



Fact Sheet

Artificial Groundwater Recharge

The Oregon Water Resources Department and Department of Environmental Quality review artificial groundwater recharge projects that can replenish water in aquifers through engineered processes. Artificial groundwater recharge is defined as "the intentional addition of water diverted from another source to a groundwater reservoir" (OAR 690-350-0110). This can occur by injection through a well or another type of infiltration system to the groundwater.

Artificial groundwater recharge is different than aquifer storage and recovery. Aquifer storage and recovery is "the storage of water from a separate source that meets drinking water standards in a suitable aquifer for later recovery and not having as one of its primary purposes the restoration of the aquifer" (OAR 690-350-0010). Practically, the key difference is that artificial groundwater recharge source water must meet background water quality criteria. Aquifer storage and recovery source water must meet drinking water standards.

OWRD adopted the rules for artificial groundwater recharge in 1961. These projects have been operating in Oregon since 1976, with more than 3 billion gallons stored annually. Projects include irrigation, industrial and quasi-municipal storage. Some projects are designed to increase groundwater supply to wells, others to allow stored water to discharge indirectly to streams for temperature or flow benefits. DEQ's review process is one part of the approval for artificial groundwater recharge projects. Oregon Water Resources Department officially approves the projects to move forward (more information below). **As of January 2025, OWRD has licensed 92% of artificial groundwater recharge and aquifer storage and recovery applications received.**

Water Resource Protection

To ensure that Oregon's groundwater resources are protected for current and future uses, applications for artificial groundwater recharge require extensive water quality and quantity evaluation by a qualified hydrogeologist. Once the project is approved, it also requires continuous monitoring and reporting to ensure the project operates as intended. OWRD and DEQ work with applicants to carefully evaluate both the quality of the source of water to be injected and the natural groundwater quality of the aquifer to be recharged. The character of the aquifer needs to be evaluated to determine the capacity to hold water, the direction of groundwater flow, and potential impacts to nearby groundwater and surface water users.

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Permitting artificial groundwater recharge projects

Applications for artificial groundwater recharge projects go through OWRD. OWRD determines if water is available to issue a water right permit for a project. If the source water does not have an in-stream water right, an Oregon Department of Fish and Wildlife waiver is also required before permit issuance. OWRD authorization is required specifically for storing water underground. A secondary groundwater permit will be required to later retrieve any stored water, if desired. OWRD requires a conference with applicants ahead of an application submittal. Public notice of applications is sent out by OWRD and there is a public interest review of the application.

DEQ is responsible for reviewing artificial groundwater recharge projects to ensure natural groundwater quality is protected. DEQ must consider potential chemical interactions of the source and receiving waters and whether the recharge could cause harmful chemicals to be released from the soil or be mobilized or changed in the groundwater. In addition, DEQ considers any other contaminated sites, or other groundwater quality issues, in the groundwater where recharge is planned to ensure the project does not worsen an existing problem.

Importantly, the project may not degrade the existing groundwater quality. If the source water is from a wastewater facility operating under a DEQ permit, DEQ will need to ensure the water treatment is sufficient to protect groundwater quality. Additionally, DEQ must ensure chemicals used in water treatment and not typically monitored in wastewater do not become new contaminants in the aquifer. In certain situations, other DEQ rules and conditions may apply. For example, if source water is reaching the groundwater through buried perforated pipes or through a well, DEQ's Underground Injection Control rules and conditions apply.

Emerging Concerns

Recent interest in contaminants that do not occur in natural groundwater but have been observed in treated wastewater such as pharmaceuticals, pesticides, disinfection byproducts including perchlorate, and perfluoroalkyl and polyfluoroalkyl substances (PFAS) has broadened the thinking about acceptable quality of water recharging drinking water aquifers.

Relevant Rules and Regulations

- OWRD Rules for artificial groundwater recharge: OAR 690-350-0110 to -0130, 690-340-0030
- DEQ Groundwater Protection Rules: OAR 340-040-0020(2)
- DEQ Water Reuse Rules: OAR 340-055-0005 to -0025
- DEQ Underground Injection Control OAR 340-044

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