement the Port's Spill response procedures.
   - ✓ *The Port continues to train appropriate employees in order to properly implement effective spill response procedures. Reportable quantity spill cleanup is conducted by on-call contractors trained and equipped to minimize discharges to the environment. Incidental spill response is performed by trained employees.*

BMP: Implement a Water Line Flushing Procedure

Implementation Tasks:

1. Implement a water line flushing procedures to ensure appropriate disposal of chlorinated water (Responsibility: PDX Maintenance, MFM).

Measureable Goals:

1. Implement waterline flushing consistent with guidelines described in the BMP description included in the December 28, 2012 SWMP.
   - ✓ *Marine and Aviation staff are aware of the requirements associated with this type of discharge and implement procedures to comply with the Port's work instruction ("Disposal of Chlorinated Water: Hydrant & Waterline Flushing") on the subject. This work instruction has been posted for operating area reference and is covered in stormwater pollution prevention training.*

7.1.2 Element #2: Industrial and Commercial Facilities

BMP: Screen Existing and New Industrial Facilities

Implementation Tasks:

1. Coordinate with the City of Portland over the permit term to develop a screening process for industrial facilities (Responsibility: Environmental Affairs).

Tracking Measures:

1. Track leaseholds that have an individual or industrial stormwater permit.
   - ✓ *The Port maintains a list of tenants who hold an individual Industrial Stormwater General Permit. These include: Yoshida Foods International Limited Partnership, International Container Terminal Services, Inc., Stevedoring Services America, Inc., Kinder Morgan Bulk Terminal 4, Toyota Logistics Services, Inc., Columbia Grain, Inc., Auto Warehousing Company (for Hyundai),Swan Island Batch Discharge Plant (Rinker), the Oregon Air National Guard, Con Global Industries, and Northwest Cascade Honey Bucket.*

Measureable Goals:

1. Coordinate with the City of Portland on a process for screening industrial facilities over the permit term.
   - ✓ *The Port has an IGA with the City which states that the City will cover the screening of Port tenants regarding the need for an industrial permit.*

BMP: Implement an Inspection Program for Significant Pollutant Source Areas

Implementation Tasks:

1. Conduct inspections of Priority Facilities annually, or more frequently if needed (Responsibility: Environmental Operations).
2. If inspections identify conditions needing improvements, coordinate with tenant and Port property manager to ensure appropriate control measures to minimize pollutant loading from priority facilities (Responsibility: Environmental Operations).

Tracking Measures:

1. Track the number of facilities inspected annually.
   - ✓ *12 inspections of Aviation Priority Facilities were conducted in FY2012.*
   - ✓ *10 inspections of Marine Priority Facilities were conducted in FY2012.*
2. Track improvements made to Priority Facilities as a result of inspections.
   - ✓ *Inspection follow up letters are kept by Environmental Operations documenting any issues that require attention. In FY2012 some of the issues addressed included, maintaining spill and stormwater training documentation, updating Spill Prevention Control and Countermeasures plans, compliance with monthly inspection requirements, improper outdoor material storage, conducting required good housekeeping measures, documentation of catch basin cleaning, and labeling hazardous material storage areas.*

Measureable Goals:

1. Conduct Annual Inspections at Priority Facilities.
   - ✓ *Complete for FY2012. (See Tracking Measures response above).*
2. Document the procedure and rationale for selection of "Priority Facilities" by 11/1/2011.
   - ✓ *Previously completed and reported (FY2011).*

7.1.3 Element #3: Construction Site Runoff Control

Construction projects on Port property comply with the MS4 permit's runoff control requirements through compliance with the NPDES 1200-CA Permit (for Port operations), NPDES 1200-C permits (for tenant projects) as required by DEQ, or the City of Portland's erosion control ordinance (for smaller tenant projects). In addition, these requirements are incorporated into contracts to the extent construction site operators are performing work for the Port. Therefore, control of construction site runoff is addressed independently from the Port's SWMP. Coverage for Port operations and tenants is outlined in Table 2-1.

7.1.4 Element #4: Education and Outreach

BMP: Implement Public Education Measures to Protect Stormwater Quality

Implementation Tasks:

1. During inspections conducted under BMP – "Implement Inspections of Significant Pollutant Source Areas", and BMP – "Implement a Stormwater System Cleaning and Maintenance Program", identify catch basins where it would be relevant and appropriate to apply "Dump No Waste, Drains to Stream" decals and apply decals (Responsibility: MFM, PDX Maintenance).
2. Include stormwater education materials at Port sponsored outreach events (Responsibility: Public Affairs).

Tracking Measures:

1. Track the number of "Dump No Waste, Drains to Stream" decals applied to catch basins.
   - ✓ *The Port applied 276 decals in FY2012.*
2. Track events where stormwater educational materials were made available.
   - ✓ *Seaport Celebration (Environmental Programs booth) - August 2012 – attendance – approx. 2,000*
   - ✓ *Better Living Show – March 2013 – approx. 550 people*
   - ✓ *Columbia Slough Regatta – July 2012 – approx. 150 people*
   - ✓ *Deicing stormwater treatment facility tours (2 tours – approx. 50 people)*
   - ✓ *LEED Platinum headquarters building tours (14 tours - approx. 230 people)*
   - ✓ *World Environment Day PDX Sustainability Tour – June 2013 – 25 people*
   - ✓ *PDX Sustainability Tour – 15 students from Portland State University*
   - ✓ *Columbia Slough Watershed Council Annual Dinner – Environmental Achievement Award for deicing stormwater treatment facility – approx. 200 people*
   - ✓ *OEC Brown Bag for Port employees about protecting stormwater – April 2013 – 25 staff*

Measureable Goals:

1. "Dump No Waste, Drains to Stream" decals will be applied to catch basins associated with all new Port construction annually (with the exception of FAA restricted areas).
   - ✓ **See the tracking measure response above.*
2. Provide stormwater education materials at outreach events.
   - ✓ *The Port continues to address stormwater issues in a broad variety of outreach events. The details are presented in the tracking measure response above. Moving forward, the Port intends to maintain some outreach to the general public at events. However, our primary focus will be on outreach to industrial/commercial tenants since the Port's jurisdiction does not include any residential property. Education and outreach modules addressing target pollutants are in development for this target audience.*

BMP: Implement a Tenant Stormwater BMP Program

Implementation Tasks:

1. Maintain an inventory of all tenants or lease holders (Responsibility: Environmental Operations).
2. Provide technical assistance to the tenants regarding structural and non-structural/ source control stormwater BMPs (Responsibility: Environmental Operations).
3. Maintain an active property management role by conducting inspections of property vacated by tenants to ensure proper disposal of waste materials (Responsibility: Environmental Operations, Aviation and Marine Properties Management).

Tracking Measures:

1. Compile/ update a leasehold inventory annually.
   - ✓ *Marine, Aviation, and Industrial Development Properties groups provide an updated list of leaseholders annually. Tenant information is also updated on its own GIS layer within PortGIS, through a separate process. However, many of these leaseholds do not have any significant exposure to stormwater. Operating area environmental staff are familiar with the circumstances and needs of specific leaseholders. This information is taken into consideration when selecting priority facilities for inspection.*
2. Provide technical information related to structural and non-structural/ source control BMPs to tenants over the permit term.
   - ✓ *In FY2012, this was done during the Port's Priority Facility Inspections. *See issues addressed under BMP: Implement an Inspection Program for Significant Pollutant Source Areas (pg. 19). The Port is developing stormwater BMP education and outreach modules targeting industrial properties. These will be used in conjunction with the industrial inspection program and distributed to a larger group of industrial/commercial entities within the Port's jurisdiction.*

Measureable Goals:

1. Verify the completion and/ or update of a leasehold inventory.
   - ✓ *Completed in FY2012. *See tracking measure response above.*
2. Track technical assistance documentation provided to tenants.
   - ✓ *Technical assistance was provided on all stormwater issues encountered during priority facility inspections. *See a list of issues under BMP: Implement an Inspection Program for Significant Pollutant Source Areas (pg. 19).*
3. Describe property management activities for lease termination inspections.
   - ✓ *Inspections include a number of different areas including stormwater. The stormwater portion is focused on determining if the condition of the vacated property presents a source of potential stormwater contaminants. Any sources are identified and mitigated by the former tenant or by the Port and billed back to the responsible party. This means cessation of activities exposed to stormwater, such as outdoor storage. The stormwater system is surveyed and the tenant is asked to clean the catch basins if necessary. Sweeping or clean-up of surface staining can also be requested before a tenant is released from the lease.*

BMP: Require Training and Licensing for Staff Conducting Pest Management Activities

Implementation Tasks:

1. Require all pesticide applicators to obtain and maintain licenses issued by the Oregon Department of Agriculture (ODA) (Responsibility: PDX Maintenance, PDX Landscape, Marine Properties Maintenance, MFM).

Tracking Measures:

1. Track the Port employees who are ODA-licensed pesticide applicators.
   - ✓ *The following Port employees are ODA-licensed; Tim Cooper, Mark Griffith, Dustin Sandberg, Lyle Larson, Corrine Fritz, Don Goodman, Shawn Groom, Tim Guymon, Michael Sands, Luis Guevara, Marco Guevara, Jeff Morehead, Gary Tudor, Greg Croteau, Eric Dorrance, and Joe Harris*

Measureable Goals:

1. All pesticide applicators will be licensed by the ODA.
   - ✓ *All pesticide applicators working on Port-operated properties are licensed by the ODA. This includes four groups within the Port operating areas who work with these materials (PDX Maintenance, PDX Landscape, Marine Facilities Maintenance (MFM), and Marine Property Maintenance/Landscape).*

BMP: Provide Erosion Prevention and Sediment Control Training for Construction Inspectors

Implementation Tasks:

1. Provide annual erosion prevention and sediment control training for all Port construction inspectors (Responsibility: Environmental Operations).

Tracking Measures:

1. Track the number of employees receiving erosion and sediment control training.
   - ✓ *The Port provided a one hour training session to 14 staff members involved in construction inspection activities for Port projects. Staff trained through this process inspects projects regulated under the Port's 1200-CA permit.*

Measureable Goals:

1. Erosion prevention and sediment control training will be conducted annually for Port construction inspectors.
   - ✓ *Completed in FY2012. *See the tracking measure response above.*

BMP: Participate in a Public Education Effectiveness Evaluation

Implementation Tasks:

1. Coordinate with other local, Phase I jurisdictions in providing/ compiling information regarding a public education effectiveness evaluation by November 1, 2014 (Responsibility: Environmental Operations).

Tracking Measures:

1. Track related efforts annually.

   ✓ *The Port is participating in a DEQ approved project with other Phase I jurisdictions to conduct a large scale Public Education Effectiveness Evaluation. The effort is being spearheaded by the Association of Clean Water Agencies (ACWA).*

Measureable Goals:

1. Coordinate with other local, Phase I jurisdictions regarding a public education effectiveness evaluation by November 1, 2014.

   ✓ **See the tracking measure response above.*

BMP: Implement a Spill Response Training Program

Implementation Tasks:

1. Distribute updated emergency contact information and spill response procedures to employees responsible for responding to spills (Responsibility: Environmental Operations).
2. Conduct general spill response training annually for designated employees (Responsibility: Environmental Operations).

Tracking Measures:

1. Document spill response training activities.

   ✓ *Environmental Operations maintains documentation listing operations area personnel receiving annual spill response training. The criteria used to determine which employees receive training are explained under the second measurable goal below.*

Measureable Goals:

1. Annually train designated Port employees on spill response.

   ✓ *Spill response training was provided for 70 employees at Marine facilities*

   ✓ *Spill response training was provided for 129 employees at Aviation facilities*

2. Document the procedure to determine which employees will receive spill training by November 1, 2011.

   ✓ *Previously completed (FY2011).*

BMP: Implement a Staff Training Program for Stormwater Pollution Prevention

Implementation Tasks:

1. Continue to conduct training for new employees during their orientation (Responsibility: Public Affairs).
2. Provide targeted annual stormwater pollution prevention training for specific staff that conducts activities relevant to stormwater (Responsibility: Environmental Operations).
3. Port staff to attend conferences and educational presentations (Responsibility: Environmental Operations and Environmental Affairs).

Tracking Measures:

1. Document all staff training activities.
   - ✓ *Environmental Operations maintains documentation for all annual stormwater training provided to existing employees, as well as the new employee stormwater training provided during orientation. The Port provided stormwater pollution prevention training to 210 existing employees and 44 new employees during FY2012.*
2. Document attendance at conferences.
   - ✓ *Environmental Operations collects documentation of stormwater-related conferences attended by environmental staff. These conferences ensure Port staff is up to speed on relevant implementation, technology, and regulatory issues (examples include, NEBC Industrial Stormwater Conference, CASQA Stormwater Conference, Northwest Environmental Conference, ACWA Stormwater Summit, and various stormwater related training courses).*

Measureable Goals:

1. Participate in water quality organizations and stakeholder groups annually.
   - ✓ *The Port continues to participate as a member of the Columbia Slough Watershed Council, with a Port staff member sitting on the board. Other participation includes financial sponsorship, volunteer assistance at events, and in-kind services.*
2. Conduct annual training.
   - ✓ *Completed in FY2012. *See the tracking measure response above.*
3. Conduct new employee training.
   - ✓ *Completed in FY2012. *See the tracking measure response above.*

7.1.5 Element #5: Public Involvement and Participation:

BMP: Provide for Public Participation with SWMP and Benchmark Submittals

Implementation Tasks:

1. Provide opportunities for public comment on the SWMP and pollutant load reductions benchmarks for a minimum of 30 days prior to submittal of the permit renewal to DEQ (Responsibility: Environmental Operations and Public Affairs).

Tracking Measures:

1. Report annually on public participation in these areas.
   - ✓ *No public participation opportunities were available in FY2012.*

Measureable Goals:

1. Provide for public participation on the SWMP revisions and pollutant load reduction benchmarks (developed for permit renewal).
   - ✓ **See the tracking measure response above. Pollutant load reduction benchmarks will not be prepared for public comment again until the renewal application is submitted 180 prior to the permit expiration date.*
2. Provide public access to the Port's most current MS4 Annual Report via its public website.
   - ✓ *The Port's annual reports are available on-line via a link (on the "Stormwater Management Page" of the Port's public website) to the City of Portland's website http://www.portlandonline.com/bes/index.cfm?c=50289.*

BMP: Implement a Public Participation Approach that Provides Opportunities for the Public to Effectively Participate in the Implementation of the Stormwater Management Plan

Implementation Tasks:

1. Determine what projects are appropriate for public involvement (Responsibility: Environmental Operations, Public Affairs).
2. Make the public aware of the selected involvement opportunities via the Port's website, and the Columbia Slough Watershed Council (Responsibility: Environmental Operations and Public Affairs).
   - ✓ *In FY2012, the public was made aware of involvement opportunities via communications from the Environmental Outreach Coordinator using the website, email, and the Port's online newsletter, Port Currents.*
3. Implement selected projects and document public involvement (Responsibility: Environmental Operations and Public Affairs).

Tracking Measures:

1. Describe any projects implemented where the public has opportunity to participate and the extent of public involvement for each.
   - ✓ *The following FY2012 events provided the opportunity for the public to participate in implementation of the Port's stormwater program:*

- *West Hayden Island volunteer clean-up event, held in conjunction with SOLVE's Beach and Riverside Cleanup Weekend – September 2012 - 128 people (Port staff, friends, family, Starbucks employees, University of Portland students, Portland AmeriCorps Alums, general public)*

- *Tenant survey to support creation of Stormwater Education and Outreach materials (28 respondents)*

Measureable Goals:

1. Document what projects are identified as public involvement opportunities.
   - ✓ *The following have been identified as possibilities for next year:*
     - *West Hayden Island Clean-up*
     - *Baltimore Woods Clean-up*

7.1.6 Element #6: Post-Construction Site Runoff Control

BMP: Develop, Adopt, and Implement New Port-Specific Post-Construction Runoff Control Standards

Implementation Tasks:

1. By January 1, 2014, adopt and implement Port-wide post-construction standards for development and redevelopment. Airport specific standards will be consistent with FAA and airport operations requirements (Responsibility: Environmental Operations)
2. By December 2012, update Intergovernmental Agreement (IGA) with the City of Portland to clarify responsibilities, so that one set of post-construction standards are applied to the Port's MS4, avoiding duplication and conflicting requirements (Responsibility: Environmental Affairs).
3. By end of permit term, design and initiate construction on a stormwater capital improvement retrofit to address at least one applicable TMDL pollutant of concern (Responsibility: Environmental Operations).

Tracking Measures:

1. Adopt Port-wide post-construction development/ redevelopment standards by January 1, 2014.
   - ✓ *This work has been rolled into a Port-wide stormwater master planning contract. The Port continued work on several key elements of this process in FY2012 (pollutant loading analysis, hydraulic capacity modeling, and development standards). An update on the progress will be provided in the 2013-14 annual report.*
2. Update IGA with the City of Portland by December 31, 2012.
   - ✓ *Completed by December 2012.*
3. Design and initiate construction on a stormwater retrofit project to address a TMDL pollutant of concern.
   - ✓ *A pavement removal project at Terminal 4 was identified as the Port's required retrofit project and completed in FY2012. It removed 1.24 acres of impervious area, and six catch basins. Thereby, infiltrating an estimated 3.6 acre feet of stormwater annually and reducing potential bacterial loading to the Willamette River.*

Measureable Goals:

1. Document the design, construction, and rationale for the retrofit project addressing a TMDL pollutant of concern.
   - ✓ **See the third tracking measures response.*

7.1.7 Element #7: Pollution Prevention for Municipal Operations

BMP: Implement a Street and Vehicle Maneuvering Area Cleaning and Maintenance Program

Implementation Tasks:

1. Sweep the McCarthy Park (Swan Island) parking lot annually (Responsibility: Marine Properties Maintenance).
2. Sweep Port-managed areas of the marine terminals annually. If additional sweeping is needed, Environmental Operations will coordinate with MFM staff (Responsibility: Environmental Operations, MFM).
3. Sweep Airport Way, Frontage Road, and PDX employee parking lots twice per week in winter and once per week in summer (Responsibility: PDX Maintenance).
4. Maintain and repair roadway areas to minimize pollutant impacts to stormwater as needed (Responsibility: MFM, PDX Maintenance).
5. Follow manufacturer's recommendation for application of deicing products (Responsibility: MFM, PDX Maintenance, Marine Properties Maintenance).
   - ✓ *Operating area personnel apply pavement deicing materials per the manufacturer's requirements. Application equipment is calibrated by weight and volume to apply the material at the suggested rate in order to avoid over application.*
6. As necessary, decant street sweeping wastes in covered, water-tight drop boxes (Decant Water Collection Boxes) that drain to an approved sanitary sewer discharge point (Responsibility: PDX Maintenance, MFM).
   - ✓ *Completed for FY2012*
   - ✓ *Previously completed (FY2011).*

Tracking Measures:

1. Track sweeping frequency at McCarthy Park.
   - ✓ *MFM contracts sweeping for McCarthy Park on the frequency of twice a month December through September, five times in October and four times in November.*
2. Track sweeping frequency at the marine terminals.
   - ✓ *Environmental sweeping was conducted at Terminals 2, 4, and 6 monthly between July and November.*
3. Track sweeping frequency at Airport Way, Frontage Road, and the PDX employee parking lots.
   - ✓ *PDX Maintenance schedules sweeping for these areas based on the frequency outlined in the task.*
4. Report the amount of materials removed. Materials will include those collected from catch basins and other structural devices.

- ✓ *239 tons of material were removed from catch basins and sweeping combined at Aviation facilities during FY2012. The PDX Basin 6 quiescent pond was also cleaned, resulting in the removal of an additional 850 tons of sediment.*
- ✓ *91.7 tons of material were removed from catch basins and sweeping combined at Marine facilities during FY2012.*

Measureable Goals:

1. Sweep McCarthy Park parking lot annually.
   - ✓ *Completed in FY2012. *See tracking measure response above.*
2. Sweep Port-managed, accessible areas of the marine terminals annually.
   - ✓ *Complete in FY2012. *See tracking measure response above.*
3. Sweep Airport Way, Frontage Road, and the PDX employee parking lots a minimum of once per week.
   - ✓ *Completed in FY2012. *See tracking measure response above.*

BMP: Limit Landscape Maintenance Activities Impact on Stormwater

Implementation Tasks:

1. Apply pesticides and fertilizers, using an Integrated Pest Management approach to minimize impacts to stormwater (Responsibility: Marine Properties Maintenance, MFM, PDX Maintenance, PDX Landscape).
   - ✓ *Marine Properties Maintenance staff is responsible for the landscaping and maintenance of the Port's industrial parks, marine terminals, and mitigation sites. Staff continued to implement the IPM and Work Schedules Program for Port-owned mitigation sites. This program identifies problem plant species at each site, provides a profile for each species, recommends control methods, and outlines monitoring protocol and schedules.*

     Environmental Operations provides Port maintenance staff and Port-contracted workers with the Vegetation Management Plan. The plan gives information on the appropriate herbicides and use of those herbicides to control particular invasive plant species, and it identifies the locations where specific herbicides can be applied.

     MFM conducts weed control activities at marine parking areas, rail yards, and specific vegetated areas at Marine Terminals 2, 4, and 6 on an as-needed basis.

     PDX Landscape staff, responsible for landscaping at PDX facilities, continues to implement BMPs aimed at improving stormwater quality at the airport. Some of the issues they focused on included testing pesticide alternatives recommended by the Oregon Department of Agriculture, reducing the concentration of pesticides/herbicides/fertilizers applied where possible, and incorporating native plants into the landscaping to reduce water and chemical requirements.

     PDX Maintenance staff applies pesticides on the airfield to comply with FAA requirements. They continue to look for ways to reduce chemical usage where possible by working with different pesticide combinations to achieve required conditions.
2. Review the Port's program to control pesticides, herbicides and fertilizers annually, and update as appropriate (Responsibility: Environmental Operations, Marine Properties Maintenance, MFM, PDX Maintenance, PDX Landscape).

- ✓ *The Port groups applying landscape chemicals documented new approaches considered during FY2012. Some of the issues include: Early intervention to stop invasive species before they can get established, testing herbicide alternative (e.g. vinegar) or lower doses and different combinations of certain pesticides for efficacy, and more rigorous granular spreader calibration.*

3. Maintain an inventory of pesticides used on Port property and update annually (Responsibility: Environmental Operations).

Tracking Measures:

1. Document the annual pesticide use update.
   - ✓ *The amounts of each pesticide/herbicide/fertilizer used are presented below for each of the groups listed above.*

Table 7-1 Port of Portland Pesticide/Herbicide/ Fertilizer Use in 2012-13

Marine Property Maintenance (Landscape)	
Ranger Pro	27.3 gal.
Powerzone	76 oz.
Snapshot 2.5 TG	173 lbs.
Dimension 270G	2,557 lbs.
T-Zone	154 oz.
Simatrol 4L	21.6 gal.
Aquamaster	118 oz.
Oust	1.75 lbs.
Surflan AS	28.5 gal.
Element 3A	7 gal.
Casaron 4G	837 lbs.
Rodeo	37 oz.

PDX Landscape	
T-Zone Broadleaf herbicide	4 gal.
Atrimmec Growth regulator	19 gal.
34-0-0 slow-release turf fertilizer	18,500 lbs.
Freehand Granular	100 lbs.
Simtrol pre-emergent	17.5 gal.
Dimension pre-emergent	10
Snapshot Granular	100 lbs.
Surflan AS pre-emergent	27.5 gal.
Gallery DF pre-emergent	50 lbs.
Prozap Rodenticide	25 lbs.
Casoron 4G	50 lbs.
Agristar 3A	2.5 gal.
Lada insecticide	2 quarts

MFM (Labor Shop)	
Ranger Pro	15 gal.
Element 3A	15 gal.
Sulfomet XP	48 oz.
LI 700	10 gal.
Prokoz Glyphosate Pro4	15 gal.
Agri Star Triclopyr 3A	15 gal.

PDX Maintenance (Airside Spraying)	
Payload	26 oz.
Diuron	32.5 gal.
Tordon 22K	4 gal.
Crossroads	12 gal.
Ranger Pro	38 gal.
Spray Fast	2 gal.
Direx 4L	40 gal.
Terminator II Defoamer	2 qts.

Measureable Goals:

1. Annually update the Port's pesticide use inventory.
   - ✓ *Completed for FY2012. *See list above.*

BMP: Require Training and Licensing for Staff Conducting Pest Management Activities (partial applicability)

*See section 7.1.4 for information on implementation of this BMP.

BMP: Implement a Tenant BMP Program (partial applicability)

* See section 7.1.4 for information on implementation of this BMP.

BMP: Implement a Program to Limit Infiltration from Port-Owned Sanitary Sewer System into the MS4

Implementation Tasks:

1. Monitor pump stations electronically to ensure proper function of Aviation pump stations (Responsibility: PDX Maintenance).
2. Monitor pump stations through weekly inspections and audible/visual alarms to ensure proper function of Marine pump stations (Responsibility: MFM).
   - ✓ *MFM staff documented weekly inspections for FY2012. The MFM plumber and electricians contribute to meeting this requirement.*
3. Conduct annual pump station maintenance, including flushing, float and alarm testing, and debris removal for all pump stations (Responsibility: PDX Maintenance, MFM).
   - ✓ *Work orders were generated to ensure the completion of this work at PDX and Marine operated sanitary lift stations.*
4. Clean Port-owned grease interceptor vaults at PDX on an annual basis (Responsibility: Aviation Facilities Maintenance).
   - ✓ *PDX maintains two large grease interceptor vaults as a back-up to grease traps maintained by PDX concessions tenants under the FOG program. Documentation of this maintenance is provided to Environmental Affairs.*
5. Continue to implement the tenant FOG (fats/oils/grease) program to ensure proper handling of these materials at PDX (Responsibility: PDX Business/Properties).

Tracking Measures:

1. Maintain a list of Port tenants implementing the FOG program.
   - ✓ *Environmental Operations maintains a list of tenants who are inspected as part of the effort to prevent fats, oil, and grease from clogging sanitary sewer lines. These are primarily concessions tenants located in the terminal. This relates to stormwater, as it prevents overflow in obstructed sanitary lines from entering the storm system.*

Measureable Goals:

1. Document completion of implementation tasks (2-4) associated with this BMP (with PDX Maintenance, Aviation Facilities Maintenance, MFM, and PDX Business/Properties)

   ✓ *Completed for FY2012. Environmental Operations maintains documentation for the lift station inspections/maintenance, grease vault cleaning and grease trap inspections (FOG program).*

BMP: Implement a Stormwater System Cleaning and Maintenance Program (partial applicability)

* See section 7.1.8 for information on implementation of this BMP.

7.1.8 Element #8: Structural Stormwater Controls Operations and Maintenance

BMP: Implement a Stormwater System Cleaning and Maintenance Program

Implementation Tasks:

1. Continue to implement a stormwater system feature inspection and maintenance program (Responsibility: Environmental Operations, MFM, Marine Properties Maintenance).
2. Inspect and clean catch basins (as necessary) annually in Port-managed Marine Business Line areas (Responsibility: MFM).
3. Conduct litter pickup and vegetation management activities to ensure adequate access and performance of all stormwater system features as needed (Responsibility: MFM, Marine Properties Maintenance).

   ✓ *Marine Properties Maintenance staff maintained landscaped areas within the industrial parks at Swan Island and Rivergate and at the marine terminals. Crews removed and disposed of vegetative debris, scrap metal, and garbage. They also cleared vegetation around stormwater outfalls and associated stormwater conveyance system infrastructure on Port-owned industrial park properties to provide better access for inspections and illicit discharge monitoring.*

4. Coordinate updates of storm sewer system maps to include updated stormwater conveyance system features and Port-owned and operated structural controls (Responsibility: Environmental Operations).
5. By June 30, 2012, review and update the existing inspection and maintenance procedures for structural stormwater controls, in accordance with requirements outlined in the Port's MS4 NPDES permit (Responsibility: Environmental Affairs)..

   ✓ *Previously completed (FY2011)*

6. As necessary, decant storm system and catch basin cleaning wastes in covered, water-tight drop boxes (Decant Water Collection Boxes) that drain to an approved sanitary sewer discharge point (Responsibility: MFM, PDX Maintenance).

   ✓ *Completed for FY2012.*

Tracking Measures:

1. Track number of catch basins cleaned annually.
   - ✓ *902 catch basins were cleaned at Aviation facilities in FY2012.*
   - ✓ *546 catch basins were cleaned at Marine facilities in FY2012.*
2. Track cleaning frequency for the Port owned and operated structural stormwater controls by facility type.
   - ✓ *Marine-operated water quality treatment facilities are inspected at least on a quarterly basis and cleaned as needed to maintain proper operation. Catch basins in Marine-operated areas are scheduled to be inspected and cleaned (if necessary) on an annual basis.*
   - ✓ *Aviation-owned water quality treatment facilities (with the exception of quiescent ponds) are cleaned on an annual basis. The ponds are cleaned on a rotating basis. Basin 6 pond was cleaned in FY2012, resulting in the removal of 850 tons of material.*
   - ✓ *PDX has over 3,000 catch basins. PDX Maintenance inspects and cleans those associated with industrial activity on an annual basis. Many of these facilities also have catch basin inserts that are inspected and changed as needed on a monthly basis. The balance of PDX catch basins are cleaned on a 4-year rotating basis. If necessary, catch basins are moved to a more frequent cleaning schedule or fitted with an insert based on field observations.*
3. Track storm sewer system pipe cleaning activities annually.
   - ✓ *37,468 feet of storm line were cleaned at Aviation facilities during FY2012.*
   - ✓ *Marine did not perform line cleaning in FY2012.*
4. Track updates to the stormwater system features maps.
   - ✓ *No updates in FY2012. All Port storm system maps are available to operations and administrative personnel through the PortGIS interphase located on Navigator (the Port's intranet).*
5. Report amount of materials removed. Materials will include those collected from catch basin cleaning and street sweeping.
   - ✓ **See BMP: Implement a Street and Vehicle Maneuvering Area Cleaning and Maintenance Program.*

Measureable Goals:

1. Inspect and clean all catch basins within the Port-managed areas not otherwise covered by a 1200-series industrial stormwater permit annually.
   - ✓ *PDX completed this work based on their schedule (listed above under tracking measure for this BMP).*
   - ✓ *MFM completed this work in FY2012.*

2. Inspect and maintain all Port-owned and operated structural controls within the Port-managed areas not otherwise covered by a 1200-series industrial stormwater permit annually.

   ✓ *Completed in FY2012. (See the Tracking Measure response above).*

BMP: Implement a Program for the Tracking and Maintenance of Private Structural Controls

Implementation Tasks:

1. Work with the City of Portland to establish and maintain an inventory of existing private structural control facilities on tenant properties by December 31, 2012 (Responsibility: MID Properties Management, and Environmental Operations).
2. Develop a program in conjunction with the City of Portland to track private structural control facilities on tenant properties over the permit term (Responsibility: Environmental Operations).
3. By June 30, 2012, develop an updated inspection and maintenance procedure for structural stormwater controls for distribution to owners of private structural control facilities (Responsibility: Environmental Operations).

Tracking Measures:

1. Track the number of existing and new private structural control facilities installed on Port-properties.

   ✓ *The Port coordinated with the City of Portland to develop a complete list of water quality treatment facilities on Port property that includes tenant operated facilities.*

Measureable Goals:

1. Develop an inventory and mechanism for tracking of private structural controls on tenant properties.

   ✓ *The Port's IGA with the City of Portland (completed in December 2012) addresses the tracking requirements. The City will cover all water quality treatment facility maintenance tracking for Port tenants outside of the PDX security fence through its Maintenance Inspection Program. The Port will track all remaining facilities on Port property.*

BMP: Implement a Tenant BMP Program (partial applicability)

* See section 7.1.4 for information on implementation of this BMP.

8.0 Adaptive Management Process Implementation and Proposed SWMP changes

As it has, since permit year one, the Port continues to modify how its BMPs are carried out to find the most efficient approach and reduce pollutant loading to the maximum extent practicable. This process directly involves operating area personnel with knowledge of the program goals who provide suggested BMP modifications.

In permit year 18, an adaptive management process was used to ensure all ideas are heard, documented, and implemented, if viable. The process identified potential improvements to the way pavement deicing is accomplished which will minimize the amount of chemicals that are used. Through this discussion it was also noted that PDX Maintenance used a more efficient decanting procedure which reduced the water content of the catch basin and sweeper waste going landfill. The potential to include "dump no waste" decal installation in the catch basin construction specification was discussed as a way to ensure completion of the task and increase efficiency.

The Port is not seeking SWMP revisions at this time.

Stormwater Program Monitoring Component	Monitoring Component Description	MS4 Monitoring Objectives					
		i. Evaluate the sources of the 2004/2006 303(d) listed pollutants as applicable.	ii. Evaluate the effectiveness of BMPs in order to help determine BMP implementation priorities.	iii. Characterize MS4 runoff discharges based on landuse, seasonality, geography or other catchment characteristics.	iv. Evaluate long-term trends in receiving waters associated with MS4 stormwater discharges.	v. Assess the chemical, biological, and physical effects of MS4 discharges on receiving waters.	vi. Assess progress towards meeting TMDL pollutant load reduction benchmarks.
Environmental Monitoring Activities							
Environmental Monitoring	*Instream Monitoring (field, conventional, metals, nutrients)	Includes many TMDL and a few 303(d) listed pollutants (some are monitored using surrogates, such as TSS). Many 303(d) listed pollutants are listed for media other than surface water.	Data can be used to evalutate the overall effectiveness of BMP's in combination with basic stormwater monitoring.	Provides information to support the evaluataion and comparison of in-stream concentrations during dry and wet weather. This information will support the characterization of MS4 discharges.	Comprehensive monitoring program with other permittees where appropriate. The plan includes in-stream pollutant monitoring during dry and wet season at locations and frequencies according to the plan criteria.	Instream monitoring will provide information to assess the chemical and physical effects of MS4 runoff on receiving waters.	Instream monitoring will provide information regarding progress towards meeting pollutant load reduction benchmarks and TMDL waste load allocations.
	*Continuous Instream Monitoring (flow, temperature)	Flow monitoring in combination with temperature at most locations and turbidity as some locations will allow for the evalutation of some 303(d) listed pollutants or their surrogates.	Data can be used to evaluate the overall effectiveness of BMPs in removing sediment loads where (turbidity data is collected)	Provides information to support the evalutation and comparison of in-stream concentrations during dry and wet weather. This information will support the characterization of MS4 discharges.	Continuous instream monitoring provides data to support the evaluation of status and trends associated with MS4 discharges.	Continuous instream monitoring provides data to help assess physical effects in the lower Columbia Slough.	Continuous instream monitoring provides flow data to help assess pollutant loads in the lower Columbia Slough.
	*Stormwater Monitoring (field, conventional, metals, nutrients)	Stormwater monitoring will provide information to evaluate what influences stormwater quality.	Stormwater monitoring will provide general information to support the evaluation of the overall effectiveness of BMPs to reduce pollutants in the monitored catchment.	Comprehensive monitoring program to answer very specific questions to evaluate stormwater pollutant concentrations.	Stormwater monitoring will assist in the interpretation of in-stream trend analysis.	Stormwater monitoring will assist in the interpretation of in-stream water quality concerns and will be used to evaluate potential impacts.	Stormwater monitoring will provide information (improved land use concentrations; answers to specifc questions) for use in the pollutant loads model.
	*Pesticide Monitoring (Stormwater)	Stormwater pesticide monitoring provides information to evaluate what pesticides are of concern and general information on types of sources.	Stormwater pesticide monitoring will provide information to support the evaluation of the overall effectiveness of BMP to reduce pollutants in the monitored catchment.	Comprehensive monitoring program to potentially answer very specific questions to evaluate stormwater pesticide concentrations.	N/A, since no in-stream pesticide monitoring is planned during this permit cycle.	Pesticide monitoring will assist in the interpretation of in-stream water quality data concerns and will be used to evaluate potential impacts.	N/A, since no TMDLs for current use pesticides are in place.
	*Mercury Monitoring (Stormwater)	Mercury monitoring in stormwater will allow the quantification of mercury loads from the MS4 system to streams in preparation of the development of a mercury TMDL.	Mercury monitoring will provide information to support the evaluation of the overall effectiveness of BMPs to reduce mercury in the monitored catchment.	Mercury monitoring will charaterize the discharges of mercury from large MS4 catchments.	N/A, since no in-stream mercury monitoring is planned during this permit cycle.	Mercury monitoring will assist in the interpretation of in-stream water quality data collected by others and will be used to evaluate potential impacts.	N/A, since no TMDLs for mercury are in place and no TMDL benchmarks have been set.
	*Macroinvertebrate Sampling	Macroinvertebrate sampling will provide information to support identification of types of pollutants and pollutant sources.	Provides and assessment of overall improvements made using multiple BMPs.	Indirectly provides information to support the characterization of MS4 runoff discharges based on land use type, seasonality and/or geography.	Provides information to support the evaluation of trends in receiving waters and allows for trending as an independent measure.	Provides information to help assess biological effects on MS4 receiving waters.	Macroinvertebrate IBI may contribute to the asssessment of progress toward meeting TMDL WLAs in general terms.

Other Stormwater Program Monitoring Activities							
Best Management Practice Monitoring	Measurable goals and tracking measures for Port BMPs.	SWMP BMP monitoring does not address this objective.	SWMP BMP monitoring may help evaluate effectiveness of source controls/non-structural BMPs.	SWMP BMP monitoring does not address this objective.	SWMP BMP monitoring does not address this objective.	SWMP BMP monitoring does not address this objective.	SWMP BMP monitoring does not address this objective.
Dry-weather Field Screening	Inspect the Port's Priority outfalls annually during the dry weather season.	Based on results of inspection and monitoring (if applicable), may identify potential illicit discharges of 303(d) pollutants.	Dry-weather field screening does not address this objective.	Dry-weather field screening does not address this objective.	Dry-weather field screening does not address this objective.	Dry-weather field screening does not address this objective.	Dry-weather field screening does not address this objective.
Industrial Stormwater Permit Monitoring (1200-Z and 1200-COLS)	Required sampling for the Port's specific industrial facilities.	Results may help determine potential sources of 303(d) listed pollutants.	Outfall sampling results may indicate if existing BMPs are effective for 303(d) and industrial permit parameters.	Sampling results can be used to help characterize runoff from industrial lands.	Industrial stormwater monitoring does not address this objective.	Industrial stormwater monitoring does not address this objective.	Industrial stormwater monitoring does not address this objective.
Pollutant Load/ WQ Modeling	Modeling per Columbia Slough and Willamette River TMDL to evaluate overall pollutant loads and BMP effectiveness.	Pollutant Loads Modeling does not address this objective.	Results indicate overall effectiveness of structural BMPs, estimate effectiveness of non-structural BMPs, and determine locations of high pollutant load generation (for future BMP implementation).	Pollutant load modeling provides estimated MS4 runoff discharge characteristics (by land use based on land use event mean concentration data used in modeling).	Pollutant loads modeling does not address this objective.	Pollutant loads modeling does not address this objective.	Pollutant load modeling allows for development of new benchmarks and assessment of progress towards meeting existing benchmarks.
Intergovernmental coordination efforts	Continued participation with other agencies and groups (i.e., ACWA).	Participation may provide further information related to potential sources of 303(d) pollutants.	Participation may provide further information related to BMP effectiveness.	Participation may further inform the MS4 discharge characterization.	Intergovernmental coordination does not address this objective.	Participation may further assess chemical, physical, and biological effects.	Participation may provide further information related to progress towards meeting TMDL WLA and associated benchmarks.

Section IV
MONITORING COMPLIANCE REPORT

MONITORING COMPLIANCE REPORT

Table of Contents

1. Introduction IV-2

2. Objectives IV-2

3. Required Monitoring Tasks IV-3
   3.1. Instream Monitoring IV-3
   3.2. Continuous Instream Monitoring IV-7
   3.3. Stormwater Monitoring IV-8
   3.4. Stormwater Monitoring – Pesticides IV-10
   3.5. Stormwater Monitoring – Mercury IV-13
   3.6. Macroinvertebrate Monitoring IV-15

4. Illicit Discharge Monitoring IV-17

5. Stormwater Management Facility Monitoring IV-18

1. INTRODUCTION

The purpose of this *Monitoring Compliance Report* is to comply with Schedule B of Portland's National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) permit. The report summarizes monitoring activities conducted by the City of Portland (hereinafter referred to as Portland) during fiscal year (FY) 2012-13 (permit year 18) and briefly discusses the results.

DEQ issued Portland's current (third-term) NPDES MS4 permit on January 31, 2011. The monitoring requirements in the permit became effective July 1, 2011, when DEQ gave conditional approval to Portland's *MS4 Quality Assurance Monitoring Plan* (QAMP), which the City submitted to DEQ on June 1, 2011. This *Monitoring Compliance Report* is the second report on monitoring activities that were conducted in accordance with the requirements of the 2011 permit. Monitoring procedures, locations, frequency, and other detailed information can be found in the QAMP.

On June 28, 2012, Portland submitted a *Pesticide Monitoring Plan* to DEQ and began to implement that plan in FY 2012-13.

Table B-1 in Schedule B of the 2011 permit summarizes required monitoring types, locations, frequency, and analytic parameters. The required monitoring information is included in Section 3 of this *Monitoring Compliance Report*, in the order listed in Table B-1. Sections 4 and 5 of this report provide additional MS4 stormwater-related monitoring information that is not required by the permit.

The complete set of monitoring data is available on CD-ROM upon request.

2. OBJECTIVES

Schedule of B.1.a of the 2011 MS4 permit lists six objectives the monitoring program must incorporate:

i. Evaluate the source(s) of the 2004/2006 303(d) listed pollutants applicable to the co-permittees' permit area;
ii. Evaluate the effectiveness of Best Management Practices (BMPs) in order to help determine BMP implementation priorities;
iii. Characterize stormwater based on land use type, seasonality, geography or other catchment characteristics;
iv. Evaluate status and long-term trends in receiving waters associated with MS4 stormwater discharges;
v. Assess the chemical, biological, and physical effects of MS4 stormwater discharges on receiving waters; and,
vi. Assess progress towards meeting TMDL pollutant load reduction benchmarks.

Section 3 of this report describes how monitoring activities address these objectives and summarizes the monitoring results.

3. REQUIRED MONITORING TASKS

3.1. INSTREAM MONITORING

Purpose

Instream monitoring refers to the collection of water quality samples from streams that receive MS4 discharges. Instream monitoring contributes to monitoring objectives ii, iv, v, and vi identified in Schedule B.1 of the MS4 permit. Specifically, instream monitoring is critical for evaluating long-term trends in receiving waters with MS4 discharges, as well as for assessing the effects of MS4 discharges on receiving waters.

Background

The City has conducted a comprehensive ambient monitoring program at fixed locations since the early- to mid-1990s. The data collected have been used to help DEQ establish TMDLs in the Columbia Slough, Johnson Creek, Willamette River, Fanno Creek, and Tryon Creek. Sites are monitored during both dry-weather and wet-weather conditions. The City will continue that monitoring program at fixed locations at a reduced scale through the end of this permit term, while at the same time implementing a probabilistically based monitoring program. FY 10-11 was the first year instream data were collected using the probabilistic approach. The number of monitoring locations, monitoring frequency, and analytical parameters are shown in Table B-1 of the 2011 permit.

Results

Comprehensive Ambient Sampling – Summary

Surface Water Body	No. of Locations [1] Fixed / Probabilistic	Monitoring Frequency [1] Fixed / Probabilistic
Columbia Slough[2]	2 / 5	Bi-monthly / quarterly + 1 storm
Fanno Creek	3 / 2	Monthly to quarterly / quarterly + 1 storm
Johnson Creek[2]	2 / 7	Bi-monthly / quarterly + 1 storm
Tryon Creek	3 / 2	Most monthly / quarterly + 1 storm
Willamette River Tributaries	0 / 3	--- / quarterly + 1 storm
Willamette River[3]	1 / 0	monthly to quarterly / ---

[1] The numbers of sampling locations and monitoring events are greater than shown in Table B-1 of the MS4 permit, but do not necessarily represent future sampling activities.

[2] Some sampling locations are outside the City of Portland urban services boundary (USB).

[3] There are no probabilistically selected monitoring locations in the Willamette River. Through January 2013, the fixed locations consisted of transects with three monitoring locations each; since February 2013, only the center of the transect was sampled.

Attainment of Selected Important Water Quality Standards / Guidance Values

Surface Water Body	Attainment of Water Quality Standards or Guidance Values[1]				
	Bacteria[2]		Dissolved Copper[3]	TSS[4]	Total Phosphorus[5]
	406 MPN/100 mL	126 MPN/100 mL	2 µg/L		
Columbia Slough	35/37 (95%)	6/7 (84%)	36/37 (97%)	28/37 (76%)	27/30 (90%)
Fanno Creek	16/30 (53%)	1/4 (25%)	12/16 (75%)	27/30 (90%)	11/21 (52%)
Johnson Creek	39/47 (83%)	4/9 (44%)	46/47 (98%)	42/47 (89%)	26/30 (87%)
Tryon Creek	32/40 (80%)	2/5 (40%)	16/20 (80%)	41/46 (89%)	27/27(100%)
Willamette River	11/11 (100%)	1/1 (100%)	12/12 (100%)	11/12 (92%)	8/8 (100%)

[1] Number of samples that attain standard/number of samples collected (percent attainment).
[2] 406 MPN/100mL is the single sample standard; 126 MPN/100mL is the 30-day geometric mean of ≥ 5 samples. (For this summary, the geometric mean of weekly or monthly data collected throughout the permit year was calculated for each monitoring location separately.)
[3] Based on the best available science and best professional judgment on the potential impact of dissolved copper on salmonids, a lower guidance value of 2 µg/L was used starting in FY 11-12, down from a value of 5 µg/L used in previous years.
[4] Guidance values: Columbia Slough – 25 mg/L; all other streams – 20 mg/L.
[5] Guidance value for Fanno Creek, spring to fall, is the Fanno Creek TMDL of 0.13 mg/L. Guidance value for all other streams, spring to fall, is the Columbia Slough TMDL of 0.155 mg/L.

With the exception of bacteria, most streams meet most of the standards or guidance values most of the time.

Bacteria concentrations in the highly urbanized smaller tributaries are of some concern, with the single sample standard met between 53 and 83 percent of the time. The mainstem Willamette River met the single sample standard and the geometric mean standard all the time, and the Columbia Slough was a close second in terms of attaining the bacteria standards.

The attainment of the dissolved copper guidance value ranges from a low of 75 percent in Fanno Creek to a high of 100 percent in the Willamette River. In general, smaller tributaries to the Willamette River had higher concentrations than the Willamette mainstem.

The Columbia Slough and Johnson Creek met their respective TSS guidance values, established to meet the toxics TMDLs, 76 and 89 percent of the time, respectively. All other streams occasionally had TSS concentrations above the guidance level, and the attainment ranged from 89 to 92 percent.

The Columbia Slough and Fanno Creek met their respective phosphorus TMDL concentrations across all locations 90 and 52 percent of the time, respectively. This attainment level is in line with previous years. Using the Columbia Slough TMDL as a guidance value for all other streams, only Johnson Creek had occasionally higher total phosphorus concentrations.

Portland Water Quality Index (PWQI)

The PWQI, developed by BES, is designed to compile water quality data of importance to Portland's streams into a single value that can be tracked over time. The PWQI has its roots in the Oregon Water Quality Index (OWQI) established and used by DEQ to track water quality at key locations in water bodies throughout Oregon. However, there are significant differences that make the PWQI more suitable than the OWQI for Portland's streams. The PWQI:

- Normalizes the score so that a score of 60 means that water quality standards, TMDL wasteload allocations, or other benchmarks are met.
- Puts greater emphasis on the health of aquatic species by including TSS, dissolved copper, ammonia, dissolved oxygen, and temperature.
- Focuses on human health by including mercury, for which DEQ will create a TMDL in the entire Willamette Basin in the near future.
- Continues to track pollutants of concern for contact recreation (E. coli) and aesthetics (phosphorus).
- Uses the 90th percentile of all available data as a measure protective of the beneficial uses most of the time, either at a specific location or at all locations throughout the water body.

The following two tables show PWQI scores based on the FY12-13 monitoring data.

Portland Water Quality Index (PWQI) Scores – Summary of Fixed Locations

Analyte	**CS [1]**	**FC [1]**	**JC [1]**	**TC [1]**	**WR [1,2]**
Copper, dissolved	77	63	69	68	84
Dissolved Oxygen	92	74	89	85	93
E. coli	87	10	77	29	81
Mercury, total	38	39	60	44	33
Nitrogen, ammonia	66	91	96	96	92
Phosphorus, total	61	38	76	73	85
Solids, total suspended	41	69	91	90	89
Temperature	40	73	63	81	46
PWQI	**56**	**36**	**76**	**61**	**66**

[1] CS = Columbia Slough; FC = Fanno Creek; JC = Johnson Creek; TC = Tryon Creek; WR = Willamette River
[2] Based on one location (St. Johns Railroad Bridge) only

Portland Water Quality Index (PWQI) Scores – Summary of Probabilistic Locations

Analyte	CS	FC	JC	TC	WR Tributaries
Copper, dissolved	78	49	67	54	49
Dissolved Oxygen	90	90	87	89	90
E. coli	82	37	15	53	60
Mercury, total	48	13	10	10	10
Nitrogen, ammonia	91	99	97	97	99
Phosphorus, total	65	45	49	45	63
Solids, total suspended	44	44	15	10	49
Temperature [1]	41	92	71	80	86
PWQI	**61**	**39**	**26**	**27**	**39**

[1] Temperature is based on grab samples and not continuous monitoring and is not truly representative of watershed conditions throughout the critical summer period.

Probabilistic and fixed monitoring locations serve different purposes. Fixed locations are designed to provide information about the changes in water quality at a specific location, while the probabilistic locations are used to make statistically valid statements about the water quality of the entire water body. Therefore, it is not appropriate to make a direct comparison of the PWQI scores at these two types of monitoring locations within the same water body.

The PWQI scores are based on one year of data collection and have the following limitations:

- Because insufficient continuous temperature data were available at the probabilistically selected monitoring locations and grab sample temperature data were used, the scores do not reflect true temperature conditions in these streams, especially during the critical summer period.
- The mercury target concentration for the Willamette River mainstem is based on the mercury reduction goal established in the 2006 Willamette Basin TMDL. The mercury target concentrations for the other Portland streams are based on best professional judgment. Both values are subject to change, which may result in changes in the PWQI scores.
- One of the five sampling events at probabilistic locations is storm-driven; this type of event often results in the highest concentrations for many analytes and is therefore responsible for the low PWQI scores to a large extent.
- Fixed location monitoring is conducted on a monthly or bi-monthly basis and most often does not occur during storm events larger than 0.2 inch per day.

Based on the monitoring data from FY 12-13, the following general observations can be made:

- Scores for the fixed locations in Johnson and Tryon Creeks were substantially higher than for the probabilistic locations.
- Total mercury was the parameter most responsible for the low PWQI scores at probabilistic locations in all watersheds, except the Columbia Slough. TSS in Johnson and Fanno Creeks and E. coli in Johnson Creek were responsible for the low PWQI scores in those watersheds.

- The analytes with the least variability across the watersheds are dissolved oxygen (scores = 74-93) and ammonia-nitrogen (scores = 66-99). E. coli (score = 10-87) and TSS (score = 10-91), on the other hand, showed the greatest variability. Total mercury (score = 10-48) had consistently low scores, especially at probabilistic locations.
- The largest streams (the Willamette River and the Columbia Slough) had the highest E. coli scores, which indicate concentrations well below the standard.
- Total phosphorus scores were lowest in Fanno Creek, one of the two streams with a phosphorus TMDL. The Columbia Slough, on the other hand, had total phosphorus scores above 60.

3.2. CONTINUOUS INSTREAM MONITORING

Purpose

Continuous instream monitoring refers to ongoing physical stream monitoring at fixed locations within streams that receive MS4 runoff. It typically consists of stream gage and temperature measurement, as well as the calculation of stream flow, based on the cross section of the stream at the monitoring location. The U.S. Geological Survey (USGS) operates the monitoring sites, and the City provides partial funding via intergovernmental agreements (IGAs). USGS provides data management and storage and some limited data interpretation. Continuous instream monitoring contributes to monitoring objectives i, ii, iii, iv, v, and vi identified in Schedule B.1 of the MS4 permit.

Background

The USGS operates stream gages in many Portland streams. Some sites have been monitored since 1940, but more typically, monitoring started in the 1980s. At a minimum, all gages provide gage height and discharge. Most gages also provide temperature monitoring, and the Willamette River gage provides a number of additional parameters.

Results

Summary of Selected USGS Continuous Monitoring Stations

	Discharge [cfs]			Temperature [°C]			SC [µS/cm]
Statistic	**FC**	**JC-1**	**WR**	**JC-1**	**JC-2**	**WR**	**WR**
Maximum	171	1,570	126,000	24.8	24.9	24.2	93
Date of Maximum	11/19/12	11/19/12	12/8/12	6/30/13	8/6/12	8/16/12	8/22/12
Minimum	0.01	12	NA [1]	2.7	1.1	3.6	52
Date of Minimum	9/11/12	7/26/12		1/22/13	1/21/13	1/24/13	2/1/13

SC = Specific Conductance
FC = Fanno Creek at SW 56th Ave
JC-1 = Johnson Creek at Milwaukie (SE Milport Rd.)
JC-2 = Johnson Creek at Sycamore (SE 158th Ave.)
WR = Willamette River at Morrison Bridge
[1] A minimum flow cannot be determined because the WR experiences a flow reversal because of tidal influence, resulting in a negative flow

The highest discharge at two of the three stations occurred on the same day in the middle of November 2012. The lowest discharges in Johnson Creek and Fanno Creek were observed in mid and late summer 2012, respectively. The temperature maxima in Johnson Creek and the Willamette River were almost one month apart and occurred in late June 2013 and early August 2012, respectively, while the temperature minima in these waterbodies occurred within three days in January 2013. Small streams respond more quickly to high ambient temperature and solar radiation and therefore typically exhibit the temperature maximum earlier in the year than large streams. The temperature minimum at JC-1 occurred in late June 2013 and at JC-2 in early August 2012. The summer temperature at JC-1 is mainly driven by what happens in the Crystal Springs Creek system, rather than the Johnson Creek main stem. While the summer water temperature at JC-1 is typically cooler than at JC-2, the three large unshaded inline ponds in Crystal Springs are a source of heat during very hot days (>32°C), and the temperature at JC-1 can be higher than at JC-2.

The temperature maxima in both Johnson Creek and the Willamette River exceeded the respective biological criteria temperatures.

The conductivity minimum and maximum in the Willamette River appear correlated to the flow, indicating that summer flows are mainly derived from springs and groundwater that have lower conductivity than stormwater runoff.

3.3. STORMWATER MONITORING

Purpose

Stormwater monitoring refers to the monitoring of stormwater discharges from a defined point in the stormwater system during defined storm events. Stormwater monitoring contributes to monitoring objectives i, ii, iii, iv, v, and vi identified in Schedule B.1 of the MS4 permit. More specifically, the City is interested in gaining a better understanding of the drivers of stormwater pollutant concentrations; this has proven very difficult to date because of the large size of the stormwater catchments sampled. Selecting smaller catchments limits the number of variables that must be considered when trying to determine the factors that influence stormwater quality.

Background

The City began collecting stormwater samples from 10 land use-based monitoring locations in 1991 as part of a multjurisdictional effort coordinated by the Oregon Association of Clean Water Agencies (ACWA) to characterize stormwater. Monitoring at the 10 land use stations continued through 1997.

In 1997, a comprehensive stormwater land use characterization report[3] was prepared that concluded that stormwater pollutant concentrations are related to similar land uses across all six participating jurisdictions. To date, this is still the most comprehensive stormwater characterization study conducted in Oregon. Beginning in 1997, with DEQ approval, stormwater monitoring was gradually reduced, and monitoring priorities shifted to other aspects of the MS4 program, including BMP effectiveness and surface water monitoring. Until January 2011, when

[3] Oregon Association of Clean Water Agencies. 1997. *Analysis of Oregon Urban Runoff Water Quality Monitoring Data Collected from 1990 to 1996*. Prepared by Woodward-Clyde Consultants.

the City's MS4 permit was renewed for the third permit term, three representative locations were being monitored.

With the implementation of the 2011 QAMP, the City changed MS4 program stormwater monitoring locations to the City's existing Underground Injection Control (UIC) Water Pollution Control Facility (WPCF) permit stormwater monitoring network. The UIC monitoring network is organized into six panels containing 15 sampling locations each. During each permit year, a given panel with 15 UICs is sampled. During permit year 18, the 15 locations in panel 3 were sampled.

Results

Stormwater Monitoring – Summary Panel 3

Statistic	E. coli MPN/100 mL	Dissolved Copper µg/L	TSS mg/L	Total Phosphorus mg/L
Number of Samples	45	45	45	45
Detection	96%	100%	100%	98%
< 1000 ADT Median [1]	629	2.48	19	0.160
< 1000 ADT 90th Percentile	6,500	5.27	83	0.32
> 1000 ADT Median [1]	547	2.78	14	0.174
> 1000 ADT 90th Percentile	4,330	9.12	56	0.29
Standard or Guidance Value [2]	406 / 126	2.00	20	0.155
Samples above standard or guidance value	58%	69%	44%	53%
Ratio Median: >1000 ADT / <1000 ADT	0.75	1.1	0.71	1.1

ADT = Average Daily Trips

[1] Geometric mean of all data collected throughout the year was calculated for E. coli.

[2] Standards or guidance values were created for surface water bodies and are presented only for comparison. 406 MPN/100mL is the single sample E. coli standard; 126 MPN/100mL is the 30-day geometric mean of ≥ 5 samples E. coli standard.

A total of 45 samples at 15 locations – eight at locations with greater than 1,000 average daily trips (ADT) and seven at locations with > 1,000 ADT – were collected during three storm events.

The median concentrations of dissolved copper and total phosphorus were slightly above the respective guidance values for both traffic categories, and the 90th percentile concentrations for both pollutants in both traffic categories were well above the guidance values.

The median TSS concentrations in both traffic categories were below the guidance value of 20 mg/L, but the 90th percentile was well above. The geometric mean of the E. coli concentrations in both traffic categories was above the standard of 126 MPN/100 mL, and the 90th percentile was more than ten times the single sample standard.

While the difference in the median of the analytes shown in the table above is relatively small, the maximum concentrations for all metals, nutrients, and conventional analytes, and all but one PAH were detected in the > 1,000 ADT traffic category. In fact, most maxima occurred during a May 2013 sampling event at one residential location, a curbless street in proximity to SE 82nd Ave. At the time of sampling, a 5-minute high intensity storm generated very turbid runoff, as

evidenced by the TSS concentration of 160 mg/L, the highest concentrations observed at a stormwater monitoring location this FY.

Portland Water Quality Index (PWQI) Scores – Summary

Analyte	< 1000 ADT	> 1000 ADT
Copper, dissolved	20	10
Dissolved Oxygen	78	42
E. coli	10	10
Mercury, total [1]	NA	NA
Nitrogen, ammonia	70	81
Phosphorus, total	32	36
Solids, total suspended	12	21
Temperature	88	90
PWQI	**23**	**22**

ADT = Average Daily Trips
[1] Total mercury was not analyzed

The PWQI was developed for surface water bodies and is calculated using stormwater data for comparison with surface water PWQI scores provided in Section 3.1 of this report.

With few exceptions, the PWQI scores for both traffic categories were much lower than the scores reported for surface water bodies (see PWQI tables on pages IV-5 and IV-6). The greatest difference between the lower and higher traffic category was the score for dissolved oxygen, while the remainder of the subindex scores showed little difference. The lowest scores were observed for E. coli, dissolved copper, and total suspended solids.

3.4. STORMWATER MONITORING – PESTICIDES

Purpose

Pesticides monitoring refers to the monitoring of pesticides in stormwater during defined storm events. Stormwater monitoring for pesticides contributes to monitoring objectives ii, iii, and v identified in Schedule B.1 of the MS4 permit. More specifically, the monitoring is designed to help identify activities and practices that discharge pesticides at concentrations above DEQ water quality criteria (or, in the absence of water quality criteria, EPA aquatic health benchmarks) and to focus BMPs on those activities and practices.

Background

Although the City has monitored extensively for legacy pesticides in all media, including stormwater, surface water, sediment, and fish tissue in multiple water bodies, it has not monitored as extensively for current-use pesticides. The City's UIC WPCF permit requires monitoring of a select number of pesticides (mainly herbicides) in stormwater, including the two pesticides (2,4-D and pentachlorophenol) the MS4 permit requires the City to monitor. These are the only two pesticides that have been detected in more than 10 percent of the samples taken in stormwater draining to UICs since 2005. All other current-use pesticides monitored to date have either never been detected or have had less than 10 percent detects.

The City submitted a pesticide monitoring plan to DEQ on June 28, 2012. That plan provides a list of pesticides to be monitored and describes the monitoring protocol. The first two samples

that followed the protocol of the pesticide monitoring plan were collected in October 2012 and April 2013. In addition, a number of pesticides were analyzed as part of the UIC WPCF monitoring. Those samples were collected in December 2012 and February 2013.

Results

UIC WPCF Pesticide Monitoring –Summary of Detected Pesticides

Statistic	2,4-D	2,4-DB	dicamba	DCP	PCP	picloram
Number of Samples	57	57	57	57	57	57
Detection	5%	2%	11%	5%	98%	9%
< 1000 ADT Median [µg/L][1]	<0.06	<0.5	<0.05	<0.7	0.34	<0.05
> 1000 ADT Median [µg/L] [1]	<0.06	<0.5	<0.05	<0.7	0.45	<0.05
Maximum [µg/L]	0.71	1.2	0.3	1.2	2.9	0.57
EPA Aquatic Life Benchmark [µg/L] [2]	12,075	1,000	NA	14,000	25	6500
Proposed Table 30 Criterion [µg/L] [3]	NA	NA	NA	NA	8.7 [4]	NA

DCP = dichloroprop; PCP = Pentachlorophenol
[1] ADT = Average daily trips
[2] Lowest EPA aquatic life benchmark (invertebrate or fish)
[3] Acute freshwater criterion (OAR 340-041, Proposed Table 30)
[4] Acute freshwater criterion at pH = 7.0

UIC WPCF Panel 3, as well as one location from Panel 6 and three locations from the Supplemental Panel,[4] were monitored for pesticides during FY 12-13 (December 2012 and February 2013). Of the 12 pesticides analyzed, six were detected. One (2,4-DB) was detected only once in 57 samples collected; 2,4-D was detected in three of 57 samples (5 percent) at a maximum concentration of 0.71 µg/L, which is over three orders of magnitude below the lowest EPA aquatic life benchmark. Dicamba, dichloroprop (DCP), and picloram were detected at a frequency of up to 11 percent, but the maximum value detected was orders of magnitude below established standards.

Pentachlorophenol (PCP) was detected in all but one sample (98 percent) at a maximum concentration of 2.9 µg/L, which is well below the EPA aquatic life benchmark and the Oregon Administrative Rules (OAR) 340-041 acute freshwater criterion. Unlike last year, the median pentachlorophenol concentration in locations with > 1000 ADT was only slightly greater than in locations with < 1,000 ADT.

Substantial differences among the three sampling seasons were observed. In winter samples, PCP was the only pesticide detected. During fall events, 2,4-D, dichloroprop, and PCP were detected, while during spring events, all six pesticides were detected at the highest frequency of all three seasons.

[4] Additional information about the UIC WPCF sampling design and panels can be found in the City's *WPCF Permit Sampling and Analysis Plan* (City of Portland, 2006).

MS4 Pesticide Monitoring –Summary of Detected Pesticides

Statistic	2,4-D	carbaryl	Flumio xazin	MCPA	MCPP	quinclorac	triclopyr
Number of Samples	30	30	30	30	30	30	30
Fall Detections	1	0	0	0	1	1	1
Spring Detections	7	1	1	2	3	0	4
< 1000 ADT Detections [1]	3	0	0	1	1	1	2
> 1000 ADT Detections [1]	5	1	1	1	3	0	3
Fall maximum [µg/L]	0.58	<0.12	<0.12	<0.08	0.11	0.14	0.092
Spring maximum [µg/L]	2.5	0.15	0.3	2.1	0.38	<0.08	0.27
EPA Aquatic Life Benchmark [µg/L] [2]	12,075	0.85	NA	380	>45,500	14,900	180
Proposed Table 30 Criterion [µg/L] [3]	NA	NA	NA	NA	NA	NA	NA

[1] ADT = Average Daily Trips
[2] Lowest EPA aquatic life benchmark (invertebrate or fish)
[3] Acute freshwater criterion (OAR 340-041, Proposed Table 30)

Fall and spring samples were collected at the 15 UIC Panel 3 locations and analyzed for 187 pesticides. All fall samples were collected over a 2-day period (October 30 and 31, 2012), while the spring samples were collected during four events spread over a 7-week period (from April 4 to May 21, 2013). This spring sampling pattern is reflective of the duration and distribution of rainfall typical of Western Oregon—i.e., storms are difficult to predict, do not last very long, and are limited in spatial extent.

Of the 187 pesticides, seven were detected. Three of these were detected only one time, and the remaining four were detected between two and eight (2,4-D) times. Detections during the spring events (18) were much more frequent compared to fall events (four). The higher traffic category (>1,000 ADT) had 14 detections, compared to the lower traffic category, which had eight detections. With the exception of quinclorac, which was only detected in fall, all pesticides detected in spring showed higher maximum concentrations than the fall detections. None of the maximum concentrations of any of the detected pesticides were above the respective lowest EPA aquatic life benchmark; it therefore appears that none of the detected pesticides pose any risk to aquatic life at the detected concentrations.

The most common combination of pesticides, detected at three locations, was 2,4-D, MCPP, and triclopyr, all herbicides recommended for the postemergence control of common broadleaf weeds, such as dandelion and white clover. Two of these locations are in residential land use, and one location is adjacent to a golf course. The other multi-pesticide combination that was detected at one residential location was 2,4-D, carbaryl, and MCPP. Carbaryl is a fairly commonly used insecticide to control ants, aphids, beetles, and mosquitoes and is readily available for home use.

3.5. STORMWATER MONITORING - MERCURY

Purpose

Stormwater monitoring of mercury refers to the monitoring of low-level total recoverable and dissolved mercury and total recoverable and dissolved methyl mercury in stormwater during defined storm events. Stormwater monitoring of mercury contributes to monitoring objectives i, iii, iv, and v identified in Schedule B.1 of the MS4 permit. An additional objective is to make a connection between the total and dissolved mercury data the City has collected in stormwater since 2005, which used a different analytical method than that prescribed in a recent DEQ mercury memo[5] (see Background section, below) and the mercury data that will be collected as part of the MS4 permit. Making such a connection would allow the City to use a much larger dataset, which would help DEQ create the most scientifically sound mercury TMDL and WLAs.

Background

In 2006, DEQ established the first phase of a mercury TMDL as part of the Willamette Basin TMDL process. A mercury budget was created, and a target concentration was calculated based on fish tissue concentrations and estimated mercury methylation rates. However, no load or wasteload allocations were assigned to potential sources. DEQ initiated the second phase of the mercury TMDL process by issuing a memorandum (referred to as the "mercury memo") requiring Willamette Basin point sources to implement mercury monitoring (DEQ, December 23, 2010). The minimum monitoring requirements from that memo were incorporated into Table B-1 of the MS4 permit. The MS4 permit requirements and an updated version of the mercury memo (February 23, 2011) form the basis of the mercury monitoring described in this section.

The City has a large dataset of total and dissolved mercury in stormwater dating back to 2005, but no data on methyl mercury. Although the likelihood of methylation of mercury in stormwater is small, it is important to evaluate methyl mercury levels in stormwater because methyl mercury is the most bioavailable form of mercury. A rainfall study conducted in 2005 and the available stormwater data indicate that mercury concentrations within the City do not vary significantly by land use or geographic location. Comparing total mercury in stormwater and in rainfall indicates that almost all of the mercury in stormwater originates from atmospheric wet deposition.

Results

The City conducted the second of the required mercury monitoring events on March 20, 2013. (The first was conducted in March 2012.) In addition to the permit-required mercury species, supplemental parameters were analyzed that may have an impact on the methylation of inorganic mercury.

Two large outfall basins that had been monitored during previous permit cycles were monitored during one wet-weather storm on March 20, 2013. The antecedent dry period with less than 0.1 inch of precipitation for this event was about 24 hours. The amount of rainfall of the storm event prior to collection of the grab samples was 0.98 inch at outfall S45U and 0.73 inch at outfall M1.

[5] Oregon Department of Environmental Quality. 12/23/10; updated 2/23/11. Mercury Monitoring Requirements for Willamette Basin Permittees. Memorandum issued to Willamette Basin point sources.

Mercury Monitoring at MS4 Outfalls – Wet Season – March 20, 2013

Analyte	Method	Units	M1 – Columbia Slough	S45U – Johnson Creek
Carbon - dissolved organic	SM 5310B	mg/L	2.88	4.41
Carbon - total organic	SM 5310B	mg/L	2.96	3.99
Conductivity - specific	FO SOP 1.03a	µmhos/cm	88	197
pH	FO SOP 1.01a	std units	6.2	6.9
Solids - total suspended	SM 2540D	mg/L	26	4
Sulfate (SO4)	EPA 300.0	mg/L	6.2	11
Temperature	FO SOP 1.05a	°C	10.9	12
Mercury, total	EPA 1631E LL	ng/L	4.73	3.18
Mercury, dissolved	EPA 1631E LL	ng/L	0.30 J[1]	0.39 J
Methyl-mercury, total	EPA 1630	ng/L	0.16 B[2]	0.07 B[2]
Methyl-mercury, dissolved	EPA 1630	ng/L	0.05 B[2]	0.041 J[1] B[2]

[1] J = Estimated value below method reporting limit, but above method detection limit.
[2] B = Analyte was found in both the blank and the sample.

The concentrations of all mercury species are not substantially different between the two outfall samples, even though the ancillary analytes (total and dissolved organic carbon, conductivity, and sulfate) show substantial differences, mainly in conductivity, TSS, and sulfate. The substantially higher rainfall amount of the storm event sampled at both outfalls this year did not appear to have led to a dilution effect. Concentrations of all analytes at M1 were higher than last year. Concentrations of organic carbon and TSS were lower at S45U compared to last year. Dissolved mercury is less than 15 percent of total mercury in both outfall samples. Total methyl mercury is less than 5 percent of total mercury, while dissolved methyl mercury is less than 17 percent of dissolved mercury.

Compared to last year's event, total mercury was a little higher, dissolved mercury was substantially lower, and both total and dissolved methyl mercury were fairly similar. Total and dissolved methyl mercury had detects in the trip and the field blank, which suggest a contamination in the laboratory and not the field. Based on these detects, however, the methyl mercury results are flagged.

Based on the two FY12-13 samples, it does not appear that stormwater is a significant source of methyl mercury.

Mercury Monitoring UIC Stormwater – Summary

	Total Mercury		Dissolved Mercury	
Statistic	**FY 12-13 [1]**	**2005 - 2013**	**FY 12-13**	**2005 - 2013**
Number of Samples		118	57	1427
Detection [%]		68	79	80
< 1000 ADT Median [ng/L][1]		5.8	2.49	1.90
> 1000 ADT Median [ng/L] [1]		7.8	1.64	1.75
Maximum [ng/L]		99.6	15.2	27

[1] Total mercury was not analyzed in the samples collected in FY 12-13.

Compared to most other metals and some pesticides, total and dissolved mercury showed a smaller difference between the two average daily trip categories. While total mercury shows higher median concentrations in the > 1,000 ADT category, dissolved mercury has lower concentrations in that category. Overall, dissolved mercury is less than 30 percent of total mercury in the stormwater samples draining to UICs, while the dissolved mercury concentration is only around 10 percent in samples collected at the two major outfalls this year. In last year's sample, this ratio at the outfalls was around 25 percent.

3.6. MACROINVERTEBRATE MONITORING

Purpose

Macroinvertebrate monitoring refers to the annual monitoring of benthic macroinvertebrates in late summer from the same rotating sampling locations where instream monitoring occurs. Macroinvertebrate monitoring contributes to monitoring objectives ii, iv, v, and vi identified in Schedule B.1 of the City's MS4 Permit. Macroinvertebrate monitoring is intended to track the status and trends of biological communities within water bodies that receive MS4 discharges. It is designed to evaluate whether and to what degree the biological conditions of streams are changing relative to the three other main goals (besides biological communities) of the 2005 *Portland Watershed Management Plan* (PWMP): habitat, hydrology, and water quality. Macroinvertebrate monitoring is timed to coincide with the first instream monitoring of the fiscal year so biological information is collected at the same time that summer water quality samples are collected.

Background

Macroinvertebrates are a useful tool to evaluate water quality and habitat condition because they are present in diverse habitat types; represent local conditions because they have limited dispersal ability; are an important food source for fish and other wildlife; and are sensitive to changes in physical habitat and water chemistry.

Results – Macroinvertebrate Monitoring

Macroinvertebrate Monitoring – Summary by Watershed

Watershed	FY 10-11 and FY 11-12	FY 12-13	
	Median O / E Ratio		Range of O/E Ratio
Columbia Slough	0.26	0.33	0.24 – 0.48
Fanno Creek	0.46	0.36	0.32 – 0.39
Johnson Creek	0.50	0.49	0.34 – 0.58
Tryon Creek	0.62	0.60	0.54 – 0.67
Tualatin Tributaries	0.44	0.48	0.48
Willamette River Tributaries	0.49	0.64	0.57 – 0.79

Macroinvertebrate samples were collected in summer and early fall of 2012. The sampling protocol is described in the 2011 City of Portland *Quality Assurance Monitoring Plan*. The PREDATOR score (observed macroinvertebrate communities over modeled expected macroinvertebrate communities, based on reference conditions [O/E] ratio), one of a number of options to summarize macroinvertebrate data, was calculated and compared to the benchmark of 0.85 established by DEQ.

- The highest O/E value of 0.79 was found in Miller Creek close to its confluence with the Willamette River, but it did not meet the DEQ benchmark.
- Two other locations had a score above 0.60: one in Nettle Creek in Tryon Creek State Park and one in a tributary to the Willamette River originating on the campus of Lewis and Clark College.
- Three of the four lowest PREDATOR scores were found in the Columbia Slough. No reference sites exist to which a slough with silty bottom can be compared.
- The highest score in the Columbia Slough watershed came from Wilkes Creek, one of the few free-flowing streams entering the Upper Columbia Slough. Even though the sampling location in the upper portion of this stream is surrounded by dense residential development, it still has a narrow strip of intact riparian vegetation.
- The FY 12-13 median O/E ratios are comparable to the median FYs 10-12 ratios for all but the Fanno Creek and Willamette tributaries. Fanno Creek had substantially lower and the Willamette Tributaries had substantially higher scores in FY 12-13 than in FYs 10-12. Fanno Creek scores are subject to change because of the relatively small number of monitoring locations. The Willamette tributaries represent some of the most diverse streams, ranging from highly urbanized (e.g., Stephens Creek) to completely forested (e.g. Miller Creek), and the scores are highly dependent on which monitoring locations were randomly selected in a given year.

4. ILLICIT DISCHARGES MONITORING

Purpose
The purpose of the City's Illicit Discharge Elimination Program (IDEP) (described under BMP ILL-1 in the *Stormwater Management Plan*) is to identify illicit discharges to the MS4 system, investigate citizen complaints, and evaluate the potential impact of permitted non-stormwater discharges to the MS4 system.

Background
IDEP has been conducting the following monitoring activities since 1995 to identify and eliminate illicit discharges.

- **Dry-Weather Monitoring.** The City inspects City-owned outfalls every summer to locate illicit discharges from cross-connections, spills, non-residential vehicle washing, illegal dumping operations, etc. Inspections consist of field observations and testing with meters, kits, and grab samples. This was the second year of expanded field screening for analytes (e.g., ammonia and potassium) in addition to field parameters and chlorine that may help in detecting illicit discharges. The majority of dry-weather discharges from major outfalls is from groundwater infiltrating into stormwater pipes and is not of concern. Historically, about four illicit discharges, ranging from cross connection and truck washing operations to minor spills, have been detected each month of the five dry-weather monitoring months (June – October).
- **Spill Response**. The City received and responded to approximately 2,000 complaint calls that were made to the City's spill hotline during FY12-13. Staff members conduct visual observation and some monitoring to identify and track reported spills or other illicit discharges. The vast majority of identified materials are sediment, washwater, or discharges related to dye tests.

Results
During the five dry month (June – October 2012), 186 major outfalls inspections were conducted at 149 outfalls; nine of these outfalls are priority outfalls that were inspected three times, and two of these are priority outfalls that were inspected four times. In addition, 13 outfalls were inspected twice for a variety of reasons, including the presence of a submerged outfall or standing water in the manhole during early summer inspections when stream levels were still fairly high.

The following table summarizes illicit discharge inspection activities.

Illicit Discharge Monitoring – Summary of Activities

Sampling Date	Sampling Locations	Follow-up Investigations
June 2012	6 Total Inspections 5 – Johnson Creek 1 – Columbia River	Four had discharge, but based on the field measurements, no follow-up investigations were warranted.
July 2012	129 – Total Inspections 24 – Columbia Slough 44 – Willamette River 5 – Johnson Creek 2 – Columbia River 1 – Fanno Creek 1 – Tryon Creek	41 had discharges at the time of inspection, and 10 of these discharges were too small to collect any sample for analysis of field parameters. Five lab samples (four for E. coli and one for metals) were collected. Follow-up sampling was initiated at two locations (outfall 08, ABA648) because of E. coli results.
August 2012	15 – Total Inspections 10 – Columbia Slough 5 – Willamette River	Ten had discharges at the time of inspection, and two of these discharges were too small to collect any sample for analysis of field parameters. Based on field analyses, lab samples were collected at seven outfalls and analyzed for E. coli. The outfall 08 E. coli sample prompted a more in-depth investigation. Follow-up sampling was initiated of outfall 53-B because of E. coli results.
September 2012	22 – Total Inspections 13 – Willamette River 5 – Columbia Slough 4 – Columbia River	13 had discharges at the time of the inspection, two of which did not have sufficient flow to collect any sample. Based on field measurements, samples for lab analysis of E. coli were collected at nine outfalls and for metals at two outfalls. None of the metal concentrations indicate a concern. All but one outfall (53-B) had E. coli concentrations below the action level, and no follow-up investigation was conducted. Outfall 53-B was identified for further sampling based on E. coli results.
October 2012	15 – Total Inspections 9 – Willamette River 5 – Columbia Slough 1 – Columbia River	12 had discharges at the time of the inspection, two of which did not have sufficient flow to collect any sample. None of the field measurements indicated a concern that warranted a follow-up investigation.

Based on the results of the illicit discharge monitoring, follow-up investigations were conducted, with the following outcomes:

- ABA648: Follow-up sampling indicated that the source of the E. coli was from a private development, and an enforcement action was issued.
- Outfall 08: Two E. coli sources in the outfall 08 basin were identified and addressed.
- Outfall 53B: In additional samples, E. coli was under detectable limits.

5. STORMWATER MANAGEMENT FACILITY MONITORING

Purpose

The purpose of this monitoring task is to evaluate the effectiveness of existing and new stormwater management facilities (SMFs) in reducing pollutants in discharges and managing stormwater.

Background

In 1995, the City began to monitor various types of structural BMPs that were installed as public and private facilities within the City boundaries (as reported in the MS4 annual compliance

reports). Since then, many types of structural BMPs have been well characterized by various other jurisdictions and organizations nationwide. Although it is not a permit requirement, the City continues to monitor the effectiveness of ecoroofs, stormwater curb extensions, and street planters for retention and detention of various sizes of storm events, as well as to collect data from stormwater flow-through planters for various storm events. Only ecoroofs are monitored for water quality because green streets (curb extensions, street planters, etc.) are designed to infiltrate the water quality storm and rarely bypass stormwater. Ongoing collection of soil samples in infiltration facilities is conducted to evaluate whether the pollutant concentration in those facilities is changing compared to a control or background soil sample.

Results—Water Quality Monitoring

Ecoroofs

Ecoroofs are vegetated facilities that replace a standard roof, mostly on buildings with a low roof pitch. They consist of soil media and vegetation atop a waterproof membrane. They are designed to reduce peak flows and total runoff volume.

Ecoroof Effluent Water Quality – Summary

		Ramona Apartments	Marine Drive Pump Station	Sellwood Pump Station	Hamilton West Roof	
Parameter	Units	FY 12-13 Mean (4 Samples)	FY 12-13 Mean (2 Samples)	FY 12-13 (1 Sample)	FY 12-13 (1 Sample	2001-2012 Mean (24 Samples)
Dissolved Copper	µg/L	14.2	35.8	15.0	15.0	11.2
Dissolved Lead	µg/L	<0.1	0.33	<0.1	<0.1	<0.1
Dissolved Zinc	µg/L	7.4	115	12.1	39.7	18.7
Total Dissolved Solids	mg/L	155	603	264	204	114
Nitrate-N	mg/L	0.14	<0.1	0.12	10	0.72
Total Phosphorus	mg/L	0.66	1.23	3.16	0.304	0.41
Ortho Phosphate	mg/L	0.45	0.85	2.44	<0.02	0.30

The Ramona Apartments and the City's Marine Drive and Sellwood Pump Station ecoroofs were built in 2012, and monitoring started in fall 2012. All three ecoroofs consist of a thin soil layer topped by crushed red cinder to protect the soil.

One fall sample was collected at the Sellwood Pump Station and the Hamilton West Roof; two fall samples were collected at the Marine Drive Pump Station ecoroof; and one fall and one spring sample were collected at both discharges point at the Ramona Apartments ecoroof, for a total of four samples.

As expected based on observations at other ecoroofs, the initial phosphorus concentrations in all three new roofs were elevated, but, as observed for other ecoroofs, appear to decline fairly quickly. The unusually high total dissolved solids and dissolved metals concentrations from the Marine Drive Pump Station ecoroof may be attributable to sampling the first storm in fall after a very long summer dry period. The second fall storm sample already had much lower concentrations for all analytes.

The same storm event that produced high total dissolved solids and dissolved metals concentrations was also sampled at the Hamilton ecoroof. Even though this ecoroof was built in and has been monitored since 2001, it still exhibited spikes of dissolved metals and nitrate that were substantially above the averages of 24 samples collected since 2001. It also appears that dissolved zinc concentrations have been trending higher over the past few years, while other dissolved metals have remained constant. It is unknown at this point whether this upward trend is related to changes in atmospheric depositions, changes in the chemistry of the ecoroof medium, or other changes.

Results—Soil Quality Monitoring

Typically, soil sampling events occur about every three to five years, since annual changes in the soil composition and pollutant accumulations are expected to be very small. Once three to four sampling events have been conducted for a given facility, an initial data comparison can be conducted to evaluate if there is a substantial change that could potentially be attributed to the accumulation of stormwater pollutants.

In 2010, control samples were taken for the first time. The control samples are from locations adjacent to the stormwater facilities, from areas that do not manage stormwater runoff. The control samples are more likely to be composed of native soil than the samples in the infiltration facilities, which more likely contain a mix of imported soil and compost. The control samples therefore are not necessarily directly comparable to the facility samples, but can be used to evaluate pollutants that are present or introduced through processes unrelated to stormwater infiltration.

In FY 12-13, soil samples were collected from 33 facilities that had not previously been monitored. The facilities were selected to be geographically representative of facilities built by the City over the past few years. In addition to soil samples, a variety of mulch samples were collected to assess the potential introduction of pollutants with the mulch. Only two facilities, the OMSI parking lot swale and the SW Montgomery Planter, had been sampled previously. Results from the SW Montgomery Planter are shown below.

SW 12th & Montgomery Street Planter Bay 1 - Soil Sampling Summary (0 - 6 inch)

Pollutant	Units	2005[1]	2007	2010	2011	2013	Median	Background	
								2010	2011
motor oil / lube oil	mg/kg	342	257	**749**	310	590	342	337	380
copper	mg/kg	30.1	31.2	31.2	34.4	**43.7**	31.2	26.4	29.7
lead	mg/kg	29.9	41.3	**51.7**	37.6	45.6	41.3	34.3	33.7
mercury	mg/kg	0.043	**0.125**	0.049	0.044	0.048	0.048	0.047	0.051
zinc	mg/kg	120	138	**233**	149	212	149	132	125
benzo(a)pyrene	µg/kg	61	**77**	57	37	64	61	52	39
benzo(g,h,i)perylene	µg/kg	91	107	160	61	**180**	107	88	64
chrysene	µg/kg	56	**81**	52	27	55	55	54	25
fluoranthene	µg/kg	57	**96**	77	51	86	77	59	38
pyrene	µg/kg	65	90	110	52	**120**	90	73	40

[1] 0 to 6 inch composite of all bays
Bold = highest value of an analyte detected to date

Based on five sampling events and two control samples, the following general observations can be made:

- In 2013, some analytes (copper, benzo(g,h,i)perylene, and pyrene) in the facility showed the highest concentrations to date. However, these maxima are less than 25 percent higher than the previous highest value and less than twice the median concentration.

- There is a potential indication that the copper concentration shows an increasing trend; future sampling will be used to evaluate whether there is a trend.

- With the exception of the 2007 sample, mercury concentrations are virtually identical in all facility and background samples.