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

Stormwater Underground Injection Control

December 2006 – Version 2 (December 2012)

Prepared By:
City of Portland, Bureau of Environmental Services

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LIST OF ACRONYMS

BES	Bureau of Environmental Services
BMP	Best Management Practices
CAP	Corrective Action Plan
CAR	Corrective Action Request
CART	Corrective Action Review Team
CFR	Code of Federal Regulations
CIP	Capital Improvement Plan
CLV	Concentration Limit Variance
DEQ	Oregon Department of Environmental Quality
DQO	Data Quality Objective
EPA	Environmental Protection Agency
HASP	Health and Safety Plan
MADL	Maximum Allowable Discharge Limit
NFA	No Further Action
O&M	Operations and Maintenance
OAR	Oregon Administrative Rule
OSHA	Occupational Safety and Health Administration
PPS	Priority Pollutant Screen
QAPP	Quality Assurance Project Plan
SAP	Sampling and Analysis Plan
SAPS	Site Assessment Priority System
SARA	Superfund Amendment and Reauthorization Act
SDMP	Stormwater Discharge Monitoring Plan
SOP	Standard Operating Procedure
SPCR	Spill Protection-Citizen Response
SPPC	Spill Prevention and Pollution Control
SWDA	Safe Drinking Water Act
UIC	Underground Injection Control
UICER	UIC Evaluation and Response
UICMP	UIC Management Plan
USGS	U.S. Geological Survey
WPCF	Water Pollution Control Facility

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Section 1

1 Introduction and Organization

1.1 Overview

The City of Portland (City) has prepared this Underground Injection Control (UIC) Management Plan (UICMP) in compliance with the requirements of the Water Pollution Control Facility (WPCF) permit issued to the City by the Oregon Department of Environmental Quality (DEQ) in June 2005. This UICMP describes the overall UIC Program, and the activities the City will implement throughout the WPCF permit term (June 1, 2005 – May 31, 2015) to protect groundwater and meet WPCF permit requirements.

As used in this document, **UIC** means any Class V underground injection control system owned or operated by the City of Portland.

The City currently has approximately 9,000 UICs that collect stormwater from public rights-of-way and discharge it to the subsurface. UICs are most prevalent in the eastern portion of the City, where subsurface soils support greater stormwater drainage and infiltration rates. For many areas east of the Willamette River, UICs are the only form of stormwater disposal available. UICs are also an essential element of a comprehensive watershed strategy to use stormwater as a resource by infiltrating it back into the ground. UICs quickly and efficiently reintroduce stormwater into subsurface soils, which filter and cool the runoff before it finds its way to groundwater and eventually helps recharge streams. UICs are an essential element of street-side swales and "green street" (*i.e.*, vegetated stormwater management facilities) applications because they provide an infiltration point for overflow during large storm events when stormwater cannot be fully infiltrated through swales, planters, or other surface infiltration systems. UICs also preclude the need to install or increase the capacity of piped stormwater infrastructure that eventually discharges into local surface water bodies, including Johnson Creek, the Columbia Slough, and the Willamette River.

In the Portland area, groundwater serves as a backup drinking water supply to the Bull Run reservoirs. The WPCF permit establishes the UIC construction, operation, and maintenance requirements that the City must implement to protect groundwater for use as a drinking water resource. The WPCF permit calls for a comprehensive stormwater management strategy that will prevent, minimize, and control pollutants at the surface before they are discharged to the ground.

1.2 Purpose of the UIC Management Plan

The UICMP presents the comprehensive management strategy to meet the requirements of the WPCF permit. It is the umbrella document that describes the City's overall UIC Program, which comprises four major program elements: System Management, System Monitoring, Evaluation and Response, and Corrective Action.[1] It also identifies various other documents the City has prepared to address specific program activities and management practices that are part of the

[1] Section 2.0 describes the relationship of these four program elements and how they function together. Sections 3.0 through 6.0 describe each of the four elements in more detail.

UIC Program (see Section 1.5). The main body of the UICMP provides an overall description of the UIC Program and the program elements. This portion of the document also summarizes and references more detailed plans and guidance documents, which are the UIC Program "tools" for carrying out specific program tasks. These tools are included as Appendices to this UICMP. Organization of the UICMP in this modular fashion will allow the tools to be updated over time in a more efficient manner. Additional details regarding the purpose and use of the UICMP are provided in Section 2.3.

1.3 Regulatory Requirements

Congress enacted UIC rules in 1974 under the federal Safe Drinking Water Act (SDWA) and modified the rules in 1999. The U.S. Environmental Protection Agency (EPA) administers these rules under Title 40 of the Code of Federal Regulations (CFR) Parts 144 -148. In Oregon, EPA has delegated the regulation of UICs to DEQ. Oregon Administrative Rules (OAR) 340-044 regulate all groundwater as a potential source of drinking water and require municipalities with more than 50 UICs to operate under a permit. DEQ issued a WPCF permit to the City of Portland on June 1, 2005 (DEQ Permit Number 102830). The WPCF permit establishes the construction, operation and maintenance requirements the City must implement to protect groundwater as a drinking water resource.

Schedule D(1) of the WPCF permit requires the City to prepare a UICMP and submit it to DEQ for approval. After submittal to DEQ, the UICMP must undergo public review and comment before DEQ approval. Upon DEQ approval, the UICMP becomes an enforceable part of the WPCF permit.

The UICMP must identify and discuss the BMPs that will be employed to meet WPCF permit conditions. These may include structural, non-structural, and institutional controls. The WPCF permit indicates that the UICMP must also discuss the following:

- UIC Registration Database;
- Operations and Maintenance (O&M) Plan;
- Best Management Practices (BMP) Monitoring Program;
- Employee Training and Public Education;
- Spill Prevention and Pollution Control (SPPC) Plan; and
- Abandonment, Decommissioning, or Alteration of Public UIC Injection Systems Plan.

In addition, the UICMP must meet the requirements of OAR 340-044-0018(3)(b)(C). These requirements specify that municipalities with 50 or more UICs must prepare and implement a written stormwater management plan that includes a systemwide assessment, system controls, monitoring, and a plan for record keeping and reporting.

1.4 UICMP Organization

The UICMP is organized as follows:

Section 1.0: Introduction and Organization, provides the purpose of the UICMP and a brief description of the document. It also summarizes relevant regulatory background information and WPCF permit requirements, describes the UICMP's relationship to other documents required by the permit, UICMP reporting requirements, and when and how the UICMP may be modified.

Section 2.0: Program Description, describes the goals and objectives of the UIC Program, the four major program elements, the intent of each element, and how the elements function together to protect groundwater and meet WPCF permit requirements. Each of the four elements is then further described in Sections 3.0 through 6.0.

Section 3.0: System Management, provides detailed descriptions of citywide BMPs taken to prevent, minimize, and control pollutants in stormwater prior to discharge to UICs. It also briefly describes three documents related to System Management that are included as Appendices in this UICMP: The Operations and Maintenance (O&M) Plan, the Spill Prevention and Pollution Control (SPPC) Plan, and the Decommissioning Procedure.

Section 4.0: System Monitoring, summarizes the System Monitoring actions that demonstrate that UICs are operated in a manner that meets permit requirements and protects groundwater as a drinking water resource. It briefly describes the *Stormwater Discharge Monitoring Plan* [SDMP; City of Portland, 2006] and the BMP Monitoring Program, which is included in this UICMP as Appendix E.

Section 5.0: Evaluation and Response, provides a detailed description of the process and criteria that will be used to identify, evaluate, and prioritize actions necessary to protect groundwater and meet WPCF permit requirements.

Section 6.0: Corrective Action, summarizes the evaluation, selection, and implementation of actions to address UICs that do not meet WPCF permit requirements. It briefly describes the *Corrective Action Plan* (CAP; City of Portland, 2006), which has already been submitted to DEQ as a separate document, and is referenced in this UICMP as Appendix I.

Section 7.0: Bureau of Environmental Services (BES) Staff Roles and Responsibilities, identifies the key staff positions involved in the UIC Program and summarizes their responsibilities.

The **Appendices** to this UICMP contain the following documents:

Appendix A: BMPs for Overall System Management
Appendix B: Operations and Maintenance Plan
Appendix C: Spill Prevention and Pollution Control Plan
Appendix D: Decommissioning Procedure (Final) for UIC Systems
Appendix E: BMP Monitoring Program
Appendix F: Compliance Determination Procedure
Appendix G: Prioritization Procedure
Appendix H: Evaluation and Response Guidelines
Appendix I: Corrective Action Plan
Appendix J: Glossary

1.5 Relationship of UICMP to Other Documents

The WPCF permit requires the City to prepare a variety of documents that together describe the programmatic actions and management practices that it will implement to protect groundwater quality and meet WPCF permit requirements. Some of these documents have already been prepared and submitted to DEQ, and others are included in the Appendices of this UICMP. The UICMP integrates all of these documents by showing how they relate to each of the four major UIC Program elements. These relationships are shown in Table 1-1 and further described in Section 2.4.

Table 1-1: Relationship of UICMP to Other Documents

Document	Related UICMP Program Element	Submittal Information
Systemwide Assessment	System Management (Section 3.0 of UICMP)	Submitted 7/15/06, under separate cover.
UIC Registration Database	System Management (Section 3.0 of UICMP)	Submitted 9/1/05, under separate cover, and updated quarterly.
Operations and Maintenance Plan (O&M)	System Management (Section 3.0 of UICMP)	Submitted 12/1/06 with UICMP as Appendix B. Revised Appendix B in Version 2 (December 2012).
Spill Prevention and Pollution Control Plan (SPPC)	System Management (Section 3.0 of UICMP)	Submitted 12/1/06 with UICMP as Appendix C. Revised Appendix C in Version 2 (December 2012).
Stormwater Discharge Monitoring Plan (SDMP) - Sampling Design Plan - Quality Assurance Project Plan (QAPP) - Sample Analysis Plan (SAP)	System Monitoring (Section 4.0 of UICMP)	Submitted 7/15/05, under separate cover. Final document submitted 8/30/06[1]. Updated in Version 2 (December 2012)
Decommissioning Procedure (Final) for Underground Injection Control Systems	System Management (Section 3.0 of UICMP)	Submitted 11/1/05, under separate cover. Final document submitted 12/1/06 with UICMP as Appendix D. Revised Appendix D in Version 2 (December 2012).
BMP Monitoring Program	System Monitoring (Section 4.0 of UICMP)	Submitted 12/1/06 with UICMP as Appendix E.
Corrective Action: Category 1 Underground Injection Control Systems	Corrective Action (Section 6.0 of UICMP)	Submitted 7/15/05, under separate cover. Completed July 2006.
Corrective Action Plan (CAP)	Corrective Action (Section 6.0 of UICMP)	Submitted 7/15/06, under separate cover.

[1]The draft SAP (July 2005) and draft QAPP (July 2005) were made available for public review and comment by DEQ in accordance with OAR 340-045-0055. In addition, DEQ and EPA reviewed draft versions (Version 1) of the SAP and QAPP, submitted in February 2006. Both the SAP and QAPP were revised to address and integrate DEQ, EPA, and public comments. The final SAP was submitted to DEQ for review and approval in August 2006.

1.6 Program Reporting

The UICMP is a comprehensive plan that expresses the overall intent and breadth of the City's UIC Program. It includes processes, implementation tasks and, where possible, schedules. In many cases, however, it is difficult to determine implementation details years in advance because multiple variables are involved. For that reason, a greater level of detail will be included in the annual UICMP reports that the City submits to DEQ (by December 1 in 2006 and November 1 for each following year). Each annual UICMP report will provide information about activities that have been implemented in the previous fiscal year (July 1 to June 30) and identify activities planned for implementation in the coming fiscal year.

In addition to the annual UICMP reports, the City will fulfill reporting requirements specified in the WPCF permit by submitting the following documents to DEQ:

- Annual Stormwater Discharge Monitoring report (due July 15 of each year prior to 2012, due November 1st of each year thereafter);
- Interim compliance reporting:
  - Detection of Priority Pollutant Screen (PSS) pollutants;
  - Exceedance of Maximum Allowable Discharge Limits (MADLs; WPCF permit, Table 1); and
  - Exceedance of annual mean concentration for any MADL.
- UICMP update (due November 1, 2010);
- Corrective Action Plan update (due November 1, 2010).

1.7 UICMP Modification

In accordance with the WPCF permit, the annual UICMP reports must include a discussion of any proposed changes to the UICMP or its components. The City must re-evaluate and update the UICMP during the fifth year of the WPCF permit duration. The UICMP update must be submitted to DEQ for approval by November 1, 2010. If the update represents a major modification to the UICMP, the public will have the opportunity to review and comment on the revised UICMP prior to DEQ approval.

The re-evaluation must:

- Assess UICMP effectiveness;
- Include all minor UICMP modifications made and reported in previous annual UICMP reports; and
- Provide recommendations for mid-permit UICMP modification as necessary to protect groundwater quality during discharges from public UIC.

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Section

2

2 Program Description

2.1 Introduction

As noted previously, UICs are the only form of stormwater disposal available for many areas located east of the Willamette River. They serve as stormwater drainage infrastructure for many public rights-of-way.

UICs are also an essential element of a comprehensive watershed strategy to use stormwater as a resource by infiltrating it back into the ground. They reintroduce stormwater into subsurface soils quickly and efficiently, which acts to filter and cool the runoff before it reaches groundwater and eventually recharges streams. In this regard, UICs are an important tool in promoting overall watershed health.

The UIC Program also supports the overall BES mission to:

- Protect the quality of surface and groundwater and conduct activities that promote healthy ecosystems in City watersheds; and
- Provide sewage and stormwater collection and treatment services to accommodate current and future City needs.

This Section describes the overall goals of the City's UIC Program and the role of the UICMP in explaining how all program elements work together to ensure that goals established are achieved.

2.2 Program Goals

The five goals of the UIC Program are to:

- Ensure that UICs are constructed, operated, and maintained in a manner that meets WPCF permit requirements and protects groundwater for use as a drinking water resource.
- Use stormwater as a resource by facilitating long term operation of stormwater facilities that support the natural hydrogeologic cycle, provide baseflow for surface waters, and contribute to normative stream flow conditions by reducing storm flow to piped sewer systems.
- Emphasize management actions that prevent, minimize, and treat pollutants in stormwater before they can be discharged to a UIC.
- Collect and evaluate stormwater data that is representative of the overall UIC system to verify groundwater protection and WPCF permit compliance, and identify where system improvements are needed.
- Ensure that non-compliant UICs are identified, operated, modified, and/or decommissioned in a manner that brings them into compliance.

2.3 Using the UIC Management Plan

The UICMP presents the overall management strategy for the UIC Program. It is organized into two equally important pieces, the body of the UICMP and the Appendices. Taken together, the two pieces describe the actions the City will implement to meet permit requirements and protect groundwater quality.

The body of the UICMP is the "umbrella" document that describes the four major program elements:

- System Management;
- System Monitoring;
- Evaluation and Response; and
- Corrective Action.

It explains the scope and function of each program element, and describes how they work together. The level of detail presented in the UICMP varies from section to section, with some sections minimally describing specific technical documents that are included as UICMP Appendices.

The technical documents included in the UICMP Appendices are the "tools" used to implement the UIC Program. The body of the UICMP summarizes and references these tools, which are the detailed plans and guidance documents used to implement the program. These tools are presented in their entirety in the following Appendices:

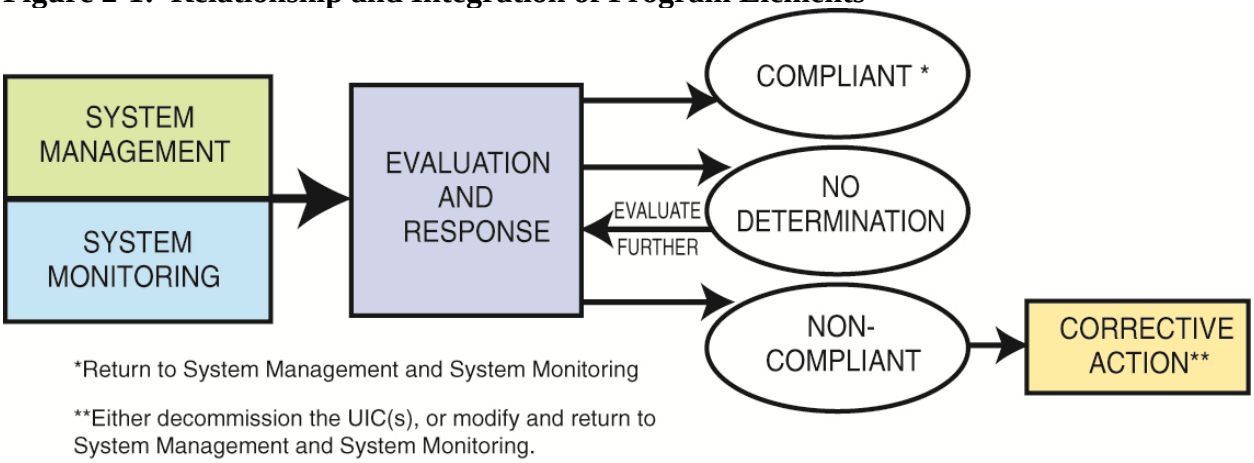
- Appendix A: Best Management Practices for Overall System Management;
- Appendix B: Operations & Management Plan;
- Appendix C: Spill Prevention and Pollution Control Plan;
- Appendix D: Decommissioning Procedure (Final) for UIC Systems;
- Appendix E: Best Management Practice Monitoring Program;
- Appendix F: Compliance Determination Procedure;
- Appendix G: Prioritization Procedure;
- Appendix H: Evaluation and Response Guidelines; and
- Appendix I: Corrective Action Plan.

Organization of the UICMP in this modular fashion will allow the technical tools to be updated over time in a more efficient manner.

2.4 Relationship between UICMP Program Elements

BES established the UIC Program as the administrative and technical support structure that enables it to continue to operate its UICs, implement WPCF permit requirements, and protect groundwater quality. The program goals listed in Section 2.2 will be achieved through implementation of the four program elements and related activities. The relationship and integration of these program elements is described in this Section and shown in Figure 2-1. A diagram of the four program elements and the components of each is presented in Table 2-2.

Figure 2-1: Relationship and Integration of Program Elements



The System Management program element consists of BMPs that serve to prevent, minimize, and control pollutants prior to their discharge to a UIC. BMPs are applied to the entire UIC system on an ongoing basis. These BMPs specify practices to be used in the UIC registration and assessment process. They implement systemwide actions including O&M, spill prevention and response, and education and training. They also provide the provide the background necessary for developing policies, processes, or administrative rules to manage stormwater in a manner that meets WPCF permit requirements, protects groundwater quality, and supports bureau and watershed health goals.

The System Monitoring program element consists of ongoing monitoring activities that are conducted to demonstrate that UICs are operated in a manner that meets WPCF permit requirements and protects groundwater. System Monitoring includes two program monitoring areas that address different needs of the UIC Program:

- Stormwater discharge monitoring; and
- BMP monitoring.

Collectively, the System Management and System Monitoring program elements provide the following:

- Systemwide actions that meet permit requirements and protect groundwater; and
- Provide data necessary to identify UICs that may require additional evaluation or action to ensure they meet permit requirements.

The Evaluation and Response program element uses data and information generated in System Management and System Monitoring to classify individual UICs or groups of UICs as compliant, non-compliant, or no-determination. The Evaluation and Response program element consists of a variety of related strategies, procedures, criteria, and guidelines developed to evaluate UICs that may not meet WPCF permit requirements, to identify and address data gaps necessary to make sound technical compliance determinations, and to prioritize identified actions to fully evaluate UIC compliance status. The Evaluation and Response program element is designed to use available data and other information in a "weight-of-evidence"-type approach to determine compliance and to assess potential impacts to groundwater. The process employs adaptive management and uses UIC Evaluation and Response (UICER) guidelines to describe the steps

that may be appropriate to fully evaluate or address the specific issues identified. At key points in the process, a decision will be made as to whether the assessment should continue within Evaluation and Response, or move to another program element.

As shown in Figure 2-1, if, a UIC is determined to be compliant (*i.e.*, meets WPCF permit requirements and protects groundwater) through the Evaluation and Response process, , then operations, maintenance, and monitoring of the UIC will continue to be addressed through the System Management and System Monitoring program elements. If a UIC is determined to be non-compliant, then it moves to the Corrective Action program element. The Corrective Action program element includes processes to evaluate, rank, select, and implement appropriate corrective action(s). A variety of corrective actions are available, ranging from options that do not involve construction (*e.g.*, institutional controls such as a technical assessment to demonstrate protection of groundwater), to structural/engineering controls, and UIC closure. After a corrective action has been implemented, UICs that continue to operate will be managed in accordance with the System Management and System Monitoring program elements to ensure continued compliance.

UICs that require further evaluation to determine compliance status (*e.g.* "no determination") will continue to be evaluated using the UICER guidelines within the Evaluation and Response program element until a determination can be made.

Table 2-2: Summary of UICMP Program Elements

System Management	System Monitoring	Evaluation and Response	Corrective Actions
Actions to prevent, minimize, and control pollutants prior to discharge System Inventory and Assessment • UIC Registration Database and updates • Systemwide Assessment and follow-up Pollution Control • Spills and leaks per SPPC Plan, illegal disposal, improper site management • Erosion and pollutants from active construction sites Education and Training • Public education • Employee training Operations and Maintenance • Public rights-of-way • Other City facilities/ infrastructure per Operations & Maintenance Plan Policy and Regulation	*Actions that demonstrate public UICs are operated in a manner that protects groundwater as a drinking water resource* Monitoring • Stormwater discharge monitoring, including Stormwater Discharge Monitoring Program (SDMP) • BMP monitoring, including BMP Monitoring Plan	*Process and criteria to identify, evaluate and prioritize actions necessary to protect groundwater and meet WPCF permit requirements* Compliance determination • Compliant • No determination (Evaluation procedure) • Non-compliant (Corrective Actions) Prioritization Evaluation (Scoping) • Nature and Extent • Threat to groundwater • Design Response actions to manage UICs and protect groundwater quality	*Evaluation, selection and implementation of actions to address UICs that do not meet WPCF permit requirements* Corrective Action Plan • Protectiveness demonstration • Pretreatment • Increased separation distance • Non-structural/ institutional controls • UIC closure per Decommissioning Procedure

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Section

3

3 System Management

3.1 General

System Management is one of the four major elements of the UIC Program. It involves a series of BMPs, which are on-going actions to prevent, minimize, and control pollutants in stormwater prior to discharge to a UIC. The BMPs are grouped within five general action categories.

- System Inventory and Assessment (SA);
- Pollution Control (PC);
- Education and Training (ET);
- Operations and Maintenance (OM); and
- Policy and Regulation (PR).

The System Management program element utilizes four tools in its implementation. The first tool is systemwide BMPs. The general BMP categories for overall system management and specific BMPs under each category are summarized in Section 3.4. Detailed descriptions of these BMPs are provided in Appendix A. Specific tasks that will be performed to meet permit requirements are also discussed.

The three remaining tools are required elements of the WPCF permit. They are listed below and described in the following Sections and Appendices:

- **Operations & Maintenance (O&M) Plan.** Describes in detail how UICs will be used and maintained as a critical component of the City's stormwater infrastructure (Section 3.5, Appendix B);
- **Spill Prevention and Pollution Control (SPPC) Plan.** Describes in detail the steps that will be taken to prevent release of pollutants that could enter a UIC through stormwater, and mitigating steps that will be taken in the event of a release (Section 3.6, Appendix C); and
- **Decommissioning Procedure.** Describes the general steps and requirements for taking public UICs out of operation (Section 3.7, Appendix D).

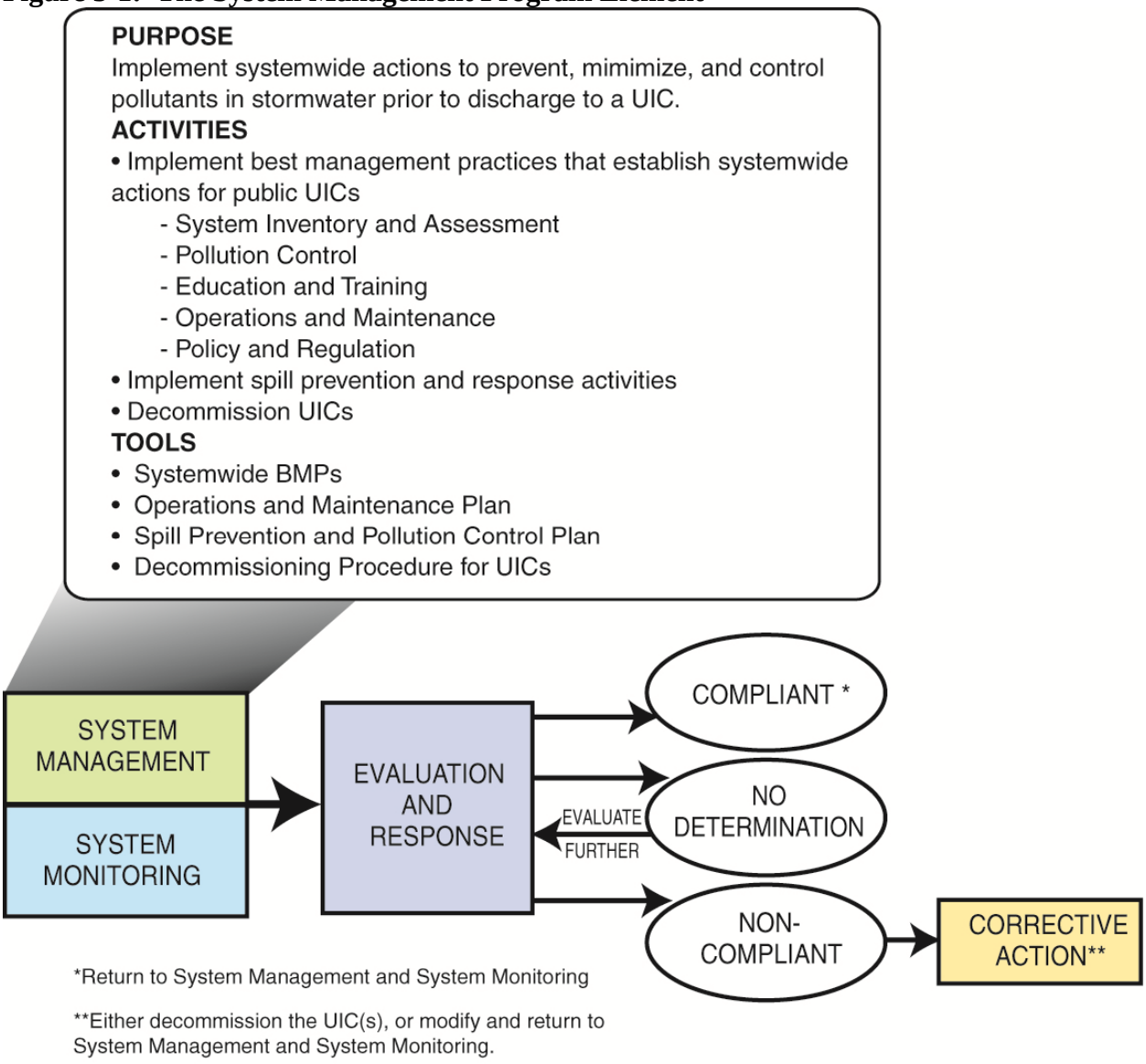
Figure 3-1 shows the relationship of the System Management program element to the other UICMP program elements. It also summarizes the purpose of this program element and the specific tools that are available to support related System Management activities (discussed in Sections 3.3 through 3.7).

3.2 Applicability

The System Management program element establishes BMPs that are applied to the entire UIC system on an ongoing basis. Since it is difficult to determine years in advance that these BMPs will be effective at all locations over the life of the WPCF permit, it is likely that some modification will be necessary based on the results of System Monitoring (Section 4.0). The

annual UICMP reports will describe any needed BMP modifications and the schedule for implementing these modifications.

Figure 3-1: The System Management Program Element



3.3 Purpose and Objectives

The purpose of the System Management program element is to implement systemwide actions that will be used to prevent, minimize, and control pollutants in stormwater prior to its discharge to a UIC. The System Management objectives are to:

- Operate UICs in a manner that meets WPCF permit requirements.
- Use data and information generated during System Management activities to identify system improvements and UICs that may not meet WPCF permit requirements.

- Provide information on all City UICs in a comprehensive UIC Registration Database.
- Guide management decisions for future System Management and System Monitoring activities.

3.4 Description of Best Management Practices

The five general BMP categories described below encompass a comprehensive range of actions that together will help ensure that UICs are constructed, operated, and maintained in a manner that meets WPCF permit requirements and protects groundwater for use as drinking water resource. Detailed descriptions of the BMPs are provided in Appendix A. Appendix A also identifies specific tasks and timelines that will be undertaken to address WPCF permit requirements. In addition to those WPCF permit-required tasks, the City implements a number of other activities that are not required by the WPCF permit but that contribute to stormwater management, groundwater protection, and watershed health. Those additional activities are also described under each BMP presented in Appendix A.

3.4.1 Category: System Inventory and Assessment (SA)

This BMP category focuses on tracking, updating, and refining information related to the location and physical characteristics of existing and new public UICs. It captures information from ongoing infrastructure management, including the registration and construction of new UICs, replacement or retrofit of existing UICs, and decommissioning of existing UICs. This BMP category fulfills two WPCF requirements:

1. Develop and implement a comprehensive UIC Registration Database.
2. Evaluate UICs relative to factors that could present a risk to groundwater quality.

This category includes the following two BMPs:

- **SA-1: Install, replace, retrofit, and decommission UICs as needed to provide public infrastructure for stormwater management. Maintain a comprehensive system inventory/data management system to register new UICs and track the location, physical characteristics, and status of all public UICs.**

  The WPCF permit requires the City to develop and maintain a comprehensive UIC Registration Database. This BMP includes the following activities:
  - Tracking data and information that results from the installation, replacement, retrofit, or decommissioning of UICs, as needed, to provide stormwater infrastructure for public facilities and rights-of-way.
  - Registering new UICs and maintaining, updating, and reporting on the physical and spatial characteristics of public UICs as part of the UIC Registration Database.

  Shortly after the WPCF permit was issued in July 2005, the City developed a UIC Registration Database that identifies the physical and spatial characteristics of known

public UICs. This database serves as the primary tracking mechanism and data source for new, existing, and decommissioned UICs. The database was completed and submitted to DEQ on September 1, 2005. Since that time, updates have been provided quarterly to DEQ.

- **SA-2: Evaluate the location of public UICs relative to factors that may create adverse impacts to groundwater.**

  The WPCF permit requires the City to evaluate every public UIC for factors that may present a risk for adverse impacts to groundwater. These factors include the following:
  - Receives drainage from motor vehicle maintenance floor drains, indoor parking facilities, or fire station bay drains;
  - Receives drainage from Superfund Amendment and Reauthorization Act (SARA) Title III facilities;
  - Receives drainage from commercial/industrial properties that have site activities that may result in a permit violation;
  - Has inadequate separation distance to groundwater; or
  - Is within 500 feet of a drinking water well or within a 2-year time of travel.

  The City submitted a *Systemwide Assessment* of all known public UICs to DEQ on July 15, 2006. This assessment included the identification of public UICs for which further evaluation/information was needed to make a conclusive determination about any of the five above-listed factors.

  This BMP includes the following activities:
  - Developing and implementing a description of follow-up activities (*e.g.*, additional field investigations) for UICs identified in the *Systemwide Assessment;* and
  - Evaluating proposed or newly identified UICs for the above-listed factors.

  Ongoing systemwide activities will identify UICs that may drain commercial/industrial properties or SARA Title III facilities where site activities could adversely impact stormwater (Section 3.4.2).

3.4.2 Category: Pollution Control (PC)

This BMP category focuses on reducing pollutant discharges from activities and practices, such as spills, illegal disposal, improper site management, and erosion, that can increase the discharge of pollutants to UICs. It applies to activities on both public and private sites that may impact discharges to public UICs. This BMP category fulfills the following two WPCF permit requirements:

- Implement the SPPC Plan, included in Appendix C.
- Identify activities conducted on commercial/industrial properties, or SARA Title III facilities that may result in a violation of WPCF permit-required MADLs in stormwater discharging to a public UIC.

This category includes one BMP.

- **PC-1: Identify, prevent, minimize, and control activities and practices that can increase pollutant discharges to public UICs.**

  The major activity under PC-1 is implementation of the SPPC Plan. The SPPC Plan defines prevention and response activities for spills and emergency events where pollutants may enter a public UIC. Development of the SPCC Plan is required by the WPCF permit. Spill prevention activities identified in the SPPC Plan includes working with the BES Spill Protection-Citizen Response (SPCR) team to identify and control activities conducted on private property that may impact stormwater discharges to public UICs (*e.g.,* illegal disposal, improper storage and handling of materials, and erosion) (Section 3.6 and included in Appendix C).The SPCR team will respond immediately to emergency spills and investigate pollution complaints. 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.

  The WPCF permit requires the City to identify commercial/industrial properties or SARA Title III facilities where site activities could result in a violation of MADLs in stormwater discharge. Based on information obtained through PC-1 activities, a UIC or group of UICs may be identified for further assessment in the Evaluation and Response program element.

3.4.3 Category: Education and Training (ET)

This BMP category fulfills the WPCF permit requirement for an employee training and public education program to educate City personnel and the public about permit conditions and requirements. This category includes two BMPs.

- **ET-1: Implement public education activities that will raise awareness of groundwater protection and promote pollution prevention and control.**

  The City currently conducts a number of public education programs and activities that convey information and messages relevant to stormwater, pollution prevention, source control, and environmental protection. The City will continue to implement these existing public education programs and activities. In addition, the City will develop UIC-specific information and messages about groundwater protection to incorporate into existing and new education programs.

- **ET-2: Conduct employee training to ensure that UICs on public property are designed, constructed, operated, and closed in ways that meet WPCF permit requirements and protect groundwater.**

  Employee training focuses on providing information to City staff to raise their knowledge of WPCF permit requirements and to ensure that City practices related to UICs are protective of groundwater.

3.4.4 Category: Operations and Maintenance (OM)

This BMP category identifies O&M practices to remove and prevent pollutants from entering public UICs located in City-managed rights-of-ways and on other City-owned property. This BMP fulfills the WPCF permit requirement to implement an O&M Plan for public UICs. There is one BMP in this category.

- **OM-1: Implement operations and maintenance practices to remove or prevent pollutants from entering public UICs located in City-managed rights-of-way and on other City-owned property.**

  The major activity under OM-1 is implementation of the O&M Plan, which describes the activities the City currently implements to effectively manage its public UICs and protect groundwater quality (Section 3.5, Appendix B). Additions or revisions to current O&M activities are identified in OM-1 in Appendix A.

3.4.5 Category: Policy and Regulation (PR)

This BMP category involves the development, review and modification, where appropriate, of City policies, codes, and administrative rules to meet permit requirements and enhance groundwater protection. There is one BMP in this category.

- **PR-1: Review and modify City policies, codes, and regulations to enhance groundwater protection.**

  This BMP includes City initiatives, such as policies that promote the use of green streets as an alternative to or retrofits for UICs, as well as code and administrative rules pertaining to groundwater protection. There are no specific permit requirements relevant to this BMP.

3.5 Description of Operations and Maintenance Plan

The O&M Plan describes the inspection, maintenance, recordkeeping, and reporting protocols the City uses to manage UICs and sedimentation manholes. The plan is based on the UIC Sections of BES's *Surface Stormwater Facilities Maintenance Management Manual* (1997) with updates incorporated to reflect current practices the City implements to effectively manage UICs. The plan focuses on UICs in the public right-of-way, which account for the vast majority of public UICs. The O&M Plan also discusses UICs on other City property—*e.g.*, drywells and soakage trenches used to drain other City facilities.

The O&M Plan describes the following activities:

- Maintenance targets for sedimentation manholes and UICs;
- Specific inspection, cleaning, and repair procedures for sedimentation manholes and sumps;
- Vector control and street sweeping;

- Materials management, including dewatering, solids testing, disposal, and reuse; and
- Recordkeeping procedures, including inventory records, inspection records, and maintenance work orders.

The primary maintenance activity is sediment removal; the cleaning procedure is aimed at restoring the UIC system to 100 percent of the designed treatment and storage capacity. The City prioritizes maintenance activities based on the amount of sediment accumulated within a sedimentation manhole or UIC. Maintenance targets were developed based on standard citywide sediment accumulation rates, and are intended to minimize potential resuspension of collected materials and localized flooding resulting from system failure. Adjustments to maintenance intervals and practices will be based on 1) annual compliance monitoring results, 2) data obtained following compliance response actions, and/or 3) the results of BMP monitoring activities.

Bureau of Maintenance (BOM) cleaning staff conduct routine inspections of the UIC system prior to cleaning, as part of preventive maintenance. Additional inspections may be conducted as needed. Repair activities generally occur when there is a structural defect within the system or when new street grades require adjustment of the lid and lid frame. Repairs are based on BOM inspections, BES referrals or on citizen complaints. Repairs are performed by a specialized BOM repair crew. Contractors conduct certain maintenance activities that require specialized equipment and expertise, and respond to UICs that require immediate cleaning as a result of spills or illicit discharges.

In addition to the above maintenance practices, the City conducts street sweeping to protect water quality, prevent physical damage to pavement, and minimize the burden on the sewer system from surface debris, and vector control.

3.6 Description of Spill Prevention and Pollution Control Plan

The SPPC Plan describes the spill/emergency prevention and response activities the City implements to prevent and control the release of pollutants to UICs. It updates the general response duties identified in the City's *Spill Response, Containment, and Prevention Handbook* (1995) and adds response to emergency situations. The SPPC Plan also provides UIC-specific activities to ensure protection of groundwater resources. The SPPC Plan applies to all public rights-of-way and City properties with UICs.

The SPPC plan describes the roles of the City bureaus involved in controlling and responding to spills and emergencies: BES, BOM, Fire & Rescue, Portland Water Bureau, Portland Parks & Recreation, General Services, Police, and the Office of Emergency Management. Implementation of the SPPC Plan will be coordinated through the Regional Spill Response Committee, which was formed in 1995 to consult and debrief on spill response activities throughout the region.

Elements of the SPPC Plan include the SPCR hotline; spill response actions for UICs in the public right-of-way and on other public properties; emergency preparedness, prevention,

mitigation, and response (for fire, flood, earthquake, volcano eruption, and severe weather events); employee training; public education; spill prevention materials; containment features; and tracking systems.

3.7 Description of Decommissioning Procedure

The UIC Decommissioning Procedure provides the protocol and general requirements for decommissioning UICs. Its purpose is to establish decommissioning practices that protect groundwater and meet WPCF permit requirements. All City personnel and contractors conducting decommissioning activities must comply with the procedure to the extent that the requirements apply to the nature and scope of their work.

The draft *UIC Decommissioning Procedure* was submitted to DEQ in October 2005. The *Final Decommissioning Procedure*, included as Appendix D, was revised to incorporate DEQ's comments on the draft plan and subsequent conversations and correspondence with DEQ including:

- UIC Decommissioning Sampling Plan: Category 1 Corrective Actions – City of Portland (Letter from BES to DEQ, dated February 6, 2006); and
- Decommissioning Activities and Sampling Plan (Letter from BES to DEQ, dated January 10, 2005).

The Decommissioning Procedure describes the following 12 steps:

1. Describe general characteristics of UIC to be decommissioned.
2. Conduct site inspection of UIC; note any contaminants of potential concern.
3. Identify UIC type and determine sampling requirements.
4. Collect representative samples.
5. Review sample analytical results.
6. Prepare follow-up site-specific sampling plan (as needed).
7. Prepare site-specific contaminated media management plan (as needed).
8. Develop alternative stormwater management design for UIC.
9. Prepare and submit DEQ UIC pre-closure notification form.
10. Prepare decommissioning scope of work and select contractor.
11. Decommission UIC (field procedure).
12. Prepare closure and decommissioning report.

The document also identifies key personnel and their areas of responsibility for the UIC permit program and decommissioning activities.

Section

4

4 System Monitoring

4.1 General

The System Monitoring program element involves ongoing stormwater discharge monitoring activities that will be conducted to demonstrate that UICs are operated in a manner that meets WPCF permit requirements and protects groundwater quality.

System Monitoring includes two types of monitoring that address different needs of the UICMP, and each utilizes a different tool to implement this program element:

- Stormwater discharge monitoring of a representative subset of City UICs to assess the quality of stormwater entering the UICs (Section 4.4); and
- BMP monitoring to determine the effectiveness of BMPs in controlling pollutant discharges to UICs and identify technologies that can be used to improve stormwater quality or successfully implement corrective actions (Section 4.5).

Stormwater sampling and data evaluation methods are described in the City's SDMP, which was submitted to DEQ under separate cover on August 30, 2006 and updated in Version 2 (December 2012). Monitoring results will be used to determine if UICs meet compliance requirements or should be addressed through either the Evaluation and Response or Corrective Action program elements. The results of this ongoing work will be reported in the annual Stormwater Discharge Monitoring reports, and summarized in annual UICMP reports submitted to DEQ.

Monitoring to evaluate BMP effectiveness in improving stormwater quality to meet WPCF permit requirements or other water quality goals is described in the BMP Monitoring Program, which is provided as Appendix E to this UICMP document. Monitoring results, as well as a description of proposed monitoring for the next fiscal year, will be reported in the annual UICMP reports.

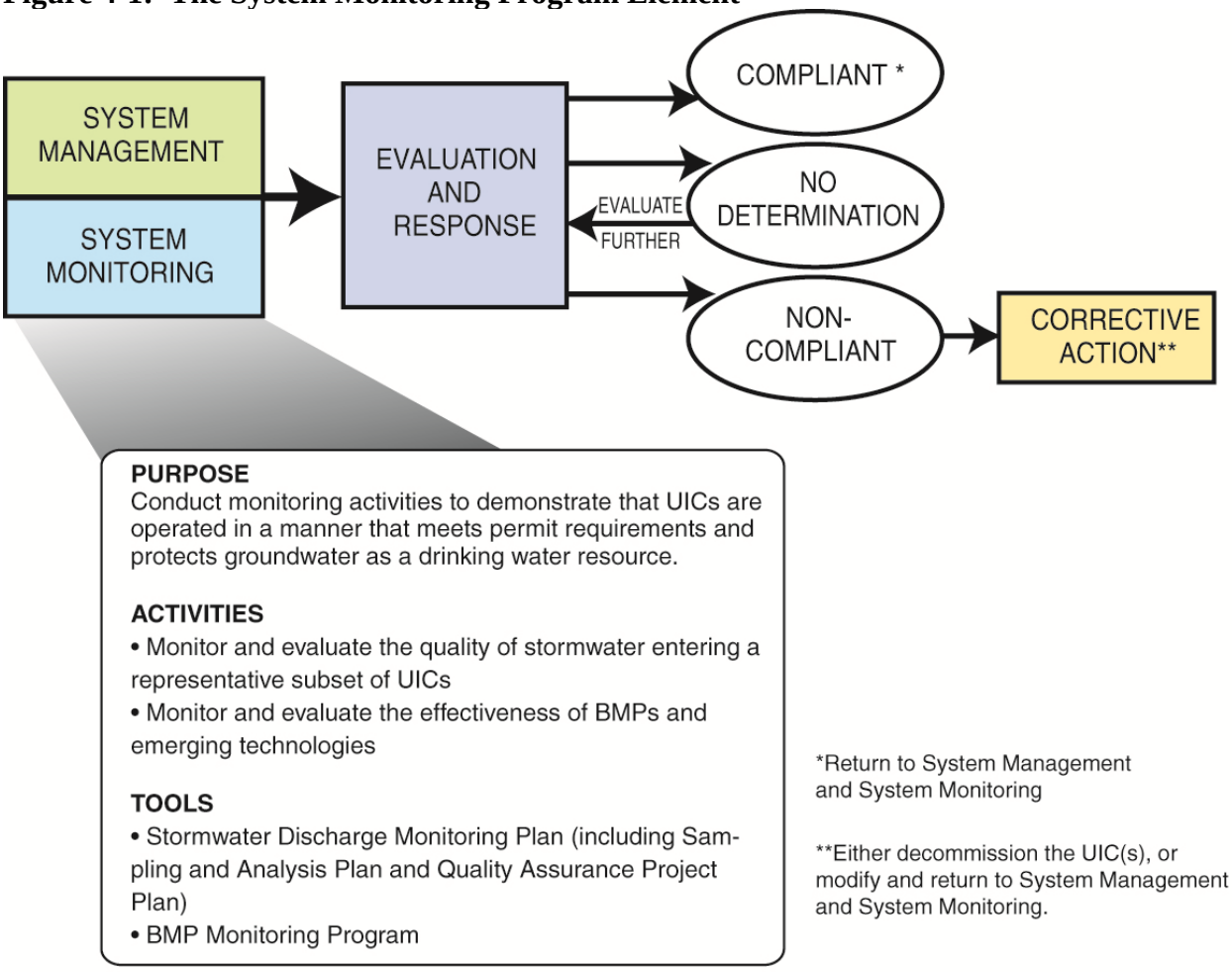
Figure 4-1 shows the relationship of the System Monitoring program element to the other UICMP program elements. It also summarizes the purpose of this program element and the specific tools that are available to support related System Monitoring activities (discussed in Sections 4.3 through 4.5).

4.2 Applicability

Stormwater discharge monitoring applies to the entire UIC system on an ongoing basis. It defines how a representative subset of all UICs will be regularly monitored to ensure compliance with the WPCF permit.

BMP monitoring will be conducted for the duration of the WPCF permit to assess the effectiveness of applying a range of structural and non-structural BMPs and to identify technologies that will both protect groundwater and comply with the WPCF permit.

Figure 4-1: The System Monitoring Program Element



4.3 Purpose and Objectives

The System Monitoring program element, along with the System Management program element, will ensure that UICs are operated in a manner that supports watershed health, protects groundwater quality, and meets WPCF permit requirements. These elements also provide systemwide data and information necessary to identify system improvements or UICs that may require additional evaluation to make a conclusive determination regarding compliance (through the Evaluation and Response program element) or that may require corrective action (through the Corrective Action program element).

The System Monitoring objectives are to:

- Use stormwater monitoring data to provide information necessary to identify UICs that may not meet WPCF permit requirements.
- Design and implement a monitoring program for UICs that is representative of the entire UIC population, informs the City of sources of stormwater pollutants, and can be used to evaluate long term trends in stormwater quality.

- Design and implement a monitoring program that will test the effectiveness of structural or non-structural BMPs used in System Management or Corrective Action.
- Identify potential system improvements and guide management decisions for future System Management and System Monitoring activities.

4.4 Stormwater Discharge Monitoring Plan

The WPCF permit requires the City to:

- Monitor the quality of stormwater discharged into these UICs to demonstrate that operation of the City-owned UICs meets WPCF permit conditions and protects groundwater quality.
- Prepare and submit to DEQ a SDMP for approval.

The City submitted its final SDMP to DEQ in August 2006, revised December 2012. The SDMP comprises a Sampling and Analysis Plan (SAP) and Quality Assurance Project Plan (QAPP), which are summarized in the following Sections.

4.4.1 Sampling and Analysis Plan (SAP)

The SAP includes the stormwater discharge monitoring sample design, as well as procedures and protocols for field-sampling activities. The intent of the SAP is to ensure that data collected is of known quality and can be used to demonstrate WPCF permit compliance. The SAP includes the following elements:

- **UIC Sample Design Plan:** Describes the basis for developing a statistically valid UIC monitoring network (*i.e.,* sample population) that is representative of the UIC system. The monitoring network was stratified in accordance with two WPCF permit-required traffic volume populations.
- **Field Sampling Procedures:** Describes the field procedures and protocols for collecting stormwater samples and performing WPCF permit-required laboratory analyses. Standard operating procedures (SOPs) for routine field sampling procedures and field sampling forms are provided.
- **Project Health and Safety Plan (HASP):** Provides the health and safety protocols to be implemented during stormwater monitoring. The HASP was prepared in accordance with Oregon Occupational Safety and Health Administration (OSHA) regulations and the policies of the City of Portland.
- **Maps:** Provides area and UIC-specific maps showing UIC sampling locations.

4.4.2 Quality Assurance Project Plan (QAPP)

The QAPP establishes the minimum quality assurance standards and measures to be followed during sample collection activities and laboratory analyses. These standards and measures will ensure that data of acceptable quality are obtained and project-specific data quality objectives are met. The QAPP also presents the method for calculating annual mean stormwater pollutant concentrations for comparison to the WPCF permit-required MADLs.

Information obtained through the implementation of the SAP and QAPP will consist of verified environmental data or information of known and acceptable quality and will be generated in a scientifically-defensible manner, as required.

4.5 BMP Monitoring Program

The UICMP describes a range of structural and non-structural BMPs that are applied to the entire UIC system to meet permit requirements, protect groundwater, and meet overall watershed health goals.

The BMP monitoring program is designed to provide the framework for identifying and assessing the effectiveness and limitations of systemwide BMPs to meet permit requirements, and to identify opportunities for overall system improvement. For the purposes of BMP monitoring, systemwide BMPs are divided into two broad categories:

- Water Quality BMPs. This category includes structural and non-structural BMPs that will improve the quality of stormwater entering a UIC. Examples of water quality BMPs include vegetated swales, planters, street sweeping, and cleaning of sedimentation manholes and UICs. Water quality monitoring will identify practices that can be implemented to meet MADLs in stormwater or improve overall stormwater quality. BMP monitoring data will be used to analyze the type and concentration of pollutants in stormwater, and evaluate water quality improvements resulting from application of various BMPs.
- Separation Distance BMPs. These structural BMPs will be applied to increase the separation distance between the bottom of the UIC and groundwater. Examples of separation distance BMPs include backfilling existing UICs, and using shallow UICs or horizontal UICs. Monitoring of BMPs in this category consists of testing and evaluating various technologies to determine the technical feasibility of wide scale application.

To quantify the impacts and effectiveness of BMPs to reduce or remove stormwater pollutants, the City conducted a BMP effectiveness evaluation (*Effectiveness Evaluation of Best Management Practices for Stormwater in Portland, Oregon*, September 2006). The Effectiveness Evaluation focused on the removal of total suspended solids to demonstrate reductions in pollutant discharges. This evaluation was the basis for selecting Water Quality BMPs.

Separation Distance BMPs were developed to meet basic criteria used in the corrective action process (*Corrective Action Plan*, July 2006), including:

- Constructability – space constraints, potential utility conflicts, permitting issues, construction methods available, required vertical separation distance;
- Effectiveness – ability to handle quantity of flow;
- Acceptability – aesthetics, legal constraints, political considerations;
- Unit Costs – operational and capital present worth expense; and
- Operational impacts –operational and maintenance constraints.

The BMP monitoring categories reflect the two primary issues that are anticipated to drive permit compliance and the need for overall system improvements. Information generated from BMP monitoring activities will be used for the following purposes:

- Identify technologies that are most likely or most promising to correct non-compliant conditions (*e.g.*, exceedance of MADLs or insufficient separation distance).
- Identify the potential limitations of selected BMP technologies to allow for permit modifications when best available technologies are unable to meet permit conditions.
- Support the overall UIC Program by identifying factors that significantly affect the quality of stormwater entering the UIC system.

BMP monitoring results will be reported in the annual UICMP report submitted to DEQ. The annual UICMP report will also present recommendations for additional monitoring and changes to program resulting from BMP monitoring results.

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Section

5

5 Evaluation and Response

5.1 General

The Evaluation and Response program element uses data generated by the System Management and System Monitoring program elements to identify, evaluate, and prioritize actions necessary to ensure that groundwater is protected and the WPCF permit requirements are met. This program element employs a "weight-of-evidence" approach that is implemented through a variety of related procedures and guidelines. A weight-of-evidence approach is one in which multiple sources of information are combined into a single measure for the purpose of making a decision. The procedures and guidelines established for this program element will be used to develop the weight-of-evidence necessary to determine UIC compliance status, identify pollutant sources, and demonstrate groundwater protection.

The Evaluation and Response program element identifies the appropriate type and level of evaluation needed, and determines when a UIC should be addressed under other program elements, such as Corrective Action. This program element also identifies response measures that may be implemented concurrently with specific evaluation guidelines to address potential non-compliance.

The Evaluation and Response program element includes the implementation tools identified below. These tools are described in the following Sections, and provided in their entirety in the Appendices:

- Compliance Determination Procedure (Section 5.5, Appendix F);
- UIC Prioritization Procedure (Section 5.6, Appendix G);
- UICER Guidelines (Section 5.7, Appendix H); and
- Response Actions (Section 5.8, Appendix H).

Figure 5-1 shows the relationship of the Evaluation and Response program element to the other UICMP program elements. It also summarizes the purpose of this program element and the specific tools that are available to support related Evaluation and Response activities (discussed in Sections 5.3 through 5.8).

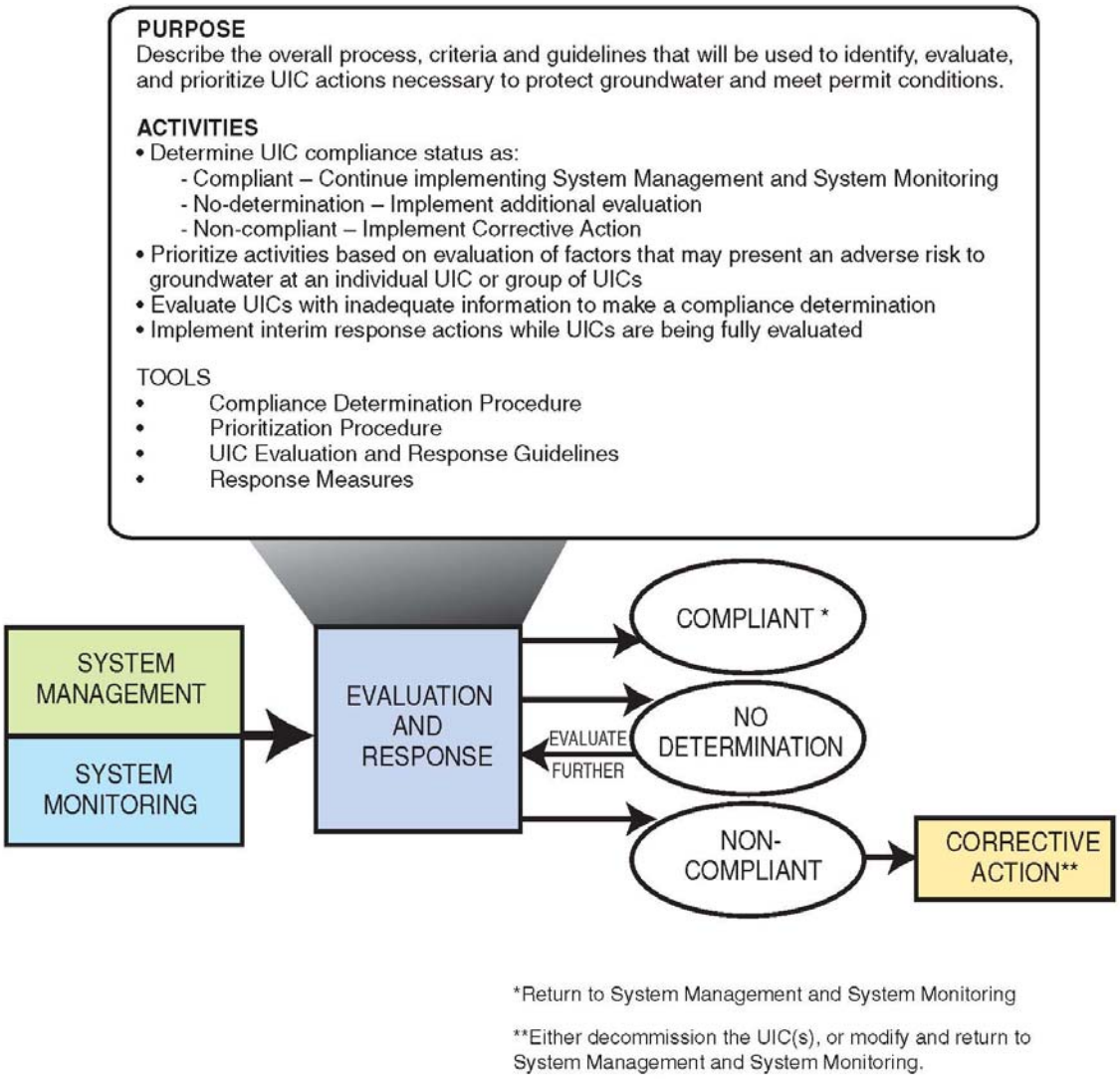
5.2 Applicability

The Evaluation and Response program element will primarily apply to UICs that have been identified through the System Management or System Monitoring program elements as having conditions that may not comply with WPCF permit requirements. These conditions include:

- Physical or spatial characteristics that may not meet WPCF permit requirements; and
- Stormwater pollutant concentrations entering a UIC that exceed the applicable MADLs for either an individual monitoring event or for the annual mean concentration during the first monitoring year (annual mean concentrations

exceeding the MADL for two consecutive years are handled in the Corrective Action program element).

Figure 5-1: The Evaluation and Response Program Element



5.3 Purpose and Objectives

The Evaluation and Response program element describes the overall process, criteria and guidelines that will be used to identify, evaluate, and prioritize UICs requiring further evaluation necessary to protect groundwater and meet WPCF permit conditions. The Evaluation and Response objectives are to:

- Implement criteria and procedures that will be followed to determine if an individual UIC or group of UICs meet compliance requirements, require further evaluation to determine compliance status, or are non-compliant and require corrective action.

- Implement a standardized procedure for prioritizing UICs that require further evaluation or corrective action.
- Conduct additional investigations on UICs identified for further evaluation. Evaluations will be based on Evaluation and Response guidelines that describe the general steps and data that will be used to fully evaluate a UIC or group of UICs before making a compliance determination.
- Evaluate and implement response action, as appropriate, to improve or correct conditions at a UIC.

5.4 Description of the Evaluation and Response Program

The Evaluation and Response program element provides a general framework for conducting investigations, data evaluation, or implementing response actions consistent with permit requirements and to meet the objectives listed in Section 5.3. A schematic representation of the process within the Evaluation and Response program element is presented in Figure 5-2. The general steps in the Evaluation and Response program element are summarized below:

Step 1: **Compliance Determination**

The Compliance Determination Procedure, discussed in Section 5.5, is the first step in this program element. It establishes the criteria and process that will be used to identify the compliance status of one UIC or a group of UICs. The procedure uses available data and information and defined criteria to separate the UICs into three categories:

- **Compliant**: UIC complies with permit conditions and will continue to be operated and managed through the System Management (Section 3.0) and System Monitoring (Section 4.0) program elements to ensure continued compliance with permit conditions.

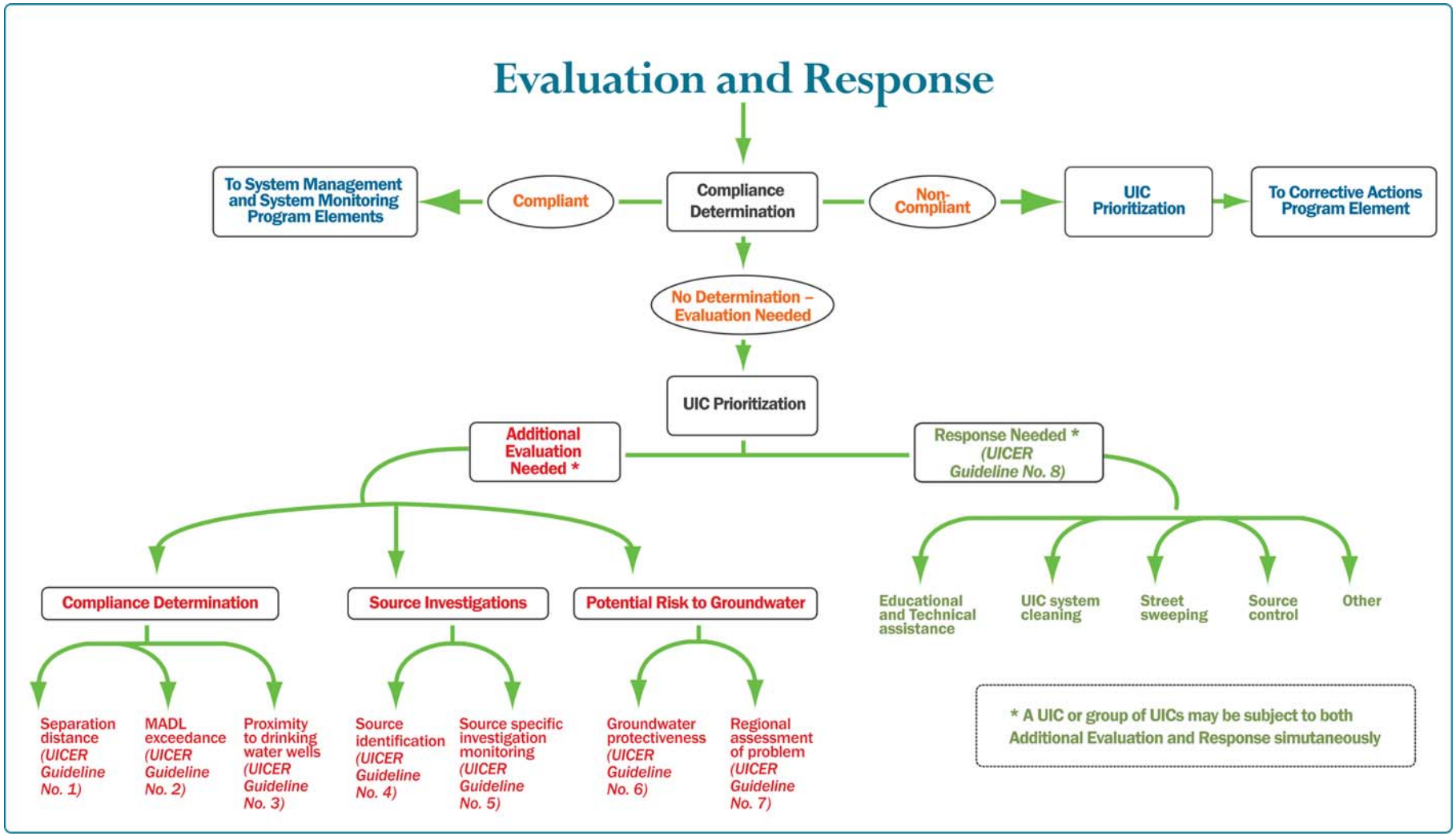
- **Non-compliant**: UIC does not comply with permit conditions and will be addressed through the Corrective Action (Section 6.0) program element.

- **No-determination** *(i.e.,* further evaluation required to determine if UIC meets permit conditions): The no-determination category is intended to capture UICs where preliminary data indicates a UIC may be non-compliant, however, the quantity or quality of available data is insufficient to make a conclusive determination. These UICs will be further investigated or addressed by UICER Guidelines and response actions as discussed in Sections 5.7 and 5.8.

Step 2: **UIC Prioritization**

The UIC Prioritization Procedure, discussed in Section 5.6, is the second step in this program element. It is a tool for identifying those UICs with the greatest likelihood of adversely impacting groundwater quality, based on readily available information. Potential impacts to groundwater are assessed based on a number of site-specific factors. The procedure is an important decision making tool for scheduling and implementing UIC evaluations, response measures, or corrective actions.

Figure 5-2: The Evaluation and Response Process



Step 3: **UIC Evaluation**

Addressing UICs identified as requiring further evaluation is the third step in this program element. UIC Evaluation and Response (UICER) guidelines, discussed in Section 5.7, were developed to help facilitate timely decisions regarding UIC compliance, stormwater pollutant sources, and groundwater protection. The intent of the guidelines is to outline the general steps and range of analyses that may be performed to fully evaluate a UIC or group of UICs and determine compliance status. The guidelines provide a common-sense approach to address issues and ensure that the level of planning, investigation, and documentation is commensurate with the issue being addressed and the potential threat to groundwater. The guidelines are designed to identify the types of data or information and the appropriate level of analyses needed to adequately fulfill the identified need for further evaluation.

Step 4: **UIC Response Actions**

Response actions to prevent or address potential UIC non-compliant conditions may be implemented concurrently with UIC evaluations (*i.e*., Steps 1 through 3). Section 5.8 identifies a range of potential response actions that may be performed, such as: UIC system cleaning, street cleaning, public outreach, technical assistance, and other actions as necessary and appropriate, to address site-specific issues at individual UICs or related to a group of UICs. These response actions differ from System Management BMPs in that they are applied to specific UICs or groups of UICs using enhanced schedules or methodologies.

5.5 Compliance Determination Procedure

The Compliance Determination Procedure will be used in conjunction with information generated during implementation of System Management BMPs (Section 3.0) and the System Monitoring program element (Section 4.0) to identify UICs that may not meet WPCF permit requirements. The intent of the procedure is to define the criteria and types/quality of data (*i.e.,* "weight of evidence") needed to determine UIC compliance. The Compliance Determination Procedure is presented in Appendix F.

UIC Compliance Determination
The UIC Compliance Determination Procedure identifies whether one UIC or a group of UICs meets WPCF permit requirements. The procedure uses available data and information and defined criteria to determine compliance status. A determination can be made using verifiable data of known quality, otherwise UICER guidelines can be used to collect additional information. There are three compliance categories: compliant, non-compliant, and no-determination.

The Compliance Determination Procedure consists of a series of worksheets that allow the user to determine compliance status using established criteria and available data. In general, data used in the worksheets come from one of three sources:

- Data or information collected while implementing comprehensive systemwide[2] BMPs performed under the System Management program element (Section 3.0);
- Information collected as part of stormwater discharge monitoring in the System Monitoring program element (Section 4.0); and
- Subsequent assessments or investigations (*i.e.*, UICER implementation to evaluate UIC compliance).

Verifiable data of known quality are needed to make a conclusive Compliance Determination. If verifiable data are not available, the UICER guidelines, presented in Section 5.7, describe the approach that will be used to collect the necessary information.

5.6 UIC Prioritization Procedure

UIC Prioritization

Prioritization accounts for the reasonable likelihood of a given UIC to impact groundwater quality. It is based on a number of factors that may reflect potential risk to groundwater. Based on this exercise, UICs are given high, medium, or low priority for further action categories. The UIC Prioritization Procedure is based on the DEQ Cleanup Program's site assessment priority system (see http://www.deq.state.or.us/wmc/cleanup/sa-fact.htm).

The UIC Prioritization Procedure will, in general, be applied following completion of the UIC Compliance Determination. The UIC Prioritization Procedure was developed as a decision-making tool to categorize UIC Corrective Actions (see *Corrective Action Plan*) and Evaluation and Response activities according to each UIC's likelihood of adversely impacting groundwater quality.

The UIC Prioritization Procedure consists of a numerical scoresheet and accompanying instructions for its completion. It provides a means of assessing the potential adverse impacts to groundwater that may be associated with individual UICs or groups of UICs and prioritizing them for further action. It uses readily available data from the *Systemwide Assessment* (2006), UIC Database, System Monitoring program element, and other sources, as appropriate. The UIC Prioritization Procedure scoresheet and instructions are provided in Appendix G.

Completing the scoresheet provides a numeric score for non-compliant or potentially non-compliant public UICs and places them in a high-, medium- or low-priority category for further action. The results may be used by the City to focus and manage the UIC Program workload for further evaluation or corrective action activities.

[2] The City conducted a comprehensive system inventory and assessment to evaluate the spatial and physical characteristics of City-owned UICs relative to the WPCF permit conditions, and assessed UIC systems for potential impacts to groundwater. The results of this study were presented in *Systemwide Assessment* (submitted to DEQ July 15, 2006). The results of this study were used to identify non-compliant UICs in accordance with the permit. Non-compliant UICs are identified in the annual UICMP report submitted to DEQ on December 1, 2006.

5.7 Evaluation and Response Guidelines

5.7.1 Purpose and Applicability

This Section describes the UICER guidelines that may be followed by the City for individual UICs or groups of UICs identified as needing further evaluation to determine compliance status, to identify pollutant sources, or to demonstrate groundwater protection. They are intended to provide general consistent direction on how to address further evaluation needs and objectives. The guidelines provide, but are not limited to:

- A description of general protocols and criteria that may be used, as necessary and appropriate, to determine UIC compliance; and
- A general framework for performing investigations that may be needed to make a compliance determination, identify a pollutant source(s), or demonstrate groundwater protection.

UIC Evaluation and Response (UICER) Guidelines

UICER Guidelines may be used to identify whether individual UICs or groups of UICs that have been identified as needing further evaluation are compliant or non-compliant. They may also be used to identify pollutant sources or to demonstrate groundwater protection. They are intended to provide general consistent direction on how to address further evaluation needs and objectives.

The guidelines are intended to clarify WPCF permit requirements and establish consistency in interpreting and meeting these requirements. In addition, these guidelines may be used on a case-by-case basis to develop the criteria and conditions when a "no further action" determination (NFA) may be an appropriate corrective action response for a non-compliant UIC condition (see WPCF permit Schedule D, Section 12(c)).

Use of the UICER guidelines will ensure that the level of planning, investigation, and documentation is commensurate with the intended use of the information and the available resources. The guidelines address both the management and scientific elements of the evaluation, and are intended to facilitate the logical development of the evaluation, efficient use of resources, transparency of the City's intent and direction, soundness of project conclusions, and proper documentation. The guidelines were developed using EPA's Data Quality Objectives (DQO) Process[3]. The DQO process, which is widely accepted, is used to facilitate either decision making (*e.g.*, compliance or non-compliance with a standard) or estimation of parameters (*e.g.*, ascertain the mean concentration level of a pollutant). The DQO process and their application in the development of the UICER guidelines are described in Appendix H.

5.7.2 Applying UICER Guidelines

The UICER guidelines will be applied on an as-needed basis to address further evaluation needs and objectives. The need for further evaluation will be identified through ongoing implementation of the UICMP activities, such as:

- Inventory and assessment of UICs;
- Evaluation of stormwater monitoring results; and/or

[3] "*Guidance on Systematic Planning Using the Data Quality Objectives Process*" prepared by the EPA. EPA/240/B-06/001. February 2006. EPA QA/G-4.

- Application of the Compliance Determination Procedure.

In general, the UICER guidelines address the following issues:

- Making a UIC compliance status determination (*e.g.*, as a result of separation distance, stormwater quality, proximity to drinking water wells);
- Identifying and investigating potential stormwater pollutant sources;
- Ensuring groundwater quality protection (*i.e.*, protection of groundwater may be demonstrated through: pollutant fate and transport analyses, additional stormwater monitoring, or evaluation or development of concentration limits defined by the permit); and
- Addressing potential non-compliant conditions by implementing response actions (Section 5.8).

The tasks and steps defined in the guidelines are intended to be adapted, as necessary and appropriate, based on the site- or issue-specific information. Use of these guidelines will allow City staff to consistently implement timely and decisive actions to address UIC compliance issues and to assure groundwater is protected.

Implementation of the UICER guidelines, to the extent feasible and practicable, will be performed considering the priority assigned to the individual UIC or group of UICs (Section 5.5). The overall goal is to implement actions that will first address those UICs with the greatest likelihood of adversely impacting groundwater quality. However, implementation of these guidelines will also consider other factors, including, but not limited to:

- Permit requirements;
- Geographic proximity of other UICs being evaluated;
- Site or issue specific conditions;
- Scope of evaluation (*e.g.*, number of UICs to be evaluated);
- Staff, equipment, and funding availability;
- Other BES and Capital Improvement Program (CIP) priorities or ongoing or planned projects;
- Relationship to watershed or other citywide projects (*e.g.*, sewer, transportation);
- Opportunities to streamline or more efficiently perform Further Evaluation activities (*e.g.*, grouping similar problems, geographic approach); and
- Best professional judgment.

These guidelines are intended to provide flexible, dynamic, and iterative approaches to evaluating UICs and will be applied and adapted on a site-specific basis, as determined necessary and appropriate by the City of Portland, based on factual information. The specific scope of actions implemented from the guidelines will vary, based on site-specific conditions, available information, and the complexity of the issue.

The guidelines are generally designed to apply to larger, more complex issues or sites with the highest likelihood for adversely impacting groundwater quality or exceeding permit limits. Only limited elements of the information or data described in the guidelines may be necessary or applicable to address relatively simple or straightforward issues. The level of effort and

application of the additional detailed elements described in the guidelines will increase, as appropriate, to evaluate complex multivariate issues.

5.7.3 UICER Guidelines and WPCF Permit Requirements

The UICER guidelines address specific WPCF permit requirements. The WPCF permit and the DEQ "*Fact Sheet and Class V Underground Injection Control (UIC) WPCF Permit Evaluation*" (DEQ, June 2005) identify several types of activities that may be used to support additional evaluation of specific conditions and/or demonstrate groundwater protection. These activities include groundwater monitoring, "risk assessment", structural retrofitting of UICs, UIC decommissioning, or other actions as directed or approved by DEQ.

The term "risk assessment" as referenced in the WPCF permit and as used in the UICMP, is a broadly defined and multifaceted term. For the purposes of the City's UIC Program, the term "risk assessment" is used to indicate the evaluation of potential risk for adverse impacts to groundwater quality, as defined by OAR 340-040 and OAR 340-044, associated with stormwater discharged into City-owned UICs. One or more of the following activities may be used to evaluate potential stormwater impacts:

- Pollutant fate and transport analyses;
- Additional stormwater discharge monitoring to identify pollutant sources or facilitate data interpretation; and
- Evaluation/modification or development of MADLs or groundwater compliance limits to assure protection of human health and the environment.

Risk Assessment
The term "risk assessment" is used to indicate the evaluation of potential risk for adverse impacts to groundwater quality, as defined by OAR 340-040 and OAR 340-044, associated with stormwater discharged into City-owned UICs.

The UICER guidelines are specific to the potential stormwater impacts listed above, as well as to compliance determination and pollutant source identification. The remainder of this Section provides a summary of the specific provisions of the WPCF permit that will be assessed through application of these guidelines.

5.7.3.1 Compliance Determination

The WPCF permit requires UICs be constructed and operated in a manner protective of groundwater quality and defines non-compliant UIC conditions. The following UICER guidelines address anticipated UIC compliance determination conditions:

- Separation Distance (UICER Guideline No. 1)
- MADL Exceedances (UICER Guideline No. 2)
- Proximity to Drinking Water Wells (UICER Guideline No. 3)

5.7.3.2 Source Investigation

The WPCF permit requires the City to minimize the potential for groundwater quality degradation resulting from public UIC discharges. In accordance with OAR 340-044-0014, the City must not allow the direct or indirect movement of fluids containing pollutants into

groundwater, if the presence of that contamination may cause a violation of drinking water standards or fails to comply with the groundwater protection requirements specified in OAR 340-40. These WPCF permit requirements are addressed through implementation of the UICMP. However, the following evaluation guidelines were developed to help the City identify and evaluate potential pollutant sources in the event the System Monitoring program element (Section 4.0) suggests the potential for systemwide presence of pollutants at a concentration near or exceeding their respective MADLs. These guidelines could also be used as follow-up to the ongoing System Management (Section 5.0) activities:

- Source Identification (UICER Guideline No. 4)
- Source Specific Investigation Monitoring (UICER Guideline No. 5)

5.7.3.3 Potential Risk to Groundwater

DEQ states[4] that the overarching goal of the UIC WPCF permit is to protect the highest beneficial use of groundwater, while allowing underground injection of permitted fluids. The WPCF permit conditions are specifically designed to protect groundwater through managing and monitoring stormwater quality before it is discharged into the subsurface. In addition, the City may request DEQ review and approval of modifications to the WPCF permit (OAR 340-045-0055) or revisions to the UICMP. In the event a permit modification is requested or UICMP revision submitted, the City would present the basis for the proposed change. This basis would include scientifically valid data and appropriate analyses to demonstrate that the proposed change (*e.g.*, an increase in the MADL concentration, development of a MADL for a pollutants not currently identified in the WPCF permit, decrease in separation distance) does not adversely affect groundwater quality for its beneficial uses (as defined in OAR 340-040-0020) and is protective of public health and the environment. The following UICER guidelines were developed to evaluate and/or demonstrate that stormwater discharges into City-owned UICs comply with OAR 340-040, do not adversely affect the beneficial uses of groundwater, and are protective of public health and the environment:

- Groundwater Protectiveness Demonstration (UICER Guideline No. 6)
  - Fate and Transport Analysis (UICER Guideline No. 6a)
  - Additional Stormwater Monitoring (UICER Guideline No. 6b)
  - Concentration Limit Evaluation (UICER Guideline No. 6c)
- Regional Assessment (UICER Guideline No. 7)

5.8 Response Actions

5.8.1 Purpose and Applicability

This Section describes potential response actions that may be implemented by the City for an individual UIC or group of UICs to mitigate or resolve conditions that may not comply with the permit and/or otherwise protect groundwater quality. The need for a response action may be

[4] "Fact Sheet and Class V Underground Injection Control (UIC) WPCF Permit Evaluation" prepared by DEQ for Permit Number: 102830. Dated June 1, 2005.

identified during System Management (Section 3.0), System Monitoring (Section 4.0), compliance determinations (Section 5.5) or application of the UICER guidelines (Section 5.7).

Response actions are intended to reduce pollutant loading to stormwater at the land surface in order to achieve MADLs. In general, response actions are intended to be interim in nature, until a final Compliance Determination is made (Section 5.5; *i.e.*, a determination of whether or not Corrective Action is required) or the issue that may have been creating the potentially non-compliant condition has been resolved. A range of potentially applicable response actions is identified in Section 5.8.2. Response actions may be implemented concurrently with further evaluation activities described in Section 5.7.

5.8.2 Applying the Response Action Guideline

As described in Section 5.7, UICER guidelines were developed to help facilitate timely and common-sense decisions. As such, UICER Guideline No. 8, Response Actions, was developed to assist City staff in assessing, selecting, and implementing response actions, as needed and appropriate, to prevent or improve conditions at potentially non-compliant UICs. This guideline is presented in Appendix H.

The Response Action guideline identifies several potential corrective actions and other UICER guidelines that may be implemented for an individual UIC or group of UICs, as necessary and appropriate. These include, but are not limited to the following:

- **UIC System Cleaning**[5]. Cleaning of the UIC system inlet, stormwater lines, sedimentation manhole (if present), and UIC sump to remove accumulated sediment and debris.

- **Street Sweeping**[5]. Sweeping of public streets in the UIC catchment to the extent practicable. This may include, as appropriate, street washing and/or use of high efficiency vacuum equipment.

- **Site Referral(s)**. Selected sites may be referred to DEQ for further evaluation and investigation under the appropriate DEQ regulatory authority (e.g., Water Quality; UIC, Environmental Cleanup; Solid Waste; Hazardous Waste; Underground Storage Tanks).

- **Spill Protection-Citizen Response (SPCR)**[5]. Referral to City's SPCR program to work with private facilities to minimize or eliminate pollutant discharge to City UIC system. This may include site inspections and/or education and training at potential pollutant source facilities.

- **Public Outreach**[5]. Outreach activities may include developing educational materials (e.g., fact sheets, flyers, inserts, door hangers); open houses, public meetings, or door-to-

[5] Response actions are considered separate and distinct from the BMPs described in System Management (Section 3 or the UICMP). BMPs are applied system wide, while response actions are applied to address compliance-related issues with a specific UIC or group of UICs.

door campaigns to educate and promote clean stormwater and groundwater; and technical assistance to homeowner, commercial, and/or industrial facilities.

- **Source Identification** (UICER No. 4). City investigation to identify potential pollutant sources.

- **Source Specific Investigation** (UICER No. 5). Investigation of specific pollutant sources.

- **Permit Modification(s)**[5]. The City may request that DEQ modify the WPCF permit for various reasons including but not limited to: language clarification, consistency between Sections, increased or decreased MADLs, changes to the lists of common pollutants or PPS analytes, etc.

Section

6

6 Corrective Action

6.1 General

The Corrective Action program element addresses UICs that are shown through the Compliance Determination Procedure to be non-compliant with WPCF permit requirements. Corrective Action includes the process of evaluating, ranking, selecting, and implementing appropriate actions. A variety of corrective actions are available, including institutional controls, structural/engineering controls, and UIC closure. If a completed corrective action brings a UIC into WPCF permit compliance, its continued compliance will be assured through the System Management and System Monitoring program elements.

Figure 6-1 shows the relationship of the Corrective Action program element to the other UICMP program elements. It also summarizes the purpose of this program element and the specific tools that are available to support related Corrective Action activities (discussed in Section 6.3 and 6.4, with detailed documents referenced in Appendix I).

6.2 Applicability

The Corrective Action program element will apply to UICs that have been identified through the Evaluation and Response program element as having conditions that do not comply with WPCF permit requirements. These conditions include:

- UICs with physical or spatial characteristics that do not meet permit requirements;
- UICs that have exceeded annual MADLs for two consecutive years; and
- UICs that do not meet general permit requirements.

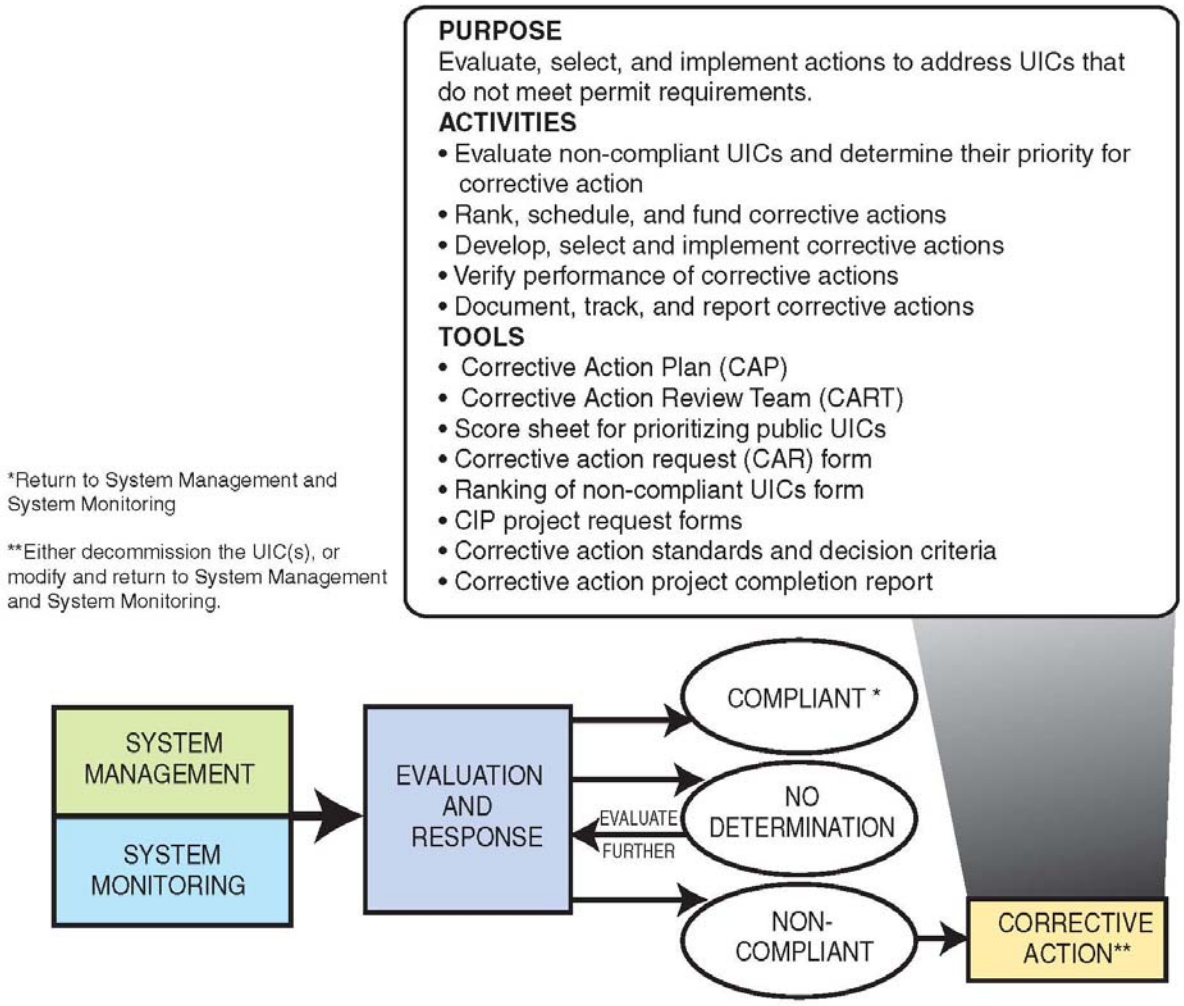
6.3 Purpose and Objectives

The Corrective Action program element describes the processes that will be used to evaluate, prioritize, rank, select, schedule, fund, implement, verify, and report corrective actions for non-compliant UICs. After a corrective action has been implemented that adequately resolves the non-compliant condition, the UIC will continue to be addressed through the System Management and System Monitoring program elements to ensure continued compliance.

The Corrective Action objectives are to:

- Implement the CAP, which describes the process that BES staff will use to identify, evaluate, select, implement, and document corrective actions for non-compliant UICs.
- Complete corrective action within three full CIP cycles after identification of a non-compliant condition, or within extended timelines as allowed by the WPCF permit for regional actions.

Figure 6-1: The Corrective Action Program Element



6.4 Description of Corrective Action Plan

In compliance with WPCF permit requirements, the City submitted a CAP to DEQ in July 2006. The CAP describes in detail how the Corrective Action program element will be implemented. The complete CAP is referenced in Appendix I of this Plan.

The CAP describes the process BES will use to identify and prioritize UICs that are non-compliant and require corrective action. It describes the data sources from the UIC systemwide assessment and stormwater discharge monitoring that are used to identify potentially non-compliant UICs, and summarizes the Compliance Determination Procedure and UIC Prioritization Procedure (Sections 5.5 and 5.6).

After non-compliant UICs have been identified and prioritized, the CAP describes the process BES will use to initiate, rank, and schedule corrective actions for these UICs. It describes the process for initiating corrective action though use of the Corrective Action Request (CAR) form, and the ongoing, iterative process of maintaining a ranked and ordered list of UICs requiring corrective action. Funding sources for implementing corrective actions are also described.

The CAP outlines the process BES will use to identify general response actions for non-compliant UICs, screen corrective action technologies and BMPs, assemble and develop corrective action alternatives, and select appropriate corrective actions to resolve a non-compliant condition. The process is intended to first address those UICs with the highest likelihood of adversely impacting groundwater. A step-by-step process is outlined below to develop and select corrective actions.

1. Define site-specific corrective action objectives.
2. Identify general response actions. The categories of general response actions are protectiveness demonstration, pretreatment, increased vertical separation distance of UIC to estimated seasonal high groundwater, non-structural and institutional controls, and UIC decommissioning/closure.
3. Screen potential corrective action technologies.
4. Assemble corrective action alternatives.
5. Evaluate and compare the corrective action alternatives.
6. Select and approve the corrective action(s).

After selection of the appropriate corrective action, the CAP outlines the existing BES procedures that will be used to design and implement corrective action projects. Corrective actions that rely on non-structural or institutional controls will be implemented using existing BES and UIC Program plans, policies, and programs. Corrective actions that require structural or engineering controls will be designed and implemented by BES's Engineering Services Group, in cooperation with the UIC Program.

Following implementation of the corrective action, the CAP describes the verification process/performance evaluation that will be conducted to demonstrate that implementation adequately resolved the non-compliant condition. The CAP also explains the data management and reporting procedures that will be used to document, track, and report corrective actions.

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Section 7

7 Staff Roles and Responsibilities

7.1 Introduction

This Section describes the roles and responsibilities assigned to key BES staff members who oversee or participate in implementing the City's UIC Program. These roles and responsibilities are clearly defined and communicated to ensure effective management of the program.

The WPCF permit designates 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. BES has ultimate responsibility for meeting the WPCF permit conditions; overseeing the implementation of UIC management plans, programs, and procedures by other bureaus as required to meet regulatory requirements.

7.2 Summary of Roles and Responsibilities

Table 7-1 summarizes staff roles and responsibilities for the UIC Program leadership and major program elements.

Table 7-1: Roles and Responsibilities for UIC Program

Position/Staff Member	Area of Responsibility and Authority
Bureau Director: *Dean Marriott*	• Direct UIC policy and program relative to BES bureau and direction. • Provide citywide coordination and implementation of program policies and requirements. • Ensure adequate program resources.
Pollution Prevention Services Group Manager: *Marveita Redding*	• Provide citywide coordination and implementation of program policies and requirements. • Approve UIC Program policies and plans. • Allocate group resources to meet program goals and requirements.
Environmental Compliance Manager: *Matt Criblez*	• Provide citywide coordination and implementation of program policies and requirements. • Assist in development of UIC policy and program. • Provide technical and policy support and direction for UIC Program. • Review and approve UIC plans and documents. • Ensure adequate group resources are allocated to UIC Program.

UIC Program Manager: *Barbara Adkins*	• Develop, recommend, and oversee implementation of UIC Program, budget, and policies with assistance from the Division and Group Managers. • Ensure UIC Program management and regulatory requirements are identified, implemented, and maintained in accordance with BES policy and the WPCF permit. • Ensure that UIC Program personnel have the appropriate qualifications, knowledge, and experience. • Report to BES management on the performance of the UIC Program. • Liaison with DEQ and other interested parties regarding the UIC Program. • Provide citywide coordination of UIC Program requirements. • Review and approve UIC plans and documents; ensure adequate resources are allocated to the UIC Program.
UICMP Program elements collectively implemented by: *Barbara Adkins, Program Manager; Joel Bowker, Hydrogeologist; and Tracy Rauscher, Environmental Specialist*	• Implement UIC System Management program element to meet permit requirements and protect groundwater. • Evaluate existing program activities, develop and recommend changes to program element. • Implement system-wide Best Management Practices • Develop and maintain UIC Database. • Prepare annual UIC Management Plan report and associate plans/reports as required. • Assist in the preparation of corrective action strategies and priorities. • Implement System Monitoring and Evaluation and Response Program elements to meet permit requirements and protect groundwater. • Evaluate existing program activities, develop and recommend changes to program element. • Oversee implementation of the Stormwater Discharge Monitoring Plan, BMP Monitoring Program, and Pollutant Source Monitoring. • Oversee implementation of Prioritization Procedure and Compliance Determination. • Oversee development and implementation of Evaluation and Response Actions. • Prepare annual UIC Monitoring report and associated plans/reports as required. • Assist in the preparation of corrective action strategies and priorities. • Coordinate and communicate UIC Program and WPCF permit needs (stormwater event sampling, source investigations, or response actions) with applicable BES UIC personnel. • Conduct data evaluation.

(cont.) UICMP Program elements collectively implemented by: *Barbara Adkins, Program Manager; Joel Bowker, Hydrogeologist; and Tracy Rauscher, Environmental Specialist*	• Develop sampling and analysis plans for decommissioning and corrective actions and preparation of annual UICMP reports. • Assist with preparation of corrective action plans, procedures, and strategies. • Implement UIC Corrective Action program element to meet permit requirements and protect groundwater. • Develop UIC corrective action priorities, strategies, procedures, and plans. • Evaluate existing program activities, develop and recommend changes to program element. • Develop scope, schedule, and budget for UIC corrective action projects. • Develop UIC decommissioning process and procedures. • Assist in acquisition of required CIP project funding for UIC corrective actions. • Assist in the preparation of annual reports and plans as required. • Assist with UIC Program budget needs.

7.3 Updates of Roles and Responsibilities

As required by Section D(5) of the WPCF permit, the City will notify DEQ in the annual UICMP report of any changes in key personnel or areas of responsibility.

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