Federal Requirements Under the Underground Injection Control Program for Carbon Dioxide Geologic Sequestration Wells

Kobelski, Bruce J.[1]; Bayer, Mary Rose [1]; Porse, Sean [1] (1) OGWDW, USEPA, Washington, DC.

In July 2008, the U.S. Environmental Protection Agency (EPA) issued a proposed rule to address Geologic Sequestration of CO2. EPA took a number of steps to support and inform the proposed rulemaking. The Agency sponsored research by national laboratories; coordinated with the U.S. Department of Energy (DOE); and monitored international GS projects. For several years, EPA consulted with technical experts, states, tribes, utilities, industry, and others through technical workshops and public stakeholder meetings. The proposal is part of an adaptive approach that is necessary to allow regulatory development to move ahead in time to meet the anticipated demand for GS permits, while recognizing the need to continue to gather data from pilot projects and other research as it becomes available.

EPA proposed the new federal requirements for the geologic sequestration (GS) of carbon dioxide (CO2) under the authority of the Safe Drinking Water Act (SDWA). EPA proposed a new class of underground injection well-Class VI-to address the unique nature of CO2 injection for GS and ensure protection of underground sources of drinking water (USDWs) from injection-related activities.

The elements of the proposed rule build upon the existing Underground Injection Control (UIC) regulatory framework established under the SDWA. The relative buoyancy of CO2, its corrosivity in the presence of water, the potential presence of impurities in captured CO2, its mobility within subsurface formations, and large injection volumes anticipated at full scale deployment warrant specific requirements tailored to this new practice. The tailored requirements include:

●Geologic site characterization to ensure GS wells are appropriately sited;
● Requirements to construct wells with injectate-compatible materials and in a manner that prevents fluid movement into unintended zones;
● Periodic re-evaluation of the area of review around the injection well to incorporate monitoring and operational data and verify that the CO2 is moving as predicted within the subsurface;
● Testing of the mechanical integrity of the injection well, ground water monitoring, and tracking of the location of the injected CO2 to ensure protection of USDWs;
● Extended post-injection monitoring and site care to track the location of the injected CO2 and monitor subsurface pressures; and
● Financial responsibility requirements to assure that funds will be available for well plugging, site care, closure, and emergency and remedial response.

The final rule, anticipated in 2011, will apply to owners and operators of wells that will be used to inject CO2 into the subsurface for the purpose of long-term storage.