



Permit Evaluation Report

General Permit for Class V Stormwater Underground Injection Control Systems

Oregon Department of Environmental Quality
700 NE Multnomah Street
Suite 600
Portland OR 97232

Contact: UIC Hydrogeologist, DEQ-Portland, (503) 229-5263, UIC@deq.state.or.us

Proposed Permit

The Oregon Department of Environmental Quality (DEQ) proposes to issue a new Water Pollution Control Facilities General Permit for Class V Underground Injection Control (UIC) systems that are used to discharge stormwater underground but do not meet the conditions for authorization by rule in Oregon Administrative Rules (OAR) 340-044-0018(3)(a)(D), (E), or (G)¹.

Permit Category

Water Pollution Control Facilities General UIC Permit.

Activities Covered Under this Permit

This permit authorizes the discharge of stormwater and the incidental fluids identified in Schedule A, condition 1 into the ground using Class V UICs only in conformance with all the requirements, limitations, and conditions set forth in this permit.

Coverage and Eligibility

This is a general permit that DEQ will issue in accordance with OAR 340-045-0033 where activities involve similar types of operations and types of wastes. This permit authorizes disposal of wastewaters generated from stormwater that falls on roofs, pavement, or other impervious surfaces and that is not exposed to chemical-storage or waste-handling areas.

A general permit is issued by the state of Oregon, and UIC owners register for coverage under the permit. An owner of a UIC is eligible for coverage under this permit if:

- The owner is registered for coverage,
- The owner has at least one UIC that does not meet the conditions for authorization by rule in OAR 340-044-0018(3)(a)(D), (E), or (G)², and
- The owner either: (1) owns or operates fewer than 50 stormwater UICs at a facility (a single tax lot or multiple contiguous tax lots) or (2) for a municipality or other government agency, owns or operates fewer than 50 stormwater UICs within the jurisdiction. If you own UICs at multiple facilities, you can submit separate registrations for coverage under the general permit for each facility.

¹ OAR 340-044-0018(3)(a)(D) and (E) require that a UIC is located over 500 feet from a water well to be authorized by rule, OAR 340-044-0018(3)(a)(E) requires that a UIC is located outside of the two-year time-of-travel to be authorized by rule, and OAR 340-044-0018(3)(a)(G) requires that a UIC does not intersect the seasonal high groundwater table to be authorized by rule.

² See footnote 1 above

What is DEQ Proposing?

The federal Safe Drinking Water Act regulates underground injection of fluids, and the national UIC program is administered by the U.S. Environmental Protection Agency (EPA). In 1984, EPA delegated the UIC program in Oregon to DEQ. Accordingly, the DEQ issued rules³ 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. UICs are also subject to Oregon's groundwater quality protection rules⁴.

Oregon's UIC rules require the owner or operator of a UIC to register the injection system and either obtain authorization from DEQ by rule⁵ or permit⁶. DEQ is currently issuing Water Pollution Control Facilities Individual Permits to allow underground injection of stormwater from municipal and commercial entities that own or operate a large number of UICs. In addition, DEQ developed this simpler Water Pollution Control Facilities General Permit for businesses or jurisdictions which operate fewer than 50 UICs. DEQ designed the Water Pollution Control Facilities General Permit conditions specifically to allow underground injection of permitted fluids while protecting the public's health, safety and welfare, and the environment.

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 fluids⁷, which are Class V UICs. A stormwater UIC is a well, improved sinkhole, sewage drain hole, subsurface fluid distribution system or other system used for the subsurface emplacement or discharge of fluids. Examples of stormwater UICs are drywells, soakage trenches, drill holes, and infiltration galleries. Best management practices that allow stormwater to infiltrate below ground such as swales, ponds, porous pavers, and porous concrete are not considered UICs unless such best management practices also use fluid distribution mechanisms (usually perforated pipe) to distribute stormwater underground.

In this permit evaluation report, the following topics are covered: the background of how the general permit conditions were developed, intent of each condition, and a guide to DEQ staff for implementing permit conditions.

Background

DEQ reviewed stormwater quality data⁸, groundwater quality data⁹, studies of the fate and transport of stormwater pollutants after discharge from a UIC¹⁰, and incidents of soil and groundwater contamination related to UICs¹¹, and has concluded that:

³ Oregon Administrative Rules (OAR) Chapter 340, Division 44

⁴ OAR Chapter 340, Division 40

⁵ OAR 340-044-0018

⁶ OAR 340-044-0035

⁷ See Schedule A, condition 1 for a list of the incidental fluids.

⁸ 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).

⁹ Laboratory analyses of pentachlorophenol in groundwater downgradient of UIC areas are available for the following cities: Eugene (DEQ, 2001), Portland (DEQ, 2015a), Hermiston (DEQ, 2015b), and Umatilla (DEQ, 2015c). Pentachlorophenol is an indicator pollutant for groundwater contamination from stormwater because it is common in the types of stormwater discharges that are covered under this permit, and it is the most mobile and persistent of the common stormwater pollutants. In addition, DEQ considers pentachlorophenol to pose the highest risk of adverse impact to groundwater because it is detected in stormwater above the EPA Maximum Contaminant Level more frequently than other stormwater pollutants, and has a higher mobility in subsurface soils than other common stormwater pollutants (see Appendix A for a full discussion of stormwater quality data for pentachlorophenol and the subsurface mobility of pentachlorophenol).

- The types and concentrations of pollutants in stormwater from parking lots and streets are well-characterized based on the large number of stormwater samples that have been collected from UICs (see Appendix A for a summary of pollutant concentrations in stormwater discharges to UICs).
- Statistical analyses of municipal stormwater quality data used appropriate statistical methods (for example, 95 percent upper confidence limits on the average to conservatively estimate average concentrations, and nonparametric analyses to test hypotheses). The results of the municipal stormwater quality analyses are consistent with stormwater quality data collected from UICs in parking lots (*i.e.*, as is shown in Appendix A, the same pollutants exceed their respective EPA Maximum Contaminant Level in over one percent of samples)¹².
- The pollutant fate and transport studies were based on conservative models for pollutant attenuation and were correctly applied to UICs. 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 meets the background groundwater concentrations at the groundwater table for stormwater pollutants that commonly exceed regulatory standards, as long as a minimum vertical separation distance exists between the bottom of the UIC and groundwater. The minimum vertical separation distance depends on the pollutant, and ranges from about one foot (lead and benzo(a)pyrene) to about five feet (pentachlorophenol)¹³.
- Based on groundwater quality data from areas with a high density of UICs, 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.

Compliance with Federal Regulations

UIC Permits issued by DEQ must comply with the federal UIC permit requirements specified in 40 CFR 144.51. DEQ carefully compared the permit conditions in the general permit with federal requirements. The permit's general conditions in Schedule F meet the UIC 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 water¹⁴. The following permit conditions are designed to protect groundwater to its highest beneficial use, and 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 identified in Schedule A, condition 1, 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). These UICs are prohibited, are not permitted, must be closed pursuant to OAR 340-044-0015(2).

¹⁰ 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).

¹¹ Environmental Cleanup Site Information (ECSI) database, available online at: <http://www.deq.state.or.us/lq/ecsi/ecsi.htm>.

¹² The stormwater quality data from parking lots is from rule-authorized UICs located at high risk sites (*i.e.*, parking lots with over 1,000 vehicle trips per day and sites where hazardous substances are used or stored).

¹³ See the fact sheet "Groundwater Protectiveness Demonstrations for Underground Injection Control Permits," available online at: <http://www.deq.state.or.us/wq/uic/guidance.htm>

¹⁴ See OAR 340-040-0020(3)

- Structural and operational best management practices must be implemented at sites that are authorized under this permit¹⁵. 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.
- 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 wells¹⁶, 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 as defined in 42 USC 300h(d)(2) or violate the prohibition of fluid movement standard as defined in 40 CFR 144.12, retrofit the UIC with additional protection controls¹⁷, or decommission the UIC.
- A minimum vertical separation distance between the bottom of a UIC and seasonal high groundwater is not established 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). However, permittees may need to demonstrate that the vertical separation distance at their UICs is protective of water wells, in accordance with Schedule A, condition 7.
- The applicant must prepare an inventory¹⁸ to identify UICs that do not have minimum setbacks (500 feet to a water well or within the two-year time-of-travel of a public supply well) or that are prohibited UICs, and the permit provides a schedule for addressing these UICs.
- Applicants must prepare a robust Stormwater Management Plan for certain types of UICs¹⁹. The plan must include best management practices for source control and treatment, spill prevention and spill response plans, maintenance procedures, employee education, and stormwater sampling.
- The permit requires stormwater quality monitoring at certain types of UICs, reporting of stormwater monitoring data²⁰, and sets pollutant-specific concentration limits in stormwater (i.e., action levels)²¹. Action levels are equal to the EPA Maximum Contaminant Level. If an action level is exceeded, then the permittee is required to take corrective action²². This is more protective than the federal UIC rules because the federal rules do not require stormwater monitoring or stipulate action levels for Class V stormwater UICs.
- Structural spill control is required for UICs within setbacks to water wells (500 feet or the two-year time-of-travel) if hazardous substances, toxic materials, or petroleum products are handled within the UIC drainage basin and have the potential to drain to the UIC in case of a spill. This is more prohibitive than the federal regulations, which have no requirement for structural spill control at stormwater UICs.

Area Permit Coverage

The permit allows *area permit coverage*, meaning it can be used to authorize all UICs at a single facility (street address or contiguous tax lots), or within a municipality's or government agency's jurisdiction. Under area permit coverage, the permittee may construct, operate, maintain, convert, or plug and abandon UICs covered under the permit, provided they meet conditions of the permit.

¹⁵ See Schedule A, condition 6.

¹⁶ Schedule A, condition 7

¹⁷ See Schedule A, condition 7 of this Permit Evaluation Report for additional discussion

¹⁸ Schedule B, condition 1

¹⁹ Schedule D, condition 5

²⁰ Schedule B, condition 2

²¹ Schedule A, condition 2

²² Schedule A, condition 3

Permit Conditions

The UIC WPCF permit is effective for 10 years from the date it is issued, unless we terminate, revoke, or reissue the permit. Within the 10 years, a permittee may request termination of coverage under the permit. The permittee must maintain permit coverage and renew registration as long as the permittee operates UICs that are not authorized by rule or does not have an individual permit for the UICs.

If DEQ determines that the permittee is not in compliance with the permit, DEQ may revoke coverage of the permit, or require the permittee to take corrective actions to protect groundwater quality. DEQ may also take enforcement action, including assessment of civil penalties, if permittee does not comply with the permit or violates any other statute, rule, or order administrated by DEQ.

The remainder of this permit evaluation report annotates the permit conditions.

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 National Pollutant Discharge Elimination System Municipal Separate Storm Sewer System permit (that is, under what is called an *MS4 permit*).

2. Action Levels.

The permittee may be required to monitor stormwater under Schedule B, condition 2 for the pollutants listed in Table 1. The pollutants in Table 1 were chosen for monitoring because they are the most persistent and environmentally mobile pollutants in stormwater, and occur above EPA Maximum Contaminant Levels more frequently than other stormwater pollutants. A detailed discussion of the selection criteria for the pollutants in Table 1 is provided in Appendix A. The action levels in Table 1 are equal to EPA Maximum Contaminant Levels.

3. Action Level Exceedance.

Condition 3 tells the permittee what corrective actions to take when a pollutant concentration in stormwater exceeds an action level. The first step for addressing an action level exceedance is to identify the source of the exceedance and determine which UICs require corrective action. The second step includes one or more of the following: assess whether to adjust best management practices so that the pollutant concentration is reduced to below action levels, retrofit the UIC, decommission the UIC, or demonstrate that the action level exceedance is protective of groundwater.

An action level exceedance is protective of groundwater if the exceedance does not violate the prohibition of fluid movement standard [which includes endangerment of groundwater as defined in USC 300h(d)(2)]. Several scientific studies have calculated pollutant concentrations that may endanger groundwater²³ or violate the prohibition of fluid movement standard²⁴ based on the geologic unit in which a UIC is installed. DEQ has developed a fact sheet that summarizes these studies, which is available on DEQ's UIC website at: <http://www.deq.state.or.us/wq/uic/guidance.htm>²⁵. You can cite these scientific

²³ Endangerment occurs if injection results in pollutants in 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 public drinking water regulations or adversely affecting public health [see 42 USC 300h(d)(2)]

²⁴ The prohibition of fluid movement standard is violated when a UIC allows movement of fluid containing contaminants into underground sources of drinking water, if the presence of that contaminant may cause a violation of an MCL or otherwise adversely affect the health of persons (see 44 CFR 144.12).

²⁵ See "Groundwater Protectiveness Demonstrations for Underground Injection Control Permits"

studies to demonstrate that an action level exceedance is protective of groundwater (if the studies are applicable to the geology at your facility), or you can conduct your own study to demonstrate that an action level exceedance is protective of groundwater.

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.

Spill response procedures are included in your Stormwater Management Plan, if one is required by Schedule D, condition 5. If you are not required to prepare a Stormwater Management Plan, then spill response procedures are detailed in DEQ's fact sheet "What to Do When You've Had a Spill," included in Appendix B of this report.

5. Endangerment and the Prohibition of Fluid Movement Standard.

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 endanger human health or the environment or violate the prohibition of fluid movement standard. 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 is a spill of a hazardous material, toxic substance, or petroleum product into an injection system.

6. Source Controls and Best Management Practices.

Source controls or best management practices must be used to treat stormwater prior to discharge to the subsurface. This permit condition meets DEQ's policy to minimize groundwater quality degradation from point sources by using the highest and best practicable methods to prevent the movement of pollutants to groundwater²⁶. For example, vegetated planters and swales installed upstream of UICs 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)²⁷ and EPA (2015)²⁸ provide examples of acceptable source controls and best management practices.

7. Horizontal Setbacks.

Corrective action is necessary if UICs are located within horizontal setbacks to water wells because the state UIC rules presume that injection systems within setbacks could adversely affect groundwater quality, groundwater beneficial uses, or human health. Corrective action may include structural spill control, and always includes demonstrating that a UIC is protective of groundwater, retrofitting the UIC, or decommissioning the UIC.

- **Structural Spill Control.** If a UIC drains stormwater from an industrial or commercial property where hazardous substances, toxic materials, or petroleum products are handled and have the potential to enter a UIC in the case of a spill, then structural spill control is required. The type of structural spill control that is required will be specific to the chemical types and quantities used on site, and may include sedimentation manholes (i.e., a structure, typically cylindrical and made of concrete, that is designed to trap sediment, oil, and debris from stormwater before conveying

²⁶ See OAR 340-040-0020(11)

²⁷ Available online at: <http://www.deq.state.or.us/wq/wqpermit/docs/IndBMP021413.pdf>

²⁸ Available online at: <http://water.epa.gov/polwaste/npdes/swbmp/PostConstruction-Stormwater-Management-in-New-Development-and-Redevelopment.cfm>

the stormwater to a disposal point) or automatic shut off valves.

- **Demonstration that a UIC is Protective of Groundwater.** A UIC is considered to be protective of groundwater if discharges to the UIC do not violate the prohibition of fluid movement standard and do not endanger groundwater. Several scientific studies have calculated horizontal separation distances²⁹ and vertical separation distances³⁰ that, if met, are protective of groundwater. The vertical and horizontal separation distances are based on the geologic unit in which the UIC is located. DEQ has developed a fact sheet that summarizes these studies, which is available on DEQ's UIC website at: <http://www.deq.state.or.us/wq/uic/guidance.htm>. A UIC owner can cite these scientific studies to demonstrate that a UIC is protective of groundwater (if the studies are applicable to the geology at the owner's facility), or can develop a new study to demonstrate that a UIC is protective of groundwater.
- **Retrofit.** If the permittee cannot demonstrate that a UIC is protective of groundwater, the permittee can structurally retrofit the UIC. A structural retrofit is a physical modification to the UIC, which may include backfilling a UIC with engineered media 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 the pollutant load to the UIC.

Schedule A, condition 7, applies to injection systems the permittee knows of, or should have known of, at the time we assign coverage under the permit. It also applies to injection systems located within a setback area discovered after the general permit is assigned to an applicant.

SCHEDULE B MONITORING AND REPORTING CONDITIONS

1. Inventory.

Federal regulations (40 CFR 144.26) require that owners or operators of injections systems submit an inventory of their systems to us. The inventory is used to track the permittee's UIC systems, identify UICs that do not meet permit conditions, and inform which UICs need to be sampled in accordance with Schedule B, condition 2. DEQ provides a form for completing this inventory, which is available online at: <http://www.deq.state.or.us/wq/uic/forms.htm>.

The inventory requires that UIC owners identify the number of vehicle trips per day in the parking lot or street that is drained by the UIC. Vehicle trips per day can be calculated using the Institute of Transportation Engineers Trip Generation Manual (ITE, 2012), by direct measurement, or by assuming that parking lots with more than 100 parking spaces experience more than 1,000 vehicle trips per day.

The inventory must identify UICs that are within the setback distances to water wells listed in Schedule A, condition 7 (within 500 feet of a water well or within the two-year time-of-travel of a public water supply well). For each UIC within a setback, you must do one of the following in the inventory:

- **Cite an existing study that demonstrates the UIC is protective of the water well.** If a study shows that the vertical separation distance between the bottom of your UIC and groundwater is protective of the water well, or that the horizontal separation distance between your UIC and the water well is protective of the water well, then you can cite that study to meet Schedule A, condition 7 of the permit. See the discussion in Schedule A, condition 7 of the Permit Evaluation Report for additional information.

²⁹ The distance between a UIC and water well

³⁰ The distance between the bottom of the UIC and seasonal high groundwater

- **Indicate that you plan to conduct your own study that demonstrates the UIC is protective of the water well.** The study must be conducted within one year of permit issuance, and must be based on the geologic conditions at your facility.
- **Describe your plans and schedule for retrofitting or decommissioning the UIC.**

2. Stormwater Monitoring.

Stormwater monitoring involves the collection of stormwater samples from your UIC during a storm event. Annual stormwater quality monitoring is required if your UIC drains a surface with 1,000 or more vehicle trips per day, or if your UIC is located at a facility that handles or stores hazardous substances, toxic materials, or petroleum products that could reach the UIC if a spill occurs. Stormwater sampling must be conducted between July 1 and June 30 of the following year. Sampling should focus on UICs within the Schedule A, Table 2 setbacks.

You must submit stormwater monitoring reports to DEQ by November 1 of each year, using a template provided by DEQ. DEQ requires that you submit your monitoring data and identify corrective actions to ensure that you are taking actions to improve stormwater quality if the quality exceeds action levels. In addition, DEQ compiles your stormwater data to inform requirements of future permits and changes to the Oregon Administrative Rules regulating UICs. If you are a municipality, you may combine your UIC and MS4 annual reports, as long as you submit copies of the report to both the UIC and MS4 programs.

You must include an appendix to the Stormwater Management Plan (see Schedule D, condition 5) that includes the following information:

- Sampling Procedures, including:
 - Monitored pollutants,
 - Sampling locations,
 - Sampling schedule,
 - Sample collection methods (criteria for sampling a given storm, sampling equipment, health and safety, sample containers, and techniques), and
 - Sample collection criteria.
- Quality Assurance/Quality Control:
 - Criteria for selecting a laboratory, and
 - Duplicates, blanks and indicators.
- Reporting

3. UIC Decommissioning.

UIC decommissioning (or closure) is regulated under Oregon Administrative Rules (OAR) 340-044-0040. DEQ has developed a fact sheet that describes a step-by-step process for implementing these regulations, which is available online at: <http://www.deq.state.or.us/wq/uic/guidance.htm> (see "Closure of an Injection System").

4. UIC Construction or Discovery.

UIC owners must submit the necessary registration information to DEQ and pay DEQ any associated fees for UICs discovered or constructed after the permit is issued. DEQ will add the underground injection system to the DEQ UIC database.

5. Best Management Practices.

Best Management Practices are discussed in Schedule A, condition 6 of the Permit Evaluation Report.

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) if 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.

This condition is only applicable to municipalities. The permittee must adopt and maintain, through ordinance or other means, adequate legal authority to implement and enforce the provisions of this permit.

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 responsibilities.

If the ownership of the property changes, the new owner must notify DEQ using the "Application for Name Change and/or Transfer of Underground Injection Control (UIC) Registration, UIC Authorization by Rule, or UIC WPCF Permit" within 30 calendar days of the planned transfer. This form is available online at: <http://www.deq.state.or.us/wq/uic/forms.htm>. The new owner may be required to re-register for coverage under the permit (see Schedule F, condition 4.d of the permit).

3. Adaptive Management.

Permittees must follow an adaptive management approach to assess annually, and modify as necessary, any or all existing source controls and best management practices to ensure that they minimize the amount of contamination that can affect the stormwater they are injecting. They also must routinely assess the need to further improve groundwater quality and protect groundwater beneficial uses, and review available technologies and practices.

4. Rule Authorization.

This permit covers all UICs owned or operated by you, including those that have been previously rule authorized.

5. Stormwater Management Plan.

You are required to prepare a Stormwater Management Plan if your UICs drain a surface that experiences 1,000 or more vehicle trips per day, or if your UICs are located at a facility that uses, handles, or stores hazardous substances, toxic materials, or petroleum products. If you are a municipality, you may use the same Stormwater Management Plan for your UIC permit and your MS4 permit, provided that the plan meets UIC and MS4 program requirements, and copies of the Stormwater Management Plan are submitted to both the UIC and MS4 programs (if required by the programs).

6. 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, Division 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 F
GENERAL CONDITIONS**

The conditions in Schedule F have been taken directly from the federal regulations (40 CFR 144.51). Some of the wording has been changed to make it applicable to general permits in Oregon.

References

City of Bend, 2014. 2013-2014 Annual Report, Stormwater UIC WPCF Permit No. 103052. Prepared by: City of Bend. Submitted to: Oregon DEQ. October 28.

City of Eugene, 2014. Underground Injection Control System Annual Report. Permit Year 2 (July 1, 2013 to June 30, 2014). Prepared by: City of Eugene. Submitted to: Oregon DEQ. December 30.

City of Gresham, 2013. WPCF Permit Annual Compliance Report to Permit Year 1. Prepared by: City of Gresham. Submitted to: Oregon DEQ. December 31.

City of Gresham, 2014. WPCF Permit Annual Compliance Report to Permit Year 2. Prepared by: City of Gresham. Submitted to: Oregon DEQ. December.

City of Keizer, 2014. Annual Report, Permit Year 2013/2014, Class V WPCF Permit 103068. Prepared by: City of Keizer. Submitted to: Oregon DEQ. December.

City of Portland BES, 2006. Annual Stormwater Discharge Monitoring Report to Year 1 (October 2005 to May 2006). Prepared by: City of Portland. Submitted to: Oregon DEQ. July.

City of Portland BES, 2007. Annual Stormwater Discharge Monitoring Report to Year 2 (October 2006 to May 2007). Prepared by: City of Portland. Submitted to: Oregon DEQ, July.

City of Portland BES, 2008a. Annual Stormwater Discharge Monitoring Report to Year 3 (October 2007 to May 2008). Prepared by: City of Portland. Submitted to: Oregon DEQ, July.

City of Portland BES, 2008b. Decision making framework for groundwater protectiveness demonstration, underground injection control system evaluation and response. Available online at: <http://www.deq.state.or.us/wq/uic/templates.htm>.

City of Portland BES, 2009. Annual Stormwater Discharge Monitoring Report to Year 4 (October 2008 to May 2009). Prepared by: City of Portland. Submitted to: Oregon DEQ, July.

City of Portland BES, 2010. Annual Stormwater Discharge Monitoring Report to Year 5 (October 2009 to May 2010). Prepared by: City of Portland. Submitted to: Oregon DEQ, July.

City of Portland BES, 2011. Annual Stormwater Discharge Monitoring Report to Year 6 (October 2010 to May 2011). Prepared by: City of Portland. Submitted to: Oregon DEQ, July.

City of Portland BES, 2012. Annual Stormwater Discharge Monitoring Report to Year 7 (October 2011 to May 2012). Prepared by: City of Portland. Submitted to: Oregon DEQ, November.

City of Portland BES, 2013. Annual Stormwater Discharge Monitoring Report to Year 8, Fiscal Year 2012 to 2013 (July 1, 2012 to June 30, 2013). Prepared by: City of Portland. Submitted to: DEQ, November.

City of Portland BES, 2014. Annual Stormwater Discharge Monitoring Report to Year 9, October 1, 2013 to June 30, 2014. Prepared by: City of Portland. Submitted to: Oregon DEQ. November 1.

City of Redmond, 2014. 2013 Underground Injection Control System Report. Prepared by: City of Redmond. Submitted to: DEQ. May.

DEQ, 2001. Eugene Area Wide Initial Groundwater Investigation Summary Report. Prepared by: DEQ. April 23.

DEQ, 2015a. Permit Evaluation Report, City of Portland Class V Underground Injection Control Systems, Water Pollution Control Facilities Permit #102830. Issued 19 May 2015.

DEQ, 2015b. LASAR Web App. Accessed by DEQ on 23 January 2015. Available online at: <http://deq12.deq.state.or.us/lasar2/>

DEQ, 2015c. Permit Evaluation Report, City of Umatilla Class V Underground Injection Control Systems, Water Pollution Control Facilities Permit #103110. Issued 8 May 2015.

EPA, 2004. Superfund Chemical Data Matrix Methodology Report. Appendix A. Available online at: <http://www.epa.gov/superfund/sites/npl/hrsres/tools/scdm.htm>.

GSI and EnviroIssues, 2008. Evaluation of Vertical Separation Distance Groundwater Protectiveness Demonstration. Prepared for: City of Portland BES. Available online at: <http://www.deq.state.or.us/wq/uic/docs/template/PortlandReport.pdf>

GSI, 2011a. Technical Memorandum, Pollutant Fate and Transport Model Results in Support of the City of Bend UIC WPCF Permit ó Groundwater Protectiveness Demonstration and Proposed EDLs, Prepared for: City of Bend. Available online at: <http://www.deq.state.or.us/wq/uic/templates.htm>.

GSI, 2011b. Technical Memorandum, Pollutant Fate and Transport Model Results in Support of Clackamas County WESøUIC WPCF Permit ó Groundwater Protectiveness Demonstration and Proposed EDLs, prepared for: Clackamas County WES. Available online at: <http://www.deq.state.or.us/wq/uic/templates.htm>.

GSI, 2011c. Technical Memorandum, Pollutant Fate and Transport Model Results in Support of the City of Gresham UIC WPCF Permit ó Proposed EDLs, prepared for: City of Gresham, Oregon. Available online at: <http://www.deq.state.or.us/wq/uic/templates.htm>.

GSI, 2011d. Technical Memorandum, Pollutant Fate and Transport Model Results in Support of the City of Redmond UIC WPCF Permit ó Groundwater Protectiveness Demonstration and Proposed EDLs, prepared for: City of Redmond, Oregon. Available online at: <http://www.deq.state.or.us/wq/uic/templates.htm>.

GSI, 2012. Determination of Waste Management Areas at Wet Feet UICs by Numerical Simulation of Pollutant Fate and Transport. May 22.

GSI, 2013a. Groundwater Protectiveness Demonstrations, prepared for: City of Eugene, Oregon. Available online at: <http://www.deq.state.or.us/wq/uic/templates.htm>.

GSI, 2013b. Groundwater Protectiveness Demonstrations, prepared for: Lane County, Oregon. Available online at: <http://www.deq.state.or.us/wq/uic/templates.htm>.

GSI, 2013c. Unsaturated Zone Groundwater Protectiveness Demonstration, prepared for: City of Milwaukie, Oregon. Available online at: <http://www.deq.state.or.us/wq/uic/templates.htm>.

GSI, 2013d. Groundwater Protectiveness Demonstrations and Risk Prioritization for Underground Injection Control (UIC) Devices, City of Canby, Oregon, prepared for: City of Canby, Oregon

GSI, 2013e. Groundwater Protectiveness Demonstrations and Risk Prioritization for Underground Injection Control (UIC) Devices, City of Keizer, Oregon, prepared for: City of Keizer. Available online at: <http://www.deq.state.or.us/wq/uic/templates.htm>.

ITE, 2012. Trip Generation Manual, 9th ed.

Jurries, D., and K. Ratliff, 2013. Industrial Stormwater Best Management Practices Manual. February. Available online at: <http://www.deq.state.or.us/wq/wqpermit/docs/IndBMP021413.pdf>.

Kennedy-Jenks, 2009. Compilation and evaluation of existing stormwater quality data from Oregon, prepared for the Oregon Association of Clean Water Agencies

Kennedy/Jenks, 2011. Effects of structural best management practices on stormwater quality in central Oregon, prepared for the City of Bend

Mackay, D., Sharpe, S., Cahill, T., Gouin, T., Cousins, I., and L. Toose, 2001. Assessing the Environmental Persistence of a Variety of Chemical Substances including Metals. CEMC Report No. 200104. Trent University, Peterborough, Ontario.

Appendix A

The pollutants in Schedule A, Table 1 were selected because they met all of the following criteria:

- **Pollutant has exceeded EPA MCLs in at least one percent of stormwater samples that have been collected.** Hundreds of stormwater samples have been collected by UIC owners as a condition for authorization by rule or authorization by permit. DEQ has compiled and analyzed this data to determine which pollutants in stormwater occur at concentrations of concern (i.e., exceed the EPA Maximum Contaminant Level).
- **Mobility of the pollutant in the subsurface is medium or high.** GSI and EnviroIssues (2008) assigned mobility ranks to pollutants in stormwater using EPA's groundwater mobility value for liquid, non-karst aquifer (EPA, 2004). The mobility ranks were *high* (EPA mobility ranking of 1.0), *medium* (EPA mobility ranking of 0.01), or *low* (EPA mobility ranking of <0.01).
- **Persistence of the pollutant in the subsurface is medium, high or infinite.** GSI and EnviroIssues (2008) assigned persistence ranks to pollutants in stormwater using pollutant half lives (Mackay, 2001). The persistence ranks were *infinite* (does not break down), *high* (a half life of 500 days or greater), *medium* (a half life of 50 to 499 days), or *low* (a half life of less than 50 days).

The application of these criteria to municipal stormwater and parking lot stormwater is summarized in the following sections.

Municipal Stormwater Quality Data

Table A-1 summarizes stormwater analytical data from annual stormwater discharge monitoring required under individual UIC WPCF permits that have been issued to municipalities, as well as the associated mobility and persistence rankings for each pollutant. The data indicates that three pollutants—pentachlorophenol (PCP), total lead, and di(2-ethylhexyl)phthalate (DEHP)—exceed the Maximum Contaminant Level in more than one percent of samples. Of these four pollutants, PCP and lead have a mobility *and* persistence ranking of medium, high, or infinite. Therefore, we included PCP and lead as pollutants for sampling in Schedule A, Table 1. PCP and lead are highlighted in grey in Table A-1 below.

Table A-1. Stormwater Discharge Monitoring Data From Streets. The table summarizes stormwater quality data collected under municipal WPCF permits for UICs, and includes data from the cities of Portland, Gresham, Redmond, Bend and Keizer through June 30, 2014.

Analyte	MCL (ug/L)	Number of Samples	% of Samples Exceeding MCL	Mobility Ranking	Persistence Ranking
Pentachlorophenol (PCP)	1.0	1,279	14.5%	High	Medium
Total Lead	15	1,284	13.3%	Medium	Infinite
di(2-ethylhexyl)phthalate (DEHP)	6.0	1,284	5.5%	Low	Low
Benzo(a)pyrene	0.2	1,284	0.93%	Low	Medium
Total Arsenic	10	1,183	0.08%	Medium	Infinite
Total Copper	1,300	1,284	0.0%	Medium	Infinite
Total Zinc	5,000	1,284	0.0%	Medium	Infinite
Total Chromium	100	1,183	0.0%	Medium	Infinite
Total Cadmium	5.0	1,183	0.0%	Medium	Infinite
2,4-D	70	1,238	0.0%	High	Low
Picloram	500	1,238	0.0%	Medium	Medium
Dinoseb	7.0	1,238	0.0%	High	Low
Total Nitrogen	10,000	1,136	0.0%	High	Infinite
Benzene	5.0	970	0.0%	High	Low
Toluene	1,000	970	0.0%	High	Low
Ethylbenzene	700	970	0.0%	High	Low
Xylenes	10,000	970	0.0%	High	Low
Chlorobenzene	100	940	0.0%	High	Medium
Carbon Tetrachloride	5.0	940	0.0%	High	Medium
o-Dichlorobenzene	600	940	0.0%	High	High
p-Dichlorobenzene	75	940	0.0%	High	Medium
1,3-Dichlorobenzene	5.5	940	0.0%	High	Low
1,2,4-trichlorobenzene	70	940	0.0%	High	Medium
Total Barium	2,000	225	0.0%	Medium	Infinite
Total Antimony	6.0	277	0.0%	Medium	Infinite
Inorganic Mercury	2.0	221	0.0%	Medium	Infinite
Alachlor	2.0	77	0.0%	Medium	Low
Atrazine	3.0	77	0.0%	Medium	Medium
Carbofuran	40	77	0.0%	Medium	Medium
Lindane	0.2	77	0.0%	High	High
Beryllium (Total)	4.0	65	0.0%	Medium	Infinite
Glyphosate	700	53	0.0%	Low	Medium
Total Selenium	50	49	0.0%	High	Infinite
Total Cyanide	200	45	0.0%	High	Infinite
Total Thallium	2.0	45	0.0%	Medium	Infinite
Chlordane	2.0	45	0.0%	Medium	High
Dalapon	200	45	0.0%	High	Low
Bis(2-chloroisopropyl)ether	0.8	45	0.0%	Medium	Medium
Bis(2-chloroethyl)ether	0.3	45	0.0%	Medium	Medium
Diquat	20	45	0.0%	Low	Infinite
Endothall	100	45	0.0%	Medium	Low
2,4,5-TP	50	60	0.0%	Not Assigned	Low

Note:

ug/L=micrograms per liter

MCL=Maximum Contaminant Level

Parking Lot Stormwater Quality Data

Table A-2 summarizes stormwater analytical data from UIC facilities that are authorized by rule to infiltrate stormwater from parking lots (almost all of which experience over 1,000 vehicle trips per day) and facilities that use or store hazardous substances, as well as the associated mobility and persistence rankings for each pollutant. The data indicates that four pollutants— DEHP, lead, benzo(a)pyrene, and PCP— exceed the Maximum Contaminant Level in more than one percent of samples. Of these four pollutants, lead and PCP have a mobility *and* persistence ranking of medium, high or infinite. Therefore, we included lead and PCP as pollutants for sampling in Schedule A, Table 1, and highlighted the pollutants in grey in Table A-2 below.

Table A-2. Stormwater Discharge Monitoring Data From Parking Lots. The table summarizes stormwater quality data collected at high-risk facilities with UICs that are authorized by rule. Data were collected through December 31, 2014.

Analyte	MCL (ug/L)	Number of Samples	%of Samples Exceeding MCL	Mobility Ranking	Persistence Ranking
di(2-ethylhexyl)phthalate (DEHP)	6.0	19	15.8%	Low	Low
Total Lead	15	340	11.8%	Medium	Infinite
Benzo(a)pyrene	0.2	247	2.4%	Low	Medium
Total Chromium	100	339	0.6%	Medium	Infinite
Nitrate+Nitrite as N	10,000	278	0.4%	High	Infinite
Total Arsenic	10	19	0.0%	Medium	Infinite
Total Barium	2,000	34	0.0%	Medium	Infinite
Total Cadmium	5.0	338	0.0%	Medium	Infinite
Total Copper	1,300	337	0.0%	Medium	Infinite
Total Mercury	2.0	35	0.0%	Medium	Infinite
Total Selenium	50	35	0.0%	High	Infinite
Benzene	5.0	357	0.0%	High	Low
Toluene	1,000	363	0.0%	High	Low
Ethylbenzene	700	363	0.0%	High	Low
Total Xylenes	10,000	359	0.0%	High	Low
Tetrachloroethene (PCE)	5.0	68	0.0%	Medium	
Trichloroethene (TCE)	5.0	68	0.0%	High	
cis-1,2 Dichloroethene (DCE)	70	64	0.0%	High	
Vinyl Chloride	2.0	59	0.0%	High	
Pentachlorophenol (PCP)	1.0	30	3.3%	High	Medium

Note:

ug/L=micrograms per liter

MCL=Maximum Contaminant Level