City of Portland, Oregon

Water Pollution Control Facilities (WPCF) Permit For
Class V Stormwater Underground Injection Control Systems

Permit Number: 102830

Underground Injection Control Management Plan Annual Report No. 2 (2015 Permit)

Fiscal Year 2016-2017
(July 1, 2016 – June 30, 2017)

November 1, 2017

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This *Underground Injection Control Management Plan (UICMP) Annual Report No. 2 (2015 Permit)* is submitted to the Oregon Department of Environmental Quality (DEQ) to fulfill reporting requirements for the City of Portland's (City's) Water Pollution Control Facilities (WPCF) Permit for Class V Stormwater Underground Injection Control (UIC) Systems. This report summarizes UIC Program activities during the 2015 Permit reporting year, Year 2 (July 1, 2016, through June 30, 2017).

Background

DEQ issued the City's second WPCF Permit on May 19, 2015. As required by the Permit, the City submitted a UICMP, which DEQ approved on March 24, 2015. The UICMP describes the activities the City will implement throughout the second permit term (June 1, 2015 – May 31, 2025) to protect groundwater and meet WPCF Permit requirements. The Permit also requires the City to submit a UICMP annual report that summarizes the status of implementing the UICMP and each of its components.

The UICMP and the annual report are organized into the following major program elements:

- **System Management** includes ongoing, programmatic activities (best management practices) that prevent, minimize, or control pollutants.

- **System Monitoring** includes ongoing actions to demonstrate that UICs are operated in a manner that protects groundwater and meets WPCF Permit conditions.

- **Response** describes the process and criteria used to identify and implement actions needed to protect groundwater and meet Permit requirements. Corrective actions address UICs that do not meet WPCF Permit requirements.

This annual report describes the activities that occurred from July 1, 2016 through June 30, 2017 (FY16-17) in each of these areas. Key accomplishments are summarized below and described in more detail in the body of the report.

Key Accomplishments

Many City stormwater programs focus on preventing adverse impacts to its stormwater management system. In turn, these programs increase the level of protection for groundwater and surface water and improve the overall health of the City's watersheds. Though some of the key accomplishments summarized below are UIC-specific management actions, many are implemented on a citywide basis and help the City manage stormwater as a whole and not just in the areas where stormwater is discharged through UICs.

System Management

UIC-Specific Management Actions

- Continued ongoing evaluation of City UIC characteristics to update the UIC Registration Database; submitted updates to DEQ with this report.
- Received and responded to 55 calls regarding spills located within or near an area where UICs are the primary method of stormwater management. (One UIC system required additional follow up and remains closed until extent of potential impacts to the system can be determined).
- Continued to educate and train employees on WPCF Permit requirements and groundwater protection, including duty officer training on the Bureau of Environmental Services (BES) spill response hotline and procedures.
- Coordinated with other bureaus on source control, operations and maintenance (OM), spill prevention and response, and development review for UICs and groundwater protection.
- Provided ongoing coordination with other City bureaus that own UICs. Responded to UIC site-specific questions and discussed OM practices.
- Coordinated with the City's Bureau of Development Services on UIC design standards and on the review and approval process for UICs registered on private property.
- Cleaned approximately 1,398 UIC sedimentation and sump manholes.
- Continued evaluation of the review and approval process for private UICs to achieve a more streamlined and consistent registration process for both public and private UICs.

Citywide Management Actions

- Issued 31 enforcement actions in response to pollution complaints citywide, with proposed penalties and costs totaling $34,532.
- Conducted 102 groundwater-related inspections and 43 plan reviews in the Columbia South Shore Well Field Wellhead Protection Area (excluding Gresham and Fairview) of regulated businesses.
- Conducted 588 case reviews for source control measures (citywide) at commercial and industrial properties subject to the City's *Stormwater Management Manual* requirements. Required and approved 1,459 source control measures at these commercial and industrial properties citywide.
- As a partner, administered about 61 clean-up collection events citywide to help prevent illegal dumping.
- Conducted and approved 6,802 erosion control-related inspections of private construction sites citywide. (Erosion control inspections resulted in 1,212 enforcement actions and corrections notifications).
- Inspected 142 active public construction projects citywide with erosion control components.
- Involved approximately 22,409 students citywide in activities and presentations that teach the causes and effects of water pollution and how to protect water resources.

- Participated in numerous community activities and events involving stormwater management and watershed protection issues and actions. Awarded 13 grants totaling $74,907 to encourage watershed protection; several promoted stormwater infiltration projects.
- Inspected and mapped private stormwater management facilities at 788 properties with 1,443 total facilities for compliance with BES-approved OM agreements. Issued 32 enforcement actions.
- Partnered to make 2,700 outreach contacts and provided technical assistance to 22 businesses affected by the Columbia South Shore Well Field Wellhead Protection Program.
- Maintained over 20 BMP fact sheets online for commercial and industrial site operators. During FY16-17, the most-viewed fact sheets discussed sand-blasting and painting operations (approximately 1,222 views), catch basin maintenance (approximately 1,175 views), and preparing emergency response and spill clean-up plans (approximately 661 views).
- Cleaned approximately 10,599 catch basins and inlets citywide.
- Swept major arterials four to six times during the year, residential streets approximately once per year, and downtown core streets five times per year.

System Monitoring

- Implemented FY16-17 stormwater compliance monitoring. Sampled 15 UICs located in areas of shallow groundwater and tested for pollutants required by the 2015 Permit.
- Compiled and evaluated stormwater data included with this report. There were no FY16-17 exceedances of the 2015 Permit's action levels.

Response

- Evaluated UICs for corrective action response due to database updates, monitoring results, or spill response.
- Evaluated FY16-17 data to ensure that no major changes occurred in the City's depth-to-groundwater estimates and evaluated monitoring data to confirm the results of groundwater protectiveness demonstrations conducted during the 2005 Permit term.
- Confirmed no new UICs needed corrective action during FY16-17.

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1 Introduction

1.1 Overview

The Oregon Department of Environmental Quality (DEQ) renewed the City of Portland's (City's) Water Pollution Control Facilities (WPCF) Permit for Class V Stormwater Underground Injection Control Systems (UICs) (Permit No. 102830) on May 19, 2015.[1] As required by this 2015 Permit, the City submitted a UIC Management Plan (UICMP), which DEQ approved on March 24, 2015. The UICMP describes the activities the City will implement throughout the 2015 Permit term (June 1, 2015, to May 31, 2025) to protect groundwater and meet WPCF Permit requirements.

The 2015 Permit also requires the City to submit a UICMP annual report that summarizes the status of implementing the UICMP and each of its components. Accordingly, this annual report provides information about key accomplishments during the second fiscal year of permit implementation (July 1, 2016 through June 30, 2017, also known as FY16-17) and identifies activities planned for implementation in the next fiscal year where applicable.

Table 1-1 summarizes the 2015 Permit requirements for the annual report and identifies where the requirements are addressed in this annual report.

Table 1-1. Summary of the City's 2015 Permit Annual Report Requirements

Annual Report Requirement (as identified in Schedule B.5 of the 2015 Permit)	**Where Requirement Is Addressed in this Annual Report**
System Monitoring	
Results of stormwater monitoring conducted in accordance with the Stormwater Discharge Monitoring Plan	Appendix C Section 3.1.1
Spreadsheet of all data from sampled UICs provided in analytical laboratory reports	
Evaluate and report trends in emerging pollutant types and concentrations required by Schedule D, Condition 6 (*fourth year and ninth year annual reports only*)	
Discussion of any Schedule A, Table 1, action-level exceedances, and actions taken to address the exceedances	

[1] Information about the City's first WPCF Permit term (2005 – 2015) can be found in its annual UICMP reports for 2005 through 2015.

System Management	
Description of actions taken to implement the UICMP. *UICMP requirements are as follows:*	Section 2: Key accomplishments are listed for each best management practice (BMP)
Decommissioning activities	Section 2.2.1 and Appendix A
Employee education and public outreach	ET-1, ET-2
Operations and maintenance and inspection protocols	OM-1, OM-2, OM-3, ET-2
Accidental spills/illicit disposal	ET-1, ET-3, PC-1, PC-2
Preventing discharge of stormwater from refueling areas, hazardous/toxic material storage/handling areas, materials storage/ handling areas, or other discharges that may contain pollutants above levels of concern[2]	ET-2, ET-3, OM-3, PC-1, SA-1
Housekeeping practices to protect groundwater quality	ET-2, ET-3, OM-1, OM-2
Facility designs and practices that block discharges to UICs	PC-1, PM-1
Site control measures and BMPs (Schedule A, Condition 7)	OM-1, PC-1
Description of any proposed modifications to the UICMP	Section 1.5
Description of any additional actions taken to manage the UIC system to ensure groundwater protection	Section 2.8
Description of any actions included in the UICMP that were not completed and why	Section 2.9
Identification of UICs closed, retrofitted, or installed during the year	Section 2.2.1 and Appendix A
Future (in the next year) plans to install, modify, convert, or close any UIC	Section 2.7
Changes to key personnel or areas of responsibilities for the permit	Section 1.4.2
Identification of any newly discovered UICs	Section 2.2.1 and Appendix A
Adaptive Management	Section 2.10

[2] The Systemwide Assessment (2015) did not identify any City-owned or -operated UICs located in refueling areas, hazardous or toxic material storage or handling areas, or materials storage or handling areas.

Response	
Progress reporting on corrective actions	Section 4.5
Report of all instances of noncompliance and other permit violations that are not reported per Schedule F.4.e. (compliance schedule) or F.4.f (24-hour and 5-day reporting)	Section 4.6

1.2 Overview of the UICMP

The UICMP meets the requirements of the City's 2015 UIC WPCF Permit. These requirements specify that the City prepare and implement a written UICMP that includes a systemwide assessment, system controls, monitoring, and a plan for recordkeeping and reporting.

The UICMP is organized into the following three major elements:

- **System Management** includes ongoing, programmatic activities (best management practices, or BMPs) that prevent, minimize, or control pollutants before they discharge to a UIC. BMPs include structural, nonstructural, and institutional controls. They are organized into the following five categories:

  - Systemwide Assessment
  - Pollution Control
  - Education and Training
  - Operations and Maintenance
  - Program Management

- **System Monitoring** includes ongoing actions to demonstrate that UICs are operated in a manner that protects groundwater and meets WPCF Permit conditions.

- **Response** uses data and information from system monitoring and system management to identify any UICs that may be a threat to groundwater protection and thus are out of compliance with the Permit. When a UIC is identified as such, a corrective action is required to evaluate the threat and may result in either further action to bring the UIC into compliance, or closure of the UIC. The objective of the response is to improve or correct conditions at a UIC or group of UICs.

1.3 Legal Authority

The Charter of the City of Portland grants broad authority to the City "to exercise any power or authority granted to the City by statute… and [provides that the City] may do any other act necessary or appropriate to carry out such authority, or exercise any other power implied by the specific power granted." Such authority includes, among other things, "all powers commonly known as the police power to the same extent as the State of Oregon has or could exercise said

power… and to make and enforce… all necessary or appropriate water, local, police, sanitary and safety laws and regulations" (Chapter 2-105, *Charter of the City of Portland, Oregon*).

In addition, the Portland City Code addresses the regulation of stormwater discharges, building requirements, zoning, erosion and sediment control, and public improvements in Chapters 10, 17, 24, 29, and 33. Chapters 17.38 and 17.39 specifically address Drainage and Water Quality and Stormwater Discharges, respectively.

1.4 UIC Program Staff

1.4.1 Key Roles and Responsibilities

The 2015 Permit designates the Bureau of Environmental Services (BES) as the bureau responsible for implementing the Permit and for identifying and managing the regulatory and technical components of the UIC Program citywide and across bureaus. Key staff roles and responsibilities for the UIC Program are summarized in the UICMP.

1.4.2 Personnel Changes

There were no personnel changes in UIC Program staff in FY16-17.

1.5 Proposed Changes to the UICMP

There are no proposed changes to the UICMP at this time.

1.6 City Budget and Funding

The City has invested more than $1.465 billion in stormwater management services and facilities over the past 22 years.[3] The revenue requirements for FY16-17 were allocated as described in Table 1-2:

Table 1-2: Stormwater Program Expenditures

Major Program Category	Revenue Requirements (*millions*)		Percent Change
	2010-11	2016-17	
Enforcement and Development Review	$5.8	$14.1	143%
Watershed Program & Habitat Restoration	$18.3	$19.9	9%
Facilities Operations and Maintenance	$21.0	$25.2	20%
Capital Improvements*	$45.8	$63.3	38%
Total Expenditures	**$90.9**	**$122.5**	**35%**

*Includes debt service, facilities planning and engineering, construction engineering, and construction contracts.

In FY17-18, the City plans to invest $132.6 million in stormwater management services and facilities. Direct monthly user fees will pay for 89% of these investments.

[3] The 22-year time period reflects the implementation period of the City's National Pollutant Discharge Elimination System Permit.

Stormwater Management Charges

City Council approves revised stormwater system monthly user fees at the start of each fiscal year. Monthly system 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.

Table 1-3 reports the change in the monthly single-family stormwater management charge and in the residential and nonresidential monthly stormwater rate per 1,000 square feet of impervious area, between 2010 and 2017.

Table 1-3. Stormwater Management Charges and Rates

Stormwater Management Monthly Charges & Rates	2010-11	2016-17	Percent Change
Single-Family Residential Charge	$21.79	$27.44	26%
Residential Rate ($/1,000 ft^2 impervious area)	$9.08	$11.43	26%
Nonresidential Rate ($/1,000 ft^2 impervious area)	$9.66	$11.95	24%

Stormwater System Development Charges

In addition to stormwater system monthly user fees, City Council also approves revised stormwater system development charges (SDCs) for new development and significant redevelopment at the start of each fiscal year.

The methodology for assessing SDCs includes two components. One component, onsite runoff management, represents the charge for stormwater facilities that handle runoff from individual properties. For FY16-17, this onsite portion is assessed based on $190 per 1,000 square feet of impervious area (see Table 1-4). Riparian properties that drain directly to the Columbia Slough, Columbia River, or Willamette River are exempt from this portion of the SDC.

The other component, public right-of-way (ROW) runoff management, represents the cost of stormwater facilities that handle runoff from public ROWs. This portion is assessed based on the use of the transportation system, using road frontage and vehicle trips associated with the proposed development to allocate the costs. For FY16-17, the rates were $6.05 per linear foot and $3.24 per 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% for retention of the 100-year event, to no discount for control of the 10-year storm.

Table 1-4. Stormwater System Development Charges (SDCs) and Rates

SDC Charges & Rates	2010-11	2016-17	Percent Change
Onsite Portion ($/1,000 ft^2)	$154.00	$190.00	23%
ROW Portion ($/linear foot of frontage)	$4.78	$6.05	27%
ROW Portion ($/vehicle trips)	$2.51	$3.24	29%

1.7 Organization of the Annual Report

The remainder of this annual report contains the following sections:

Section 2: System Management identifies citywide BMPs implemented to prevent, minimize, and control pollutants prior to infiltration. Where relevant, it also identifies projected main activities for FY17-18.

Section 3: System Monitoring summarizes compliance monitoring. Details are provided in Appendix C.

Section 4: Response identifies response actions conducted during FY16-17 and those projected for next fiscal year (FY17-18).

Appendix A identifies UICs added and removed from service during FY16-17 (including closure reports for decommissioned UICs, provided on a separate CD).

Appendix B identifies spills that occurred within areas serviced by UICs.

Appendix C is a report presenting the annual results of the City's 2015 Permit-required UIC monitoring.

2 System Management

2.1 Overview

The System Management program element involves a series of actions, called best management practices (BMPs), that serve to prevent, minimize, and control pollutants in stormwater prior to discharge to an underground injection control (UIC). These BMPs are organized into the following five general categories and are applied to the entire UIC system on an ongoing basis:

- Systemwide Assessment
- Pollution Control
- Education and Training
- Operations and Maintenance
- Program Management

Although this report is focused on the City's management of its UIC system, it is important to understand that many programs detailed in this section provide stormwater management benefits (improved water quality, groundwater and stormwater protection, and increases in overall watershed health) across the entire City and not just to areas that discharge stormwater to UICs.

2.2 Systemwide Assessment (SA)

The purpose of the Systemwide Assessment (SA) BMP is to identify, evaluate, track, and report on spatial and physical characteristics of existing and new City-owned and -operated UICs. This enables the City to evaluate whether drainage entering individual UICs may pose a risk to groundwater, as well as to overall watershed health, as a result of these characteristics. Ongoing activities necessary to provide stormwater drainage infrastructure include the registration and construction of new UICs, replacement of existing UICs, and decommissioning of existing UICs. This BMP category focuses on updating information related to the location and physical characteristics of existing and new UICs. It fulfills two WPCF Permit requirements:

- Develop and implement a comprehensive UIC Registration Database.
- Evaluate UICs for factors that could present a risk to groundwater quality.

SA-1: Inventory and Assess City-Owned UICs

2.2.1 SA-1: Key Accomplishments

- Submitted UIC Registration Database updates to the Department of Environmental Quality (DEQ) with this report. All updated UIC database information is posted by November 1, 2017, to the City's FTP site where it can be accessed by DEQ. The files provide all new and removed UIC information as well as any attribute changes to existing information currently included in the UIC database.

- Identified 58 new public UIC[4] records in UIC Registration Database updates. These UIC records are listed in Appendix A.

- Removed or changed the status[5] of 16 public UIC records in UIC Registration Database updates. These records are listed in Appendix A.

- During FY16-17, five UICs were decommissioned. Closure reports for the five decommissioned UICs are included on a CD as part of Appendix A.

- Other changes to database records included as part of the database update include:

    - 0 updates to maintenance period
    - 19 updates to operational status
    - 3 updates to address
    - 34 updates to latitude
    - 133 updates to longitude
    - 36 updates to distance to nearest water well[6]
    - 157 updates to distance to nearest wetland[5]
    - 518 updates to distance to nearest surface water[5]
    - 4 updates to size of impervious area
    - 72 updates to UIC pretreatment
    - 18 updates to installation date
    - 7 updates to UIC depth and diameter
    - 89 updates to depth-to-groundwater (most of these updates are due to a new calculation method causing minor changes in rounding)
    - 3107 updates to date updated
    - 0 updates to discharge rate

2.3 Pollution Control (PC)

Activities and practices such as spills, illegal disposal, improper site management, and erosion can increase the discharge of pollutants to public UICs, with potential negative impacts to groundwater. This BMP category focuses on reducing such pollutant discharges from both public and private sites and activities. It fulfills two 2015 Permit requirements:

- Implement spill prevention and pollution control.
- Identify activities conducted on commercial/industrial properties that may result in a violation of action levels in stormwater discharging to a public UIC.

[4] Some UICs identified as new facilities may not be recently discovered or newly constructed UICs. UICs may be identified as new due to database management. For example, correcting a database identifier for a facility from "sedimentation manhole" to "UIC" would make the UIC appear to be a new sump in the BES database, even though the facility itself is not new.

[5] The reasons for removal may include identification through field investigations as not existing, change in ownership, or data error. The reason for changing status (e.g., from "active" to "closed") is UIC decommissioning.

[6] Most of these updates are due to a change in GIS calculation methods causing minor shifts in location information.

PC-1: Identify, prevent, minimize, and control activities that can increase pollutant discharges to public UICs. These activities include illegal dumping of solid and liquid wastes (such as paint, used motor oil, or solvents) into catch basins; accidental or unplanned discharges (such as car accidents and firefighting activities); site uses that may generate pollutants; and construction site activities.

2.3.1 PC-1: Key Accomplishments

Spill Prevention and Pollution Control

- Continued to respond to pollution complaints citywide and issue enforcement actions for violations of Portland City Code 17.39 for prohibited discharges. During FY16-17, issued 31 enforcement actions citywide, with proposed penalties and costs totaling $34,532.
- Continued to implement City programs, which included improving ongoing citywide pollution control activities to identify and control activities on private properties and commercial/industrial properties where site activities (e.g., illegal disposal, improper storage and handling of materials, and erosion) could result in a violation of action levels in stormwater discharging to a UIC.

Spill Protection-Citizen Response (SPCR) Team

SPCR staff responds immediately to spill emergencies and investigates pollution complaints regarding spills, illegal disposal, improper site management, and erosion. Citizens can call in reports on a dedicated spill response hotline 7 days a week, and staff is available 24 hours a day to respond to spills, slicks, and other suspicious or inappropriate discharges. The program refers problems to other local or state agencies for response and enforcement as appropriate. The SPCR team also provides education and technical assistance to property owners to improve site management and address work practices that may impact stormwater discharges (see ET-3, Education and Training, Key Accomplishments). SPCR staff supports the entire City, including areas that use UICs for stormwater management.

- Received 55 calls regarding spills located within or near an area where UICs are the primary method for stormwater disposal. Appendix B shows this information in table format, including date, release type, volume, location, identification of the closest City-owned UIC catch basin, and if the spill entered a City-owned UIC. Of the 55 reported spills, 10 reached a UIC system:
    - Two of the 10 were determined to have no impacts, and the cases were closed.
    - Seven of the 10 were inspected and cleaned by City staff. It was determined that, once cleaned, the volumes of sewage, sediment, or auto fluids discharged to the UIC systems did not pose a threat to groundwater, and the cases were closed.
    - The remaining spill occurred on March 22, 2017, at 11214 SE 112th Avenue (Space Age Gas Station). During filling of the station gas tanks, the delivery truck hose became disconnected. Approximately between 50 and 200 gallons of gasoline were released to the ground and into the right-of-way and entered a City-owned UIC (ADV235). The Portland Fire Department was the initial responder to the spill, initiated clean-up activities, and notified both the City's on-call duty officer

and the DEQ duty officer. On March 25, 2017, as required by the City's WPCF UIC Permit, the City's UIC Program Manager provided written notification to the DEQ UIC Program, meeting the 5-day reporting requirement. Initial activities conducted by the on-call contractor included cleaning the UIC, all inlets and inlet leads, as well as portions of the right-of-way that were impacted. All storm inlets that connected to the impacted UIC were closed, and storm drainage was directed to a different UIC further down the street. Under direction from Mike Greenberg (DEQ Cleanup Program), Space Age developed a sampling plan to determine if the soil around the UIC was impacted. Soil sampling was conducted on August 22, 2017. Though petroleum hydrocarbon constituents concentrations in soil at 10 feet were above their respective DEQ RBC for leaching to groundwater, they were below at 15 feet and non-detect at 20 feet. Based on sampling results, both DEQ Cleanup and UIC programs determined that any impacts to the surrounding soil were minimal and would not require any additional actions other than to re-clean remaining sediments from the UIC. The final report from Space Age's environmental consultant was not available at the time of this report.

Regional Spill Response Committee

- Initiated a "re-boot" of the Regional Spill Response Committee in 2016-17 to re-focus efforts, solicit input about new participants and meeting topics, and increase coordination with emergency responders and planners. This re-boot has produced a significant amount of material, information, and suggestions that the Committee is analyzing to determine next steps. The Regional Spill Response Committee includes representatives from various City bureaus, DEQ, the U.S. Coast Guard, Clackamas County Water Environment Services, the Port of Portland, and the City of Gresham.

Columbia South Shore Well Field (CSSWF) Wellhead Protection Program

The City continued to implement the CSSWF Wellhead Protection Program and reference manual for the City of Portland (also in effect in Gresham and Fairview). The program focuses on groundwater protection through mandatory spill-containment BMPs and facility inspections for commercial and industrial facilities within the CSSWF Wellhead Protection Area (WHPA) overlay zone. The program also includes education and outreach efforts to affected residents and businesses and one-on-one technical assistance to businesses to help them comply with program requirements (See ET-3). Program requirements include structural and operational BMPs to reduce the occurrence of spills and minimize their impacts.

- Conducted 102 groundwater-related site inspections in the WHPA (excluding Gresham and Fairview) of regulated businesses. Conducted 43 plan reviews for applicability/compliance with the WHPA Reference manual.

Source Control Measures

The City's *Source Control Manual* [formerly part of the *Stormwater Management Manual* (SWMM)] requires storm and sanitary source controls for site uses and characteristics that generate, or have the potential to generate, specific pollutants of concern. These requirements apply to new development and post-development activities that are considered to be "high-risk"

or pollutant-generating. The manual identifies structural, operational, and treatment BMPs designed to prevent or control conventional and toxic pollutants in stormwater, groundwater, and wastewater.

- Conducted 588 case reviews[7] for source control measures at commercial and industrial properties subject to SWMM requirements.

- Required and approved 1,459 source control measures at these commercial and industrial properties.[8] These numbers are citywide and are not limited to areas draining to UICs. (Note: When the SWMM is applied, drainage from high-risk areas is prohibited from draining to public UICs, and stormwater is managed onsite.)

- Continued to implement the City's SWMM and *Source Control Manual*, which became effective in early FY16-17.

Prevention of Illegal Disposal

- 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 clean-up collection events. During the year, 61 events took place throughout the City. Volunteers removed and properly disposed of bulky waste from over 400 properties. The Bureau of Planning and Sustainability (BPS) launched "Keep It Pretty Rose City," an anti-litter toolkit to help community groups organize litter pick-up activities.

PC-2: Focus on erosion control during construction activities, on both public and private sites.

2.3.2 PC-2: Key Accomplishments

The City has a comprehensive erosion control program that applies to both public and private construction projects. Portland City Code Title 10 and the City's *Erosion and Sediment Control Manual* outlines requirements and provides technical guidance for temporary and permanent erosion prevention and for sediment and pollution control. Program requirements apply to all ground-disturbing activities, regardless whether a development permit is required, unless such activities are otherwise exempted by Portland City Code. As part of its comprehensive plan to manage stormwater, protect water quality, and promote watershed health, the City has implemented the following erosion-control actions citywide:

- Conducted 6,802 erosion control-related inspections of private construction sites. This number includes all inspections.

[7] This includes 147 land use reviews and 441 early assistance appointments and pre-application conferences.

[8] The City reviews and requires source control measures for some projects that never materialize due to development issues, project financing, etc. This metric reflects projects that eventually received final building and occupancy permits and, therefore, were actually constructed. The number includes properties that re-enter the permitting process from previous years, such as re-development or tenant improvement projects.

- Inspected all private development sites with qualifying ground disturbance areas for temporary and permanent erosion control measures at the beginning and near or at completion of the project. At interim checks conducted during regular building inspections (or as needed), the inspector noted any erosion control deficiencies, and the site operator was required to implement corrective action.

- As a result of erosion control inspections, the City issued a combined total of 1,212 enforcement actions and corrections notifications[9] (i.e., stop work orders, correction notices, and notices of violation).

- Inspected 142 active public construction projects with erosion control components. In general, public sites are inspected daily during construction.

- Additional erosion control activities and accomplishments in FY16-17 included the following:

    - Provided annual construction inspector training to BES inspection staff.
    - Conducted monthly erosion control program meetings with BDS and BES.
    - Provided erosion control program and compliance guidance to permittees at seven BDS Pre-Construction Conferences.
    - Provided an "Erosion Control Program Status and Goals" presentation for upper management at BDS and BES to consider opportunities for building the program.
    - Hired a BDS Site Development Inspector for erosion and sediment control oversight on residential construction projects.

2.4 Education and Training (ET)

The purpose of this education and training (ET) BMP category is to inform and educate the public; businesses; and City employees about UICs, groundwater protection, WPCF Permit conditions, and also to promote pollution prevention and source control.

ET-1: Provide education and outreach to members of the public living and working in areas served by UICs. Implement public information, education, involvement, and stewardship activities that will raise awareness, foster community stewardship, and promote pollution prevention, stormwater and groundwater management, and environmental protection.

2.4.1 ET-1: Key Accomplishments

As part of its comprehensive plan to manage stormwater, protect water quality, and promote watershed health, the City has implemented the following actions citywide:

[9] The substantial increase in enforcement actions is due to inclusion of all Correction Notices.

Clean Rivers Education Program

- Reached 6,916 students (grades K-12) with classroom programs that provide hands-on, interactive science education about stormwater and other environmental issues.

- Involved 4,426 students (K-12) in education field programs that offer watershed investigations and field assessments, stormwater tours, boat tours, and restoration experiences.

- Provided canoe trips to students in the Columbia Slough watershed. These included classroom studies and stewardship projects related to stormwater pollution.

- Presented *Stormwater - Soak It Up*, a 75-minute classroom program for grade 4-12 students and teachers and special interest groups.

- Presented *Tours of Stormwater Solutions*. Students visited bioswales, stormwater planters, ecoroofs, areas with porous pavement, and creative downspout disconnections.

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

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

- Worked with Zenger Farm to provide classroom and field education lessons focused on stormwater management, watershed health, environmental stewardship, and sustainability.

- Conducted students tours of sustainable stormwater infiltration facilities, including bioswales, ecoroofs, stormwater planters, green streets, rain gardens and creative downspout disconnections. Students learn how these solutions allow stormwater to soak into the ground to reduce volume, while plants and soil filter pollutants and improve water quality.

An estimated 22,409 students participated in these activities citywide.

Stewardship Activities and Community Events

- Sponsored, cosponsored, funded, and participated in numerous community activities and events throughout the City's watersheds that involved stormwater management and watershed protection issues and actions (e.g., workshops, educational presentation and activities, training, restoration projects). FY16-17 examples included the following:

    - Awarded 13 stewardship grants totaling $74,907. The program provides up to $10,000 per project to citizens and organizations to encourage watershed protection in Portland. Several awards were given to projects that promoted stormwater infiltration, such as Depave at Bridgeport Church and Greenview Terrace rain garden.

- One hundred thirty-six community and school volunteers distributed door-hangers with stormwater pollution prevention messages to residences as part of the storm drain curb marker program.

Stormwater-Related Information

- Included four different inserts in City water/sewer bills mailed to approximately 200,000 customers:

  - Fall 2016: Get Ready for the Rain
  - Winter 2016/17: Old Sewers & New Technologies
  - Spring 2017: What Is Stormwater Runoff?
  - Summer 2017: Planning Some River Recreation? Check the Weekly Willamette River Recreation Index

- Updated and posted fact sheets, brochures, and educational materials on the BES website:

  - "Clean River Rewards" stormwater discount program (168,727 page views)
  - Treebate incentives for planting yard trees (24,751 page views)
  - Green Street Stewards Program (49,175 views)

- Continued to educate and recruit volunteer Green Street Stewards. In FY16-17, the program reached over 900 individuals through tabling events and trainings. Thirty-seven people volunteered to become Green Street Stewards (citywide).

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

Ecological Business Program

- 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 using sustainable and environmental practices under the Eco-Logical Business Program (EcoBiz). This involves performing site visits and technical assistance during FY16-17 on ways to:

  - Reduce and eliminate pollutants such as volatile organic compounds and chlorinated solvents
  - Prevent spills by adding secondary containment for tanks over 55 gallons
  - Provide employee spill response trainings
  - Properly manage and dispose of hazardous materials
  - Conserve water in the office, shop, and on managed landscaped areas
  - Wash vehicles and equipment using environmentally responsible systems
  - Adopt sustainable purchasing and inventory policies
  - Adopt the principles of Integrated Pest Management (landscapers)
  - Reduce or eliminate the use of pesticides (landscapers)

- Partnered with DEQ to create a green dry cleaners certification program. The criteria to be an EcoBiz dry cleaner is being finalized, with implementation anticipated in Winter 2017.

ET-2: Promote knowledge of WPCF Permit conditions and requirements for City staff responsible for implementing UIC program elements and BMPs, and ensure that City practices related to UICs are protective of groundwater.

2.4.2 ET-2: Key Accomplishments

- Continued to educate employees and develop training on groundwater protection and WPCF Permit requirements, including duty officer training on the BES spill response hotline and specific duty officer procedures.

- Coordinated with other bureaus on source control, operations and maintenance (OM), spill prevention and response, and development review for UICs and groundwater protection.

- Provided ongoing coordination with bureaus that own UICs. Responded to UIC site-specific questions and discussed OM practices.

- Coordinated with the City's Bureau of Development Services development review staff on UIC design standards and on the review and approval process for UICs registered on private property.

ET-3: Provide outreach and technical assistance to businesses to reduce and control pollutant discharges from industrial and commercial facilities to protect groundwater quality.

2.4.3 ET-3: Key Accomplishments

As part of its comprehensive plan to manage stormwater, protect water quality, and promote watershed health, the City has implemented the following actions citywide.

Maintenance Inspection Program

- The Maintenance Inspection Program (MIP) ensures that property owners follow site-specific, BES-approved OM agreements. Program staff conduct inspections, provide technical assistance to property owners on the OM of their onsite stormwater management facilities (SMFs), and provide guidance on pollution prevention BMPs for site activities that may impact the functionality of the SMFs. The program also collects information on SMF deficiencies and corrective actions taken to address deficiencies. MIP activities in FY16-17 included the following:

    - Inspected 788 properties with 1,443 associated private stormwater management facilities.

- Recorded 406 OM Agreements for 913 SMFs managing 154.6 acres of impervious surface.
- Tracked and mapped SMFs and SMF attributes.
- Issued 32 enforcement actions (i.e., Warning Notices, Notices of Violation, and Voluntary Compliance Agreements.

CSSWF Wellhead Protection Program

- Provided education and outreach to affected residents and businesses to help them comply with local drinking water source protection requirements of the program, in conjunction with the Columbia Corridor Association (CCA) and Columbia Slough Watershed Council. Activities in FY16-17 included the following:

  - Made 2,700 individual outreach contacts.
  - Provided technical assistance to 22 businesses.
  - Published newsletter articles on the protection program.
  - Distributed free spill kits, required signs, and secondary containment pallets.
  - Maintained the CCA and City of Portland webpages on the Groundwater Protection Program with information for businesses and residents.

Sustainability at Work

- Sustainability at Work (formerly the BEST Business Center) continued to assist Portland businesses with resources and information to help them "green" their operations, including managing stormwater and preventing pollution. The program is run by the City of Portland in partnership with Metro and Energy Trust of Oregon. The program conducted the following activities in FY16-17:

  - Conducted site visits at 203 businesses, providing assistance across a broad range of topics, including water conservation, stormwater management, hazardous waste, energy efficiency, renewable power, alternative transportation, and waste prevention.

  - Distributed an e-newsletter monthly to 4,000 Sustainability at Work customers, providing tips, case studies, and best practices in the above-mentioned topic areas.

  - Administered Sustainability at Work certifications, recognizing businesses that have taken measurable steps to conserve resources and reduce their greenhouse gas emissions. In FY16-17, the program completed 121 certifications and renewals (for businesses at the end of their 3-year certification period). As of June 30, 2017, 268 businesses were certified.

Industrial Stormwater Program

- Over 20 BMP fact sheets are posted on BES's Industrial Stormwater Program website, which provides technical assistance for proper spill prevention and response outdoors. Information is targeted to commercial and industrial site operators, helping to educate and assist in the

prevention of spills and the protection of groundwater and surface water. During FY16-17, the most-viewed BMP materials continue to be related to sand-blasting and painting operations (approximately 1,222 views), catch basin maintenance (approximately 1,175 views), and preparing emergency response and spill clean-up plans (approximately 661 views). The number of views increased significantly over the previous year. Other BMP materials included information on dewatering activities, loading and unloading materials, and outside container storage and waste disposal.

2.5 Operations and Maintenance (OM)

Operations and maintenance (OM) BMPs for City UICs are important to both remove pollutants from UICs (e.g., UIC cleaning, catch-basin cleaning) and prevent pollutant discharges into UICs (e.g., street sweeping). This BMP category identifies OM practices both for UICs located in City-managed rights-of-way and for UICs on other City-owned property.

OM-1: Address the inspection, maintenance, cleaning, and repair of City-owned UICs in public rights-of-way.

2.5.1 OM-1: Key Accomplishments

- Cleaned approximately 10,599 storm inlets (citywide).
- Cleaned 1,398 UIC sedimentation and sump manholes.
- Repaired 241 storm inlets and inlet leads and 284 linear feet of culverts (citywide).

OM-2: Address operation and maintenance activities that are conducted in public rights-of-way and may affect City-owned UICs.

2.5.2 OM-2: Key Accomplishments

Street Sweeping

- The street sweeping program cleans over 4,000 lane miles of curbed streets in the City each year. The City swept major arterials four to six times, residential streets approximately once, and downtown core streets five times during the year. Removed 4,385 tons of sediment and material from City roadways in FY16-17.
- Continued to implement a street leaf removal program in 30 leaf service areas (areas that have streets lined with large, mature trees). Under the program, the Portland Bureau of Transportation (PBOT) schedules and implements one or two leaf collection days per zone. Removed 6,930 tons of leaf material in FY16-17.

PBOT Maintenance Operations BMPs

- Continued to implement BMPs within the right-of-way to protect water quality, including:
    - Following the Oregon Department of Transportation Routine Road Maintenance Water Quality and Habitat Guide Best Management Practices.
    - Controlling erosion during all sediment-disturbing activities.
    - Using Cured in Place Piping (CIPP) technology when replacing stormwater piping in the right-of-way to reduce the amount of digging needed.
    - Using low-disturbance sign installation methods to avoid or minimize digging.
    - Using mild, solvent-free cleaners to clean signs.
    - Using a UV-protection and anti-graffiti coating on new street signs to reduce the need for chemical cleaners.
    - Monitoring weather conditions during asphalt grinding to avoid runoff.
    - Hand-applying asphalt where necessary to prevent these materials from entering the storm drain system.

- Continued to pilot-test alternative products and practices to reduce and prevent pollutant discharges to rights-of-way. For example, the City is currently evaluating the use of sodium chloride as a deicing agent during winter storm events. Research did not discover any specific comparison of the toxicity of solid road salts to liquid deicers; however, it did indicate deicing materials are highly variable, and the level of impact can be attributed to product ratios, application rates, duration, and receiving waters. The City tested sodium chloride during the 2016-17 winter season; water quality samples were taken downstream of the test areas. Sampling results showed chloride concentrations at the sampling locations remained well below instream water quality concentrations. Continued testing and evaluation are planned.

- Continued to use the PBOT *Maintenance Environmental Handbook*, completed in 2011, that includes guidance to ensure that field crews have easily accessible information on waste handling, erosion control measures, spill control and prevention practices, and vehicle washing.

OM-3: Address operation and maintenance of UICs <u>on other City property</u>, as well as good housekeeping practices that may affect UICs.

2.5.3 OM-3: Key Accomplishments

- Continued discussions with other City bureaus to standardize OM procedures for UICs on City property, based on the OM templates established in the City's SWMM.

- Maintained the program that requires the Portland Water Bureau to submit requests to BES for potable water discharges from the 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 DEQ/BES 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.

- The City's Procurement Services engages in green purchasing best practices to spend public funds on goods and services that minimize negative impacts on human health and the environment. In FY16-17, the program included environmentally preferable product and service specifications in City solicitations and contracts, such as the use of untreated wood for boardwalks and similar exterior wood features. Additional specifications include zero-sediment runoff at construction sites, and onsite stormwater management (ecoroofs, rain gardens, etc.).

- The Portland Fire Bureau continued to control discharges from equipment washing and non-emergency firefighting training by routing discharges to the sanitary sewer system.

- PBOT Maintenance Operations inspected and maintained, as necessary, stormwater and stormwater containment and pollution prevention facilities in City maintenance yards. It continued to implement stormwater controls, which encompass installation, inspection, and maintenance of filtration and absorbent media at selected stormwater inlets.

- Portland Parks and Recreation (PP&R) continued to comply with practices required for Salmon Safe certification, including integrated pest management, reducing water and fertilizer inputs on park properties, restoring riparian and upland habitats, and using alternatives to pesticides. PP&R was the first City bureau to be certified Salmon Safe in 2004 and was recertified in 2012. Since that time, the following additional City bureaus participate and have been tasked with carrying out elements of the Salmon Safe certification: BES, PBOT, Water Bureau, Portland Fire & Rescue, Office of Management & Finance, and BPS.

- PP&R continued to implement City Integrated Pest Management activities to reduce water and fertilizer inputs on parks, including:

    - Utilizing plants with natural resistance to pests.
    - Proper mowing and irrigation of park turf to increase vigor and reduce weed populations.
    - Mulching of planting beds to reduce establishment of weeds.
    - Application of selected herbicides to control invasive weeds and prevent their spread.
    - Release of natural biological control insects to control invasive weed infestations.

- PP&R continued to implement practices to conserve water, minimize runoff, and increase infiltration in the City's park system, including:

    - Aerating and overseeding athletic fields to reduce the need for fertilizers.
    - Computerizing irrigation systems to reduce water usage.
    - Prioritizing park areas that receive irrigation based on frequency and volumes.
    - Reviewing park designs to minimize the amount of "open turf" acreage.

- PP&R consolidates maintenance activities and materials into one location, the Mount Tabor Yard. Recyclable and recoverable waste products are moved to the site, stored appropriately, and hauled offsite by specialized vendors and contract services. Used transportation maintenance wastes (oil, antifreeze, solvents, tires, dry cell batteries), paper and cardboard, scrap wood and metal, excess paint, and fluorescent lamps are managed at the site.

Site-specific OM actions conducted as a response action are discussed in Section 4: Response.

2.6 Program Management (PM)

The purpose of the Program Management (PM) BMP is to ensure effective program management, coordination, and reporting for effective implementation of the UICMP and compliance with the WPCF Permit. This approach involves strong relationships and coordination with multiple City bureaus, state agencies, and other jurisdictions and organizations. This BMP category includes City initiatives, such as policies that promote the implementation of green streets as alternatives or retrofits for UICs, as well as code and administrative rules pertaining to groundwater protection.

PM-1: Facilitate internal City coordination regulations to enhance groundwater protection.

2.6.1 PM-1: Key Accomplishments

Development Review Process and UICs

- Continued evaluation of the review and approval process for private UICs, identifying issues and process gaps and identifying strategies for a more streamlined and consistent registration process for both public and private UICs.

SWMM Revision

- Participated in quarterly meetings for System Planning and SWMM revisions, which provide policy and design requirements for stormwater management citywide, to provide input on new and retrofitted UICs on private and public property and in the public right-of-way. An update to the SWMM is expected in 2019.

Land Acquisition

- Acquired 3 acres of land in the Stephens Creek subwatershed, 40 acres in the Johnson Creek watershed, and 18 acres in the Columbia Slough watershed as part of the Grey to Green and Johnson Creek Willing Seller Programs. UICs are most commonly found in Johnson Creek and Columbia Slough eastside watersheds.

PM-2: Coordinate with external partners, including state agencies, other jurisdictions, and outside organizations.

2.6.2 PM-2: Key Accomplishments

Regional Coordination

- Participated in the Association of Clean Water Agencies Groundwater Committee, which consisted of discussing monitoring proposals and permit negotiations with other municipal permittees, tracking the issuance of individual and general municipal WPCF Permits and permit conditions, and promoting consistency in required Permit activities (e.g., adaptive management).
- During FY16-17, the City of Portland began a coordinated effort with multiple jurisdictions to undertake a permit-required evaluation of emerging pollutants. This evaluation is expected to be completed during FY17-18 and will be submitted to DEQ either under separate cover or as part of the UIC annual report.

2.7 Projected Main Activities for FY16-17

All stormwater management BMPs discussed in Sections 2.2 through 2.6 are intended to help prevent, minimize, and control pollutants in stormwater prior to discharge to a UIC. Unless otherwise noted as a one-time activity, implementation of these BMPs is expected to continue and be tracked in FY17-18. The following additional PM activity may also be added:

- Participate in the UIC rules revision process (which will include revision of OAR 340-044, UIC Rules, and OAR 340-040, Groundwater Quality Protection Rules) when initiated by DEQ.

Due to the large amount of development and redevelopment in the City of Portland, it is impossible for the City's UIC Program to forecast how many new UICs will be added or removed from the system 1 year in advance. Therefore, for UIC construction, the City has its own registration process to ensure that all new UIC installations meet the conditions of its current WPCF UIC Permit prior to construction. Also, for UIC closure, part of the City's decommissioning process is to inform DEQ directly (either by phone or email) prior to any actions in the field. Since June 30, 2017 (end of FY16-17 reporting), new UICs have either been approved for installation or were newly discovered in the field, and two UICs have been reported for decommissioning.

All newly constructed or identified UICs will continue to be evaluated for characteristics that may potentially create adverse impacts to groundwater. Resulting information will be incorporated into the Response process, as appropriate.

2.8 Additional Actions Taken to Manage the UIC System

Additional actions taken to manage the UIC system to ensure groundwater protection for this reporting year include the following:

- When work impacts a UIC that does not currently have pretreatment as part of the system, the UIC program continues to implement the policy of requiring the addition of a sedimentation manhole or other form of pretreatment to the UIC system.

2.9 UICMP Actions Not Completed

All actions identified in the UICMP have been completed for this reporting year.

2.10 Adaptive Management

Adaptive management measures will be evaluated annually and reported in Years 4 and 9.

3 System Monitoring

The System Monitoring program element involves ongoing UIC monitoring to demonstrate that UICs are operated to meet WPCF Permit requirements and protect groundwater as a drinking water resource. Stormwater discharge monitoring is conducted annually on a representative subset of UICs, as identified in the *Stormwater Discharge Monitoring Plan* (SDMP). This is referred to as "compliance monitoring" and is discussed in Section 3.1.

3.1 Compliance Monitoring

3.1.1 UIC Stormwater Discharge Monitoring Summary - Year 2 (2015 Permit)

The City's UIC monitoring program was implemented in accordance with the 2015 SDMP. The monitoring program under the City's 2015 Permit was designed to focus on UICs located in areas of shallow groundwater, defined as having less than 5 feet of separation distance between the UIC and estimated seasonal high groundwater. Fifteen UIC locations were sampled between July 1, 2016, and June 30, 2017, to implement the required compliance monitoring described in the SDMP. Stormwater discharge samples were analyzed for pollutants as defined in Table 1 of the 2015 Permit. Specific information concerning site details, monitoring results, and QA/QC can be found in Appendix C.

Year 2 (2015 Permit) Results

- All six pollutants were detected in Year 2 (2015 Permit). Specific constituent concentrations are provided in Appendix C.

Action Level Exceedances and Response Actions

- No pollutants were detected in Year 2 (2015 Permit) at concentrations above their respective action levels and, thus, no response actions were required.

3.1.2 Key Accomplishments

- Implemented Year 2 (2015 Permit) stormwater compliance monitoring. Fifteen UICs were sampled and tested for pollutants as defined by the Permit.
- Compiled and evaluated Year 2 (2015 Permit) stormwater data; there were no exceedances of the Permit's action levels.
- Prepared and submitted annual stormwater discharge monitoring results to DEQ with this report (Appendix C).

3.1.3 Projected Main Activities

- Implement Year 3 (2015 Permit) UIC compliance monitoring in accordance with the 2015 WPCF Permit and 2015 Permit SDMP.

- Document, analyze, and report results of Year 3 (2015 Permit) stormwater monitoring to DEQ by November 1, 2018 (per the 2015 WPCF Permit).

- Continue to work with DEQ to demonstrate through SDMP-required compliance monitoring that discharges to public UICs meet Permit action levels and are protective of groundwater quality (see Section 4).

4 Response

The Response program element uses data and information from System Management and System Monitoring activities (see Sections 2 and 3) to assess UIC compliance status. It also defines the process and criteria used to identify, evaluate, and prioritize actions necessary to protect groundwater and meet WPCF Permit requirements.

During the first permit term (2005-2015), the City completed numerous actions to ensure UICs were compliant with the state and federal UIC rules and protective of groundwater. Actions included required and voluntary annual monitoring, on-the-ground UIC retrofits, and decommissioning, as well as data evaluation and numerous modeling efforts to demonstrate groundwater protectiveness for various discharge scenarios. Detailed information about these activities can be found in the annual UICMP reports for 2005 through 2015.

Ongoing evaluation and annual response activities are discussed in this section.

4.1 Assessment Response

Data generated through the systemwide assessment and ongoing database updates and evaluations are used to identify whether spatial and physical characteristics of UICs could result in drainage that may pose a risk to groundwater. Assessment response then evaluates the appropriate actions to correct the condition and protect groundwater quality. Responses may include a variety of corrective actions, and they may apply to individual UICs or groups of UICs that have been identified as needing correction.

4.1.1 Key Accomplishments

- No UICs were identified that required a corrective action response.

4.1.2 Projected Main Activities

- Implement actions as needed and appropriate to respond to any Year 3 (2015 Permit) UICs identified as needing correction.

4.2 Monitoring Response

Response actions are intended to reduce elevated stormwater discharge concentrations at the ground surface to meet permit action levels. Meeting permit limits (i.e., action levels) at the “end of pipe” demonstrates compliance with state and federal requirements for the protection of “underground sources of drinking water” and “waters of the state.” Response actions are intended to be implemented in a timely manner and are considered interim in nature until a final compliance determination is made or a final corrective action is implemented.

4.2.1 Key Accomplishments

- No monitoring response actions were needed during FY16-17.

4.2.2 Projected Main Activities

- Implement actions, as needed and appropriate, in response to any Year 3 (2015 Permit) individual stormwater discharge monitoring action level exceedances, unusual conditions observed during UIC sampling, inspections, or citizen complaints.

4.3 Spill Response

Spills and illicit discharges are reported to the Spill Protection-Citizen Response (SPCR) team through the spill response hotline or by the Oregon Emergency Response System, or they are discovered by staff during site inspections. If a spill that could impact a UIC is discovered, the City will undertake a response as identified in the UICMP.

4.3.1 Key Accomplishments

- Continued to operate the BES Spill Response Hotline. Activities in FY16-17 included:
    - Received and responded to approximately 2,500 calls (citywide) regarding pollution complaints, spills, sanitary sewer overflows, and dye tests.

During FY16-17, one spill occurred that required ongoing response actions (see Section 2.3 of this report for details). The other eight spills were determined to have minimal to no impact. Systems were cleaned and inspected as appropriate. Appendix B contains a table of all spills during FY16-17 that were in close proximity to a UIC catchment.

4.3.2 Projected Main Activities

- Complete investigation at Space Age Fuel site. Continue coordination with DEQ Cleanup and UIC programs to identify any further actions and confirm permit compliance.
- Implement actions as needed and appropriate in response to any FY16-17 spills that may impact a UIC.

4.4 Groundwater Protectiveness Demonstration and Verification

During the first permit term (2005-2015), the City completed multiple groundwater protectiveness demonstrations (GWPDs). These GWPDs showed that operation of all City-owned UICs are protective of groundwater, including UICs with direct discharge and UICs that are within close proximity to a drinking water well. For the purpose of maintaining the validity of the demonstrations, the City evaluates monitoring data and depth-to-groundwater information annually to confirm that the basis of the protectiveness demonstrations have not changed and that groundwater continues to be protected.

4.4.1 GWPD Verification

The following data were evaluated to ensure that the City's GWPDs are still valid.

- **Verification of vertical separation distance:** U.S. Geological Survey depth-to-groundwater data were used in combination with existing construction information to

calculate the vertical separation distance between the bottom of the UIC and seasonal high groundwater. All vertical separation distances are reported and updated as part of the UIC database quarterly updates.

- **Verification of stormwater discharge monitoring results:** In general, pollutants detected in Year 2 (2015 Permit) monitoring are similar to detections, frequency, and concentration ranges identified during the first permit term. Common pollutants detected during the first permit term and during Year 2 (2015 Permit) are at low concentrations and below their respective action levels. Concentrations are generally low and within narrow ranges at individual UIC locations.

4.4.2 Key Accomplishments

- Evaluated all UICs for WPCF Permit compliance.
- Evaluated Year 2 (2015 Permit) monitoring information for compliance.

4.4.3 Projected Main Activities

- Continue identification and evaluation of UICs as new data become available.
- Perform compliance determinations on any new UICs.
- Review and update as appropriate the *Decision Making Framework for Groundwater Protectiveness Demonstrations* to reflect any identified changes.
- Apply the protocols in the *Decision Making Framework for Groundwater Protectiveness Demonstrations* to any new UICs as appropriate to determine if groundwater is protected or corrective action is required.

4.5 Other Non-Compliance or Violations

No instances of non-compliance or other unreported Permit violations were identified.

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Appendix A
UICs Added and Removed from Service During FY16-17

(Closure reports are provided on a separate CD)

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Appendix A: UIC Records Added to the UIC Registration Database

Unit ID	UIC #	Well #	Date Updated	DEQ Type Code	Well Depth and Diameter	Maximum Discharge Rate (gpm)	DEQ Waste Type	Ops Status	Install Date	Maintenance Period (years)	Location	Latitude	Longitude	Distance to Nearest Water Well (feet)	Distance to Nearest Wetland (feet)	Distance to Nearest Surface Water (feet)	Separation Distance to Groundwater (feet)	Size of Impervious Area (square feet)
R00511	10102	9884	6/30/2017	5D2	4' (Dia) x 30' (Deep)		1	UC		4	R00511 - 201 SE 146th Ave	45.52115088	-122.5133392	2099	8969	8968	83	37472
R00512	10102	9885	6/30/2017	5D2	0.67' (Dia) x 4' (Deep)	32.3	1	UC			R00512 - 11032 4514 NE 98th Ave	45.55592507	-122.5617728	2454	4484	2969	93	3049
ARC529	10102	9886	6/30/2017	5D2	4' (Dia) x 20' (Deep)	16.2	1	UC		4	ARC529 - NE 86th Ave and NE Eugene St	45.53792538	-122.574446	1535	1609	2335	148	43560
R00514	10102	9887	6/30/2017	5D2	0.67' (Dia) x 5' (Deep)	8.98	1	UC			R00514 - 7323 SE Grant St	45.50720848	-122.587324	4459	12312	1550	137	1742
ARL650	10102	9888	6/30/2017	5D2	4' (Dia) x 30' (Deep)	2.23	1	UC		4	ARL650 - NE Halsey NE 103rd Ave	45.53333186	-122.5568197	3210	5180	7136	150	37472
ARL657	10102	9889	6/30/2017	5D2	4' (Dia) x 30' (Deep)	2.23	1	UC		4	ARL657 - NE Halsey NE 106th Ave	45.53362277	-122.5535459	2725	5794	7878	132	37472
ARB755	10102	9893	6/30/2017	5D2	4' (Dia) x 19' (Deep)	2.23	1	AC		10	ARB755 - 13141 NE Failing	45.55070132	-122.5268728	1257	3424	3421	35	16425
R00520	10102	9894	6/30/2017	5D2	4' (Dia) x 30' (Deep)		1	UC			R00520 - 2036 SE83rd Ave	45.5077082	-122.5775749	2318	11594	3961	110	10890
R00521	10102	9895	6/30/2017	5D2	4' (Dia) x 30' (Deep)	579	1	UC			R00521 - 4203 SE Evergreen St	45.47330145	-122.619299	3621	3210	3275	85	10890
R00522	10102	9896	6/30/2017	5D2	4' (Dia) x 12' (Deep)		1	AC			R00522 - SE 3rd & Division	45.50884945	-122.662428	2103	3471	1030	14	
ARE849	10102	9897	6/30/2017	5D2	4' (Dia) x 20' (Deep)	16.2	1	UC		4	ARE849 - NE 86th and NE Eugene	45.53785529	-122.5744477	1557	1635	2347	148	37472
AQZ754	10102	9899	6/30/2017	5D2	Unknown (Dia) x Unknown (Deep)	2.23	1	AC		10	AQZ754 - NE 132nd PL and NE Shaver St	45.5522246	-122.5267644	1285	2909	2908	20	
R00525	10102	9900	6/30/2017	5G30	2' (Dia) x 2' (Deep)		5	UC			R00525 - NE 141st Drive and NE Failing St	45.55178664	-122.5192001	217	2047	1851	32	
ARD995	10102	9901	6/30/2017	5D2	Unknown (Dia) x Unknown (Deep)	2.23	1	AC		10	ARD995 - 10150 SE Market St	45.51154671	-122.559044	863	11130	8752		10341
R00526	10102	9902	6/30/2017	5D2	4' (Dia) x 30' (Deep)	89	1	UC			R00526 - 6010 SE Haig Street	45.49820367	-122.6007855	4097	8484	4209	102	5827
R00527	10102	9903	6/30/2017	5D2	4' (Dia) x 30' (Deep)	89	1	UC			R00527 - 6014 SE Franklin Street	45.49886983	-122.6007858	4073	8648	3989	104	5827
R00528	10102	9904	6/30/2017	5D2	4' (Dia) x 30' (Deep)		1	UC			R00528 - SE 148th & SE Stark	45.51920037	-122.511028	2792	9538	9511	69	37472
ARG716	10102	9907	6/30/2017	5D2	4' (Dia) x 30' (Deep)	950	1	UC		4	ARG716 - 3904 NE 131st Place	45.55055774	-122.5284425	888	3371	3371	29	18000
ARC665	10102	9909	6/30/2017	5D2	4' (Dia) x 21' (Deep)	2.23	1	AC		10	ARC665 - Ne 127th, North of Fremont st	45.54840239	-122.5320989	1121	4097	4104	63	3330
R00533	10102	9910	6/30/2017	5D2	0.667' (Dia) x 4' (Deep)	28.9	1	UC			R00533 - 12231 SE Kelly St	45.4991358	-122.5369907	1547	7060	7828	60	3100
ARL645	10102	9911	6/30/2017	5D2	4' (Dia) x 30' (Deep)	640	1	UC		4	ARL645 - NE 103rd & Clackamas St	45.53292169	-122.5568125	3069	5278	7198	150	12500
ARH656	10102	9912	6/30/2017	5D2	Unknown (Dia) x Unknown (Deep)		1	AC			ARH656 - N Willis & N Denver	45.58382313	-122.6871191	3027	2458	946		0
ARB599	10102	9913	6/30/2017	5D2	4' (Dia) x 19' (Deep)	2.23	1	AC		10	ARB599 - NE131stPl & NE Failing	45.55062184	-122.5284878	869	3345	3346	39	132885
R00536	10102	9914	6/30/2017	5D2	4' (Dia) x 5' (Deep)		1	UC		10	R00536 - 198 NW Park Ave	45.52385538	-122.6787962	2075	9704	2333	2	3000
R00537	10102	9915	6/30/2017	5D2	4' (Dia) x 5' (Deep)		1	UC			R00537 - 198 NW Park Ave	45.52385881	-122.6787727	2077	9702	2327	2	3000
R00538	10102	9916	6/30/2017	5G30	3' (Dia) x 3' (Deep)		5	AC			R00538 - 198 NW Park Ave	45.52410821	-122.6789634	2165	9805	2322	4	0
R00539	10102	9917	6/30/2017	5D2	4' (Dia) x 30' (Deep)	496	1	UC		4	R00539 - 1925 SE Taylor St	45.51553718	-122.6473149	3227	7243	5171	28	9585
ARE709	10102	9918	6/30/2017	5D2	Unknown (Dia) x Unknown (Deep)	2.23	1	AC		10	ARE709 - 3622 NE 131st Ave	45.54907145	-122.5274405	1389	3955	3955		16254
AQC159	10102	9919	6/30/2017	5D2	Unknown (Dia) x 14' (Deep)	2.23	1	AC		10	AQC159 - NE Pacific & NE99th	45.52945478	-122.5615934	1660	5461	6800	194	11754
AQK859	10102	9921	6/30/2017	5D2	Unknown (Dia) x 26' (Deep)		1	AC			AQK859 - 4906 WI/NE 6th	45.55701874	-122.6591227	8637	8775	8660	148	14823
APQ846	10102	9922	6/30/2017	5D2	Unknown (Dia) x Unknown (Deep)	2.23	1	AC		10	APQ846 - 2646 SE 111th Ave	45.50266625	-122.5492952	1466	7732	9678		11664
AQQ497	10102	9923	6/30/2017	5D2	Unknown (Dia) x 17' (Deep)		1	AC	1981		AQQ497 - SE Powell lot owned by PBOT	45.4973761	-122.6382802	2608	5245	3346	30	
AQU737	10102	9924	6/30/2017	5D2	Unknown (Dia) x 30' (Deep)	2.23	1	UC		4	AQU737 - 5636 NE Going St	45.55666681	-122.6050714	2394	5787	5829	134	37472
ARH560	10102	9925	6/30/2017	5D2	Unknown (Dia) x Unknown (Deep)	2.23	1	AC			ARH560 - SE 122nd & SE Ramona st	45.48013229	-122.5374141	1614	656	2032		

Appendix A: UIC Records Added to the UIC Registration Database

Unit ID	UIC #	Well #	Date Updated	DEQ Type Code	Well Depth and Diameter	Maximum Discharge Rate (gpm)	DEQ Waste Type	Ops Status	Install Date	Maintenance Period (years)	Location	Latitude	Longitude	Distance to Nearest Water Well (feet)	Distance to Nearest Wetland (feet)	Distance to Nearest Surface Water (feet)	Separation Distance to Groundwater (feet)	Size of Impervious Area (square feet)
ARJ106	10102	9926	6/30/2017	5D2	Unknown (Dia) x 17' (Deep)	2.23	1	AC		10	ARJ106 - 13440 NE Shaver St	45.55268174	-122.5245186	1139	2987	2661	17	4905
R00551	10102	9927	6/30/2017	5D2	4' (Dia) x 9' (Deep)	6.4	1	UC			R00551 - SE 92nd & SE Steele	45.48484231	-122.5697284	621	4507	4493	55	7900
R00552	10102	9928	6/30/2017	5D2	4' (Dia) x 30' (Deep)	159	1	UC			R00552 - 4700 NE 73rd Ave	45.55731982	-122.5878993	1542	4686	4523	86	2205
AQF030	10102	9929	6/30/2017	5D2	4' (Dia) x 19' (Deep)	2.23	1	AC		10	AQF030 - 6309 NE Columbia Blvd	45.56829036	-122.5975178	1427	1965	1226	30	52209
R00554	10102	9930	6/30/2017	5D2	4' (Dia) x 30' (Deep)	20	1	UC		4	R00554 - 6865 SE 52nd	45.47355232	-122.6096014	1488	3279	3197	93	1950
ARG050	10102	9934	6/30/2017	5D2	Unknown (Dia) x Unknown (Deep)	2.23	1	AC		4	ARG050 - 14215 NE Halsey	45.53362127	-122.5164181	318	5125	5128		10359
ARD360	10102	9935	6/30/2017	5D2	Unknown (Dia) x Unknown (Deep)	2.23	1	AC		10	ARD360 - 4222 NE Holman St	45.5686169	-122.6198141	1780	2139	2192		855
AQV594	10102	9937	6/30/2017	5D2	Unknown (Dia) x Unknown (Deep)	2.23	1	AC		10	AQV594 - N Greeley Going ramp	45.5554162	-122.6918377	7957	10546	1563		6102
AQV977	10102	9938	6/30/2017	5D2	Unknown (Dia) x Unknown (Deep)		1	AC			AQV977 - 10603 SE Long St	45.4880229	-122.5539774	2314	2457	4452		
AQV944	10102	9939	6/30/2017		Unknown (Dia) x Unknown (Deep)		5	AC			AQV944 - 8219 NE Glisan St	45.52806555	-122.5786093	4539	4824	4073		
AQF031	10102	9940	6/30/2017	5D2	Unknown (Dia) x Unknown (Deep)		1	AC			AQF031 - 6326-6510 NE Columbia Blvd	45.56810956	-122.5963868	1136	1784	1247		
AQV261	10102	9941	6/30/2017	5D2	Unknown (Dia) x Unknown (Deep)		1	AC			AQV261 - 10400 NE KNott St	45.54214768	-122.5554102	2144	4356	6937		
ARQ884	10102	9942	6/30/2017	5D2	4' (Dia) x 30' (Deep)	2.23	1	UC		4	ARQ884 - SE 105th north of SE Stark	45.51922663	-122.5556066	2077	9469	10246	116	37472
ARQ722	10102	9943	6/30/2017	5D2	4' (Dia) x 30' (Deep)	2.23	1	UC		4	ARQ722 - 1028 SE 147th Ave	45.51550874	-122.5119952	2843	9328	8751	55	37472
ARQ878	10102	9944	6/30/2017	5D2	4' (Dia) x 30' (Deep)	2.23	1	AC	2017	4	ARQ878 - 10503 E Burnside St	45.52275442	-122.5550838	1631	8416	9629	130	13862
ARQ663	10102	9945	6/30/2017	5D2	4' (Dia) x 30' (Deep)	2.23	1	UC	2017	4	ARQ663 - 4306 SE Martins	45.47842473	-122.6181594	3153	2042	2093	80	37472
ARQ740	10102	9946	6/30/2017	5D2	4' (Dia) x 30' (Deep)	2.23	1	UC		4	ARQ740 - 10339 NE Tillamook St	45.53769979	-122.5560976	3775	4517	6856	146	37472
ARQ896	10102	9947	6/30/2017	5D2	4' (Dia) x 30' (Deep)	2.23	1	UC		4	ARQ896 - 10224 NE Tillamook St	45.53770894	-122.5573506	3818	4220	6540	149	37472
ARQ897	10102	9948	6/30/2017	5D2	4' (Dia) x 30' (Deep)	2.23	1	UC		10	ARQ897 - SE Washington & 105th Ave	45.5183707	-122.5554222	1794	9769	10187	110	37472
ARQ784	10102	9949	6/30/2017	5D2	4' (Dia) x 30' (Deep)	2.23	1	UC		4	ARQ784 - 4735 NE 72nd Ave	45.55793588	-122.5890438	1196	4686	4399	86	37472
ARQ727	10102	9950	6/30/2017	5D2	4' (Dia) x 30' (Deep)	2.23	1	UC		4	ARQ727 - 5141 NE Jarrett St	45.56434191	-122.6095668	2710	2942	3025	78	37472
ARQ786	10102	9951	6/30/2017	5D2	4' (Dia) x 30' (Deep)		1	UC			ARQ786 - 1711 NE 126th Place	45.53522517	-122.5332225	1614	8114	8003	104	
ARQ881	10102	9952	6/30/2017	5D2	4' (Dia) x 15' (Deep)	2.23	1	UC		4	ARQ881 - 5200 N COLUMBIA	45.5946352	-122.7197239	1047	1528	1513	18	37472
ARN894	10102	9954	6/30/2017	5D2	Unknown (Dia) x 3' (Deep)		1	AC			ARN894 - 6918 NE Roselawn St	45.56060624	-122.5926684	720	3972	3680		

Notes:

AC = Active

UC = Under construction

Appendix A: UIC Records Removed from the UIC Registration Database

UNIT ID	UIC #	Well #	Date Updated	DEQ Type Code	Well Depth and Diameter	Maximum Discharge Rate (gpm)	DEQ Waste Type	Ops Status	Install Date	Maintenance Period (years)	Location	Latitude	Longitude	Distance to Nearest Water Well (feet)	Distance to Nearest Wetland (feet)	Distance to Nearest Surface Water (feet)	Separation Distance to Groundwater (feet)	Size of Impervious Area (square feet)
ADW010	10102	1180	6/30/2017	5D2	4' (Dia) x 10' (Deep)	2.23	1	AC	2012	10	ADW010 - 8120 NE MASON ST	45.5523964	-122.5790075	3349	3907	4227	146	67818
ADU502	10102	1207	6/30/2017	5D2	4' (Dia) x 20' (Deep)	2.23	1	AC	1998	10	ADU502 - 16604 SE MAIN ST	45.51334154	-122.4923103	2405	8430	6668	36	36142
ADH685	10102	4487	6/30/2017	5D2	6' (Dia) x 14' (Deep)	2.23	1	AC		10	ADH685 - 10306 SW RADCLIFFE RD	45.45055675	-122.6619021	2734	1359	19	37	344903
ADV230	10102	800	6/30/2017	5D2	4' (Dia) x 0' (Deep)	2.23	1	AC		10	ADV230 - 3498 SE 116TH AVE	45.49698398	-122.5436045	322	5792	7582	40	17126
ADW789	10102	5016	6/30/2017	5D2	4' (Dia) x 0' (Deep)	2.23	1	AC		10	ADW789 - 7200 SE 82ND AVE	45.47106851	-122.5791499	2802	2080	2130	20	24884
ADW792	10102	5018	6/30/2017	5D2	4' (Dia) x 0' (Deep)	2.23	1	AC		10	ADW792 - 6720 SE 82ND AVE	45.47409272	-122.5791651	3879	3134	3024	31	48254
ADH684	10102	4486	6/30/2017	5D2	6' (Dia) x 12' (Deep)	2.23	1	AC		10	ADH684 - 01611 SW RADCLIFFE RD	45.45051659	-122.6626353	2922	1261	11	45	397103
ADW781	10102	5014	6/30/2017	5D2	4' (Dia) x 0' (Deep)	2.23	1	AC		10	ADW781 - 6920 SE 82ND AVE	45.47234333	-122.5791634	3254	2520	2500	25	49305
ADW787	10102	5015	6/30/2017	5D2	4' (Dia) x 0' (Deep)	2.23	1	AC		10	ADW787 - 8200 SE FLAVEL ST	45.46874607	-122.5791429	1996	1328	1401	9	141204
ADW793	10102	5019	6/30/2017	5D2	4' (Dia) x 0' (Deep)	2.23	1	AC		10	ADW793 - 6535 SE 82ND AVE	45.47540278	-122.5791481	4348	3597	3438	35	1943
ADR220	10102	4218	6/30/2017	5D2	4' (Dia) x 30' (Deep)		1	PA			ADR220 - 8210 NE RUSSELL ST	45.54088504	-122.5786066					
ADW790	10102	5017	6/30/2017	5D2	4' (Dia) x 0' (Deep)	2.23	1	AC		10	ADW790 - 7300 SE 82ND AVE	45.4705399	-122.5791467	2616	1902	1988	18	15461
R00147	10102	9520	6/30/2017	5D2	4' (Dia) x 0' (Deep)	2.23	1	UC			R00147 - 3316 SE 131st Ave	45.49800679	-122.5283831	855	6388	5755	46	858
APJ327	10102	9098	6/30/2017	5D2	4' (Dia) x 6' (Deep)		1	AC			APJ327 - 4700 SE 88TH AVE	45.48508171	-122.569716	537	4590	4559	62	37472
APN236	10102	9534	6/30/2017	5D2	0.67' (Dia) x 6' (Deep)	2.23	1	AC	2011		APN236 - 6324 NE SUMNER ST	45.55957008	-122.5974638	1042	4612	4330	123	25518
ADW286	10102	5590	6/30/2017	5D2	4' (Dia) x 30' (Deep)	2.23	1	AC	1994	10	ADW286 - 3039 SE TOLMAN ST	45.47599249	-122.6316292	3443	1061	943	-2	37472

Notes:

AC = Active

UC = Under construction

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Appendix B
Spills That Have Occurred Within Areas Serviced by UICs

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Appendix B: Spills That Have Occurred within Areas Serviced by UICs

Date	Release Type	Volume	Spill Location	Did Fluids Reach City-owned UIC? (Y/N)	Closest City-owned UIC Catchbasin
7/18/2016	Foam - Fire Retardant	Unknown	4449 N Trenton	N	ADN460
7/21/2016	Debris	Unknown	11941 NE Fargo St	N	AAZ610 ADQ533
7/28/2016	Oil	Unknown	2545 SE 89th Ave	N	ADU748
8/10/2016	Oil	Unknown	10835 SE Powell Blvd	N	AMZ489
8/18/2016	Auto Fluids	Unknown	12945 NE Broadway St	N	ADV586
8/29/2016	Paint	Unknown	N Calhoun Ave and N Hudson St	N	AAF108 ADN360
9/2/2016	Oil	< 1 cup	868 NE 68th Street	N	ADR523
9/12/2016	Paint	Unknown	SE 92nd between Yamhill St & Morrison St	N	ABS235 ADS935
9/13/2016	Paint or Cement	Several 5 gal buckets	2701 NE 52nd Avenue @ NE Alameda	N	ADN504
9/30/2016	Oil	Unknown	8705 SE Pardee St	N	ADU634
10/4/2016	Kitchen hood Washwater	Unknown	7317 NE Sandy Blvd	N	ADQ943
10/11/2016	Wood chips	Piles	6704 SE 50th Ave	N	ARB139
10/19/2016	Oil	Unknown	4409 SE 64th Ave	N	ADT269
11/9/2016	Wash Water	Unknown	5225 N Minnesota Ave	N	ADT590

Date	Release Type	Volume	Spill Location	Did Fluids Reach City-owned UIC? (Y/N)	Closest City-owned UIC Catchbasin
11/11/2016	Sewage	Unknown	10849 SE Boise St	N	AMS265
11/15/2016	Watery Liquid from PVC Pipe	Unknown	8228 SE Division St	N	ADU183
11/16/2016	Liquid (from campers)	Unknown	SE 91st Ave & SE Duke St & Foster Rd	N	ACP583 ADV099
11/25/2016	Unknown	Unknown	NE 25th & NE Prescott	N	ADQ650 ADQ116 ADQ151
1/6/2017	Gasoline	Unknown	7701 SE Martins	N	ADV013
1/6/2017	Wash Water	Unknown	12000 NE Morris St	N	ADQ541
1/20/2017	Oil	Unknown	4711 NE 31st Ave	N	ADQ114
1/24/2017	Auto Fluids	Unknown, if any	7225 N Atlantic Ave	N	ADP168
1/29/2017	Auto Fluids	Unknown	SE Ash St & SE 122nd Ave	N	ADV795
2/16/2017	Soil, gravel, oil	Unknown	N Ainsworth St & N Haight Ave	N	ADP645
2/20/2017	Auto Fluids	4'x6' patch in street, diluted	SE 140th Ave & 141st Ave	N	ADS667
2/22/2017	Private Parking Lot Sump Materials	Unknown	10525 SE Cherry Blossom Dr	N	ABS569 ADT002 APX949
2/23/2017	Oil	Unknown	N Columbia Ct	Y	AAD536 ADN308
2/24/2017	Auto Fluids	Unknown	547 NE Bryant St	N	ADP274

Appendix B: Spills That Have Occurred within Areas Serviced by UICs

Date	Release Type	Volume	Spill Location	Did Fluids Reach City-owned UIC? (Y/N)	Closest City-owned UIC Catchbasin
2/26/2017	Auto Fluids	Unknown	5536 SE Mall St	Y	ADT205
3/9/2017	Auto Fluids	Unknown	4624 SE 127th Ave	N	APQ508
3/10/2017	Turbid Hydrant Water	Unknown	310 N Ainsworth St	Y	AAM872 ADP644
3/10/2017	Oil	Unknown	6710 N Curtis Ave	N	ADP162
3/11/2017	Oil	Unknown	5915 NE 15th Ave	N	ADP739
3/13/2017	Auto Fluids	Unknown	7020 N Missouri Ave	N	ADP256
3/14/2017	Oil	Unknown	NE 48th Ave between Alberta St and Sumner St	N	ADQ221
3/14/2017	Sewage	Unknown	5120 NE 102nd Ave	N	AAS386 ADQ406
3/15/2017	Oil	Unknown	SE 174th Ave between Stark St and Division St	N	AMW871 ADP062 ADP060
3/22/2017	Gasoline	Between 50 and 200 gallons	11214 SE Powell Boulevard	Y	ADV235
4/4/2017	Concrete Slurry	Unknown	8992 N Fortune Ave	N	ADN386
4/13/2017	Turbid Water	Unknown	10717 SE Division St	Y	ADS227
4/14/2017	Paint Wash Water	Unknown	1606 N Alberta St	N	AMP163
4/18/2017	Sewage	Unknown	8301 NE 72nd Ave	N	AMU190

Appendix B: Spills That Have Occurred within Areas Serviced by UICs

Date	Release Type	Volume	Spill Location	Did Fluids Reach City-owned UIC? (Y/N)	Closest City-owned UIC Catchbasin
4/18/2017	Automotive Fluids	Unknown	6718 SE Rhone St	N	ADT221
4/24/2017	Kitchen Hood Washwater	Unknown	8237 N Denver Ave	Y	AMQ469
5/19/2017	Sewage	Unknown	12800 SE Sherman St	Y	ADW545
5/23/2017	Sewage	Unknown	SE Sherrett St btwn 8th Ave & 9th Ave	N	ADU028
5/30/2017	Construction Debris	Unknown	5418 NE 17th Ave	N	ADQ075
5/30/2017	Sewage	Unknown	10300 NE Wasco St	N	ADR672
5/31/2017	Sewage	Unknown	SE 79th and Powell Blvd	Y	ARE388
6/6/2017	Oil	Unknown	8714 N Washburne Ave	N	ADN602
6/7/2017	Sewage	Unknown	4528 NE 95th Ave	N	ARM228
6/9/2017	Water	Unknown	1473 NE Prescott Street	Y	AAQ987 ADQ036
6/12/2017	Sediment	Unknown	7318 N Vincent Ave	N	ADP140
6/12/2017	RV fluids	Unknown	9330 SE Harold St	N	ADV078
6/20/2017	Auto Fluids	Unknown	6767 N Columbia Boulevard	Y	ANB159 ANB155

Appendix C
Year 2 (2015 Permit)
Stormwater Discharge Monitoring Data, Shallow Groundwater UICs

(Laboratory reports and Excel database are provided on a separate CD)

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Appendix C

Year 2 (2015 Permit), Stormwater Discharge Monitoring Data
Shallow Groundwater UICs

This report presents the stormwater discharge monitoring data collected in Year 2 (July 1, 2016, to June 30, 2017) of the City of Portland's (City's) 2015 Water Pollution Control Facilities (WPCF) Permit No. 102830 for Class V Stormwater Underground Injection Control Systems (UICs). Year 2 (2015 Permit) sampling was performed in accordance with the City's 2015 Stormwater Discharge Monitoring Plan (SDMP). This report is divided into the following sections detailing the locations sampled and the final results from the laboratory analysis:

1. Introduction
2. Sampling design
    - Year 2 Monitoring Locations
    - Chemical Analysis
3. Results, Exceedances, and Response Actions
4. Analytical Data Validation

As required in Schedule B.5 of the 2015 Permit, a spreadsheet of all data provided in the analytical laboratory reports is included in Table 1 (attached, along with a CD containing laboratory datasheets and a Microsoft Excel database).

Introduction

The City has prepared this report to be included as part of the UIC Management Plan (UICMP) annual report in compliance with Schedule B.5 its 2015 Permit. The Oregon Department of Environmental Quality (DEQ) renewed the City's WPCF Permit Number 102830 in June 2015, which approved the City's required March 24, 2015, SDMP. The SDMP describes the stormwater monitoring strategy that the City will use throughout its second WPCF Permit term (June 2015 to May 2025) to evaluate stormwater discharges from public rights-of-way to City-owned UICs in areas of shallow groundwater.[1] Monitoring is conducted to demonstrate that the City's UIC Program protects beneficial uses of groundwater, meets WPCF Permit requirements, and satisfies requirements of the federal Safe Drinking Water Act and state UIC and groundwater protection regulations (OAR Division 340, Chapters 44 and 40, respectively).

Sampling Design

To comply with the monitoring requirements of the 2015 Permit, the City implemented a program to sample stormwater entering the City's UIC system from a subset of UICs located in areas of shallow groundwater and compared stormwater data to permit Action Levels.

[1] Areas of shallow groundwater refer to locations where UICs have less than 5 feet of vertical separation distance between the bottom of the UIC and the seasonal high groundwater level. Seasonal high groundwater is discussed in Snyder's U.S. Geological Survey Report, *Estimated Depth to Ground Water and Configuration of the Water Table in the Portland, Oregon, Area* 2008-5059 (2008), http://pubs.usgs.gov/sir/2008/5059/.

Approximately 120 UICs are located in areas of shallow groundwater. During the 2015 Permit time period, a sample of 75 UICs will be selected from the list of UICs located in shallow groundwater. The 75 UICs are divided into five panels of 15 UICs each. Over the course of the 10-year permit, each panel will be sampled twice to achieve monitoring objectives in the SDMP. With a sample size of 75, approximately 62% of the UICs located in shallow groundwater will be sampled at the end of the 10-year period. A finite population correction[2] will reduce the width of confidence intervals associated with this design by almost 50% in comparison to a sample size of 75 UICs selected from a population of 10,000. This design therefore has the equivalent power of a much larger sample from the entire UIC population.

A Generalized Random Tesselation Stratified (GRTS) survey design[3] will be used to select the 75 UICs in areas of shallow groundwater. A GRTS design will result in a random sample that is spatially balanced (i.e., a sample with a spatial distribution that is similar to the spatial distribution of the population).

The GRTS design also helps simplify the implementation of a sample design if some UICs are unsuitable for sampling. A GRTS sample draw is an ordered list of locations that can be evaluated for sampling sequentially. The first 75 UICs on the list that are suitable for sampling are used, with sequential blocks of 15 UICs making up each of the five panels. To help in choosing 75 UICs to sample, the entire population of UICs located in shallow groundwater areas was placed into random order using the R package spsurvey.[4]

Year 2 Monitoring Locations

Year 2 (2015 Permit) monitoring locations are 15 shallow groundwater sites selected in accordance with the SDMP (Table 2, Figure 1, and Figure 2, attached). On November 14, 2016, the City submitted a letter to DEQ that listed the 15 sites to be sampled. This letter explains why, based on pre-sampling field inspections, seven sites (SG-028, SG-030, SG-034, SG-037, SG-041, SG-042, and SG043) were removed and replaced in accordance with 2015 Sampling and Analysis Plan (SAP) procedures. See Table 2 and Figure 2 for site-specific information.

Chemical Analysis

As identified in Table 1 of the 2015 Permit, six pollutants are required to be sampled and analyzed for each monitoring location (Benzo[a]pyrene, Pentachlorophenol, Di(2-ethylhexyl)phthalate, Total Lead, Total Zinc, and Total Copper). The list of pollutants and

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[2] When sampling more than approximately 5% of a finite population, a finite population correction is applied to the standard error of parameter estimates (e.g., annual trends, means, or population percentiles). This correction can significantly increase the precision of parameter estimates when a large proportion of the population is sampled (http://en.wikipedia.org/wiki/Standard_error#Correction_for_finite_population).

[3] Stevens, D.L., Jr., and A.R. Olsen. 2004. "Spatially-balanced sampling of natural resources." *Journal of the American Statistical Association*. 99: 262-278. In collaboration with EPA, the City utilized the GRTS design to select its UIC stormwater monitoring program locations sampled for 2005 Permit compliance.

[4] Kincaid, T. M. and A.R. Olsen. 2013. *spsurvey: Spatial Survey Design and Analysis*. R package version 2.6. (http://www.epa.gov/nheerl/arm/).

sampling and analytical methods can be found in the SDMP. Monitoring results are summarized below.

Results, Exceedances, and Response Actions

The analytical results from the 15 shallow groundwater monitoring locations are attached in Table 1. All laboratory data sheets are included on the CD included with the report. Review of the data indicated no Permit Table 1 Action Levels were exceeded, thus no response actions were required. Collected data were also consistent with UIC monitoring that was conducted in the first WPCF Permit term.

Analytical Data Validation

Analytical results were reviewed to ensure that the data quality objectives defined in the 2015 Quality Assurance Project Plan were achieved, and they were determined to be acceptable and usable. A data usability report is included as an attachment.

Attachments:

- Table 1 - Year 2 (2015 Permit) Monitoring Results
- Table 2 - Year 2 (2015 Permit) UIC Monitoring Location Information
- Figures 1 and 2 - Year 2 (2015 Permit) UIC Monitoring Locations
- Data Usability Report
- CD containing laboratory reports and Microsoft Excel database

Table 1: Year 2 (2015 Permit) Monitoring Results

				Analyte	Pentachlorophenol		DEHP		Benzo(a)pyrene		Copper		Lead		Zinc	
				MADL (ug/L)	10		300		2.0		1,300		500		50,000	
				Method	EPA 515.4		EPA 8270-SIM		EPA 8270-SIM		EPA 200.8		EPA 200.8		EPA 200.8	
Site Id	Location Description	Traffic	Node	Date												
SG-022	11246 SE Harold St	>1000	AMY402	10/13/16 11:50	=	0.057	=	1.3	=	0.012	=	5.12	=	2.23	=	16.8
SG-024	12830 SE Holgate	>1000	ADT454	11/23/16 10:26	=	0.647	=	2.2	=	0.011	=	4.77	=	1.23	=	30.2
SG-025	12010 SE Reedway St	<1000	ADV196	10/5/16 12:39	=	0.08	=	1.3	<	0.01	=	7.54	=	3.25	=	23.3
SG-025	Field Duplicate	<1000	ADV196	10/5/16 0:00	=	0.077	=	1.2	<	0.01	=	7.59	=	3.33	=	23.4
SG-026	5712 SE 103rd Ave	>1000	AMT874	10/13/16 11:27	=	0.099	=	1.1	<	0.01	=	4.74	=	2.41	=	23.2
SG-027	11501 SE Foster Rd	>1000	ADW303	11/14/16 10:54	=	1.4	=	8.2	=	0.023	=	14.3	=	8.94	=	50.9
SG-029	5500 SE 121st Ave	>1000	ADU735	10/13/16 12:07	=	0.197	=	1.6	<	0.01	=	4.78	=	2.37	=	26.3
SG-031	8111 NE Holman St	<1000	ADV384	10/13/16 9:22	=	0.148	=	0.65	<	0.01	=	3.41	=	0.953	=	22.7
SG-032	13658 SE Cora St	<1000	ADT474	10/13/16 13:15	=	0.058	=	1.8	=	0.014	=	3.52	=	0.633	=	11.8
SG-033	5423 SE 121st Ave	<1000	ADU734	10/5/16 12:01	=	0.098	=	0.86	<	0.01	=	4.56	=	1.11	=	13.7
SG-036	5544 SE 128th Ave	>1000	ADT689	10/13/16 12:49	=	0.43	=	0.85	=	0.018	=	4.54	=	0.942	=	19.1
SG-036	Field Duplicate	<1000	ADT689	10/13/16 0:00	=	0.415	=	0.81	=	0.019	=	4.68	=	0.98	=	19.8
SG-038	11134 SE Steels St	<1000	ADU731	10/5/16 13:07	=	0.117	=	0.57	<	0.01	=	8.48	=	0.738	=	14.8
SG-039	5918 SE 122nd Ave	>1000	ADV203	10/13/16 13:44	=	0.576	=	2.6	=	0.015	=	5.59	=	1.58	=	26.2
SG-040	12920 SE Holgate	>1000	ADT453	11/23/16 8:56	=	0.152	=	0.88	<	0.01	JB	1.93	=	0.499	=	11.8
SG-044	4406 SE 135th Ave	<1000	AMX686	10/13/16 10:19	=	0.119	<	0.5	<	0.01	=	3.07	=	0.62	=	6.88
SG-045	12532 SE Ellis St	<1000	ADT688	10/13/16 12:33	=	0.061	=	1.4	=	0.018	=	11.1	=	4.01	=	26.8

Notes:

All concentrations in micrograms/per liter (ug/l).

JB = Estimated due field blank contamination

Table 2: Year 2 (2015 Permit) UIC Monitoring Location Information

Location Code	Approximate Address[a]	Traffic Category[b]	Predominant Land Use[c]	BES UIC ID[d]	DEQ UIC Id	Latitude	Longitude	UIC Depth (feet)	Pretreatment System[e]	Vertical Separation Distance[f]	Distance to Nearest Well (ft)[g]	Within Two-year Time of Travel from public drinking water well?
SG-022[h]	11246 SE HAROLD ST	Collector	SFR	AQT769	10102-9792	45.482898	-122.547011	26	Sed MH	-4	898	NO
SG-024	12830 SE HOLGATE BLVD	Collector	SFR	ADT454	10102-6315	45.48972702	-122.5324173	20.6	Sed MH	0	1045	NO
SG-025	12010 SE REEDWAY ST	Residential	SFR	ADV196	10102-5269	45.48127365	-122.5393906	28'	Sed MH	-13	962	NO
SG-026	5712 SE 103RD AVE	Collector	SFR	AMT874	10102-117	45.48089981	-122.557251	21.2'	Bioswale, Sed MH	0	1457	NO
SG-027[h]	11501 SE FOSTER RD	Collector	IND	AQT809	10102-9812	45.476524	-122.544465	16.9'	Sed MH	-6	1247	NO
SG-029	5500 SE 121ST AVE	Collector	MFR	ADU735	10102-5914	45.48327636	-122.5389481	30'	Sed MH	-9	955	NO
SG-031	8111 NE HOLMAN ST	Residential	COM	ADV384	10102-3106	45.56826782	-122.5786972	14'	Sed MH	-10	2314	NO
SG-032	13658 SE CORA ST	Residential	SFR	ADT474	10102-6334	45.4914627	-122.5222931	19.7'	Sed MH	1	610	NO
SG-033	5423 SE 121ST AVE	Residential	MFR	ADU734	10102-5912	45.48351287	-122.5389404	30'	Sed MH	-8	981	NO
SG-036	5544 SE 128TH AVE	Collector	SFR	ADT689	10102-5294	45.48270797	-122.5321579	30'	Sed MH	-8	1781	NO
SG-038	11134 SE STEELE ST	Collector	SFR	ADU731	10102-5910	45.48452758	-122.5483704	30.1'	Sed MH	-2	1074	NO
SG-039	5918 SE 122ND AVE	Collector	MFR	ADV203	10102-5286	45.47868728	-122.537056	30'	Sed MH	-1	1096	NO
SG-040	12920 SE HOLGATE BLVD	Collector	SFR	ADT453	10102-6314	45.48973464	-122.5313339	19.6'	Sed MH	0	1112	NO
SG-044	4406 SE 135TH AVE	Residential	SFR	AMX686	10102-925	45.49053573	-122.5248871	25.4'	Sed MH	-9	1003	NO
SG-045	12532 SE ELLIS ST	Residential	SFR	ADT688	10102-5293	45.48248672	-122.5341415	30'	Sed MH	-8	2137	NO

Notes:

[a] Addresses should not be considered precise location information and are subject to change as City staff better describe the physical UIC locations relative to nearby properties. UIC street addresses are assigned relative to nearby properties for general locating purposes. Latitude and longitude should be relied upon for accurate locating of UICs.

[b] Traffic Category (Residential is = <1000; Collector is >1000 Trips per day).

[c] COM = commerical; POS = Parks and Open Space; SFR = Single Family Residential; MFR = Multifamily Residential; IND = Industrial

[d] BES UIC number is obtained from the BES Hansen database.

[e] Sed MH = Sedimentation manhole

[f] The estimated separation distance is defined as the approximate depth in feet from the bottom-most perforation in the UIC to the approximate seasonal-high groundwater level. The bottom-most perforation is defined as the bottom of the UIC – 2 feet. Two feet were added to all separation distance calculations to account for the standard depth of the sediment trap ring on standard City UIC design. This information is reported to DEQ by the City as “Depth to groundwater” (UIC Database Report) for inclusion in DEQ’s UIC database. Reported to nearest foot. Separation distances are based on December 2008 USGS depth to groundwater data (Snyder, D.T., 2008, Estimated depth to groundwater and configuration of the water table in the Portland, Oregon area: U.S. Geological Survey Scientific Investigations Report 2008-5095, 40p. Available at http://pubs.usgs.cov/sir/2008/5059).

[g] Horizontal distance to nearest groundwater drinking water well (e.g., muncipal, domestic, irrigation).

[h] Location was part of the Category 3 projects and UIC was updated to reflect work completed at the site.

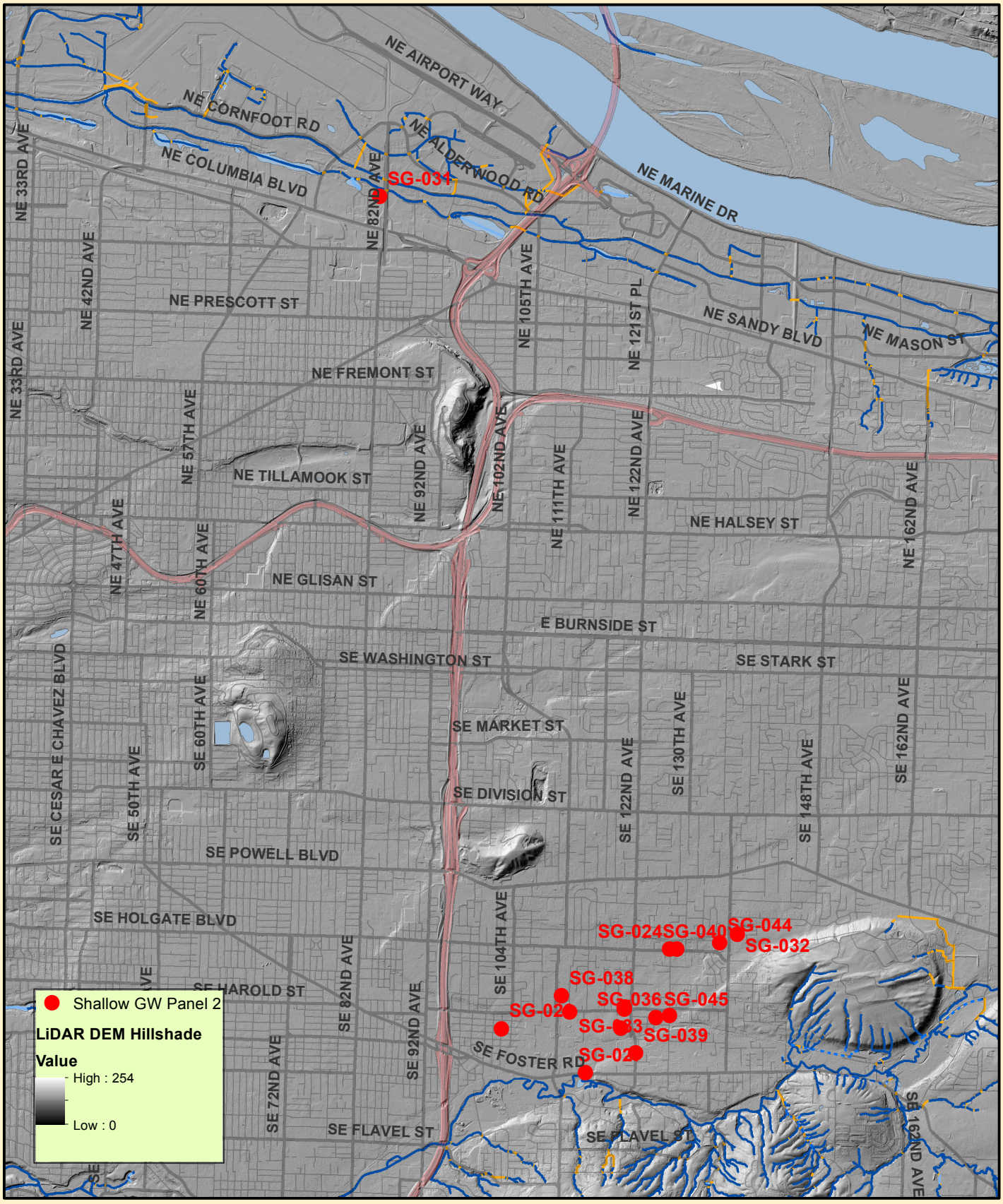

Figure 1
Year 2(2015 Permit) UIC Monitoring Locations

Investigations & Monitoring Services
Bureau of Environmental Services
City of Portland, Oregon

Source: ESRI Data & Maps CD
Created in ArcGIS 10.2 using ArcMap

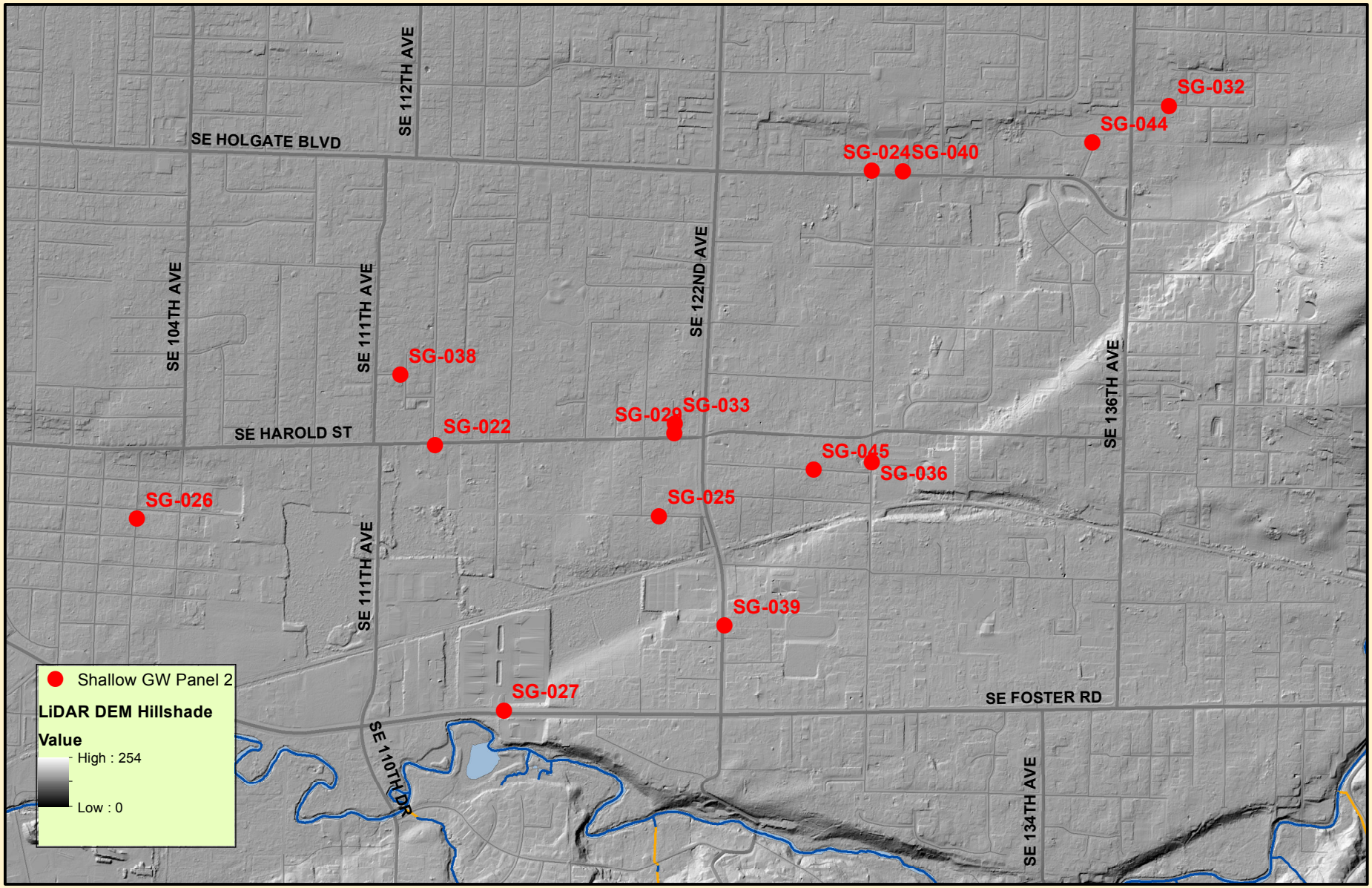

Figure 2
Year 2 (2015 Permit) UIC SE Monitoring Locations

Investigations & Monitoring Services
Bureau of Environmental Services
City of Portland, Oregon

Source: ESRI Data & Maps CD
Created in ArcGIS 10.2 using ArcMap

CITY OF PORTLAND BUREAU OF ENVIRONMENTAL SERVICES
UIC PROGRAM STORMWATER MONITORING
DATA USABILITY REPORT

YEAR 12 MONITORING
OCTOBER 2016 – NOVEMBER 2017

1.0 INTRODUCTION

Analytical results for stormwater samples collected during Permit Year 12 (PY 12) were reviewed to evaluate data usability and adherence to project data quality objectives (DQOs). All data were evaluated using the project *Quality Assurance Project Plan* (QAPP) and *U.S. EPA Contract Laboratory Program National Functional Guidelines* (NFGs) *for Data Review* (BES 2015, EPA 2014a, 2014b) for guidance in evaluating the following:

- Field practices, field quality control (QC) samples, daily activity logs, and sample collection logs;
- Sample COC and receipt documentation, preparation and analytical holding times, and reporting and detection limits for chemicals of interest; and
- Laboratory data quality, in terms of precision, accuracy, representativeness, completeness, and comparability (PARCC) as described in Section 2.5 of the QAPP.

2.0 SAMPLING SUMMARY

The City Bureau of Environmental Services (BES) Field Operations section performed sample collection and field parameter measurements for all compliance monitoring. Samples were collected from 15 locations during one "event" from October 5, 2016 through November 23, 2017. Sample locations and dates are summarized in Table 1 attached to this summary.

Samples were collected in general accordance with the *Sampling and Analyses Plan* (SAP) and QAPP, contained in the final UIC *Stormwater Discharge Monitoring Plan* (SDMP). The SDMP includes all stormwater monitoring conducted at City UICs for UIC permit compliance.

3.0 ANALYTICAL SUMMARY

WPCL performed analyses for all compliance samples collected for PY 12. Laboratory procedures were performed in general accordance with the QAPP except as noted below. The permit-required analytes measured during PY12 are listed below.

Analyte	Method	MRL (µg/L)	MADL (µg/L)	Lab
Pentachlorophenol	EPA 515.4	0.04	10	WPCL
Di(2-ethylhexyl)phthalate	EPA 8270-SIM	1.0	60	WPCL

Analyte	Method	MRL (µg/L)	MADL (µg/L)	Lab
Benzo(a)pyrene	EPA 8270-SIM	0.01	2.0	WPCL
Total Copper	EPA 200.8	0.2	1,300	WPCL
Total Lead	EPA 200.8	0.1	500	WPCL
Total Zinc	EPA 200.8	0.5	5,000	WPCL

MRL = method reporting limit
MADL = maximum allowable discharge limit

4.0 QAPP COMPLIANCE AND DATA USABILITY

BES Investigation & Monitoring Services (IMS) conducted an independent data usability assessment to ensure the data are usable. Findings are summarized below.

4.1 Field Practices

Daily Activity Logs

Daily activity logs consist of daily field reports (DFRs) and field data sheets (FDSs) which are included in this report as Attachments 1 and 2, respectively. DFRs and FDSs are used to record general and sample-specific information regarding site conditions, time of sample collection, visual stormwater observations, sample collection difficulties, deviations from the SDMP, and any information relating to potential pollutant sources. These logs were reviewed by both the Field Operations team leader and by IMS for completeness and consistency. No significant issues were identified during review of field documents.

Field measurements including temperature, conductivity, and pH are recorded on WPCL COCs so that field data can be entered into the LIMS by the WPCL sample custodian. COCs are included with the analytical laboratory reports in Appendix E of the PY12 Annual Report.

Field and Lab QC Samples

One equipment blank per year and one field decontamination blank per event were collected and analyzed for the same parameters as stormwater samples. Field duplicate samples are collected at a frequency of one duplicate for every 10 locations sampled. Extra sample volume is also collected by field teams at selected locations to provide enough volume to perform matrix QC analyses. Typically, a laboratory will choose samples at random for MS/MSD analyses; however, for this project there is an interest in evaluating potential matrix effects specific to stormwater discharged to publicly-owned UICs. Results of field and laboratory QC samples are discussed in respective sections below.

No issues were encountered that required resampling.

4.2 Data Usability Assessment

General

Discrete samples were collected at 15 sample locations, in addition to two field duplicates, one field decontamination blank, and one equipment blank. Samples were delivered to WPCL on the same business day that they were collected. Laboratory sample receipt forms indicate that all sample containers arrived intact, and all container labels matched the COC documentation.

Some data were flagged as estimated using various flags to illustrate specific laboratory QC failures. Following review of laboratory reports, case narratives, and field QC data by IMS, some of these flags were carried through as appropriate, and replaced with qualifiers presented below. Additional qualifiers were added, where necessary. Qualified data are still considered valid and usable (though should be used with caution), except for results that may have been qualified with an "R" (rejected). Qualifiers used for PY 12 Event reporting are listed below:

J	Estimated concentration
JB	Estimated due to blank contamination
U	Not detected above MDL

Note that laboratory PARCC review for this report is generally limited to permit-required analytes and analyses necessary for reporting. For example, laboratory QC is reviewed for all samples analyzed by EPA Method 8270-SIM; however, RPDs for field duplicates are only calculated for UIC permit-required analytes. Additional review is conducted where laboratory QC issues indicate more pervasive issues that may impact data quality for analytes not required for permit compliance monitoring.

Method Detection Limits

All method reporting limit (MRL) and detection limit (MDL) targets for permit-required analytes were met as specified in the QAPP (BES 2015).

MRLs were increased for selected analytes on individual samples where dilution was required in order to quantify analytes detected that were outside initial instrument calibration. Several samples required dilutions due to matrix interference for individual analytes. MRLs and MDLs did not exceed MADLs for any "non-detect" sample analytical results.

Matrix Spikes

Extra sample volume is collected by field crews at one out of every ten sample locations so that matrix QC can be performed on matrices specific to this monitoring effort. Where the laboratory does not have sufficient volume, an LCS duplicate sample is analyzed in accordance with the respective methods.

4.2.1 Holding Times

Maximum allowable holding times, measured from the time of sample collection to the time of preparation or analysis, were met for each project sample collected for PY12 permit compliance.

4.2.2 Blanks

In accordance with EPA guidelines, positive sample results should be reported unless the concentration of the compound in the project sample is less than or equal to 10 times (10x) the amount in any blank for metals and the common organic laboratory contaminants (methylene chloride, acetone, 2-butanone, cyclohexane, and phthalate esters), or 5 times (5x) the amount for other target compounds. Target compounds were not detected in associated blank samples (trip, equipment, method) prepared and analyzed concurrently with the project samples, except for the following:

Analysis	Sample	Analyte	Concentration (µg/L)	Samples Affected, Comments
200.8	FDBLANK	Copper Zinc	0.263 0.656	SG-040 copper results qualified with JB, all other sample results > 10x FDBLANK result

4.2.3 System Monitoring Compounds

System monitoring/surrogate compounds are added to each sample prior to analysis of organic parameters by EPA methods 8270-SIM and 515.4 to confirm the efficiency of the sample preparation procedure. The calculated recovery for each surrogate compound was evaluated to confirm the accuracy of the reported results. All surrogate recoveries were within the acceptance limits specified in the QAPP.

4.2.4 Laboratory Control Samples

For Laboratory Control Samples (LCSs), samples of deionized water are analyzed following the addition of a known amount of analyte in order to confirm the ability of the analytical instrument to accurately quantify target compounds. LCSs were analyzed at the appropriate QAPP-specified frequency. Additionally, all LCS recoveries were within the acceptance limits for accuracy specified in the QAPP.

4.2.5 Matrix Spike/Matrix Spike Duplicates

For Matrix Spikes (MS)/Matrix Spike Duplicates (MSD), stormwater samples are analyzed following the addition of a known amount of analyte in order to evaluate any matrix effects that interfere with the ability of the analytical instrument to accurately quantify target compounds. Typically, results are not qualified based on MS/MSD results alone unless recoveries are well outside control limits. MS/MSDs were analyzed at the appropriate QAPP-specified frequency. Additionally, all MS recoveries and MS/MSD relative percent differences (RPDs) were within the acceptance limits for accuracy specified in the QAPP except as noted below:

Analysis	Batch	Samples Affected	Comments
8270-SIM	B16J244	none	Pentachlorophenol MS/MSD results (229%/239%) above laboratory acceptance limit. Pentachlorophenol QC included in this report though no sample results were reported by 8270-SIM as pentachlorophenol is reported by method 515.4.
515.4	B16K275	none	Acifluorfen (138%) recovery slightly high, analyte not detected, no action taken.
8270-SIM	B16J408	none	Numerous MS/MSD recoveries outside laboratory acceptance limits, source sample from different project, no action taken.
515.4	B16K115	none	Acifluorfen (304%) and Dinoseb (155%) recoveries slightly high, analytes not detected, no action taken.

4.2.6 Duplicates

Field and laboratory duplicate samples were analyzed at the appropriate frequency and all recoveries were within the range specified in the QAPP.

4.3 Data Usability Summary

Appropriate sample collection and analytical methods were used for all samples and analyses, ensuring good comparability with other data. Analytical accuracy and precision were determined to be generally acceptable, with noted exceptions. Qualifiers were assigned based on other analytical QC results that exceeded project data quality criteria.

All other data reported should be considered valid as reported, representative of the samples collected, and acceptable for further use.

5.0 REFERENCES

City of Portland Bureau of Environmental Services (BES). 2015. *Quality Assurance Project Plan* - Stormwater Underground Injection Control System Monitoring. Prepared for Oregon Department of Environmental Quality (ODEQ). August 2006, revised March 2015.

City of Portland Bureau of Environmental Services (BES). 2015. *Final Stormwater Discharge Monitoring Plan* – consists of *Sampling and Analysis Plan* and *Quality Assurance Project Plan*. Prepared for Oregon Department of Environmental Quality (ODEQ). August 2006, revised March 2015.

EPA 2002. Guidance on Environmental Data Verification and Data Validation. EPA-240-R-02-004 (EPA QA/G-8). Office of Environmental Information. November 2002.

EPA 2014a. USEPA National Functional Guidelines for Superfund Inorganic Methods Data Review. EPA-540-R-14-001 (OSWER 9335.0-131). Office of Superfund Remediation and Technology Innovation (OSTRI). August 2014.

EPA 2014b. USEPA Contract Laboratory Program National Functional Guidelines for Organic Superfund Data Review. EPA-540-R-14-002 (OSWER 9335.0-132). Office of Superfund Remediation and Technology Innovation (OSTRI). August 2014.

6.0 GENERAL

This summary report was prepared by the IMS sections of BES. For any questions concerning this report, contact Aaron Wieting at 503-823-5437.

Date of Final Report: July 24, 2017

Prepared by: Aaron B. Wieting, R.G., BES IMS

Reviewed by: Joel Bowker, R.G., BES UIC Program

TABLE 1: UIC Permit Year 12 Monitoring Locations

Location Code	Location Address	Traffic	Node
SG-022	11246 SE Harold St	>1000	AMY402
SG-024	12830 SE Holgate Blvd	>1000	ADT454
SG-025	12010 SE Reedway St	< 1000	ADV196
SG-026	5712 SE 103rd Ave	>1000	AMT874
SG-027	11501 SE Foster Rd	>1000	ADW303
SG-029	5500 SE 121st Ave	>1000	ADU735
SG-031	8111 NE Holman St	< 1000	ADV384
SG-032	13658 SE Cora St	< 1000	ADT474
SG-033	5423 SE 121st Ave	< 1000	ADU734
SG-036	5544 SE 128th Ave	>1000	ADT689
SG-038	11134 SE Steele St	< 1000	ADU731
SG-039	5918 SE 122nd Ave	>1000	ADV203
SG-040	12920 SE Holgate Blvd	>1000	ADT453
SG-044	4406 SE 135th Ave	< 1000	AMX686
SG-045	12532 SE Ellis St	< 1000	ADT688

TABLE 2: UIC Permit Year 12 Field Duplicate Precision

Constituent	Units	Precision	SG-025			SG-036		
		DQO	Primary	DUP	RPD	Primary	DUP	RPD
Benzo(a)pyrene	µg/L	50	< 0.01	< 0.01	**0.0**	0.018	0.019	**5.4**
DEHP	µg/L	50	1.3	1.2	**8.0**	0.85	0.81	**4.8**
Copper	µg/L	20	7.54	7.59	**0.7**	4.54	4.68	**3.0**
Lead	µg/L	20	3.25	3.33	**2.4**	0.942	0.98	**4.0**
Pentachlorophenol	µg/L	30	0.08	0.077	**3.8**	0.43	0.415	**3.6**
Zinc	µg/L	20	23.3	23.4	**0.4**	19.1	19.8	**3.6**
Notes:								
RPD = Relative Percent Difference								
DEHP = bis 2-ethylhexyl phthalate								