



US EPA's Program to Regulate the Placement of Waste Water and other Fluids Underground



SAFE DRINKING WATER ACT • 1974-2004 • PROTECT OUR HEALTH FROM SOURCE TO TAP

Why Do We Need a Program to Regulate the Placement of Fluids Underground?

Facilities across the nation discharge a variety of hazardous and nonhazardous fluids into underground formations through more than 800,000 injection wells. Our way of life would be quite different without injection wells. Agribusiness and the chemical and petroleum industries as we know them today, could not exist. While treatment technologies exist, it would be cost prohibitive to treat and release to surface waters the trillions of gallons of wastes that industries produce each year. When wells are properly sited, constructed, and operated, underground injection is an effective and environmentally safe alternative to surface disposal.

The Underground Injection Control (UIC) Program provides these safeguards so that injection wells do not endanger drinking water. The most accessible fresh water is stored in shallow geological formations called aquifers and is the most vulnerable to contamination. These aquifers feed our lakes; provide recharge to 41 percent of our streams and rivers, particularly during dry periods; and serve as resources for 89 percent of public water systems in the United States.

What Is an Injection Well?

An injection well is used for subsurface emplacement of fluids. An injection well is a bored, drilled, or driven shaft whose depth is greater than the largest surface dimension; or, a dug hole whose depth is greater than the largest surface dimension; or, an improved sinkhole; or, a subsurface fluid distribution system. This definition covers a wide variety of injection practices that range from more than 140,000 technically sophisticated highly monitored wells which pump fluids into isolated formations up to two miles below the Earth's surface, to the far more numerous on-site drainage systems, such as septic systems, dry wells, and storm water wells, that discharge fluids a few feet underground.

How Does the UIC Program Regulate the Very Different Types of Underground Injection?

United States Environmental Protection Agency groups underground injection into five classes for regulatory control purposes. Each class includes wells with similar functions, and construction and operating features so that technical requirements can be applied consistently to the class.

- Class I injects hazardous and nonhazardous fluids (industrial and municipal wastes) into isolated formations beneath the lowermost underground source of drinking water (USDW). Because they may inject hazardous waste, Class I wells are the most



CLASS I WELL

- strictly regulated and are further regulated under the Resource, Conservation and Recovery Act.
- Class II includes injection of brines and other fluids associated with oil and gas production.
- Class III injects fluid associated with solution mining of minerals.
- Class IV addresses injection of hazardous or radioactive wastes into or above a USDW and is banned unless authorized under other statutes for ground water remediation.
- Class V includes all underground injection not included in Classes I-IV. Generally, most Class V wells inject nonhazardous fluids into or above a USDW and are on-site disposal systems, such as floor and sink drains which discharge to dry wells, septic systems, leach fields, and drainage wells. Injection practices or wells which are not covered by the UIC Program include single family septic systems and cesspools as well as non-residential septic systems and cesspools serving fewer than 20 persons that inject ONLY sanitary waste water.



Are All Injection Wells Waste Disposal Wells?

All injection wells are not waste disposal wells. Some Class V wells, for example, inject surface water to replenish depleted aquifers or to prevent salt water intrusion. Some Class II wells inject fluids for enhanced recovery of oil and natural gas, and others inject liquid hydrocarbons that constitute our nation's strategic fuel reserves in times of crisis. But most injection wells have the potential to inject fluids that may cause a public water system to violate National Drinking Water Standards. These standards provide our safety net against waterborne disease and other health risks.



CLASS V WELL - Aquifer Remediation Well

How Does US EPA's UIC Program Prevent Contamination of Our Water Supply?

In general, US EPA's UIC Program prevents contamination of water supplies by setting minimum requirements for state UIC Programs. A basic concept of US EPA's UIC Program is to prevent contamination by keeping injected fluids within the intended injection zone, or in the case of injection directly or indirectly into a USDW, the fluids must not endanger or have the potential to endanger a current or future public water supply. Most of the minimum requirements that affect the siting of the injection well, the construction, operation, maintenance, monitoring, testing, and finally, the closure of the well, are designed to address these concepts. Another basic concept is that all injection wells require authorization under general rules or specific permits. Finally, states are expected to have primary enforcement authority (primacy) for the UIC Program. To date, 33 states, Guam, Commonwealth of the Mariana Islands, and Puerto Rico have obtained primacy for all classes of injection wells. Seven states share primacy with US EPA. The US EPA administers UIC programs for the remaining ten states, and all other federal jurisdictions and Indian Country.

The UIC Program Protects More Than Ground Water

The UIC Program:

- Reduces human exposure to organic and inorganic chemicals and heavy metals by removing them from the environment;
- Eliminates more than nine billion gallons of hazardous waste and a trillion gallons of oil field waste from the environment each year;

- Decreases public water system costs for water treatment;
- Avoids cost of ground water remediation, medical monitoring for health effects, and replacing a drinking water supply;
- Reduces pollution in wellhead and source water protection areas, rivers, streams, lakes, wetlands, watersheds, estuaries and coastal zones; and
- Enables communities to make wise local land use decisions.

For More Information

To learn more about underground injection control, call the Safe Drinking Water Hotline at 1-800-426-4791 or visit the safewater web site at www.epa.gov/safewater.