

UIC/INJECTION WELLS

Underground Injection Control (UIC) and injection wells have been used since the 1930s as a safe, and effective means of managing brine (saltwater) associated with natural gas and oil development. There are five classifications of injection wells, with Class II being reserved for brine and other fluids associated with natural gas and oil production. Class II wells, as classified by the U.S. Environmental Protection Agency (EPA), are tightly regulated by state and federal officials and generally 3,000-10,000 feet deep. The target injection formations are porous rock formations that contain, or have contained natural gas, oil, or ancient saltwater.

Each well is constructed with multiple layers of steel casing cemented in place. Impermeable rock formations overlaying the injection zone also prevent fluids from flowing upward, protecting underground sources of drinking water (USDWs), and preventing soil and water contamination.

Approximately [180,000](#) Class II injection wells operate in the United States, with more than 225 wells located in Ohio. In the history of the Ohio UIC program, as licensed by the EPA, there have been no documented cases of groundwater contamination from deep injection wells, according to the [Ohio Department of Natural Resources \(ODNR\)](#).

MODERN, EFFECTIVE REGULATIONS

According to the [EPA](#), Class II injection wells are an environmentally safe and preferred method for disposal of fluids associated with natural gas and oil production. Federal and state laws and regulations provide strict guidance as to well location, construction, inspection, oversight, and compliance.

FEDERAL OVERSIGHT BY U.S. EPA

- The UIC program is a federal EPA regulatory program defined by the Safe Drinking Water Act of 1974 that contains minimum federal requirements for injection practices with the purpose to protect public health by preventing contamination of USDWs.
- EPA conducted more than 84,000 federal inspections of Class II wells in 2018. ([EPA](#))

STATE OVERSIGHT BY ODNR

Ohio's regulatory program has long been one of the most [effective](#) in the nation, with requirements and inspections exceeding federal standards. New rules adopted in 2022 by ODNR build upon that history and further establish Ohio as a regulatory leader.

- **Review & Oversight:** Environmental regulators oversee permitting, construction, and operation of each well and associated surface facility, to ensure regulatory compliance and environmental protection.
- **Regulator Inspection:** ODNR has tripled its natural gas and oil regulatory and inspection unit in order to increase oversight of injection wells. The agency conducts a minimum of 4-5 inspections of each injection well and facility per year, exceeding the annual federal inspection threshold. In addition to the inspections being conducted by ODNR, regulations require permittees to conduct regular inspections and provide the results to regulators. This two step inspection process ensures regular and frequent inspections are occurring.
- **Managing Well Injection Pressure:** Rules establish the maximum pressure allowed to inject liquids into wells. This injection pressure must be continuously monitored by the well operator and the information reported to ODNR.

- **Managing Seismicity:** In 2022, [ODNR](#) increased oversight and implemented stricter regulations. Based on regional geology, these increased requirements may include: geologic testing and reporting requirements, seismic monitoring, and additional geological and geophysical logs. ODNR may also require seismic monitoring prior to the drilling of new injection wells and the continued monitoring during operation. Private well operators often install seismic monitoring equipment at their own cost and share the data in real time with ODNR, which has nearly doubled the number of seismic monitors operating in Ohio. ODNR can order closure of wells based on this seismic monitoring data. To reduce the rare chance of seismic occurrence, drilling wells into the Precambrian basement rock and adjacent formations is not permitted under state law.
- **Monitoring Radioactivity:** ODNR inspectors monitor and test for naturally occurring radioactivity to ensure proper waste disposal. Filters, tank-solids, and used tubing must be properly evaluated for radiation content. All materials that may have been in contact with naturally radioactive shale are controlled and properly disposed of in landfills that are specifically permitted to handle such wastes. Additionally, under ODNR, permit applications must include a full radiation protection program plan approved by the chief.

- **Key Oversight Enhancements in 2022:** ODNR made a [number of changes](#) to the rules governing UIC and associated waste management facilities to ensure the ongoing safe operation of these facilities and protection of local communities. Included in the changes are:

- Increased setback distances from private residences, schools, public buildings, flood hazard areas, water wells, ponds, and developed springs.
- Requires permittees to obtain liability insurance of at least \$2 million and file a financial assurance plan with ODNR which includes a surety bond or other cash assurance.
- Requires baseline testing water wells within 1,500 feet of new Class II Disposal wells and surface facilities prior to construction.
- A thorough public notification process regarding new permits, which includes publication of the application and delivering notice to all property owners within 1,500 ft of the proposed well by hand or certified mail among other requirements.

WELL CONSTRUCTION

Following [state](#) and [federal](#) regulations, injection wells are drilled into formations conducive to fluid injection and constructed with multiple layers of steel casing cemented in place to protect groundwater resources.

- **Depth:** Injection wells are typically 3,000-10,000 feet below groundwater aquifers with layers of impermeable, protective rock in between.
- **Construction:** Class II injection wells must have layers of steel casing cemented in place to protect shallow groundwater formations. Typically there are multiple steel casing layers cemented in place which are closely monitored by state regulators.
- **Spill Prevention:** Concrete containment barriers at the surface protect against spills and a concrete container located beneath the unloading pad collects any spilled fluids.

RECOGNIZING OHIO'S FIRST CLASS SEISMIC MONITORING & UIC PROGRAMS

Ohio's seismic monitoring and UIC programs and protocols have been recognized by federal, state, and third party agencies as industry-leading, exemplary models for states and other regulatory agencies to follow.

"[ODNR's regulatory program] is of good quality and continues to provide strong protections for Ohio's underground sources of drinking water." [EPA](#)

"ODNR's ongoing efforts provide the necessary protections to help ensure that Ohio's underground drinking water resources are safe." [Groundwater Protection Council](#)

"Our extensive investment in the Class II program has enhanced protections for Ohioans, the environment, and our underground drinking water resources." [ODNR](#)

"Ohio is at the forefront of regulating Class II injection wells and is continuously advancing regulations of the UIC program." [Groundwater Protection Council](#)

"The program is strong in several areas including permitting, inspections and resolving violations found during inspections." [EPA](#)

