Project begins injection of CO2 for storage at Illinois Basin

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The Midwest Geological Sequestration Consortium (MGSC) has begun injecting carbon dioxide (CO_2) for the first million-tonne demonstration of carbon sequestration in the U.S. The CO_2 will be stored permanently in the Mt. Simon Sandstone more than a mile beneath the Illinois surface at Decatur. The MGSC is led by the Illinois State Geological Survey (ISGS), part of the Prairie Research Institute at the University of Illinois.

"Establishing long-term, environmentally safe and secure underground CO_2 storage is a critical component in achieving successful commercial deployment of carbon capture, utilization and storage (CCUS) technology," said Chuck McConnell, Chief Operating Officer for the U.S. Department of Energy (DOE) Office of Fossil Energy (FE). "This injection test project by MGSC, as well as those undertaken by other FE regional partnerships, are helping confirm the great potential and viability of permanent geologic storage as an important option in climate change mitigation strategies."

MGSC is one of seven regional partnerships created by the DOE to advance technologies nationwide for capturing and permanently storing greenhouse gases that contribute to global climate change.

"We are enthusiastic as we reach the operational stage of our project. The analysis of data collected beginning in 2003 indicates that the lower Mt. Simon Sandstone has the necessary geological characteristics to be an excellent injection target for safe and effective storage of CO_2," said Robert J. Finley, PhD, director and leader of ISGS's sequestration team.

The $96 million Illinois Basin – Decatur Project was funded in 2007 and now marks the beginning of the injection of 1 million metric tonnes of CO_2 over the next three years.

"Reaching the injection phase of this project is a major milestone in sequestration technology world-wide and for the State of Illinois," said Prairie Research Institute Executive Director, William W. Shilts, PhD. "Four years of effort are coming to fruition at a site with unique capabilities, some of them first-in-the-world with respect to the extensive subsurface monitoring system. It's a strategic investment in Illinois' future." Visitors from Australia, China, Norway, Spain, and Japan have already visited the Illinois Basin – Decatur Project and they expect to welcome more of the international sequestration research community over the next several years, Shilts noted.

The CO_2 is being captured from the fermentation process used to produce ethanol at Archer Daniels Midland Company's (ADM) corn processing complex. It is compressed into a dense-liquid to facilitate the injection process and permanent storage at a depth of 7,000 feet, according to Finley. The Mt. Simon Sandstone is the thickest and most widespread saline reservoir in the Illinois Basin, which covers two-thirds of Illinois and reaches into western Indiana and western Kentucky. The estimated CO_2 storage capacity of the Mt. Simon is 11 to 151 billion metric tonnes, and it is below several layers of shale that serve as an impermeable cap rock to hold the CO_2 in place, Finley added.

This demonstration project is part of the Development Phase of the Regional Carbon Sequestration Partnerships program, a DOE Office of Fossil Energy initiative launched in 2003 to determine the best approaches for capturing and permanently storing greenhouse gases that can contribute to global climate change.

Provided by Prairie Research Institute