
Strategy for Monitoring Carbon Dioxide Sequestration

Susan Hovorka

Bureau of Economic Geology, The University of Texas at Austin,
University Station, Box X, Austin, Texas 78713-8924

ABSTRACT

Geologic storage for the purpose of reducing atmosphere carbon dioxide emissions is in a research phase in preparation for commercialization. However, it must be recognized that monitoring programs for research projects are different from the activities that are optimal for commercial activities. A research project challenges hypotheses about the nature of the perturbation created by injection by comparing modeled response to the response observed via monitoring. It also tests the performance and sensitivity of monitoring tools to determine if they are able to detect the perturbation, the conditions under which they are useful, and reliability under field conditions. By contrast, monitoring at a long term, full scale commercial project would be used to confirm that the predictions of containment made based on site characterization at the time of permitting were valid. Confidence to continue injection is gained from monitoring observations that are reasonably close to model predictions, and any noncompliance is explained. Additionally, observations to confirm that no unacceptable consequences result from injection may be needed. Lastly, monitoring during injection should be designed to prove-up confinement so that monitoring frequency can be diminished through the life of the project and eventually stopped, allowing the project to be closed. Monitoring during a commercial project needs to be sufficiently standardized so that both operator and regulator know what is required. Dependability and durability is needed for repeat measurements to be made over decades. Measurements should be designed to be reportable to the stakeholders so that oversight is obtained.