

City of Portland, Oregon

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

Permit Number: 102830

**SYSTEMWIDE ASSESSMENT
Underground Injection Control Systems (UICs)**

July 2006

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Executive Summary

The purpose of the Systemwide Assessment is to identify, evaluate, track, and report on spatial and physical characteristics of existing and new City of Portland underground injection control systems (UICs) and to identify UICs that may impact groundwater through the discharge of surface drainage to the subsurface. The Systemwide Assessment is a requirement of the Water Pollution Control Facility (WPCF) permit issued to the City by the Oregon Department of Environmental Quality (DEQ) in June 2005.

In accordance with the WPCF permit, the Systemwide Assessment evaluates every City-owned or operated UIC relative to certain factors that may potentially create adverse impacts to groundwater. It includes:

- **Goals and objectives** for the Systemwide Assessment, as well as the City's overall watershed goals.
- Description of the **database** used, including the existing UIC Registration Database and the additional data that were generated for the assessment.
- The process used to assess all UICs in terms of each **assessment factor**, and the results of that assessment, as summarized on the table below.
- **Follow-up actions** the City will conduct for UICs that need additional analysis in order to make conclusive determinations about drainage and facility characteristics. The City will submit a workplan and implementation schedule to DEQ in December 2006 that identifies these follow-up actions. If any UICs are determined to be non-compliant before December 2006, they will be submitted to DEQ as Category 2 corrective actions in December 2006.

Assessment Factor	Results (No. of UICs)
UICs in areas of high groundwater that may have inadequate separation distance between the bottom of the UIC and groundwater.	400
UICs estimated to be located within 500 feet of a domestic well; two-year time of travel of a public water well; or 500 feet of a public water well that does not have a time of travel delineation.	332
UICs that may receive drainage from industrial and commercial properties that store, handle, or use toxic or hazardous materials that are regulated under SARA Title III.	78
UICs that may receive drainage from industrial and commercial properties that have site activities that would be expected to result in a direct or indirect discharge to a UIC that may cause a violation of permit conditions.	147
UICs that may receive drainage from motor vehicle maintenance floor drains, fire station bay drains, or indoor parking facilities.	1
UICs that receive drainage from public and private facilities that have been issued a NPDES 1200-Z permit	0

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1 Background and Approach

1.1 Introduction

The purpose of the Systemwide Assessment is to identify, evaluate, track, and report on spatial and physical characteristics of existing and new City of Portland underground injection control systems (UICs) and to provide an ongoing mechanism to identify UICs that may impact groundwater through the discharge of surface drainage to the subsurface.

The Systemwide Assessment is a requirement of the Water Pollution Control Facility (WPCF) permit issued to the City by the Oregon Department of Environmental Quality (DEQ) in June 2005

The City currently has approximately 9,000 UICs that collect stormwater from public rights-of-way and discharge it to the subsurface. Most of the UICs are perforated concrete cylinders approximately 30 feet deep from the ground surface and 4 feet in diameter.

Many are equipped with a sedimentation manhole that allows settling of suspended particles (e.g., soil and vegetation) and separation of oil and grease from the stormwater before discharge of the water to the UIC. Sedimentation manholes are solid concrete cylinders that are in integral part of the City's UIC system but are not regulated as UICs.

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

UICs are most prevalent in the eastern portion of the City, where the 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 applications because they provide an overflow point 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 the City must implement to protect groundwater for use as a drinking water resource. The 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. The Systemwide Assessment is an essential element of that strategy, providing the fundamental characterization of the system needed to administer the UIC Program.

1.2 Regulatory Background

Congress enacted UIC rules in 1974 under the federal Safe Drinking Water Act 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).

1.3 Relationship to Other Permit Requirements and Documents

The WPCF permit requires the City to prepare a variety of documents that together describe the programmatic actions and management practices the City will implement to protect groundwater and meet the requirements of the permit. In addition to the Systemwide Assessment, the following documents are required:

- UIC Registration Database (submitted September 1, 2005, and quarterly thereafter)
- Decommissioning Procedure (Draft) for Underground Injection Control Systems (submitted October 2005)
- Stormwater Discharge Monitoring Plan (SDMP) (submitted February 2006)
- Groundwater Monitoring Plan (if necessary)
- Corrective Action Plan (to be submitted by July 15, 2006)
- UIC Management Plan (UICMP) (to be submitted by December 1, 2006)
 - Operations and Maintenance Plan
 - Best Management Practices (BMPs) Monitoring Program
 - Employee Training and Public Education Plan
 - Spill Prevention and Pollution Control Plan

The UICMP will describe the relationship between the various plans in the overall context of the City's UIC program. It will describe the actions and best Management Practices the City will implement to prevent and control pollutants prior to discharge; procedures and criteria for determining UIC compliance (e.g., defining what non-compliance is); and how UICs will be prioritized for further evaluation and corrective actions.

1.4 Systemwide Assessment Approach

The WPCF permit requires the City to inventory all public UICs within the City of Portland, assess them relative to the spatial and physical factors identified in Table 1-1, and evaluate whether drainage entering each UIC would be likely to contribute to a violation of maximum allowable discharge limits (MADLs). Table 1-1 describes these assessment factors, notes the relevant permit reference, and identifies the section of the Systemwide Assessment that addresses each factor.

**Table 1-1
Assessment Factors**

Assessment Factor	Relevant Permit Schedule	Systemwide Assessment
UICs in areas of high groundwater that may have inadequate separation distance between the bottom of the UIC and groundwater.	F(5)(tt)	Section 4
UICs located within 500 feet of a domestic well; two-year time of travel of a public water well; or 500 feet of a public water well that does not have a time of travel delineation.	F(5)(gg)	Section 5
UICs that may receive drainage from industrial and commercial properties that store, handle, or use toxic or hazardous materials that are regulated under SARA Title III.	D(8)(a)	Section 6
UICs that may receive drainage from industrial and commercial properties that have site activities that would be expected to result in a direct or indirect discharge to a UIC that may cause a violation of permit conditions.	D(8)(a)	Section 7
UICs that may receive drainage from motor vehicle maintenance floor drains, fire station bay drains, or indoor parking facilities.	D(8)(b)	Section 8
UICs that receive drainage from public and private facilities that have been issued a NPDES 1200-Z permit.	D(8)(a)	Section 8

1.5 Limitations on Use of the System Assessment

The Systemwide Assessment provides an initial evaluation of the factors listed in Table 1-1. It also identifies UICs that require further information and evaluation before a determination can be made regarding facility characteristics, compliance status, or the potential for adverse impacts from drainage entering the UIC. Portions of the assessment are based on estimated and modeled information that is intended to focus additional evaluation on a prioritized subset of the UIC system. Results presented in this Systemwide Assessment are not intended to be used as a definitive source for determination of compliance status.

The City will use the Systemwide Assessment results to prepare a workplan and implementation schedule that identifies follow-up actions that will be implemented to verify data and information generated in the assessment and to obtain additional information necessary to further evaluate identified UICs. Follow-up actions will be specific to each assessment factor and/or UIC. Those actions may include field verification of modeled or estimated information, refined evaluation of potential drainage issues, site inspections, verification of UIC drainage catchments, and actions to address site activities. The workplan and implementation schedule identifying specific follow-up actions will be submitted to DEQ along with the UIC Management Plan in December 2006.

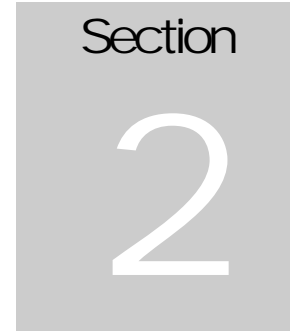
If any UICs are determined to be non-compliant before December 2006, they will be submitted to DEQ as Category 2 corrective actions in December 2006.

The general process used to conduct the Systemwide Assessment and necessary follow-up actions is summarized below. Detailed information about each Systemwide Assessment task is discussed in subsequent sections of the document.

General Process for the Systemwide Assessment and Follow-up Actions

- Evaluate the entire City-owned and operated UIC system.
- Develop lists of UICs that:
 - Are located in areas of high groundwater and may have inadequate separation distance.
 - Are within 500 feet or a two-year time of travel of a domestic or public water well.
 - Receive drainage from SARA Title III businesses.
 - Receive drainage from commercial/industrial properties that have site activities that are likely to contribute to a violation of maximum allowable discharge limits (MADLs).
 - Receive drainage from motor vehicle maintenance floor drains, indoor parking facilities, fire station bays, or 1200-Z permitted facilities.
- From the lists in the Systemwide Assessment, develop a workplan and implementation schedule that describe the follow-up actions the City will take to make conclusive determinations about drainage and facility characteristics. Submit the workplan and implementation schedule to DEQ for approval, in conjunction with submittal of the UIC Management Plan on December 1, 2006.

2 Goals and Objectives



2.1 Introduction

The mission of the Bureau of Environmental Services is to:

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

For many areas located 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. This section discusses the role the Systemwide Assessment will play in ensuring that UICs continue to play an integral role in carrying out the bureau's mission.

2.2 Systemwide Assessment Goals

An inventory and assessment is important to identify all known UICs and to assess drainage to each UIC for potential impacts to groundwater. The primary goals of the Systemwide Assessment are to:

1. Provide a comprehensive inventory of City owned and operated UICs.
2. Identify UICs that may not meet permit requirements or that may pose a risk to groundwater as a result of their physical or spatial characteristics.
3. Maintain a data management system to track the location and physical characteristics of UICs.
4. Ensure that UICs contribute to achieving watershed goals, objectives, and targets established in the Portland Watershed Management Plan (City of Portland, 2005) and the Framework for Integrated Management of Watershed Health (City of Portland, December 2005). The following watershed goals are directly supported by the existence of UICs and their proper functioning:

- **Hydrology:** *Move toward normative flow conditions to protect and improve watershed and stream health, channel functions, and public health and safety.*

UICs help mimic the natural hydrologic cycle by infiltrating stormwater into the ground and providing recharge of summer base flows in streams.

- **Physical Habitat:** *Protect, enhance, and restore aquatic and terrestrial habitat conditions to support key ecological functions and improved productivity, diversity, capacity, and distribution of native fish and wildlife populations and biological communities.*

UICs help prevent damage to riparian areas caused by increased stormwater discharges during rain events.

- **Water Quality:** *Protect and improve surface water and groundwater quality to protect public health and support native fish and wildlife populations and biological communities.*

Keeping stormwater within MADLs ensures that UICs are operated in a manner that is protective of groundwater quality. UICs also benefit surface water quality by protecting the quality of the groundwater that emerges in streams and by providing higher volumes of cool base flows to surface waters in the summer months.

- **Biological Communities:** *Protect, enhance, manage and restore native aquatic and terrestrial species and biological communities to improve and maintain biodiversity in Portland's watersheds.*

UICs contribute to healthy biological communities by restoring a more natural hydrologic cycle, providing cool base flow in the summer months, and reducing damage to physical habitat created by peak stormwater flows.

2.3 Systemwide Assessment Objectives

The overall objective of the Systemwide Assessment is to identify, evaluate, track, and report on spatial and physical characteristics of existing and new UICs. The WPCF permit requires the City to evaluate every UIC relative to five factors that may create adverse impacts to groundwater. Accordingly, the specific objectives of the Systemwide Assessment are to identify and evaluate UICs that:

- Are in areas of high groundwater and may have inadequate separation distance between the bottom of the UIC and groundwater.
- Are within 500 feet or a two-year time of travel of a domestic or public water well.
- Receive drainage from SARA Title III businesses.
- Receive drainage from commercial/industrial properties having site activities that could be expected to result in violation of permit conditions (water quality limitations).
- Receive drainage from motor vehicle maintenance floor drains, indoor parking facilities, fire station bay drains, or facilities with stormwater discharges permitted under the NPDES 1200-Z program.
- Require further investigation before a determination can be made about the potential for adverse impacts from drainage entering the UIC and the compliance status of the UIC.

3 Database

3.1 Introduction

As part of the WPCF permit requirements, the City must maintain a UIC Registration Database that meets the conditions of Schedule D(10)(a) of the permit. The database provides identification numbers, physical characteristics, and location information about UICs. The database was submitted to DEQ on September 1, 2005, with quarterly updates submitted on December 1, 2005, March 1, 2006, and June 1, 2006.

Data from the UIC Registration Database were used, as relevant, for the Systemwide Assessment. Tasks performed as part of the Systemwide Assessment have identified UIC locations not previously included in the database and have refined data reported in previous database submittals. New and refined information collected as part of the Systemwide Assessment will be incorporated into the database and reported in the next quarterly update submitted to DEQ on September 1, 2006.

3.2 Data Sources

The primary source of data for the UIC Registration Database is the facility management system (Hansen) used by the Bureau of Environmental Services (BES). Ancillary data come from a variety of internal BES sources, including BES facility maps, and external data sources, as summarized below.

3.2.1 Hansen System

The Hansen system is BES's primary asset management, inventory control, and maintenance management system for BES infrastructure elements. The system inventories and characterizes UICs and associated sedimentation manholes as a subset of the entire asset inventory. The Hansen system contains abandoned UIC locations as well as active locations.

The Hansen system data have been maintained since the early 1980s, while AutoCAD facility maps have been maintained since 1996 and GIS-based maps for UICs were developed in 2006 (see 3.2.2 below). The Hansen system data are therefore considered to be the most complete and reliable set of information currently maintained on UICs and sedimentation manholes.

3.2.2 GIS Data

The GIS data used for the UIC database are a compilation of detailed facility maps that were previously maintained in AutoCAD in a section-based filing system. These maps were recently converted to a GIS-based Data Maintenance Environment (DME) system maintained in ESRI ArcMap, enabling a more seamless collection of information between Hansen and the GIS facility maps. These GIS facility maps contain the best available spatial representation of UICs and associated sedimentation manhole locations. They are a compilation of detailed as-built construction drawings from each City-maintained UIC construction project. Any geospatial

Section

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operations conducted for the Systemwide Assessment use the mapped UIC locations from these GIS-based facility maps. The GIS maps are kept current and synchronized with the Hansen system.

3.2.3 External Data

As part of the Systemwide Assessment, spatial analysis was needed to estimate separation distance from groundwater and distance to wells. This required collection of location-specific information from data sources external to the Hansen and DME systems and not yet included in the UIC Registration Database. Sections 4 and 5 describe how these data were generated and used for the Systemwide Assessment. As previously stated, new and refined UIC data will be included in the September 1, 2006, database update.

3.3 Currency of Data used for Systemwide Assessment Tasks

The Hansen system data used for the Systemwide Assessment spatial analysis evaluations are from a June 2006 data extraction and compilation. Because of the dynamic nature of the Hansen system, this snapshot was created to provide a stable basis for analysis and reporting. At the time of that extraction, approximately 9,000 known City-owned UICs were reported in the Hansen system. Any City owned UICs identified after June 2006 will be evaluated and reported as part of the September 2006 database update submittal.

4 UICs Located in Areas of High Groundwater

The WPCF permit requires that UICs more than 5 feet deep must have a minimum vertical separation distance of 10 feet between the UIC and seasonal high groundwater. UICs less than 5 feet deep must have a minimum vertical separation distance of 5 feet. The purpose of the separation distance is so E. coli bacteria can be removed from stormwater by physical processes in the soil before reaching groundwater.

This section describes the process the City used to develop a map showing estimated depth to seasonal high groundwater for areas of the City predominantly served by UICs (east of the Willamette River). It also describes how this process was used to identify UICs in areas of high groundwater that potentially have inadequate vertical separation distance between the bottom of the UIC and groundwater. Information generated by this assessment is preliminary and must be refined before making determinations about compliance with permit requirements. Follow-up actions to refine initial estimates of depth to groundwater and estimated separation distance are discussed in Section 4.6.

4.1 Initial Mapping of Depth to Groundwater

BES used the Portland Water Bureau's Deep Aquifer Yield (DAY) model, in conjunction with additional data from the U.S. Geological Survey (USGS), to develop estimated depth to seasonal high groundwater for the area predominantly served by UICs (east of the Willamette River). That information was submitted to DEQ on April 18, 2003. Appendix A describes the development of this information in detail.

The depth to groundwater information is currently used as part of the rule authorization/registration process for all new and proposed City-owned UIC installations. All new groundwater information developed as part of this Systemwide Assessment will be incorporated into the registration processes following the July 15, 2006 Systemwide Assessment submittal.

4.2 USGS Depth to Groundwater Estimates

The USGS, in cooperation with the City of Portland, City of Gresham, Clackamas County, and Multnomah County, conducted a study to estimate the depth to the water table and seasonal water table fluctuations in the Portland metropolitan area. This section briefly summarizes the methods used in that study. A more detailed explanation of the process is provided in Appendix B. The USGS report that describes the study methods and results is in preparation and has not yet been peer reviewed or approved by USGS for release. The estimates of depth to seasonal high groundwater should therefore be considered preliminary and subject to change.

4.2.1 Baseline Depth to Groundwater Estimates

Baseline estimates of depth to water were prepared using water level data from 660 wells and information from selected surface water features. Water level measurements from 630 of these wells were taken as part of several previous USGS monitoring programs. The remaining 30 wells were newly located and measured by the USGS for this project to provide information in areas of previously limited data. Water table positions were also estimated using selected surface water features that appeared to have a hydraulic connection to groundwater. These surface water features included major springs, wetlands, lakes, streams, and rivers that represent areas of regional groundwater discharge.

The USGS interpolated depth to groundwater through a statistical method called kriging, a type of spatial moving average. Although complex, kriging is generally considered to be the best method available for interpolation. Kriging parameters were carefully selected by USGS and tested to match the data and conditions for the Portland area. The result is a baseline map of estimated depth to water for the Portland area.

4.2.2 Estimates of Seasonal High Water Table

The WPCF permit specifies that required separation distance be estimated relative to seasonal high groundwater levels. For the Portland Basin study, USGS selected wells with 10 or more water level observations to assess the spatial variation of seasonal high water. USGS found this approach to be optimal for ensuring that sufficient observations were used to represent all seasons, and that the observations would generally be uniformly distributed throughout the year. Of the 660 wells, 150 were used to assess variation in seasonal high water. Outlier measurements resulting from pumping influences or from field or data entry errors were removed before analysis.

Mapping of the seasonal water level changes revealed an apparent correlation of the magnitude of the changes with the hydrogeologic unit present at the water table. This suggests the importance of the effective porosity and thickness of the unsaturated zone in controlling available storage and seasonal water level change in areas that generally receive similar quantities of recharge. Seasonal water level variation was assigned to zones, based on the surficial hydrogeologic unit and using the median values of seasonal water level change determined for each hydrogeologic unit. USGS assigned a seasonal variation of approximately 3 feet for most hydrogeologic units.

Depth to seasonal high water was estimated by subtracting the seasonal variation from the baseline depth to water value at each UIC location. For example, if the baseline depth to water level is 20 feet, the depth to seasonal high water is estimated to be approximately 17 feet below ground surface.

4.3 ArcGIS Process for Determining Separation Distance

Using USGS estimates of seasonal high groundwater, the City used the following ArcGIS analysis to identify UICs that may have inadequate vertical separation distance between the

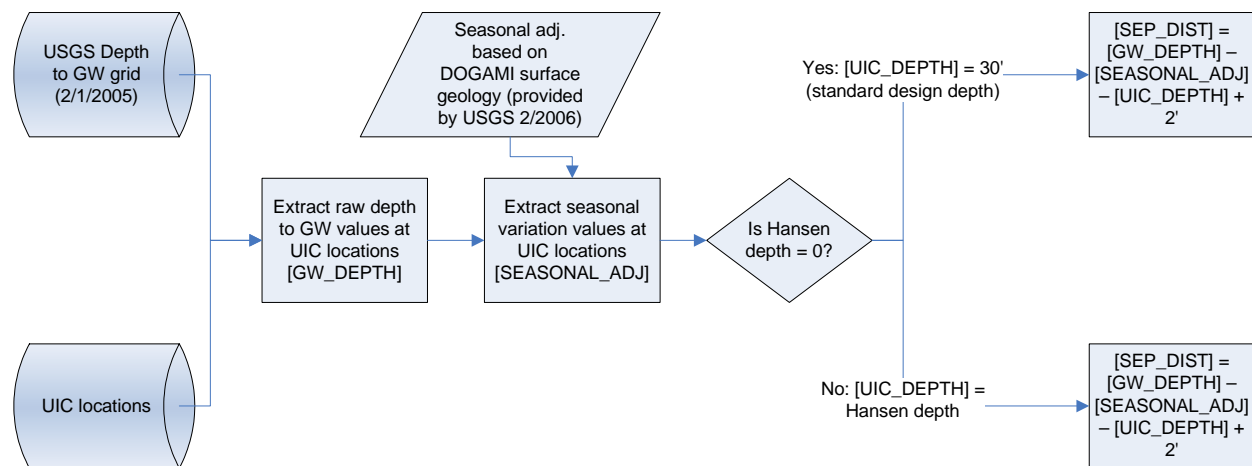
bottom of the UIC and seasonal high groundwater. Analysis of the separation distance is intended to act as an indicator for identifying and prioritizing UICs in areas of high groundwater. Separation distances calculated in this process are based on modeled information and are very preliminary. Information generated in this analysis will be refined before using it for evaluating compliance with permit conditions.

Two data sources were used to calculate separation distance at each UIC location:

- USGS depth to groundwater data: This dataset contains raw depth values from ground surface to groundwater, in feet. This information was obtained as part of the USGS depth to groundwater process described in Section 4.2.1.
- Seasonal high water adjustment data: This dataset contains seasonal groundwater variations, determined by hydrogeologic unit interpreted from surface geology units mapped by the Oregon Department of Geology and Mineral Industries (DOGAMI). A seasonal variability of approximately 3 feet was used, based on the USGS process described in Section 4.2.2.

Figure 4-1 shows the general process used to calculate separation distance. At each UIC location, USGS depth to groundwater and seasonal variation values were calculated from the datasets described above. Each UIC was then evaluated to determine if facility depth information was available in the Hansen database. If UIC depth information was recorded in the Hansen database, separation distance was calculated based on that depth information; if no depth information was recorded in the Hansen database, separation distance was calculated based on the City of Portland standard UIC design depth of 30 feet. Finally, 2 feet were added to all separation distance calculations to account for the standard depth of the sediment trap ring on the City of Portland standard UIC design (per permit schedule F.5.tt).

Figure 4-1
Process Used to Calculate Separation Distance at Each UIC Location



4.4 UICs In Areas of High Groundwater

Using the process described in section 4.3, it was determined that approximately 400 UICs are located in areas of high groundwater and may have inadequate vertical separation distance between the bottom of the UIC and estimated seasonal high groundwater levels. Of these, 94 are based on an assumed depth of 30 feet; these locations do not currently have identified depth information available. Table 4-1 (located at the back of the document) identifies the BES UIC identification, location, estimated vertical separation distance, and locations with assumed depth for the 400 UICs. Map 4-1 (on page 4-5) shows the location of the UICs identified in Table 4-1.

This preliminary identification of UICs in areas of high groundwater is intended to focus additional investigations on a prioritized subset of UICs. Section 4-6 discusses follow-up actions for the UICs identified in Table 4-1.

The Portland Water Bureau operates 20 of the reported UICs (denoted by PWB in the UIC ID column of Table 4-1). These locations are vault drains, aquifer storage and recovery wells, and tank overflows (denoted in the Notes column of Table 4-1). These locations were previously registered with DEQ by the Water Bureau and are being combined with all City-owned UICs under the current permit. Because these locations are associated with the City's potable water supply system, they pose no threat to groundwater and were previously authorized by DEQ for continued use.

The Portland Parks Bureau operates 23 of the reported UICs identified in Table 4-1. These locations predominantly consist of drinking water fountain overflows and drainage from landscaped park areas. Because of the nature of the drainage, these UICs pose limited to no threat to groundwater.

This Systemwide Assessment reports only UICs with estimated inadequate separation distance, as defined in the permit Schedule F(5)(tt). Separation distances for all UICs will be reported in the UIC Registration Database update to be submitted to DEQ September 1, 2006.

4.5 Limitations of Analysis

The analysis and results presented above have the following limitations:

- Separation distance for all UICs is based on modeled depth to groundwater information provided by USGS. Although the USGS information is the best available at this time, it can provide only estimates of seasonal high groundwater. The assumption is that the USGS data are complete.
- All UICs without reported facility depth information in the City's Hansen database are assumed to be 30 feet in depth. This is the standard construction depth for all new UIC systems. Since this is an assumed rather than confirmed depth, the estimated separation needs to be field verified. A workplan and implementation schedule will be submitted to DEQ in December 2006 that will discuss actions the City will take to confirm depth information.

MAP 4-1

(not included in report, see separate .pdf file)

BACK OF MAP 4-1

- UIC depths recorded in the City's Hansen database need to be field verified. A workplan and implementation schedule will be submitted to DEQ in December 2006 that will discuss actions the City will take to confirm depth information.

4.6 Follow-up Actions

The City will submit a workplan and implementation schedule to DEQ in December 2006 that identifies follow-up actions for UICs estimated to have inadequate distance to groundwater. The workplan and implementation schedule will identify actions the City will implement to verify UIC depths, refine depth to groundwater information, and increase separation distance where appropriate.

If any UICs are determined to be non-compliant before December 2006, they will be submitted to DEQ as Category 2 corrective actions in December 2006.

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5 UICs Estimated to be within 500 Feet of a Domestic Use Well or Two-Year Time of Travel of a Public Water Well

Section

5

The WPCF permit requires that UICs that are located less than 500 feet from a domestic well, are within a two-year time of travel of a public water well, or are located less than 500 feet from a public water well without a delineated time of travel must meet water quality requirements specified in the permit. This section describes the process the City used to identify domestic and public water wells and UICs located within 500 feet or a two-year time of travel of those wells. Information generated in this analysis will be paired with information from the Annual UIC Monitoring Program to evaluate compliance with water quality requirements established in the permit for UICs near domestic or public water wells.

Definitions from WPCF permit:

- Domestic well means a water supply well used to serve no more than three residences for the purpose of supplying water for drinking, culinary, or household uses. Domestic wells include irrigation wells because irrigation wells can be used as drinking water supply wells without well modification or notification to the Oregon Water Resources Department, unless the Permittee has adopted an enforceable regulatory mechanism that prevents the use of irrigation wells for domestic or public drinking water supply purposes.
- Public water well means a water supply well serving a public water system. A public water system means a system for the provision of piped water for human consumption, if such system has more than 3 service connections or supplies water to a public or commercial establishment which operates for a total of at least 60 days per year, and which is used by 10 or more individuals per day. Public water system also means a system for the provision to the public of water through constructed conveyances other than pipes to at least 15 service connections or regularly serves at least 25 people per day for at least 60 days per year.

5.1 Initial Well Identification Process

The City initiated an investigation in 2002 to identify domestic and public water wells within the City of Portland. The purpose of the initial investigation was to determine the scope and quality of available well location data sets, as well as to start identifying wells. It involved the following steps:

- Gather available well location data from City of Portland Water Bureau, Oregon Water Resources Department (OWRD), and Oregon Health Department (OHD).
- Use GIS tools to identify all UICs located within 500 feet of any part of identified tax lots having wells.

- Conduct limited field inspections to confirm the location and status of domestic wells.
- Use confirmed well locations relative to UICs as the basis for the rule authorization/ registration processes for all new and proposed City-owned UIC installations.

The information identified through this limited investigation has been the basis for all prior database submittals to DEQ and the U.S. Environmental Protection Agency (EPA). It provided the foundation for the more detailed investigation discussed in section 5.2.

5.2 Updated Investigation of Wells

The City conducted a detailed investigation of domestic and public water wells as part of the Systemwide Assessment. The purpose of this investigation was to develop a comprehensive list of wells located within the City of Portland. The process and resulting dataset are summarized in 5.2.1 through 5.2.4, below.

5.2.1 Identification of Possible Well Locations

A list of potential existing well locations was developed, using available data sources. The following text describes the sources of information used in the investigation.

- *Oregon Water Resources Department (OWRD) Well Logs:* Well logs were obtained from the OWRD web site. Well logs were queried from the site using township, section, range, and boundary criteria for the City of Portland. Well abandonment logs were also reviewed. These were paired up with drilling logs and removed from the list, since only non-abandoned wells were of concern for this investigation.
- *OWRD Water Rights Information:* Water rights information was obtained from the OWRD web site. This information generally had much more detail about well location than the OWRD well logs. However, only large water use wells are required to obtain water rights, so most well logs have no water rights information. Also, a number of wells were found that had water rights information, but no well logs. These well locations were identified as part of the investigation, but have no well log information to connect with.
- *United States Geologic Survey (USGS) Well Location Information:* The USGS conducted an inventory of wells in the Portland area around 1987-90. The City obtained both hard copies and electronic versions of the data. Electronic well locations were converted to GIS locations, yielding relatively precise location information.
- *State of Oregon Department of Health Services (DHS) Drinking Water Program:* The DHS Drinking Water Program web site was used to find public water wells. Operators of public water wells are required to register their wells with DHS. There are a limited number of registered wells in Portland, but most of them had not been identified by other means.

- *Portland Water Bureau Records:* The Water Bureau provided BES with locations of its municipal water wells and a list of SODNR (sewer only do not read) accounts and addresses. The Water Bureau considers the SODNR accounts to reflect residences that have private water wells, but are connected to the sewer system for discharge purposes.
- *City of Portland Source Control Inspections:* Locations of several wells were found through various City inspection processes.

5.2.2 Information Consolidation

Well location information collected from the data sources described in section 5.2.1 was reviewed and sorted to provide a comprehensive consolidated list of possible well locations and to facilitate a field investigation. The following activities were performed to develop the consolidated list of possible well locations:

- All available well logs were reviewed for relevant information, including best probable location, original well owner, well depth, static water level, and relevant well characteristics. Probable well locations were viewed using GIS tools to determine current ownership and the address of the owner.
- Online sources (portlandmaps.com), and online phone book listings (anywho.com) were used to find phone numbers to contact well owners. With subdivisions, it was occasionally beneficial to find out when all of the surrounding homes were built. For example, one probable address led to a recently subdivided area that obviously did not have a well; however, an older home down the street (with a new address) was the original property and did have the well.
- The property was cross-referenced with City records to determine if the property has water and/or sanitary sewer service. If City records do not show a water connection, this indicates that the residents may be using a well. This was used only as an indicator, to be verified by field observations.

5.2.3 Field Verification

A field investigation was conducted to verify the location, ownership, and use of the well locations identified on the consolidated list. The field verification process included the following steps:

- Visit the site location and attempt to meet with the current owner/occupant.
- Complete an inventory checklist with the owner or occupant (whoever can provide the most accurate information).
- Locate, inspect, and photograph the well using aerial photographs, digital cameras, and information on property boundaries.

- Mark the approximate location of the well on an aerial map (for post-field coordinate confirmation).
- Leave an introduction letter, aerial photo, and well questionnaire form with a self-addressed envelope for locations where no one could be contacted at the site.

5.2.4 Systemwide Assessment Dataset

The dataset used for this Systemwide Assessment includes only wells that could be located and confirmed by City staff. Out of a total 558 domestic use and public water well records, the City was able to locate and confirm 323 well locations (224 domestic drinking water and public water wells and 99 irrigation wells) within the City of Portland boundaries. Map 5-1 (on page 5-5) shows the locations of all located wells. The updated information is used in Section 5.5 to identify all UICs estimated to be located within 500 feet of a domestic or public water well. This updated information will be used to evaluate compliance with water quality limits established in the permit and as part of the rule authorization/registration process for all new and proposed City-owned UIC installations.

5.3 Determination of Two-Year Time of Travel Boundaries

This section describes the process the City used to identify two-year time of travel boundaries for public water wells. The following subsections discuss the time of travel boundaries for:

- Powell Valley Water District:
- City Bible College
- Columbia South Shore Wellfield

5.3.1 Powell Valley Water District and City Bible College

The current DHS database provides two-year time of travel boundaries for Powell Valley Water District and City Bible College. For purposes of the Systemwide Assessment, available DHS information was used as followed:

- City Bible College information was used as presented in the DHS database. That boundary is shown on Map 5-1.
- Powell Valley Water District information was revised to include new drinking water wells. The City is currently taking responsibility for the Powell Valley Water District and wells that supply water to the surrounding residences. The two-year time of travel on file with DHS was completed when only two wells were in service. Since then, four new wells have been installed. To account for this change, the Portland Water Bureau has developed a draft two-year time of travel that includes use of all six-production wells. That boundary is shown on Map 5-1.

MAP 5-1

(not included in report, see separate .pdf file)

BACK OF MAP 5-1

5.3.2 Columbia South Shore Well Field

The City does not currently have an identified two-year time of travel for its Columbia South Shore Wellfield. The City implements wellhead protection requirements based on a 30-year time of travel boundary. For purposes of this Systemwide Assessment, the pumping scenarios used to determine the 30-year time of travel boundary were evaluated to estimate two-year time of travel boundaries. The two-year time of travel boundaries were developed for individual wells that, based on identified 30-year time of travel boundaries, might have the potential to intersect a City-owned UIC. Appendix C describes the analysis used to determine the 30-year time of travel boundary and to estimate the two-year time of travel boundaries for the individual wells. The preliminary two-year time of travel boundaries were used in this Systemwide Assessment to evaluate proximity to UICs; however, they are not identified on Map 5-1 because of the preliminary nature of the assessment and because the City of Portland regulates wellhead protection activities relative to the 30-year time of travel boundary. Based on the assessment, no UICs are located within the two-year time of travel boundaries for any Columbia South Shore wells.

The two-year time of travel boundaries for the Columbia South Shore Wellfield will be used as part of the registration procedures for any new and proposed City-owned UIC installations.

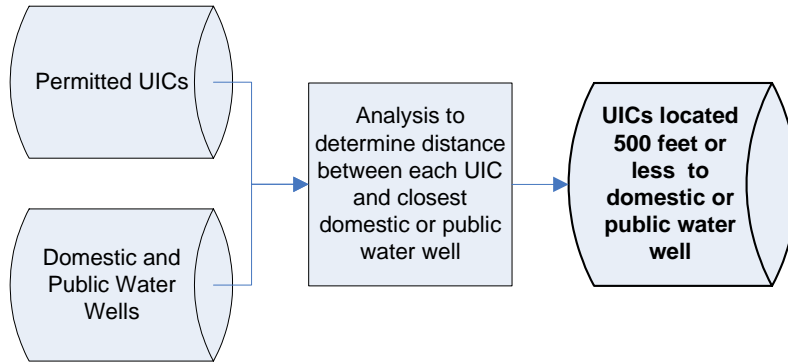
5.4 ArcGIS Process for Determining Distance between UICs and Wells

This section describes the process the City used to identify UICs located less than 500 feet from a domestic well, within a two-year time of travel of a public water well, or less than 500 feet from a public water well without a delineated time of travel. Two primary ArcGIS analyses were used, as discussed below.

5.4.1 UICs within 500 feet of a Well

Figure 5-1 shows the ArcGIS model used to develop a list of UICs located within 500 feet of domestic or public water well. The 500-foot boundary applies to public water wells that do not have a two-year time of travel or the time of travel is less than 500 feet. The wells used in this analysis included those classified as inactive as well as those classified as active.

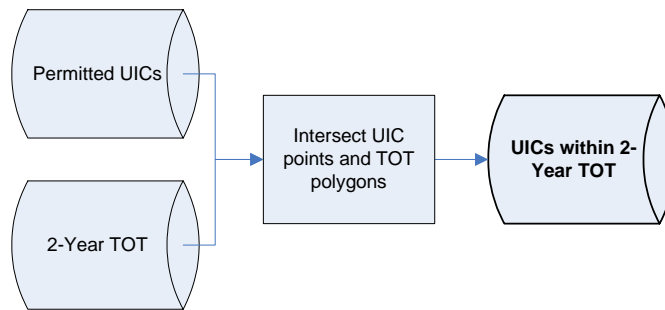
Figure 5-1
Process Used to Determine UICs Located within 500 Feet of a Domestic Well



5.4.2 Two-Year Time of Travel (TOT) Analysis for Public Water Wells

Figure 5-2 shows a simplified overview of the spatial query used to identify UICs that intersect the two-year TOT polygons established for the limited number of public water wells. The polygons are time of travel boundaries that have been reported to DHS for public water wells (i.e., those in the Powell Valley Water District and City Bible College).

Figure 5-2
Process Used to Determine UICs Located within Two-Year TOT Polygons



5.5 UICs within 500 Feet or Two-Year Time of Travel of a Well

Based on the process described in section 5.4, Table 5-1 (located at the back of the document) shows there are 332 UICs within 500 feet or a two-year time of travel of a domestic or public water well. The following is a breakdown of the total UICs:

- 141 UICs are estimated to be within 500 feet of a drinking water well (domestic and public).
- 121 UICs are estimated to be within 500 feet of a domestic use irrigation well.
- 70 UICs are estimated to be within a two-year time of travel boundary, but more than 500 feet from a public water well.

Map 5-2 (on page 5-11) shows the locations of the UICs identified in Table 5-1.

This Systemwide Assessment reports only UICs estimated to be within 500 feet or a two-year time of travel of a well. Using the updated well location information, distances of all UICs from domestic and public wells will be reported in the UIC Registration Database update to be submitted to DEQ September 1, 2006.

5.6 Limitations of Analysis

The analysis and results presented above have the following limitations.

- Datasets discussed in section 5.2.1 were limited by the following issues:
 - Many well logs do not give a street address for the well, but rather have various alternate location formats. An attempt was made to identify a well location or a general area that could be followed up as part of the field survey.
 - Well drillers were not required to complete well logs before 1955, so data before that time are less reliable. For many of the wells dug before 1955, well logs were filled out many years later, so there is less information and often duplication. An attempt was made to identify well locations from the provided information if possible.
 - Some wells included in the USGS information were not found in the OWRD well logs or water rights.
 - Some wells included in the OWRD information were not included in the USGS information.
- Datasets discussed in section 5.2.2 were limited by the following issues:
 - Well location was sometimes difficult to confirm because owner information from the well log was often incorrect, and the property may have been sold or the owner may actually live elsewhere.
 - Address changes and well logs are not updated once the logs have been filed. Therefore, the address on the well log may not exist anymore, limiting the ability to locate the well.
- The spatial analysis conducted in section 5.4 and 5.5 included only wells that could be located and confirmed by City staff.

- Data used for the analysis are based on December 2005 information. Any wells installed or decommissioned since that time were not included in the investigation.
- As with the City's Hansen database, the well log databases used in the Systemwide Assessment contain dynamic information that is constantly changing. The information provided about distance to wells is therefore subject to change at any time.
- Analysis of distances between a well and a UIC were performed with the assumption that all evaluated datasets are complete. Any information not provided in the described datasets was not included in the assessment.

5.7 Follow-up Actions

Annual stormwater monitoring data will be paired with information about UICs estimated to be within 500 feet or a two-year time of travel of a well to evaluate compliance status for these UICs. Follow-up actions and compliance response actions will be developed as appropriate and submitted to DEQ as part of the Annual UIC Management Plan report and/or the December 2006 workplan and implementation schedule discussed in section 1.5.

MAP 5-2

(not included in report, see separate .pdf file)

BACK OF MAP 5-2

6 UICs That May Receive Drainage from SARA Title III Businesses

Section

6

The WPCF permit requires an inventory of all UICs that receive stormwater or other fluids from industrial and commercial properties that store, handle, or use hazardous or toxic materials in quantities requiring registration under the federal Superfund Amendment and Reauthorization Act (SARA) Title III. This section describes the process the City used to identify UICs that may be in this category. It also identifies UICs where follow-up actions are recommended to refine the information generated in this assessment and to minimize the potential for adverse impacts from drainage entering the UICs.

6.1 Identification of SARA Title III Businesses

The Oregon State Fire Marshall (OSFM) maintains a database of all businesses in Oregon that report under SARA Title III. On June 15, 2005, OSFM provided the City a 2005 dataset that identifies SARA Title III businesses located in areas of the City that use UICs for right-of-way drainage (identified by zip code).

The SARA Title III dataset was broken into three groups, based on priority for potential impacts to groundwater. Group 1 businesses were inspected by City staff, and Group 2 businesses were assessed using mail surveys. Gaseous substances were removed from the initial assessment and grouping because they would not impact stormwater or other drainage entering a UIC. This prioritization allowed the City to focus field efforts on locations that pose the greatest potential threat to groundwater.

6.1.1 Group 1 Businesses

This group included all businesses that handle extremely hazardous or toxic materials and were considered to have the greatest likelihood of impacting stormwater or other drainage entering the UIC, resulting in a potential impact to groundwater. It comprised businesses with the following classifications:

- 112r (112r refers to the Clean Air Act, section 112r).
- PSM (Process safety management substances have the potential to pose the greatest hazard to the environment in the event of accidental release).
- EHS (extremely hazardous substances).

Field inspections for Group 1 businesses were conducted to assess the potential for site activities to impact stormwater or other drainage entering UICs. Section 6.2.1 describes the process for conducting field inspections of Group 1 businesses.

6.1.2 Group 2 Businesses

This group comprised all other businesses that report under SARA Title III.

Group 2 businesses were assessed through the use of mailed surveys. Section 6.2.2 describes the process for the mail survey.

6.1.3 Gaseous Substances

Any business that reports under SARA Title III for only gaseous substances was removed from the initial assessment and grouping because gaseous substances would not be expected to impact stormwater or other drainage that may discharge to a UIC.

6.2 Assessment of SARA Title III Businesses

Drainage assessment, field inspections, and mail surveys were used to assess the SARA Title III businesses identified in Section 6.1, as described in the following sections.

6.2.1 Assessment of Group 1 Businesses Using Field Inspections

Step 1: Preliminary Drainage Assessment: A 500-foot buffer was delineated around each Group 1 business (those that handle extremely hazardous or toxic materials) to determine if a UIC could potentially receive stormwater or other drainage from the business. Of this group, 199 businesses were determined to be within 500 feet of a UIC and to have the potential to discharge to the UIC. Appendix D lists these 199 businesses.

Step 2: Refined Drainage Assessment: Additional evaluation was completed for the 199 businesses within 500 feet of a UIC. The purpose of this refined evaluation was to determine if stormwater or other drainage from a business could actually reach a UIC, given the physical characteristics of the site. Information used to make a determination about the potential for drainage from a business to reach a UIC included:

- Topography
- Location of physical barriers (including curbs)
- Layout of impervious and pervious areas
- Location of stormwater and combined system inlets and catch basins

Based on this analysis, it was determined that 78 of the 199 businesses physically could not discharge to nearby UICs. These UICs 78 were eliminated from further evaluation

Step 3: Field Inspections: Five teams of two City staff members performed field inspections of the 121 remaining businesses identified as having the potential to drain to a UIC. Field teams visited each business and collected information necessary to answer two primary questions:

- Does drainage from the identified site discharge to a UIC?
- If so, what is the nature or characteristics of the drainage?

Field inspection results indicated that 43 Group 1 UICs have the potential to receive drainage from 35 business properties. Table 6-1 (at the back of the document) identifies these 43 UICs and the corresponding business names. Map 6-1 (on page 6-5) shows the locations of the 43 UICs identified in Table 6-1.

Table 6-1 also identifies potential issues related to site drainage and notes that the City proposes potential follow-up on 30 of the identified business properties. Follow-up actions are discussed in Section 6.4.

6.2.2 Assessment of Group 2 Businesses Using Mail Surveys

Step 1: Preliminary Drainage Assessment: A 500-foot buffer was also delineated around each Group 2 business (those that do not handle extremely hazardous or toxic materials) to determine if a UIC could potentially receive drainage from the business. Of this group, 242 businesses were determined to be within 500 feet of a UIC and to have the potential to discharge to the UIC.

Step 2: Mail Survey: On April 20, 2006, each of the 242 businesses from Step 1 was sent a mail survey, including a custom aerial map, which asked the site owner/representative to identify surface flow directions and the nature of drainage on the site. Appendix E lists the 242 businesses and whether they responded to the survey. As of June 23, 2006, 120 surveys have been returned and evaluated.

Table 6-2 (located at the back of the document) presents the results of the mail survey, showing the UICs identified as receiving drainage from Group 2 businesses and the corresponding business names. Thirty-five UICs were identified as having the potential to receive drainage from 34 businesses. Map 6-2 (on page 6-7) shows the locations of the 35 UICs identified in Table 6-2.

Table 6-2 also identifies potential issues related to site drainage and notes that the City proposes follow-up actions for 19 of the business locations. Follow-up actions are discussed in Section 6.4.

6.3 Limitations of Analysis

The analysis and results presented above have the following limitations:

- The OSFM database does not contain GIS information. It provides only business names and addresses, which may not be accurate. The process of linking property addresses to mapped information (Geo-coding) is limited to the accuracy of the provided dataset. If business location information cannot be linked to City tax lots or other appropriate information, it is not possible to perform any type of spatial analysis on the data. The result is that there may have been some businesses that were not analyzed and may have been missed as part of the investigation.
- Sites identified as potentially draining to a UIC may have been surveyed during dry weather. All assessments reflect the ability of field staff to determine the direction and nature of the

drainage. This information is intended to direct future efforts, rather than be used as a definitive assessment of site drainage and/or current or past site activities.

- The analysis assumed that the OSFM data represent all potential SARA Title III sites. Any information not contained in the OSFM dataset was not included in the assessment.
- Mailed survey information is only as accurate as the business owner provides. Surveys that were not returned could not be evaluated.

6.4 Follow-up Actions

The City will submit a workplan and implementation schedule to DEQ in December 2006 that identifies follow-up actions to evaluate whether site activities at the 49 businesses (identified in Tables 6-1 and 6-2) may have the potential to impact stormwater or other drainage entering a UIC. The follow-up actions will evaluate potential drainage issues or sources of pollution, verify site activities, verify the drainage catchment of the UIC, and identify actions to minimize the potential impact of site activities.

If any UICs are determined to be non-compliant before December 2006, they will be submitted to DEQ as Category 2 corrective actions in December 2006.

MAP 6-1

(not included in report, see separate .pdf file)

BACK OF MAP 6-1

MAP 6-2

(not included in report, see separate .pdf file)

BACK OF MAP 6-2

7 UICs That May Receive Drainage from Industrial and Commercial Properties with Site Activities That May Result in a Permit Violation

Section

7

The WPCF permit requires an inventory of all UICs that receive drainage from industrial and commercial properties with site activities that may result in a discharge of pollutants to a UIC that may cause a violation of permit conditions. This section describes the process the City used to identify UICs that potentially meet these conditions. It also identifies UICs where follow-up actions are recommended to refine data generated in the Systemwide Assessment and to minimize the potential for adverse impacts from drainage entering the UICs.

7.1 Process for Identifying and Investigating Industrial and Commercial Businesses

7.1.1 Identifying Businesses for Field Assessment

Using a business directory called Directories USA, a division of Info USA, the City accessed standard industrial classification (SIC) codes for 41,802 businesses located within the City. The City then identified the following SIC codes as business types most likely to create site drainage that could potentially contribute to a violation of the water quality requirements established in the WPCF permit:

- 551 Motor Vehicle Dealers
- 552 Used Motor Vehicle Dealers
- 553 Auto & Home Supply Stores
- 554 Gasoline Service Stations
- 556 Recreational Vehicle Dealers
- 557 Motorcycle Dealers
- 559 Automotive Dealers Not Elsewhere Classified (NEC)
- 75 Automotive Repair, Services, and Parking
- 20-38 Division D – Manufacturing
 - 20: Food And Kindred Products
 - 21: Tobacco Products
 - 22: Textile Mill Products
 - 23: Apparel And Other Finished Products Made From Fabrics And Similar Materials
 - 24: Lumber And Wood Products, Except Furniture
 - 25: Furniture And Fixtures
 - 26: Paper And Allied Products
 - 27: Printing, Publishing, And Allied Industries
 - 28: Chemicals And Allied Products
 - 29: Petroleum Refining And Related Industries

- 30: Rubber And Miscellaneous Plastics Products
- 31: Leather And Leather Products
- 32: Stone, Clay, Glass, And Concrete Products
- 33: Primary Metal Industries
- 34: Fabricated Metal Products, Except Machinery And Transportation Equipment
- 35: Industrial And Commercial Machinery And Computer Equipment
- 36: Electronic And Other Electrical Equipment And Components, Except Computer Equipment
- 37: Transportation Equipment
- 38: Measuring, Analyzing, And Controlling Instruments; Photographic, Medical And Optical Goods; Watches And Clocks

A total of 4,050 businesses with the above SIC codes were identified. Addresses of identified businesses were mapped (geo-coded) to tax lots or street addresses if possible. Limitations with the mapping process are discussed in section 7.3. Mapped locations were then evaluated as to whether they were located within 500 feet of a UIC and whether the location had already been inspected as part of the SARA Title III investigation (see Section 6 above). Following this process, 1,017 businesses were identified for a field assessment. Appendix F lists these 1,017 businesses.

7.1.2 Field Assessment

The field assessment of 1,017 businesses was performed to determine the following information:

- If stormwater drainage from a business could actually reach a UIC.
- If site activities at a business that drains to a UIC have the potential to violate water quality limits established in the permit.

Field assessments included windshield assessment and on-the ground observations of the following characteristics:

- Topography
- Location of physical barriers (including curbs)
- Layout of impervious and pervious areas
- Location of stormwater and combined system inlets and catch basins
- Site activities conducted within areas that may drain to a UIC

7.2 UICs That May Receive Drainage from Industrial and Commercial Businesses

Table 7-1 (located in the back of the document) shows that of the 1,017 businesses assessed, 138 businesses have site activities that may impact drainage to 147 UICs. The table identifies each UIC, the business that may drain to it, and the site activities that may impact the offsite drainage. Follow-up actions are proposed for all 138 identified businesses properties, as discussed in Section 7-4. Map 7-1 (on page 7-5) shows the locations of the 147 UICs.

7.3 Limitations of Analysis

The analysis described above has the following limitations:

- The Directories USA database contains only business names and addresses, which may not be accurate. The process of determining specific locations (geo-coding) is limited to the accuracy of the provided dataset. If business location information cannot be linked to City tax lots or other appropriate information, it is not possible to conduct spatial analysis.
- The analysis assumed that the Directories USA data are complete. Any information not provided by Directories USA was not included in the assessment.
- The analysis is limited to the identified SIC codes.
- Sites identified as potentially draining to a UIC may have been surveyed during dry weather. All assessments reflect the ability of field staff to determine the direction and nature of the drainage. This information is intended to direct future efforts, rather than be used as a definitive assessment of site drainage and/or current or past site activities.

7.4 Follow-up Actions

The City will submit a workplan and implementation schedule to DEQ in December 2006 that identifies follow-up actions to evaluate whether site activities at the 138 businesses (identified in Table 7-1) may have potential to impact stormwater or other drainage entering a UIC. The follow-up actions will evaluate potential drainage issues or sources of pollution, verify site activities, verify the drainage catchment of the UIC, and identify actions to minimize the potential impact of site activities.

If any UICs are determined to be non-compliant before December 2006, they will be submitted to DEQ as Category 2 corrective actions in December 2006.

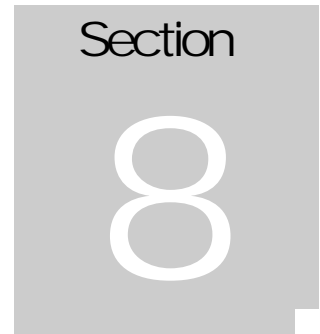
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MAP 7-1

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8 UICS That May Receive Drainage from Motor Vehicle Maintenance Floor Drains, Fire Station Bay Drains, Indoor Parking Facilities, or 1200-Z Permitted Facilities



The WPCF permit requires an inventory of UICs that may receive drainage from motor vehicle maintenance floor drains, fire station bay drains, indoor parking facilities, or 1200-Z permitted facilities. This section describes the process the City used to identify these facilities. It also identifies one UIC where follow-up actions are recommended to refine data generated in the Systemwide Assessment and to minimize the potential for adverse impacts from drainage entering the UIC.

8.1 Motor Vehicle Maintenance Floor Drain Investigation

The City does not currently have any motor vehicle maintenance floor drains that discharge to a UIC. The Pollution Prevention Outreach Team (P2O), described below, has certified the condition of all internal drains of this type for groundwater protection.

The P2O Team is a coalition of government agencies with environmental management responsibilities within the Portland metropolitan area that have banded together to coordinate pollution prevention efforts. P2O Team members include staff from the City of Gresham, City of Portland, Clackamas County, Clean Water Services, Metro, DEQ, City of Troutdale, and Washington County.

The P2O Team’s mission is “to provide coordinated educational messages and technical assistance in pollution prevention to citizens and businesses.” The P2O Team has been meeting since 1992 to provide a forum for environmental staff to network, exchange information, develop programs, and work together to resolve issues.

The P2O Team sponsors the Eco-Logical Business Program, which certifies businesses that operate environmentally responsible business practices. Under the Eco-Logical Business Program, the P2O Team developed the Automotive Ecological Certification Program in 1997. Automotive maintenance and repair facilities were selected because they use hazardous materials, generate hazardous waste, and are typically not regulated or inspected by DEQ or other local, regional, or state agencies. To date, 39 shops in the greater Portland area have been certified under the program.

One of the program requirements is that all certified facilities must identify the discharge location of all internal and external drains and catch basins. All internal drains within the shop work areas, with the exception of approved wash areas going to the sanitary sewer system, must be sealed. All UICs must be identified, registered, and, if necessary, decommissioned. When the City of Portland certified all eight of its automotive maintenance and repair shops in

2000/2001, it determined that no UICs were present at any of the facilities, all internal drains had been sealed, and all catch basins were connected to either the municipal separate storm sewer system (MS4) or the combined sanitary sewer system. When the shops were recertified in 2003-2004, it was again verified that all internal drains were still sealed. The City will recertify its repair and maintenance shops again in 2008-2009.

8.2 Fire Station Bay Drain Investigation

BES worked with the City of Portland Fire Bureau in 2005/06 to identify and evaluate all City fire station bay drains and their discharge points. The City currently operates 30 fire stations and an additional six training and administration buildings. The inventory of these buildings was conducted in two phases:

- In phase one, all current and historical Fire Bureau building plans on file with the City were collected and reviewed. Information was gathered from paper copy and microfiche documents on file with the Bureau of Development Services and the Fire Bureau logistics division.
- In phase two, site visits of all Fire Bureau buildings were conducted to confirm identified building plan information. Any bay drains that discharged to a UIC or the subsurface were identified and confirmed, and location coordinates were collected.

The inventory identified one City fire station bay drain that discharges to a UIC. This UIC may receive drainage when rainwater runs off the vehicles, but it does not receive discharge from washing or maintenance activities. Table 8-1 (located at the back of the document) and Map 8-1 (on page 8-3) show the location of the identified bay drain. Follow-up actions for this location are discussed in Section 8.5.

All other fire station bay drains currently discharge to the City sanitary sewer system or combined sewer system.

8.3 Indoor Parking Garage Investigation

BES worked with the Bureau of General Services (BGS) in 2006 to identify and evaluate all indoor parking garages owned by the City. The City currently operates seven indoor parking garages. Assessment of these facilities was conducted in two phases:

- In phase one, all current and historical building plans on file with the City were collected and reviewed. Information was gathered from paper copy and microfiche documents on file with the Bureau of Development Services.
- In phase two, site visits of the parking facilities were conducted to confirm identified building plan information.

The inventory identified no UICs that drain indoor parking garages owned or operated by the City. All indoor parking garage locations discharge to the City sanitary sewer system or combined sewer system.

MAP 8-1

(not included in report, see separate .pdf file)

BACK OF MAP 8-1

8.4 NPDES 1200-Z Permits

All of the businesses in the City that have a 1200-Z permit were evaluated by the City's industrial stormwater permitting group. All of these businesses are in areas of the City that are served by separated storm sewers and do not discharge to any City-owned UICs.

8.5 Follow-up Actions

The City will submit a workplan and implementation schedule to DEQ in December 2006 that identifies follow-up for the fire station bay drain identified in Section 8.2. The follow-up actions will verify site activities, evaluate potential drainage issues or sources of pollution, verify the drainage catchment of the UIC, and identify actions to minimize or eliminate the potential for site activities to impact drainage entering the UIC.

If any UICs are determined to be non-compliant before December 2006, they will be submitted to DEQ as Category 2 corrective actions in December 2006.

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