ADEQ
ARKANSAS
Department of Environmental Quality

FACT SHEET for the UNDERGROUND INJECTION CONTROL PROGRAM in ARKANSAS

What is Underground Injection?

Underground injection is the technology of placing fluids underground through wells. While underground rock formations may appear to be solid, most formations contain voids or pores that allow fluids to fill or move through the pores. Man-made or produced fluids can move into the pores of rocks through the use pumps and existing gravity.

What is the purpose of Underground Injection?

While technologies exist for treatment of hazardous and non-hazardous fluids, it is costly to treat and release these fluids into surface waters. When wells are properly sited, constructed and operated, underground injection is an effective method of disposal. Because of groundwater contamination occurrences in the 1960-1970s as a result of underground injection, Congress passed the Safe Drinking Water Act (SDWA) in 1974 which required the Environmental Protection Agency (EPA) to establish a system of regulations for injection activities (Part C of the SDWA). The regulations are designed to establish minimum requirements for controlling all injection activities and provide mechanisms for implementation and authorization of enforcement authority and also provide protection for underground sources of drinking water (USDW).

What is an injection well?

The Underground Injection Control (UIC) program defines a well as any bored, drilled or driven shaft or a dug hole, where the depth is greater than the largest surface dimension that is used to discharge fluids underground. This definition covers a variety of injection practices from sophisticated wells that inject more than two miles underground to many types of on-site drainage systems, such as septic systems, cesspools and storm water wells that discharge to a few feet underground.

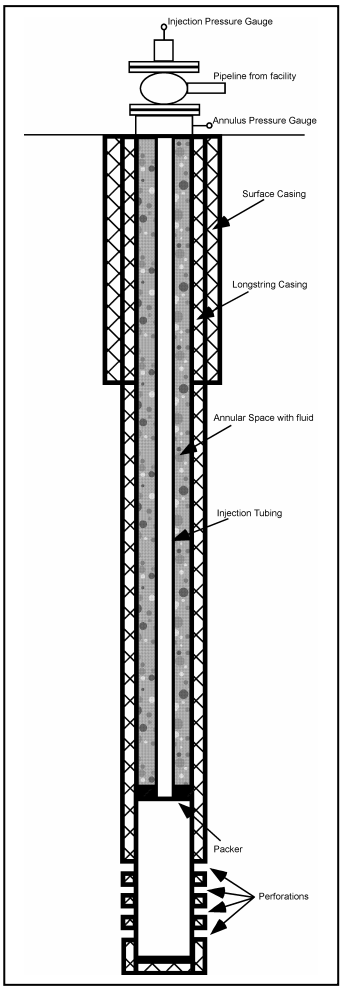
TYPES of INJECTION WELLS:

Class I	Wells that inject hazardous and non-hazardous waste beneath the lowermost formation containing an underground source of drinking water (USDW) within ¼ mile of the well bore.
Class II	Wells that inject fluids associated with oil and natural gas production, for enhanced recovery of oil or natural gas, and for storage of liquid hydrocarbons.
Class III	Wells that inject fluids for extraction of minerals from ore bodies that have not been nor cannot be conventionally mined, which includes salts, sulfur and uranium.
Class IV	Wells that inject hazardous or radioactive waste into and or above a formation containing an USDW. This type is banned unless authorized under other statutes for groundwater remediation.
Class V	Any injection well not included in the above categories. This includes, but is not limited to: air conditioning return flow wells, cesspools, drainage wells, recharge wells, salt water intrusion barrier wells, septic system for a multiple dwelling, subsidence control wells, spent brine disposal wells and

Why is underground injection important?

Groundwater contributes to the drinking water for community water systems, individual homeowners and a portion of surface water systems during periods of low flow. Injection of fluids without regulation can potentially contaminate groundwater and drinking water sources. Because contamination of groundwater can be difficult to remediate, it is important to ensure that contaminants do not enter groundwater.

TYPICAL CLASS I INJECTION WELL CONSTRUCTION:



All wells must be properly designed and constructed in order to prevent movement of fluids from the injection zone into underground sources of drinking water (USDWs). The well is checked and monitored through the use of logs and other tests to ensure adequate construction for protection of USDWs.

The typical construction is shown in the diagram and consists of several layers: surface casing, longstring casing, annular space filled with fluid, and injection tubing set through a packer. Both the surface casing and longstring casing are constructed with cement and steel tubing. The surface casing is set below the lowermost USDW and the longstring casing is set to the total depth of the well. Between the injection tubing and longstring casing is the annular space, which is filled with corrosion inhibited fluid and maintained at a permit-specified pressure. At the base of the annular space, a packer is set between the longstring casing and injection tubing to prevent upward migration of fluids inside the well. The well is perforated below the packer for the injected fluids to exit the well bore.

What is Arkansas' authority?

Arkansas was given authority to administer the UIC program as a primacy state in 1982. This primacy authority (primary enforcement authority) allows the Arkansas Dept. of Environmental Quality (ADEQ) to regulate Class I, Class III, Class IV and Class V wells. The Arkansas Oil and Gas Commission (AOGC) regulates the Class II and Class V bromine related spent brine disposal wells. Applicable Regulations include: Regulation 17 (Arkansas Underground Injection Control Code) and the Code of Federal Regulations (CFR) Title 40, Parts 144, 145, 146, and 124.

INJECTION WELLS IN ARKANSAS:

Currently, there are 15 operating Class I wells in Arkansas. There are 5 hazardous and 10 non-hazardous wells. Four of the wells are 'shut-in', meaning the wells are not currently injecting fluids. The current injection intervals range from 2500 to 8700 feet below ground surface. Please see the AOGC for information on the Class II and Class V Bromine related injection wells. There are no Class III or Class IV wells. There are estimates of 75 to 5,000 Class V wells. Inventory information for Class V wells is ongoing.

- All owners and operators of Class I injection wells must obtain a permit from the ADEQ. A permit application must be submitted and must provide geologic and hydrogeologic information, waste stream characteristics and construction specifications of the injection well and facility. Additional data may be required upon further review of the application.
- All Class V wells, except motor vehicle waste disposal wells and large capacity cesspools, are authorized by rule unless they violate drinking water standards or adversely affect public health (see the

MINIMUM REQUIREMENTS for CLASS I:

- These include siting, construction, operation, maintenance, monitoring, reporting and closure.
- The well systems are checked daily and continuously monitored by the facility.
- Annual Mechanical Integrity Tests (MIT) that check the well materials for leaks or other potential problems, and monitor the pressure of the geologic formation to ensure that injection is not causing fractures for fluids to migrate into a USDW.
- ADEQ conducts, at a minimum, bi-monthly inspections of each injection well.

For additional information, please contact:
State Permits Branch, Water Division, UIC Section
(501) 682-0648
http://www.adeq.state.ar.us/water/branch_permits/default.htm

See the following link for more information:
www.epa.gov/safewater/uic.html