United States
Environmental Protection Agency

Office of
Ground Water and
Drinking Water

CLASS V UIC STUDY FACT SHEET
MINE BACKFILL WELLS

What is a mine backfill well?	Mine backfill wells are used in many mining regions throughout the country to inject a mixture of water and sand, mill tailings, or other materials into mined out portions of underground mines. These wells can serve a variety of purposes, including subsidence prevention, filling dangerous mine openings, disposing of wastes from mine operations, and fire control.
What types of fluids are injected into mine backfill wells?	The physical characteristics and chemical composition of materials injected into backfill wells vary widely depending on the source of the backfill material, the method of injection, and any additives (e.g., cement) that may be included. In general, the materials include slurries of sand, gravel, cement, mill tailings or refuse, fly ash, or other solids.
Do injectate constituents exceed drinking water standards at the point of injection?	Available data from leaching tests (e.g., USEPA Method 1311--TCLP) of backfill materials indicate that concentrations of antimony, arsenic, barium, beryllium, boron, cadmium, chromium, lead, mercury, molybdenum, nickel, selenium, thallium, sulfate, and zinc frequently exceed primary drinking water standards and health advisory levels. Levels of aluminum, copper, iron, manganese, total dissolved solids, sulfate, and pH frequently exceed secondary drinking water standards.
What are the characteristics of the injection zone of a mine backfill well?	Mine backfill wells inject into mined out portions of underground mines. The environmental settings in which the mines are located and injection occurs are diverse.
Are there any contamination incidents associated with mine backfill wells?	No incidents of contamination of an underground source of drinking water have been identified that are directly attributable to injection into mine backfill wells. Although ground water contamination is not uncommon at mining sites, it is generally difficult to identify the specific causes. The chance that backfill injection will contribute to ground water contamination is highly dependent on site conditions, including mine mineralogy, site hydrogeology, backfill characteristics, and injection practices.
Are mine backfill wells vulnerable to spills or illicit discharges?	The vulnerability of mine backfill wells to receiving spills or illicit discharges depends on site-specific conditions and practices. For example, if coal ash is hauled to a mine site, slurried with water, and then injected, the likelihood of contamination of the injected material resulting from a spill or illicit discharge is relatively low. On the other hand, if mill tailings are collected in a tailings pond along with site runoff and other facility wastes prior to injection, then the likelihood of contamination of the backfill material by spills would be higher.
How many mine backfill wells exist in the United States?	There are approximately 5,000 documented mine backfill wells and more than 7,800 wells estimated to exist in the United States.
Where are mine backfill wells located within the United States?	Mine backfill wells are known to exist in 17 states. However, more than 90 percent of the documented wells reported are in four states: WV (401), OH (3,570), ND (200), and ID (575).
How are mine backfill wells regulated in states with the largest number of this type of well?	*Permit by rule*: ID, KS, TX, IL, and ND (sometimes general or individual permits are required) *General permit*: WY *Individual or area permit*: WV, OH, IN, PA
Where can I obtain additional information on mine backfill wells?	For general information, contact the Safe Drinking Water Hotline, toll-free 800-426-4791. The Safe Drinking Water Hotline is open Monday through Friday, excluding federal holidays, from 9:00 a.m. to 5:30 p.m. Eastern Standard Time. For technical inquiries, contact Amber Moreen, Underground Injection Control Program, Office of Ground Water and Drinking Water (mail code 4606), EPA, 401 M Street, SW, Washington, D.C., 20460. Phone: 202-260-4891. E-mail: moreen.amber@epa.gov. The complete Class V UIC Study (EPA/816-R-99-014, September 1999), which includes a volume addressing mine backfill wells (Volume 10), can be found at http://www.epa.gov/OGWDW/uic/cl5study.html.