Oregon
Kate Brown, Governor

Department of Environmental Quality
Northwest Region Office
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May 19, 2015

Barb Adkins
City of Portland
1120 SW 5th Avenue, Room 1000
Portland, Oregon 97204

Re:	Water Pollution Control Facilities Permit Issuance
File #:	111885
Permit #:	102830
Site:	City of Portland
County:	Multnomah

Dear Barb,

We have completed our review of your permit application and have issued the enclosed Water Pollution Control Facilities permit.

This permit will be considered the final action on permit application number **959173**.

If you are dissatisfied with the conditions or limitations of this permit, you have 20 days to request a hearing before the Environmental Quality Commission or its authorized representative. Any such request shall be made in writing to the Director and shall clearly state the grounds for the request.

You are urged to carefully read the permit and take all possible steps to comply with conditions established. Should you have any questions regarding this permit, please contact Matt Kohlbecker, Underground Injection Control Senior Hydrogeolgist, at (503) 229-6371.

Sincerely,

Matthew Kohlbecker
UIC Senior Hydrogeologist
Northwest Region DEQ

Enclosures:
WPCF Permit, Evaluation Report

Ecc: Joel Bowker / City of Portland BES

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

Department of Environmental Quality

2020 SW Fourth Avenue, Suite 150, Portland, OR 97201
(503) 229-5263

Issued pursuant to ORS 468B.195 and 40 CFR Parts 144, 145 and 146, implementing the Federal Safe Drinking Water Act requirements for Underground Injection Control.

ISSUED TO:
City of Portland
1120 SW 5th Avenue, Room 1000
Portland, Oregon 97204

SOURCES COVERED BY THIS PERMIT:
Type of Waste: Stormwater & Incidental Fluids
Outfall: Individual Injection Systems
Method of Disposal: Class V Underground Injection Systems

SYSTEM TYPE:
Class V Underground Injection Control Systems

SYSTEM LOCATIONS:
Multiple locations within the City of Portland

Waters of the State: Groundwater

Effective Permit Issuance Date: May 19, 2015
Permit Expiration Date: April 30, 2025
Permit Number: WPCF-DOM-UIC-102830
DEQ File Number: 111885

This permit is issued based on the Land Use Compatibility Statement in the permit record.

Matthew Kohlbecker, RG
Senior UIC Hydrogeologist

5/19/15
Date

Christine Svetkovich
Water Quality Manager

05.19.15
Date

DEFINITIONS

1. *We* or *us* means the Oregon Department of Environmental Quality (DEQ).
2. *You* means the City of Portland.
3. *Groundwater protectiveness demonstration* and *demonstrate that groundwater is protected* mean that you have modeled or otherwise scientifically shown that the discharge will not cause or contribute (a) to a violation of an applicable maximum contaminant level under 40 CFR part 141 or of a groundwater quality reference or guideline level under OAR chapter 340, division 040, at a well that is or could be used for drinking water or (b) to any other reduction in the quality of water withdrawn from a well that makes the water no longer suitable for drinking, irrigation, or other beneficial uses that are made of the water. Protectiveness demonstrations include but are not limited to modeling pollutant fate and transport; showing that an Underground Injection Control (UIC) discharge will not be captured by a water well due to geologic, hydrogeologic, or hydraulic considerations; or showing that a well is not used and will not be used in the future as a source of drinking water.
4. *Endangerment of health or the environment* means that discharge to an underground injection system is reasonably likely to lead to pollutant concentrations at a point of groundwater use that (a) violate an applicable maximum contaminant level under 40 CFR part 141, or (b) exceed a groundwater quality reference or guideline level under OAR chapter 340, division 040, or (c) otherwise harm the beneficial use of groundwater. An exceedance of a discharge action level does not in itself constitute an endangerment of health or the environment.
5. *Retrofitting* means physically modifying an existing UIC. Examples of retrofits include backfilling to increase the vertical separation distance between the bottom of the UIC and seasonal high groundwater, or implementing a variety of passive, structural, and/or technological controls to reduce or eliminate pollutants to the UIC.
6. *Definitions* of 40 Code of Federal Regulations (CFR) part 144.3 and Oregon Administrative Rules (OAR) 340 Divisions 040, 044, and 045 apply to this permit unless the definitions are inconsistent with the provisions of the permit.

PERMITTED ACTIVITIES

The permittee owns or operates UICs to manage stormwater. These injection systems are individual point sources that discharge stormwater and other incidental fluids below the ground surface.

As provided under federal law, this is an *area permit*, which means it covers all permittee-owned or permittee-operated injection systems for stormwater and incidental fluids, including UICs that are used for potable water discharges and Aquifer Storage and Recovery injection, located at multiple locations within the City of Portland's urban growth boundary. Until we modify or revoke this permit, or until it expires, we authorize you to construct, install, modify, operate, or close (decommission) injection systems in accordance with this permit. We also authorize you to discharge stormwater or other fluids specifically identified in this permit into injection systems that are under your ownership or operation, or that you will construct, or that will be transferred to your ownership or operation while the permit is in effect, provided you conform to the requirements, limitations, and conditions described in the following schedules:

Any other direct or indirect discharge of waste to waters of the state or to an underground injection system is prohibited, unless specifically authorized by this permit; by another DEQ permit, agreement, authorization, or order; or by Oregon state or administrative rule.

SCHEDULE A
CONTROL AND LIMITATION CONDITIONS

1. **Authorized Discharges.** You may discharge stormwater into your injection systems in accordance with the conditions of this permit. With the exception of Aquifer Storage and Recovery UICs, you may also discharge the incidental non-stormwater fluids listed below into your injection systems. Aquifer Storage and Recovery UICs may only receive discharges from 'w' listed below. We may approve other similar temporary discharges after we've issued the permit, provided the permittee shows us in writing that the discharge is *de minimis* and complies with OAR 340-040-0020(3), and the permittee obtains written approval from us prior to discharge. If any of these non-stormwater discharges cause or contribute to an exceedance of the action levels in Table 1, you must reduce or eliminate the discharge of pollutants associated with the source.

a. Water line flushing (with the exception of super-chlorinated discharges);
b. Landscape irrigation;
c. Uncontaminated groundwater infiltration;
d. Uncontaminated pumped groundwater;
e. Discharges from potable water sources;
f. Water from potable groundwater monitoring wells;
g. Draining and flushing of municipal potable water storage reservoirs;
h. Foundation drains;
i. Air conditioning condensate;
j. Springs;
k. Water from crawl space pumps;
l. Footing drains;
m. Lawn watering;
n. Individual residential car washing;
o. Charity car washing;
p. Vehicle washing provided that chemicals, soaps, detergents, steam or heated water are not used, and washing is restricted to the outside of the vehicle (no engines, transmissions or undercarriages);
q. De-chlorinated swimming pool and fountain discharges;
r. Street wash water, provided that chemicals, soaps, detergents, steam or heated water are not used;
s. Routine external building wash-down and pavement wash waters provided that chemicals, soaps, detergents, steam or heated water are not used;
t. Discharges or flows from emergency fire-fighting activities provided you take precautions, to the extent practicable, to protect injection systems during emergency fire-fighting activities. Wash down of spills into any underground injection system is prohibited;
u. Discharges of treated water from investigation, removal, and remedial actions selected or approved by DEQ pursuant to Oregon Revised Statutes (ORS) Chapter 465 (Hazardous Waste and Hazardous Materials);
v. Start-up flushing of groundwater wells;
w. Aquifer recharge with potable water from the Bull Run reservoir that has been approved by the Water Resources Department;
x. Other similar temporary discharges of uncontaminated water.

2. **Action Levels.** We have established action levels for pollutants in Table 1. The action levels are guideline concentrations, not limitations; an action level exceedance, therefore, is not a permit violation. The exceedance of an action level, however, may require corrective action in accordance with Schedule A, conditions 5 and 6. The action levels apply at the point of discharge into the underground injection system. You may request changes to these action levels at any time during the permit period, especially if they change based on a groundwater protectiveness demonstration. After two years of monitoring and a minimum of twelve samples, you may request in writing to DEQ that monitoring of specific pollutants be reduced or eliminated based on monitoring results. You must incorporate approved changes into your Underground Injection Control System Management Plan or Stormwater Monitoring Plan, as appropriate.

TABLE 1 – Action Levels for Pollutants

Monitoring Parameter	Action Level at Injection Point (µg/L)
Benzo(a)pyrene	2
Pentachlorophenol	10
Di(2-ethylhexyl)phthalate	300
Lead (Total)	500
Zinc (Total)	50,000
Copper (Total)	1,300

3. **Table 1 Action Level Exceedance.** When stormwater concentrations exceed a Table 1 pollutant action level, you must take corrective action with respect to the UIC(s) that exceeded the action level as described in Schedule A, condition 6.

4. **Spills.** Spills that impact UICs are subject to the oil and hazardous material emergency response requirements of OAR 340-142. As the UIC owner, you must:
   a. Take spill response measures in accordance with your Underground Injection Control Management Plan; and
   b. Take corrective action in accordance with Schedule A, condition 5.

5. **Imminent endangerment of human health or the environment.** If discharges from one or more UICs endanger human health or the environment, you must:
   a. Inform us consistent with Schedule F, condition 4(f), and
   b. Take corrective action to eliminate any endangerment of human health or the environment. You must complete all corrective actions as soon as practicable, with DEQ approval of work scope and schedule. You must submit updates regarding progress to us at least annually, and you may include them in annual reports required under Schedule B, condition 5.

6. **Corrective Action.** Corrective action in response to discharges that endanger human health or the environment must be completed according to Schedule A, condition 5. Corrective action also includes the additional actions identified in 6(a) through 6(b), and one or more of the actions identified in conditions 6(c) through 6(g) as required to protect groundwater or to demonstrate that it is already protected:
   a. Attempt to identify the source(s) of an exceedance of Table 1 action levels;
   b. When source identification efforts are complete, determine the set of UICs affected, based on the identified source(s) or other factors;
   c. Assess whether best management practices need adjustment to eliminate or reduce influent concentrations and make appropriate, practicable changes;
   d. Resample discharge to UIC(s) that had exceedances of Table 1 action levels and calculate a geometric mean that verifies or invalidates the original influent concentration;

e. Demonstrate that groundwater is protected through modeling or other approved approach;
f. Retrofit the affected UIC(s) so that groundwater is protected;
g. Decommission the UIC(s).

7. **Site Control Measures and Best Management Practices.** You must implement and maintain site control measures and structural and operational best management practices to reduce or eliminate pollutants, in accordance with the DEQ-approved Underground Injection Control System Management Plan described in Schedule D, condition 5.

8. **Underground Injection Systems - Horizontal Setbacks.** All stormwater injection systems are subject to the following horizontal setback requirements.
   a. **No Further Action.** You do not need to take further action for stormwater injection systems that are:
      i. Outside the two-year Time-of-Travel for public water wells, if one has been determined by the Oregon Health Authority, or
      ii. More than 500 feet away from a known public or private drinking water or irrigation water supply well, if the Oregon Health Authority has not designated a two-year Time-of-Travel.
   b. **Existing Systems within Horizontal Setbacks**. It is not a permit violation for existing stormwater injection systems not to meet the horizontal setbacks described above. However, for each existing stormwater injection system that does not have the horizontal setbacks described above, you must provide a protectiveness demonstration within one year of discovery. If protectiveness cannot be demonstrated for a stormwater UIC, you must complete the following as soon as practicable during the ten-year term of this permit with DEQ approval of a work plan and schedule:
      i. Retrofit the affected stormwater UIC(s) so that groundwater is protected; or
      ii. Close the underground injection system(s).
   c. **New Systems within Horizontal Setbacks**. You may construct and operate new stormwater injection systems inside a horizontal setback if you are able to provide a groundwater protectiveness demonstration for the new injection system, or implement a variety of passive, structural, and/or technological controls to reduce or eliminate pollutants to the new underground injection system(s).

SCHEDULE B
MONITORING AND REPORTING CONDITIONS

1. **System-Wide Assessment.** We have approved your March 24, 2015, System-Wide Assessment of injection systems you own or operate in conjunction with the issuance of this permit. By the end of the fifth year of the permit term, you must update the System-Wide Assessment to reflect any changes that have occurred and submit a revised System-Wide Assessment to us. If no significant changes have occurred over the previous five years, you may include the fifth year System-Wide Assessment in the annual Underground Injection Control System Report described in Schedule B, condition 5. The System-Wide Assessment must include:
   a. An updated inventory of all injection systems that receive stormwater or other fluids and their locations by latitude and longitude in decimal degrees using the NAD 83 datum. If a different datum becomes the standard during the permit term, update the underground injection system inventory using the new datum at the five year review;
   b. An estimate of vehicle trips per day for the area(s) drained by the injection systems;
   c. An inventory of all stormwater injection systems that discharge directly into groundwater;
   d. An inventory of all stormwater injection systems that are known by the permittee to not meet the setback distances listed in Schedule A, condition 8;

e. An inventory of city-owned and operated injection systems that are prohibited by OAR 340-044-0015(2), which includes injection systems in vehicle maintenance areas, fuel dispensing areas, floor pits, non-vehicle maintenance facilities' floor drains, and fire station bay floor drains. For these prohibited systems, you also must report and take corrective actions as described in Schedule A, conditions 5 and 6;
f. An inventory of all industrial facilities and commercial properties that pose a risk of pollutant discharge to injection systems that you own or operate.

2. **Stormwater Monitoring Plan.** We have approved your March 24, 2015, Stormwater Monitoring Plan of injection systems you own or operate in conjunction with the issuance of this permit. You must implement your Stormwater Monitoring Plan within 180 days of issuance of this permit, and comply with the plan requirements. You must submit any proposed revisions to the plan to us, and we must approve the revisions before you may implement them. The Stormwater Monitoring Plan must be updated by the end of the fifth year of the permit term. The revised Stormwater Monitoring Plan must incorporate changes to monitoring related to the evaluation of emerging pollutant types that is required by Schedule D, condition 6, and site-specific information collected during the first five years of the permit consistent with revisions to the fifth-year update to the System-Wide Assessment described in Schedule B, condition 1.

3. **Stormwater Sampling Waiver.** Circumstances may occur that are beyond reasonable control of the permittee to collect the stormwater samples in the Stormwater Monitoring Plan. Circumstances beyond the permittee's reasonable control include:
   a. An insufficient number of storm events during normal working hours,
   b. Weather conditions that make the collection or analyses of the samples unsafe or impracticable,
   c. Unavoidable equipment failure, or
   d. Other conditions as determined by us to be beyond the reasonable control of the permittee.

4. **Groundwater Monitoring.** If you cannot meet the action levels established in Schedule A, Table 1, or other information indicates that your injection systems may be adversely impacting groundwater quality, we may require you to monitor groundwater or take additional actions in accordance with OAR 340-040-0030 or both. Prior to completing such monitoring, you may apply for a concentration limit variance as provided in OAR 340-040-0030. If we grant a concentration limit variance, the action levels established in Schedule A, Table 1 may be revised, as appropriate.

5. **Annual Reporting.** The annual reporting period shall be July 1 to June 30 of the following year. By November 1 of each year, starting in 2016, you must submit an annual Underground Injection Control System Report. Unless we approve otherwise, the annual Underground Injection Control System Report must:
   a. Include the results of your stormwater monitoring conducted in accordance with your Stormwater Monitoring Plan. This must include a spreadsheet of all data from sampled UICs provided in the analytical laboratory reports. In the annual report for the fourth year of the permit (submitted November 1, 2019), you must include the evaluation of emerging pollutant types required by Schedule D, condition 6;
   b. Discuss any Schedule A, Table 1 action level exceedances and actions taken to address the exceedances;
   c. Describe any actions taken to implement the Underground Injection Control System Management Plan required in Schedule D, condition 5, any proposed modifications to the Underground Injection Control System Management Plan, and any additional actions taken to manage your injection systems to ensure groundwater protection;
   d. Describe any actions in your Underground Injection Control System Management Plan or Stormwater Management Plan that you were not able to complete and why;
   e. Identify any injection systems that you closed, retrofitted, or installed during the year;

f. Describe your future (in the next year) known plans to install, modify, convert, or close any underground injection system;
g. Identify any changes to the key personnel or areas of responsibility for the permit;
h. Identify any newly-discovered underground injection control system; and
i. Provide one hard copy and one electronic copy of the annual Underground Injection Control System Report. Copies of laboratory results do not need to be submitted with the annual Underground Injection Control System Report; however, you must retain copies of analytical laboratory reports as described in Schedule F, condition 3.

6. **Decommissioning an Underground Injection System.** You must provide prior notice of decommissioning any underground injection system you own or operate, including UICs that are converted or closed. Either you may notify us in advance by listing future decommissioning plans in your annual Underground Injection Control System Report as in Schedule B, condition 5, or you may notify us in accordance with OAR 340-044-0040.

7. **Summary of Submittals & Notifications.** A summary of the submittals and notifications required under the permit is provided in Table 2.

TABLE 2 – SUMMARY OF SUBMITTALS

Submittal/Notification	Permit Reference	Submittal/Notification Requirement	Estimated Date(s)
Progress Report for Corrective Actions	A.5.b	Annually	November 2016, November 2017, November 2018…
Revised System-Wide Assessment	B.1	End of 5th year of permit term	May 2020
Revised Stormwater Monitoring Plan	B.2	End of 5th year of permit term	May 2020
Emerging Pollutant Types and Concentrations Evaluation	B.5 & D.6	Year 4 Annual Report	November 2019
Annual UIC System Report	B.5	Annually	November 2016, November 2017, November 2018…
Permit noncompliance that endangers human health or the environment	F.4.f	Within 24 hours (oral) and five days (written)	N/A
Corrective actions for prohibited UICs	D.3	Within 24 hours (oral) and five days (written)	N/A
Permit Re-application	F.1.d	No later than 60 days before permit expiration	March 31, 2025

SCHEDULE C
SAFE DRINKING WATER ACT COMPLIANCE SCHEDULE

This permit does not require a Safe Drinking Water Act compliance schedule (see 40 CFR 144.53) because you do not own any injection systems known to violate the Safe Drinking Water Act, state or federal underground injection control rules or regulations, or state groundwater quality protection rules.

SCHEDULE D
SPECIAL CONDITIONS

1. **Legal Authority**. You must maintain, through ordinance or other means, adequate legal authority to implement and enforce the provisions of this permit. At a minimum, the legal authority must enable you to:
   a. Implement the DEQ-approved Stormwater Monitoring Plan and Underground Injection Control System Management Plan required in Schedule B, condition 2 and Schedule D, condition 5, respectively;
   b. Prohibit discharge to an underground injection system that may cause a violation of the conditions of this permit from publicly or privately owned properties; and
   c. Carry out all inspections, surveillance, and monitoring procedures necessary to determine compliance and noncompliance with the conditions of this permit.

2. **Permittee Personnel Responsible for Permit.** You must identify the key personnel positions and contact information responsible for establishing and maintaining compliance with all conditions of the permit. Contact information includes the employee's name, phone number, business section where the employee works, and the employee's area of responsibility for the permit. You must notify us in writing of any changes to the key personnel or areas of responsibility for the permit in the annual Underground Injection Control System Report required under Schedule B, condition 5.

3. **Reporting and Corrective Actions for Underground Injection Systems Prohibited by OAR 340-044-0015**. Within 24 hours of discovery, you must orally or in writing provide DEQ with any information you have about prohibited underground injection systems that you own. You must submit a written report within five working days of discovery and take the following actions unless otherwise approved by DEQ:
   a. To the extent practicable, you must temporarily divert the discharge away from the UIC within five days of discovering the UIC.
   b. You must permanently close the prohibited injection systems as soon as practicable, with DEQ approval of work scope and schedule.

4. **Underground Injection Systems Discovered After the Permit is Issued.** For any underground injection system you discover or identify after the permit is issued, you must:
   a. Submit the necessary information to us, either with the updated System-Wide Assessment or the next annual Underground Injection Control System Report, whichever is submitted first, so that we may add the underground injection system to our underground injection system database;
   b. Include the underground injection system in the first annual Underground Injection Control System Report after you discover or identify it; and
   c. Ensure that the newly identified injection system is represented by either the current DEQ-approved Stormwater Monitoring Plan, or by a revised Stormwater Monitoring Plan that is implemented for the annual monitoring period following discovery of the injection system.

5. **Underground Injection Control System Management Plan.** We have approved your March 24, 2015, Underground Injection Control System Management Plan of injection systems you own or operate, in conjunction with the issuance of this permit. You must implement the management plan and any update that we approve. Any proposed revision to the management plan must include an updated description, as applicable, of how the elements listed below will be implemented in order to protect groundwater quality:
   a. Stormwater Monitoring Plan, described in Schedule B, condition 2, including how you will use stormwater monitoring results to ensure compliance with the action levels in Schedule A, Table 1;
   b. Injection system decommissioning;
   c. Employee education and public outreach;
   d. Injection system operation, maintenance, and inspection protocols;

e. Protecting injection systems from accidental spills or illicit disposal of wastes or contaminants;
f. Preventing injection of stormwater from refueling areas, areas of hazardous and toxic material storage or handling, materials storage or handling areas, or other discharges that may contain pollutants above levels of concern;
g. Housekeeping practices to protect groundwater quality; and
h. Facility designs or practices that allow you to block discharge into your underground injection systems in the event of an accident, spill, or emergency fire-fighting activity.

6. **Adaptive Management**. You must follow an adaptive management approach to assess annually, and modify as necessary, any or all existing Underground Injection Control System Management Plan components, to ensure the program is efficient and effective. You must at least annually assess the need to further improve groundwater quality and protect groundwater beneficial uses, review available technologies and practices, review monitoring data and analyses as required in Schedule B, and evaluate resources available to implement the program. You must evaluate trends in emerging pollutant types and concentrations in the fourth year annual report (submitted November 1, 2019) and for the permit renewal application. Your evaluation must address the implications of any significant findings for protection of beneficial uses and for the application of best management practices.

7. **Rule Authorization.** This permit covers all UICs owned or operated by the permittee, including those that have been previously rule authorized.

8. **Permit Shield.** Compliance with this permit constitutes compliance, for purposes of enforcement, with the UIC provisions of the federal Safe Drinking Water Act, implementing federal regulations, and OAR chapter 340, divisions 040 and 044. This provision, however, does not preclude modification, revocation and reissuance, or termination of this permit as authorized by applicable federal and state law.

SCHEDULE E
PRETREATMENT CONDITIONS

Not applicable to this permit

SCHEDULE F
GENERAL CONDITIONS

1. **Standard Conditions.**
   a. **Duty to Comply.** You must comply with all conditions of this permit. Any permit noncompliance is grounds for enforcement action. It is also grounds for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application; except that you need not comply with the provisions of this permit to the extent and for the duration such noncompliance is authorized in an emergency permit under 40 CFR 144.34.
   b. **Penalties for Violations of Permit Conditions.** ORS 468.140 allows us to impose civil penalties up to $25,000 per day for each violation of a term, condition, or requirement of a permit. ORS 468.943 creates the criminal offense of unlawful water pollution in the second degree, for the criminally negligent violation of ORS chapter 468B or any rule, standard, license, permit or order adopted or issued under ORS chapter 468B. In some situations, violations of a term, condition or requirement of the permit may also be a criminal offense, specifically unlawful water pollution in the first degree (a felony) or unlawful water pollution in the second degree (a misdemeanor). [ORS 468.943 and ORS 468.946].

c. **Duty to Mitigate.** You must take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this permit. You must take all reasonable steps to minimize or prevent any discharge in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment. In addition, you must correct any adverse impact on the environment or human health or safety resulting from noncompliance with this permit, including such accelerated or additional monitoring as necessary to determine the nature and impact of the non-complying discharge.

d. **Duty to Reapply.** If you wish to continue an activity regulated by this permit after the expiration date of this permit, you must apply for and obtain a new permit. In accordance with OAR 340-045-0040(1), you must submit the application at least 60 days before the expiration date of this permit. We may grant you permission to submit an application less than 60 days in advance of the permit expiration date. We will not grant permission for a renewal application that you submit later than the expiration date of the existing permit.

e. **Permit Actions.**
   i. We may modify, revoke and reissue, or terminate this permit for cause including, but not limited to, the following:
      (1) Violation. The violation of any term, condition, or requirement of this permit, or a related state rule or statute, or a federal regulation related to underground injection control for injection wells;
      (2) Misrepresentation. Obtaining this permit by misrepresentation or failure to disclose fully all material facts; or
      (3) Change of condition. A change of any condition that requires either a temporary or permanent reduction or elimination of the authorized discharge.
   ii. You may request a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance, but this request does not stay the effectiveness of any permit condition.

f. **Property Rights.** The issuance of this permit does not convey any property rights of any sort or any exclusive privileges.

g. **Permit Reference.** All rules and statutes referred to in this permit are those in effect on the date we issue this permit, or the date we modify the permit to incorporate new provisions as provided in OAR 340-045-0055, whichever occurs later.

h. **Penalties for False Information.** Under ORS 486.953, any person who supplies false information to us commits a Class C felony. Under OAR 340-012-0053(1)(b), providing us with false information is a Class 1 civil violation. Providing us with false information includes the following:
   i. Falsifying, tampering with, or knowingly rendering inaccurate, any monitoring device or method required to be maintained under this permit;
   ii. Making any false material statement, representation or certification knowing it to be false, in any application, notice, plan, record, report or other document required by any provision of ORS chapter 465, 466, 468, 468A or 468B or any rule adopted pursuant to ORS chapter 465, 466, 468, 468A or 468B;
   iii. Omitting any material or required information, knowing it to be required, from any document described in paragraph (a) of this subsection; or
   iv. Altering, concealing or failing to file or maintain any document described in paragraph (a) of this subsection in knowing violation of any provision of ORS chapter 465, 466, 468, 468A or 468B or any rule adopted pursuant to ORS chapter 465, 466, 468, 468A or 468B.

i. **Duty to Provide Information.** You must furnish to us, within a time specified, any information that we may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with the permit. You must also furnish to us upon request, copies of records that this permit requires you to keep.

j. **Need to Halt or Reduce Activity not a Defense.** It is not a defense for a permittee in an enforcement

action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of the permit.

k. **Permit Modifications.** You may request a permit modification or we can initiate it. Any modification to the permit must be in accordance with the provisions of OAR 340-045-0055 and 40 CFR 144.41, as applicable.

2. **Operation and Maintenance.**
   a. **Proper Operation and Maintenance.** You must at all times properly operate and maintain all facilities and systems of treatment and control (and related equipment) that you install or use to comply with the conditions of this permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of a back-up or auxiliary facilities or similar systems only when necessary to comply with the conditions of the permit.
   b. **Removed Substances.** You must dispose of or otherwise manage any soil, gravel, sludge, liquids, or other materials removed from or adjacent to a UIC in accordance with 40 CFR 144.82(b).

3. **Monitoring and Records.** You must comply with monitoring requirements of 40 CFR 144.51(j) and this condition:
   a. Samples and measurements taken for monitoring must be representative of the monitored activity.
   b. **Records Contents.** Records of monitoring information you must retain include:
      i. The date, exact place, time and methods of sampling or measurements;
      ii. The name(s) of the individual(s) who performed the sampling or measurements;
      iii. The date(s) analyses were performed;
      iv. The name(s) of the individual(s) who performed the analyses;
      v. The analytical techniques or methods used;
      vi. The results of such analyses;
      vii. The nature and composition of all injected fluids until three years after completion of any plugging and decommissioning procedures; and
      viii. We may require the owner or operator to deliver the records to us at the conclusion of the retention period.
   c. **Inspection and Entry.** You must allow us, or an authorized representative, upon the presentation of credentials and other documents as may be required by law, to:
      i. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
      ii. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and
      iii. Sample or monitor at reasonable times, for the purposes of ensuring permit compliance or as otherwise authorized by the Safe Drinking Water Act or state law, any substances or parameters at any location.
   d. **Retention of Records.** You must retain records of all monitoring and maintenance information, including all field notes, calibration and maintenance records, all original strip chart recordings for continuous monitoring instrumentation, all analyses of the data generated, all reports required by this permit, and records of all data used to complete the application for this permit. You must keep them for a period of at least 10 years from the date of the sample, measurement, report, or application. You must make the records available to us upon request.

4. **Reporting and Signatory Requirements.** You must comply with the reporting requirements of 40 CFR 144.51(j) and this condition:
   a. **Planned changes.** You must give us notice of any planned physical alterations or additions to the

permitted facility as described in Schedule B, condition 4.

b. **Anticipated noncompliance.** You must give us advance notice of any planned changes in the permitted facility or activity that may result in noncompliance with permit requirements.
c. **Anticipated Violations.** You must give us advance notice of any planned changes in the permitted facilities or activities that may result in violations of permit requirements.
d. **Transfers** This permit is not transferrable to any person except after giving us notice and meeting the conditions of OAR 340-045-0045. We may require modification or revocation and reissuance of the permit to change the name of the permittee and incorporate such other requirements as may be necessary under the federal Safe Drinking Water Act (see 40 CFR 144.38; in some cases, modification or revocation and reissuance is mandatory).
e. **Compliance Schedule.** You must make compliance reports on all interim and final requirements contained in any compliance or implementation schedule included in this permit. The reports must explain the cause of any noncompliance, if known, any remedial actions taken, and the probability of meeting the next scheduled requirements.
f. **Twenty-Four-Hour and Five-Day Reporting.** Unless a different compliance schedule and reporting requirements are otherwise noted in this permit, you must report any non-compliance that endangers health or the environment in accordance with 40 CFR 144.51(l)(6). You must provide any information of non-compliance that endangers health or the environment orally within 24 hours from the time you become aware of the circumstances. You must submit a written report within 5 days of the time you become aware of the circumstances. The written report must contain:
    i. A description of the violation and its cause, if known;
    ii. The period of violation, if known;
    iii. The estimated time the violation is expected to continue if it has not been corrected; and
    iv. Steps taken or planned to reduce, eliminate, and prevent recurrence of the violation.
g. **Other Compliance.** In accordance with 40 CFR 144.51(l)(7), you must report all other instances of non-compliance not reported in Schedule F, conditions 4(e) and 4(f) at the time the annual reports are submitted. The reports must contain the information listed in Schedule F, condition 4(f).
h. **Other Violations.** You must report all permit violations that occurred during a permit-established reporting period in the annual Underground Injection Control System Report for that period. The reports must contain the information listed in Schedule F, condition 4(f).
i. **Signatory Requirements.** You must sign and certify all applications, reports or information submitted to us as provided in 40 CFR 144.32.

Permit Evaluation Report

State of Oregon
Department of
Environmental
Quality

City of Portland
Class V Underground Injection Control Systems
Water Pollution Control Facilities Permit #102830

Last Updated: **5/19/2015**
By: M. Kohlbecker/NWR

Table of Contents

Background

The federal Safe Drinking Water Act regulates underground injection of fluids, and the national Underground Injection Control (UIC) program is administered by the U.S. Environmental Protection Agency (EPA). In 1984, EPA delegated the UIC program to the Oregon Department of Environmental Quality (DEQ). Accordingly, the DEQ issued rules[1] for UIC construction and operation in 1984, and revised the rules in 2001 to conform to changes made to the federal UIC regulations in 1999.

Oregon's UIC rules require the owner or operator of a UIC to register the injection system and either obtain authorization by rule[2] or permit[3] to construct and operate the UIC. Groundwater quality is further protected in Oregon through the state's groundwater quality protection rules[4].

The EPA and DEQ classify UICs on the basis of the type of fluid that is discharged. This permit authorizes UICs that infiltrate only stormwater and incidental fluids, which are called Class V UICs. Stormwater UICs include drywells, soakage trenches, drill holes, infiltration galleries, or other systems or devices that inject or distribute fluids underground. Best management practices (BMPs) that allow stormwater to infiltrate below ground such as swales, ponds, porous pavers, and porous concrete are not considered UICs, unless such BMPs also use perforated pipe to distribute stormwater underground.

In 2005, DEQ issued the first Class V UIC permit to the City of Portland. Because UIC permits have a duration of 10 years under federal rules, the City's permit is scheduled to expire in May 2015. The City is applying for renewal of its UIC permit.

The City's 2005 permit was the first of its kind in the nation, and since it was issued the understanding of the nature of stormwater that drains to UICs has significantly improved. Extensive stormwater quality sampling has been conducted at UICs, and the data has been statistically analyzed to evaluate the types and concentrations of pollutants[5]. In addition, several permit applicants, including the City of Portland, have used well-developed and well-understood pollutant fate and transport modeling approaches to evaluate attenuation of pollutants after discharge from a UIC[6]. DEQ reviewed the stormwater quality data and pollutant fate and transport studies and concluded that:

- The types and concentrations of pollutants in municipal stormwater are well-characterized based on the large number of stormwater samples that have been collected.
- The statistical analyses of municipal stormwater quality data used appropriate statistical methods, and the results of the analyses are consistent with other stormwater quality data collected from UICs[7].

[1] Oregon Administrative Rules (OAR) 340-044
[2] OAR 340-044-0018
[3] OAR 340-044-0035
[4] OAR 340-040
[5] Kennedy/Jenks (2009, 2011); City of Bend (2014); City of Eugene (2014); City of Gresham (2013, 2014); City of Keizer (2014); City of Portland BES (2006, 2007, 2008a, 2009, 2010, 2011, 2012, 2013, 2014); City of Redmond (2014).
[6] Portland (City of Portland BES, 2008b); Bend (GSI, 2011a); Clackamas County WES (GSI, 2011b); Gresham (GSI, 2011c); Redmond (GSI, 2011d); Eugene (GSI, 2013a); Lane County (GSI, 2013b); Milwaukie (GSI, 2013c); Canby (GSI, 2013d); Keizer (GSI, 2013e).
[7] The "other stormwater quality data" is from rule-authorized UICs located at "high risk" sites (parking lots with over 1,000 vehicle trips per day and sites where hazardous substances are used or stored), which DEQ requires to be sampled annually.

- The pollutant fate and transport studies were based on conservative models for pollutant attenuation in porous subsurface soils. Pollutant attenuation occurs because pollutants sorb to unsaturated zone soils, are degraded by biotic and abiotic degradation, and are dispersed by differential advection.
- Infiltrating stormwater generally meets the background groundwater concentrations at the groundwater table for the pollutants that are common in municipal stormwater. This conclusion is based on the pollutant fate and transport studies and groundwater quality data from monitoring wells[8] and water supply wells[9] (i.e., the pollutants commonly found in stormwater at UICs are generally not detected in groundwater, and when they are detected they can be attributed to non-UIC sources).

UIC permits are issued using a template that was developed in July 2012. We have held public comment periods to solicit public input for major modifications to existing permits and changes to the permit template. The UIC permit template used for the City of Portland's permit reflects these public comments, most of which were received during a public workshop with representatives from the Environmental Protection Agency, Oregon Association of Clean Water Agencies, and Northwest Environmental Defense Center. The comments were incorporated into the template to the extent that they met federal and state UIC regulations or state groundwater protection rules. Because this permit was developed from a template for an individual permit and not a general permit, we have made minor changes to conditions in the template to address permittee-specific issues.

Overview

The City of Portland owns and operates approximately 9,600 UICs. Approximately 9,475 UICs are used to infiltrate stormwater from public rights of way within city limits, and the remaining 125 UICs are used by the Portland Water Bureau and Portland Parks for managing discharges from potable water sources or conducting aquifer recharge[10].

A typical City UIC is comprised of a catch basin that collects stormwater runoff and piping that conveys the stormwater to the UIC. The City's Stormwater Management Manual requires that new UICs are constructed with a sedimentation manhole between the catch basin and UIC. Sedimentation manholes are solid concrete cylinders, usually 10 feet deep and 3 to 4 feet in diameter, that provide pretreatment of stormwater prior to discharge into the subsurface. Sedimentation manholes are constructed with an oil/water separator hood to remove floatables, and to allow for settling of some sediment before the stormwater enters the UIC.

The City's UICs are typically 3 to 4 feet in diameter and range in depth from a minimum of 2 feet up to 40 feet. Most of the newer UICs (early 1990s and later) in the City are approximately 30 feet deep. The City's UICs are located east of the Willamette River; the blue shading in Figure 1 shows the area with the highest density of UICs.

[8] See DEQ (2001) and DEQ (2005).
[9] See DEQ (2015). Groundwater quality data has been evaluated for stormwater impacts in Hermiston and Umatilla.
[10] The City's UICs are identified by the following UIC Facility IDs: 10102, 11074, 11191, 11195, 11196, 11197, 11465, 12117, 14371, 14282, 14298

Figure 1. City of Portland UIC Area. *The highest density of UICs is shown by blue shading.*

The City's UICs are primarily located in three different geologic units: the fine-grained Catastrophic Flood Deposits (Qff), coarse-grained Catastrophic Flood Deposits (Qfc), and Troutdale Formation (City of Portland BES, 2008b). The coarse-grained catastrophic flood deposits are the most permeable of these units (McFarland and Morgan, 1996), and contains a majority of the City's UICs. The coarse-grained catastrophic flood deposits are an unconsolidated pebble to gravel conglomerate with a silt and coarse sand matrix (Madin, 1990). Within the City limits, depth to groundwater ranges from ground surface near surface water features to over 240 feet below ground surface on Alameda Ridge. Groundwater flows towards the Columbia and Willamette Rivers, which are regionally-significant groundwater discharge boundaries (Snyder, 2008).

The City has applied for an individual UIC WPCF permit because 271 of the City's stormwater UICs are located within water well setbacks, and 84 of the City's stormwater UICs intersect the seasonal high groundwater table (and therefore do not meet the conditions for authorization by rule[11]) (City of Portland, 2015b). In addition, it is more cost effective to authorize UICs under a permit for the number of UICs that the City owns and operates.

Because Oregon Administrative Rules implicitly assume that UICs located within water well setbacks endanger existing water wells, the permit requires that the City evaluate whether its UICs endanger existing water wells within one year of discovery (see Schedule A, condition 8).

[11] According to OAR 340-044-0018(3)(D) and (E), UICs located within water well setbacks (500 feet from a water well or within the two-year time-of-travel of a public supply well) cannot be authorized by rule. According to OAR 340-044-0018(3)(a)(G), UICs cannot discharge directly to groundwater.

Endangerment occurs if discharge to a UIC results in polluting groundwater which supplies or can reasonably be expected to supply a public water system, if the presence of the pollutant results in the system violating primary drinking water regulations or adversely affecting public health [see 42 USC 300h(d)(2)]. The City has evaluated the fate and transport of common stormwater pollutants in the coarse-grained Catastrophic Flood Deposits[12]. This geologic unit was selected for the pollutant fate and transport evaluations because it is the most permeable unit in the City of Portland (McFarland and Morgan, 1996), and, therefore, pollutants travel farther and faster than in other geologic units. The City found that pollutant concentrations are attenuated to below detection within five feet of vertical transport from the UIC through unsaturated soils (City of Portland BES, 2008b) or 275 feet of horizontal transport from the UIC through saturated soils (GSI, 2012). The City's pollutant fate and transport modeling results indicate that:

- Two hundred seventy of the 271 City-owned UICs located within water well setbacks have at least five feet of vertical separation from the water table, or 275 feet of horizontal separation from a water well. Therefore, these 270 City UICs within water well setbacks do not endanger groundwater.
- One UIC, ADT473, potentially endangers groundwater because the vertical separation distance is less than 5 feet, and the UIC is located within 275 feet of an existing water well (MULT 1)[13]. The City is planning to retrofit this UIC to increase the vertical separation distance to more than 5 feet, which will eliminate the potential endangerment condition, as required by this permit.

Stormwater Quality Data

The City of Portland has collected hundreds of stormwater samples from its UICs in order to characterize the effectiveness of best management practices and evaluate pollutant concentrations. DEQ reviewed the stormwater quality data to evaluate the types and concentrations of pollutants in stormwater, and to determine whether the City's pollutant fate and transport models simulate the appropriate pollutants and pollutant concentrations.

Table 1 summarizes stormwater sampling results from annual stormwater discharge monitoring for the 41 pollutants that the City was required to monitor under the first 9 years of its 2005 UIC permit[14] (City of Portland BES, 2006, 2007, 2008a, 2009, 2010, 2011, 2012, 2013, 2014). Note that data for the 10th and final year of the permit is not available because it is collected between October 2014 and May 2015, and will not be submitted to DEQ until November 1, 2015. Table 1 also shows the EPA Maximum Contaminant Level for each pollutant, which is the legally-enforceable limit for a pollutant in a public water system.

The City of Portland's stormwater discharge monitoring data indicates that four pollutants—pentachlorophenol (PCP), di(2-ethylhexyl)phthalate (DEHP), lead and benzo(a)pyrene—occur in stormwater at concentrations of concern (i.e., above the Maximum Contaminant Level) more frequently than other common stormwater pollutants.

[12] Lead, benzo(a)pyrene, pentachlorophenol, and di(2-ethylhexyl)phthalate

[13] UICs that are located within 275 feet of a water well do not necessarily endanger groundwater. The 275 feet horizontal separation distance is calculated using a pollutant fate and transport model based on conservative assumptions (GSI, 2012). For example, the model assumes that the UIC intersects the groundwater table. In reality, there are 4 feet of unsaturated soils between the bottom of UIC ADT473 and the seasonal high groundwater.

[14] See Schedule A, Table 1 of the 2005 permit.

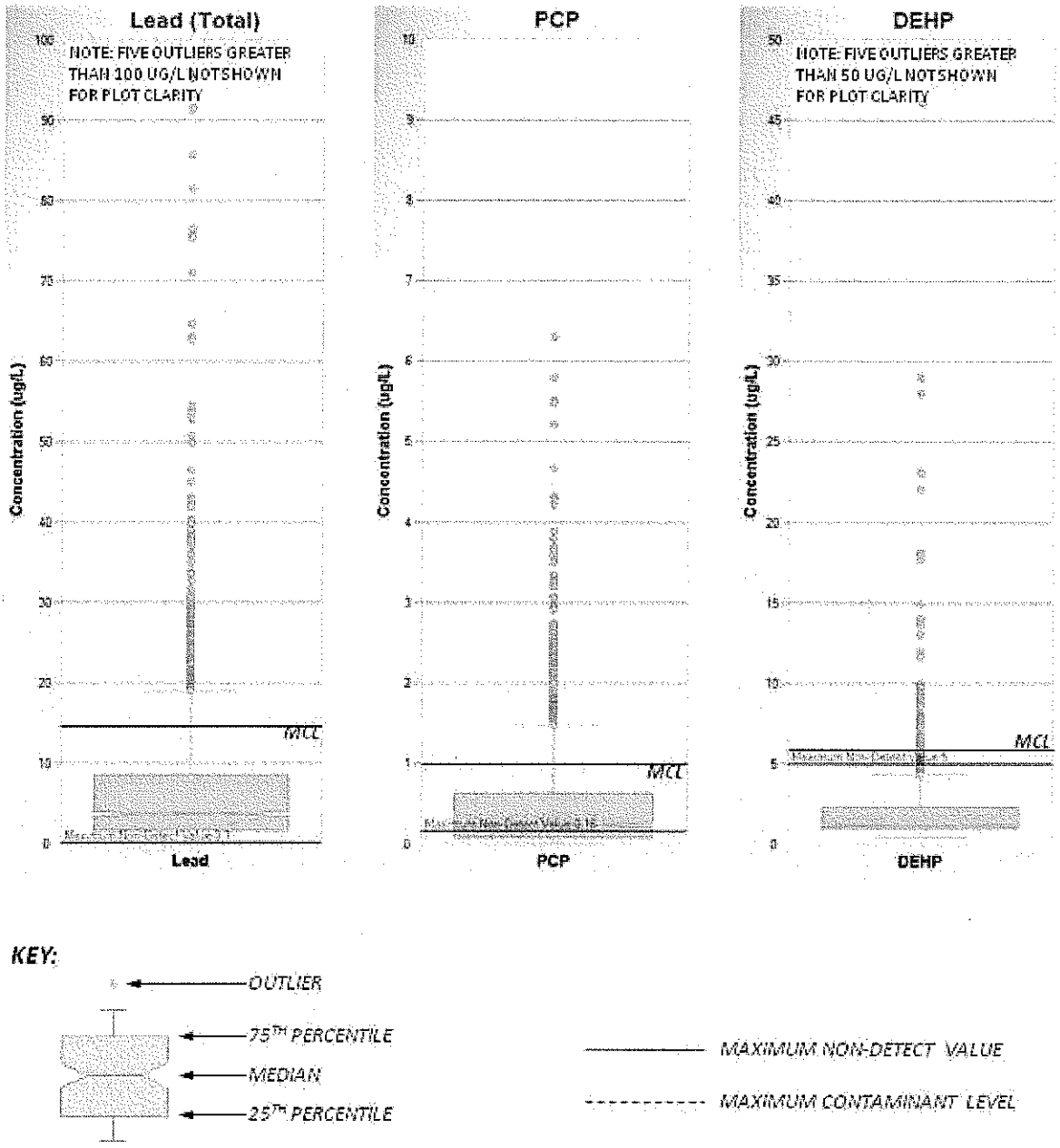
Table 1. City of Portland Annual Stormwater Discharge Monitoring Data. *The table includes data collected during the first nine years of the City's 2005 UIC permit.*

Analyte	MCL (ug/L)	Number of Samples	Percent Of Samples With Pollutant Detection	Percent of Samples Exceeding MCL
Pentachlorophenol (PCP)	1.0	1,178	87.2%	15.4%
Lead (Total)	15	1,183	99.8%	13.6%
Di(2-ethylhexyl)phthalate (DEHP)	6.0	1,183	65.9%	4.6%
Benzo(a)pyrene	0.2	1,183	36.7%	0.93%
Arsenic (Total)	10	1,183	99.9%	0.08%
Copper (Total)	1,300	1,183	100.0%	0.0%
Zinc (Total)	5,000	1,183	100.0%	0.0%
Chromium (Total)	100	1,183	81.6%	0.0%
Cadmium (Total)	5.0	1,183	34.2%	0.0%
2,4-D	70	1,178	18.4%	0.0%
Picloram	500	1,178	0.5%	0.0%
Dinoseb	7.0	1,178	0.1%	0.0%
Total Nitrogen	10,000	1,076	26.1%	0.0%
Benzene	5.0	940	0.6%	0.0%
Toluene	1,000	940	35.3%	0.0%
Ethylbenzene	700	940	0.3%	0.0%
Xylenes	10,000	940	0.9%	0.0%
Chlorobenzene	100	940	0.1%	0.0%
Carbon Tetrachloride	5.0	940	0.0%	0.0%
o-Dichlorobenzene	600	940	0.0%	0.0%
p-Dichlorobenzene	75	940	0.0%	0.0%
1,3-Dichlorobenzene	5.5	940	0.0%	0.0%
1,2,4-trichlorobenzene	70	940	0.0%	0.0%
Barium (Total)	2,000	225	100.0%	0.0%
Antimony (Total)	6.0	213	97.7%	0.0%
Mercury (Inorganic)	2.0	161	75.2%	0.0%
Alachlor	2.0	77	0.0%	0.0%
Atrazine	3.0	77	0.0%	0.0%
Carbofuran	40	77	0.0%	0.0%
Lindane	0.2	77	0.0%	0.0%
Beryllium (Total)	4.0	65	12.3%	0.0%
Glyphosate	700	53	1.9%	0.0%
Selenium (Total)	50	49	2.0%	0.0%
Cyanide (Total)	200	45	0.0%	0.0%
Thallium (Total)	2.0	45	0.0%	0.0%
Chlordane	2.0	45	0.0%	0.0%
Dalapon	200	45	0.0%	0.0%
Bis(2-chloroisopropyl)ether	0.8	45	0.0%	0.0%
Bis(2-chloroethyl)ether	0.3	45	0.0%	0.0%
Diquat	20	45	0.0%	0.0%
Endothall	100	45	0.0%	0.0%

Note:
ug/L=micrograms per liter
MCL=Maximum Contaminant Level

The stormwater data for three of these pollutants—PCP, DEHP, and lead—are shown graphically in the boxplots below. Boxplots are a graphical means to visualize the stormwater quality data, including the spread, skewness, relative frequency of MCL exceedances and occurrence of outliers. Outliers are observations that are significantly higher (or lower) than most of the data that occur infrequently (Helsel and Hirsch, 2002).

Figure 2. Boxplots Showing City of Portland Annual Stormwater Discharge Monitoring Data. *In the boxplots below, the median is the central value of the observed data. The 75th percentile is the value at which 75 percent of the observed data fall below, and the 25th percentile is the value which 25 percent of the observed data fall below.*



The boxplots show that the majority of observed lead, PCP, and DEHP concentrations are below the MCL. For DEHP, all MCL exceedances are considered to be outliers. For lead and PCP, exceedances are not considered to be outliers. On the basis of the stormwater quality data, DEQ concludes that:

- The City of Portland's fate and transport modeling[15] (City of Portland BES, 2008b; GSI, 2012) simulated the appropriate pollutants because lead, PCP, benzo(a)pyrene and DEHP occur at levels of concern (i.e., exceeding the MCL), and
- The City of Portland's fate and transport modeling (City of Portland BES, 2008b; GSI, 2012) used the appropriate input concentrations for stormwater pollutants because the pollutant concentrations in the model are higher than any observed pollutant concentration.

Groundwater Quality Data

DEQ reviewed existing groundwater quality data to evaluate whether existing groundwater quality data indicates that the City of Portland's UICs pose an endangerment condition or violate the prohibition of fluid movement standard. Endangerment occurs when pollutants in stormwater reach groundwater that supplies or can reasonably be expected to supply a public water system [see 42 USC 300h(d)(2)]. The prohibition of fluid movement standard is violated when injection into a UIC results in the movement of fluid containing contaminants into underground sources of drinking water, if the presence of that contaminant may cause violation of a MCL or otherwise adversely affect the health of persons (see 40 CFR 144.12). The first step in evaluating whether infiltrating stormwater adversely affects groundwater is to identify the types of pollutants that are detected in stormwater (see "Stormwater Quality Data" section). Of the pollutants detected in stormwater at levels of concern (i.e., above the MCL), DEQ considers PCP to pose the highest risk of adverse impact to groundwater because it is detected the most often above the MCL, and is the most mobile in the subsurface[16]. Therefore, DEQ's review of existing groundwater quality data focused on PCP.

Figure 3 shows water wells in the City of Portland where groundwater samples have been collected and analyzed for PCP concentration. Groundwater flow directions from Snyder (2008) are shown by the arrows. The wells shown in Figure 3 are completed in unconfined aquifers (i.e., there is no impermeable clay barrier between the well intake and ground surface) and are located downgradient of the City's UIC area (i.e., samples represent groundwater that has flowed beneath the City's UIC area).

[15] The City used a one-dimensional, constant-source, analytical Advection Dispersion Equation (ADE) model to simulate pollutant fate and transport, and implemented the model in a Microsoft Excel platform. The model simulated pollutant attenuation by dispersion, retardation, and degradation. Influent concentrations were equal to 10 times the MCL.

[16] Of the pollutants detected above the MCL more than 0.5 percent of the time, PCP is the most mobile. Specifically, Fetter (1994) identifies PCP mobility as "low," DEHP mobility as "slight," and benzo(a)pyrene mobility as "immobile." The City of Portland evaluated lead mobility using equations from Bricker (1998) and site-specific data, and found lead to be immobile as well. The relatively high mobility of PCP is supported by the pollutant fate and transport studies mentioned earlier in this report [Portland (City of Portland BES, 2008b); Bend (GSI, 2011a); Clackamas County WES (GSI, 2011b); Gresham (GSI, 2011c); Redmond (GSI, 2011d); Eugene (GSI, 2013a); Lane County (GSI, 2013b); Milwaukie (GSI, 2013c); Canby (GSI, 2013d); Keizer (GSI, 2013e)].

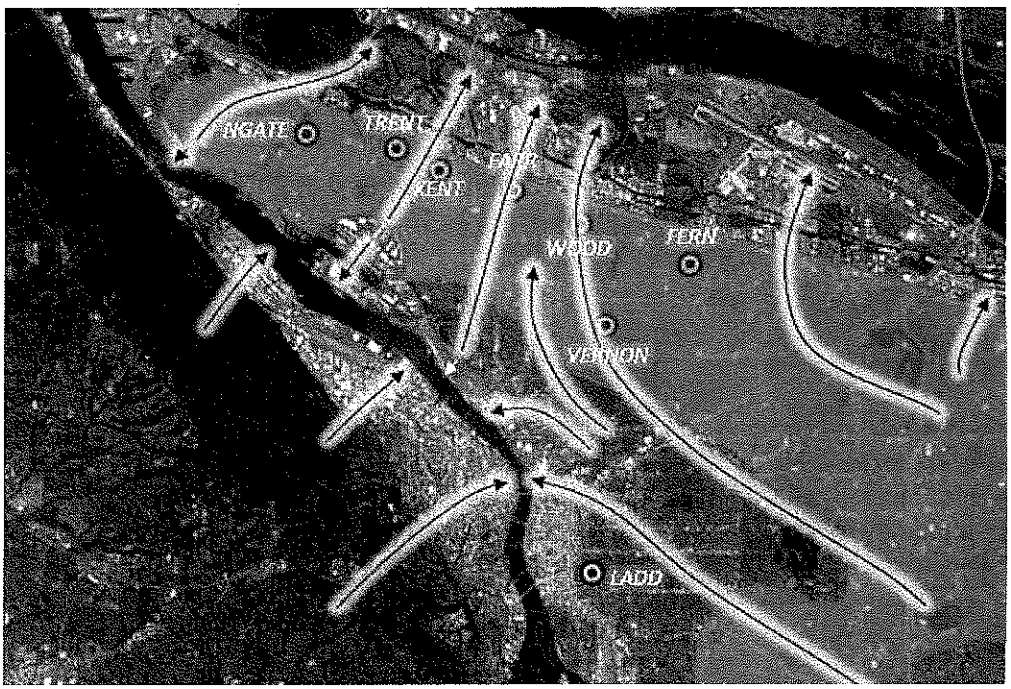


Figure 3. Groundwater Sampling Locations. *Yellow circles are groundwater sampling locations (i.e., water wells), black arrows show groundwater flow direction from Snyder (2008), and blue polygon shows the area where most City UICs are located.*

Table 2 presents a summary of laboratory analyses of PCP in groundwater. The dataset has been compiled by the City of Portland, and data were collected by the U.S. Geological Survey and City of Portland between 1998 and 2014[17].

Table 2. Laboratory Analyses of PCP in Groundwater.

DEQ Well ID	USGS ID	Well Depth[1] (feet bgs)	Depth to GW[1] (feet bgs)	Number of Samples	Number of Detections	Range of Detection Limits (ug/L)	Maximum PCP Detection (ug/L)
FARR	01N/01E-10CDA	100	75	8	0	0.01 - 0.04	NA
FERN	01N/01E-13DDB	147	124	8	0	0.0099 – 0.04	NA
KENT	01N/01E-09DBB	107	80	8	0	0.0099 – 0.04	NA
LADD	01S/01E-02DBC	77	20	8	0	0.0099 – 0.04	NA
NGATE	01N/01E-07AAC	115	98	8	1	0.01 - 0.04	0.0622
TRENT	01N/01E-09BCB	96	73	8	0	0.0099 – 0.04	NA
VERNON	01N/01E-23DAB	245	226	8	0	0.0099 – 0.04	NA
WOOD	01N/01E-14BDB	131	115	8	0	0.0099 – 0.04	NA
ALL				**64**	**1**		**0.0622**

Notes:

[1] From Snyder (2008)
bgs=below ground surface
ug/L = micrograms per liter
USGS=United Geological Survey
DEQ=Department of Environmental Quality
GW=Groundwater

[17] The dataset consists of 153 analyses of PCP in groundwater. DEQ reduced this dataset by removing 89 PCP values because the detection limits exceeded the MCL. Therefore, the summary of PCP analyses presented in Table 1 includes 64 analyses of PCP in groundwater.

As shown in Table 1, PCP has not been detected in 63 of the 64 groundwater samples. The single sample with a PCP detection was collected at the NGATE well on April 11, 2007. The PCP concentration was 0.0622 micrograms per liter, which is below the EPA Maximum Contaminant Level of 1.0 micrograms per liter. DEQ attributes this detection to laboratory quality control issues for the following reasons:

- The sample with the PCP detection was characterized by a matrix spike of 137 percent, which suggests a positive bias in the analytical results and fails the laboratory's acceptable quality control limit.
- PCP has not been detected in seven subsequent groundwater samples collected from the well.

Because PCP is not detected in groundwater and attributable to UIC discharges, the groundwater quality data does not indicate a violation of the prohibition of fluid movement standard or endangerment of the groundwater resource.

Compliance with Federal Regulations

Permits issued by DEQ must comply with the federal UIC permit requirements specified in 40 CFR 144.51. We have carefully compared the permit conditions with these federal requirements. The permit's general conditions in Schedule F meet the UIC permit requirements of 40 CFR 144.51. In addition, the permit specifically states all other pertinent local, state, and federal regulations apply.

Groundwater Protection

Oregon's policy is to protect groundwater to its highest beneficial use, which is usually drinking water[18]. In accordance with the Safe Drinking Water Act[19] and the state UIC rules[20], underground injection must not endanger existing or future underground sources of drinking water, and must not allow movement of fluid containing contaminants into underground sources of drinking water, if the presence of that contaminant may cause violation of a MCL or otherwise adversely affect the health of persons. Endangerment of groundwater and violation of the prohibition of fluid movement standard are evaluated on the basis of:

- The pollutant fate and transport modeling conducted by the City to determine the environmental fate of pollutants (City of Portland BES, 2008b; GSI, 2012).
- Existing groundwater quality data previously discussed in this report (see "Groundwater Quality Data").

The City's UICs do not appear to endanger groundwater resources on the basis of existing groundwater quality data and the City's pollutant fate and transport modeling (City of Portland BES, 2008).

[18] OAR 340-040-0108
[19] 42 USC 300h(d)(2) and 40 CFR 144.12
[20] OAR 340-044-0014(1)

The following permit conditions are designed to protect groundwater to its highest beneficial use, and to meet or exceed the minimum requirements for Class V stormwater UICs in the federal UIC rules:

- The permit only authorizes injection of stormwater runoff and incidental fluids, and does not authorize prohibited Class V UICs (e.g., cesspools, motor vehicle waste disposal wells, floor drains, agricultural drainage wells, and industrial process water disposal wells)[21]. These prohibited UICs must be closed. The City of Portland does not own or operate any of these prohibited UICs.
- Structural and operational best management practices must be implemented at sites that are authorized under this permit[22]. For example, hazardous and toxic material storage or handling areas must be segregated from stormwater run-off and run-on, the permittee must identify UICs that potentially receive drainage from areas where pollutants may be carried in stormwater, and UICs must be properly constructed and maintained.
- In accordance with federal rules (40 CFR 144.12) and state rules [OAR 340-044-0035(3)], the permit prohibits operation of UICs in a manner that violates drinking water regulations under the Safe Drinking Water Act. The permit sets conditions for horizontal setbacks from domestic, irrigation, industrial, and public water wells, which is more protective than federal UIC rules because the federal rules do not require setbacks for Class V stormwater UICs. If a UIC does not meet a horizontal setback, then the applicant must demonstrate that the discharge does not endanger groundwater supplies, retrofit the UIC with additional protection controls, or decommission the UIC[23]. A minimum vertical separation distance between the bottom of a UIC and seasonal high groundwater is not stipulated in the permit because there is no requirement for minimum vertical separation distance in the federal UIC rules (40 CFR 144) or state of Oregon UIC rules (OAR 340-044).
- The applicant has prepared a comprehensive System-Wide Assessment that identifies UICs that do not have minimum setbacks or that are prohibited UICs[24]. The permit provides a schedule for addressing these UICs[25].
- The applicant has prepared an Underground Injection Control Management Plan that details robust pollution prevention and source control actions[26].
- The permit requires stormwater quality monitoring at UICs, reporting of stormwater monitoring data, and sets pollutant-specific concentration limits in stormwater (i.e., action levels). If an action level is exceeded, then the permittee is required to take corrective action[27]. This is more protective than the federal UIC rules which do not require stormwater monitoring or stipulate action levels for Class V stormwater UICs.

Area Permit Coverage

The permit allows *area permit*[28] coverage, meaning that the permit authorizes all UICs that are owned by the permittee within DEQ jurisdiction in state of Oregon. Under area permit coverage, the permittee may construct, operate, maintain, convert, or plug and abandon underground injection systems covered under the permit, provided they meet conditions of the permit. If we

[21] See Schedule A, condition 1, and Schedule B, condition 1.e
[22] See Schedule A, condition 7
[23] See Schedule A, condition 8
[24] See Schedule B, condition 1
[25] See Schedule A, condition 8 (UICs that do not have minimum setbacks) and Schedule C (prohibited UICs)
[26] See Schedule D, condition 5
[27] See Schedule A, conditions 2, 3, 5, and 6, and Schedule B, condition 5
[28] Safe Drinking Water Act federal regulation, 40 CFR 144.3

determine that the permittee is not in compliance with the permit, we may modify or terminate the permit, or require the applicant to take corrective actions to protect groundwater quality. We may also take enforcement action up to and including civil penalty in the event the permittee does not comply.

Permit Conditions

The UIC WPCF permit allows the permittee to construct and operate injection systems which might not otherwise qualify for authorization by rule as well as injection systems that do qualify for authorization by rule. It also allows the permittee to continue to operate and maintain injection systems that meet the conditions and action levels set in the permit.

The UIC WPCF permit is effective for 10 years from the date DEQ issues it, unless DEQ modifies, terminates, revokes, or reissues the permit, or unless the permittee requests permit termination and we grant it. The permittee must maintain permit coverage and renew the permit as long as the permittee operates underground injection systems that do not meet authorization by rule conditions.

The remainder of this permit evaluation report annotates the permit conditions, which are identified in italics.

SCHEDULE A
CONTROL AND LIMITATION CONDITIONS

1. Authorized Discharges.
Condition 1 identifies which fluids can be discharged into UICs. For municipalities, most authorized discharges align with those allowed by the NPDES Municipal Separate Storm Sewer System permit (that is, under what is called an *MS4 permit*). We may approve other similar temporary discharges after we've issued the permit, provided the permittee shows us in writing that the discharge is *de minimis* and complies with OAR 340-040-0020(3) (which states that groundwater must be protected to its highest beneficial use, which is usually drinking water), and the permittee obtains written approval from us prior to discharge.

2. Action Levels.
Condition 2, Table 1 establishes action levels for discharges to UICs. The pollutants in Table 1 include the most frequently detected pollutants in municipal stormwater above their respective EPA Maximum Contaminant Levels based on the statistical analyses of stormwater quality data we described earlier in this evaluation report (i.e., PCP, DEHP, lead, and benzo(a)pyrene). Copper and zinc are also included in Table 1 because of their use in automobile brakes. We also considered a more extensive list of pesticides and herbicides commonly used in urban areas. We currently are requiring communities with an MS4 National Pollutant Discharge Elimination System (NPDES) permit to sample and evaluate which pesticides and herbicides are most prevalent in Oregon urban stormwater. These studies should be finished within five years from the date that Portland's permit is issued. We intend to use the results of these studies to consider pesticide and herbicide screening as part of the five-year review of each UIC permit (see Schedule D, condition 6 for additional information).

We set the action levels and compliance points under the Oregon groundwater protection rules (OAR 340-040). Specifically, under our groundwater protection rules, *permit-specific concentration limits*[29] for new facilities[30] must be set at background groundwater quality at a

[29] OAR 340-040-0030(3)(b)

downgradient *compliance point* that we choose. The compliance point for Portland's permit-specific concentration limits depends on vertical separation distance at the UIC (i.e., the vertical distance between seasonal high groundwater and the bottom of the UIC):

- **UICs With Greater Than Five Feet of Vertical Separation Distance.** The compliance point is the seasonal high groundwater.

- **UICs With Less Than Five Feet of Vertical Separation Distance.** The compliance point is first-encountered groundwater, 275 feet away from the UIC. This compliance point does not endanger existing groundwater wells because the permit does not allow UICs with less than 5 feet of vertical separation to be located within 275 feet of a water well[31].

Because it is logistically and economically infeasible to use monitoring wells to measure groundwater quality in place (that is, to measure quality at the physical groundwater compliance point) at over 9,000 injection points, we set what is known as an *action level* at a *detection monitoring point*. This detection point is located at the *point of injection*, or the end-of-pipe discharge point into an underground injection system after any pretreatment of the fluid. We set an action level at a value that we calculate (using the City of Portland's pollutant fate and transport model) will result in no change in groundwater quality from background at the downgradient, in-groundwater, compliance point (seasonal high groundwater table or first-encountered groundwater 275 horizontal feet from the injection point). So, the action levels, along with proper implementation of the conditions set in the permit, will protect groundwater, and meet background groundwater quality concentrations as per the rule.

3. Table 1 Action Level Exceedance.

Condition 3 tells the permittee what actions to take when pollutant concentrations in stormwater exceed an action level. When an exceedance of an action level occurs, the permittee must take the corrective action as specified in Schedule A, condition 6, which includes identifying the potential source(s), assessing whether the BMPs they implement need adjustment, making appropriate changes to reduce or eliminate the pollutant, and tracking results through monitoring.

4. Spills.

Spills of hazardous substances, toxic materials, or petroleum products must be addressed in accordance with the emergency actions in Oregon spill rules (OAR-340-142). Because spills potentially endanger human health or the environment, it is also necessary to take corrective action in accordance with Schedule A, condition 5.

5.&6. Corrective Action.

These conditions address the corrective actions required by the permit to eliminate any endangerment of health or the environment caused by UICs. Condition 5 specifies corrective actions that are necessary when an endangerment condition exists. Both the federal and state rules require the permittee to take corrective action when contaminant discharges could potentially endanger human health or the environment. Condition 5 tells the permittee what those actions should be. If there is an imminent endangerment to human health or the environment, federal requirements of 40 CFR 144.53 apply. An example of an imminent endangerment would be a spill of a hazardous material, toxic substance, or petroleum product of sufficient quantity to

[30] A "new facility" means a facility or activity authorized to operate under a DEQ-approved permit for the first time after the effective date of OAR 340-040-0030 (10-27-1989).

[31] The groundwater protectiveness demonstration, required by Schedule A, condition 8, and prepared by GSI (2012), demonstrates that protectiveness for UICs more than 275 feet away from water wells. Therefore, UICs that are less than 275 feet away from water wells must be retrofit so that groundwater is protected (Schedule A, condition 8.b.i) or closed (Schedule A, condition 8.b.ii).

adversely affect groundwater quality or into an injection system within any drinking water well setback area.

7. Site Control Measures and Best Management Practices.
We've evaluated the BMP requirements for MS4 communities and have found that most of the MS4-required BMPs also are also effective for meeting underground injection system permit requirements, and have found that they conform to OAR 340-040-0020(11) requirements. For example, vegetated planters and swales reduce suspended sediment concentrations in stormwater, thereby reducing the concentrations of pollutants that sorb to the sediment (in particular, metals and polycyclic aromatic hydrocarbons). DEQ's *Industrial Stormwater Best Management Practices Manual* (Jurries and Ratliff, 2013) provides additional examples of BMPs, and is available online at: http://www.deq.state.or.us/wq/wqpermit/docs/IndBMP021413.pdf.

Community- and site-specific BMPs and other site controls that the permittee will use to minimize the discharge of pollutants to groundwater are described in the Underground Injection Control Management Plan. Schedule D, condition 5 of the permit describes the contents of the Underground Injection Control Management Plan.

8. Underground Injection Systems - Horizontal Setbacks.
The state UIC rules for rule authorization presume that stormwater injection systems located within horizontal water well setbacks could pose a health risk to persons[32]. Condition 8 applies to stormwater injection systems the permittee knows of at the time we issued the permit. It also applies to stormwater injection systems located within a setback area discovered during or after the System-Wide Assessment (Schedule B, condition 1) has been approved by DEQ. If a new water well is installed within a setback area in the future, then the permittee must demonstrate the stormwater UIC will not cause an endangerment condition. The City has previously demonstrated that stormwater UICs are protective of existing water wells if they have greater than five feet of vertical separation from groundwater (City of Portland BES, 2008b) or greater than 275 feet of horizontal separation from the water well (GSI, 2012). No additional demonstration will be required for new UICs that meet the minimum horizontal and vertical setback distances.

SCHEDULE B
MONITORING AND REPORTING CONDITIONS

1. System-Wide Assessment.
We require the permittee develop and maintain a System-Wide Assessment to track the permittee's UIC system, identify UICs that do not meet permit conditions, and inform the Stormwater Monitoring Plan. During the fifth year of the permit, the permittee must reassess its UICs and submit an updated System-Wide Assessment by the end of that year, including all UICs added or closed during the first five years of the permit. The intent of this assessment update is to make any adjustments to the monitoring and reporting based on site-specific information collected during the first five years of the permit. If there are no changes to the permittee's UICs, the permittee may report that the system is unchanged in the required annual report for the fifth year. We also intend to use the fifth year reassessment to evaluate the merit of monitoring injection systems for emerging contaminants (e.g., pesticides, herbicides or other pollutants) based on the monitoring results from the NPDES MS4 communities reported to us.

DEQ approves the City of Portland's System-Wide Assessment dated March 24, 2015, with the issuance of this permit.

[32] OAR 340-044-0018(3)(a)(D) and OAR 340-044-0018(3)(a)(E)

2. Stormwater Monitoring Plan.
The applicant has developed a Stormwater Monitoring Plan that describes how it plans to sample the underground injection systems identified by the System-Wide Assessment. The purpose of the monitoring is to help us and the permittee understand what contaminants may be present in stormwater under their jurisdiction, and to support an adaptive management strategy that favors effective BMPs or engineering controls.

The City of Portland is proposing to collect 15 stormwater samples per year from UICs located in areas of shallow groundwater. DEQ proposes to accept this monitoring plan because the City will sample its UICs for the most mobile and persistent of the common stormwater pollutants that have been identified on the basis of sampling, and because the City is using a risk-based approach to select sampling locations (i.e., UICs located in areas of shallow groundwater pose a higher risk of adverse impact to human health than UICs located in areas of deep groundwater).

DEQ approves the City of Portland's Stormwater Monitoring Plan dated March 24, 2015, with the issuance of this permit.

The plan must be revised by the end of the fifth year of the permit term, and the revision must incorporate conclusions from the evaluation of emerging pollutants (pesticides, herbicides, or other pollutants) that are identified as a result of the evaluation described in Schedule D, condition 6.

3. Stormwater Sampling Waiver.
If the permittee does not collect the number of stormwater samples required by the Stormwater Monitoring Plan during the annual reporting period, the permittee must submit a stormwater sampling waiver request. The request must discuss the reason samples were not collected, and must include supporting data (for example, precipitation amounts, field notes, or pictures). We will issue a stormwater sampling waiver only if data supports Schedule B, condition 3.a, 3.b, 3.c, or 3.d. DEQ will take enforcement action if the permittee fails to collect samples and does not provide adequate justification.

4. Groundwater Monitoring.
Based on our technical review of the fate and transport of common stormwater pollutants[33] and groundwater quality data discussed in this report (see "Groundwater Quality Data" section), DEQ determined that no groundwater monitoring is required at this time. It is Oregon's stated policy that the injection of wastes to the subsurface shall be controlled in a manner that protects existing groundwater quality for current or potential use as an underground source of drinking water (see OAR 340-044-0010). In order to implement this policy, we may require that the permittee collect groundwater samples to evaluate impacts to an underground source of drinking water from stormwater infiltration, if there is a likely endangerment to the underground source of drinking water [see 42 USC 300h(d)(2)], or the prohibition of fluid movement standard is violated (see 40 CFR 144.12). The Groundwater Protection Rules (OAR 340-040) give DEQ the authority to require groundwater monitoring, and we have included this condition in the permit so that it is clear that DEQ has this authority under the permit as well.

[33] Portland (City of Portland BES, 2008b); Bend (GSI, 2011a); Clackamas County WES (GSI, 2011b); Gresham (GSI, 2011c); Redmond (GSI, 2011d); Eugene (GSI, 2013a); Lane County (GSI, 2013b); Milwaukie (GSI, 2013c); Canby (GSI, 2013d); Keizer (GSI, 2013e).

5. Annual Reporting.
This permit condition identifies the information that must be included in the permittee's annual Underground Injection Control System Report. The annual report for the fourth year of the permit must include the results of the emerging pollutant study (see discussion in Schedule A, condition 2 of this report, and Schedule D, condition 6 of the permit).

6. Decommissioning an Underground Injection System.
The permittee must provide prior notice of converting (e.g., by to a sedimentation manhole) or closing (e.g., by backfilling in a manner that prevents vertical fluid movement) any underground injection system they own or operate.

7. Summary of Submittals & Notifications.
Table 2 summarizes the submittal and notification requirements under this UIC permit.

SCHEDULE C
SAFE DRINKING WATER ACT COMPLIANCE SCHEDULE

A UIC permit may, when appropriate, specify a compliance schedule leading to compliance with the Safe Drinking Water Act as expressed in 40 CFR 144.53. Underground injection control systems that endanger human health typically will be subject to the federal corrective action requirements of 40 CFR 144.53. Other conditions that would meet a federal compliance schedule condition under the Safe Drinking Water Act are permit-specific and we will evaluate them on a case-by-case basis as we issue permits.

The permittee's UIC permit does not require a Safe Drinking Water Act compliance schedule (see 40 CFR 144.53) because the permittee does not own any injection systems known to violate the Safe Drinking Water Act, state or federal underground injection control rules or regulations, or state groundwater quality protection rules.

SCHEDULE D
SPECIAL CONDITIONS

1. Legal Authority.
The permittee needs to adopt and maintain the legal authority to implement and enforce permit conditions and provisions.

2. Permittee Personnel Responsible for Permit.
The permittee must identify the key positions and the names, titles, mailing addresses, email addresses, phone numbers, business section where the employees work and responsibilities of persons in those positions. The permittee must submit, in writing, timely updates to key personnel or personnel responsibility.

3. Reporting and Corrective Actions for Underground Injection Systems Prohibited by OAR 340-044-0015.
Prohibited underground injection systems are identified in OAR 340-044-0015. Under no circumstance are discharges allowed into prohibited injection systems. The most common prohibited underground injection system is the injection system that receives wastes from vehicle repair or maintenance activities. This includes vehicle wash water discharge to the injection system if the engine or undercarriage is washed.

Federal law (40 CFR 144.85) required prohibited underground injection systems to have been closed by April 2005. We recognize that some prohibited underground injection systems might still be in operation. This condition specifies the reporting and corrective actions the permittee must take if they discover a prohibited injection system *they own*. Operating a prohibited injection system is a Class I violation subject to enforcement action under OAR 340-012-0055(1)(p) and ORS 468.B.025(a). Although we do not intend to take enforcement action if the permittee complies with the requirements of this condition, the permittee must orally report prohibited injection systems to DEQ within 24 hours of discovery, and immediately implement the condition requirements, which include temporarily diverting discharges to the UIC within 5 days and permanently closing the UIC as soon as practicable.

4. Underground Injection Systems Discovered During or After the Permit is Issued.
For any injection system discovered after the permit is issued, the permittee must provide information regarding the injection systems in accordance with OAR 340-044-0020.

5. Underground Injection Control Management Plan.
The permittee must develop and maintain an Underground Injection Control Management Plan that discusses how the permittee will manage its UIC system. Specifically, the plan must describe spill prevention and response procedures; employee education and public outreach activities; procedures for operation, maintenance, inspection and decommissioning of UICs; and methods for preventing injection of fluids that are not authorized under this permit (see Schedule A, condition 1 for the types of injection that are authorized under this permit).

DEQ approves the City of Portland's Underground Injection Control Management Plan dated March 24, 2015, with the issuance of this permit.

6. Adaptive Management.
This condition requires that the permittee use an adaptive management strategy to evaluate and refine the approach for protecting groundwater and its beneficial uses, including application of best management practices. Consideration must be given for emerging pollutant types and concentrations. "Emerging Pollutant Types" refers to the pesticides, herbicides, or other pollutants identified as being most prevalent in Oregon urban stormwater on the basis of studies currently being conducted by MS4 communities (see Schedule A, condition 2 of this report). The data must be reported and evaluated in the fourth year annual report (submitted November 1, 2019) and any additional sampling that is required as a result of the evaluation must be incorporated into the revised Stormwater Monitoring Plan (see Schedule B, condition 2). In addition, the permit renewal application must consider emerging pollutant types using data from the permittee's jurisdiction or other jurisdictions, if applicable.

7. Rule Authorization.
All UICs owned or operated by the permittee are covered under this permit, including those that have been previously rule authorized.

8. Permit Shield.
Compliance with this permit constitutes compliance, for purposes of enforcement, with the UIC provisions of the federal Safe Drinking Water Act, implementing federal regulations, and OAR chapter 340, divisions 040 and 044.

SCHEDULE E
PRETREATMENT CONDITIONS

Not applicable to this permit.

SCHEDULE F
GENERAL CONDITIONS

Schedule F contains standard conditions that are required by the Safe Drinking Water Act and the EPA.

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