

Small-Scale Field Projects and Other Infrastructure Activities

NETL supports a number of small-scale field projects (injection of less than 500,000 metric tons of CO₂ per year) separate from the Regional Carbon Sequestration Partnership efforts to explore and characterize CO₂ storage opportunities in North America. The small-scale field projects are designed to demonstrate that regional storage formations have the capability to store CO₂ and provide the foundation for larger volume, commercial-scale projects. The field projects are focused on developing a better understanding of different types of geologic storage reservoir classes, thus providing insight into how these depositional systems are capable of influencing the fluid flowing within them. These storage reservoirs may contain natural gas, oil, or saline water—any of which may impact CO₂ storage. Small-scale project data provides valuable information regarding specific formations that have not yet been evaluated for CO₂ storage. The Carbon Storage Program strategy includes the following field-project objectives for small-scale injection projects:

- Confirm storage resources and injectivity estimates for target reservoirs.
- Validate the effectiveness of simulation models and MVA technologies to predict and measure CO₂ movement in the geologic formations and confirm the integrity of the seals.
- Develop guidelines for well completion, operations, and abandonment in order to maximize CO₂ storage potential and mitigate release.
- Satisfy the regulatory requirements for small-scale CCS projects.
- Gather field data to improve estimates for storage capacity that could be used to update regional and national storage resource and capacity estimates.

Understanding the impacts of different depositional systems on flow, injectivity, containment, and capacity are critical to both first mover and broad deployment CCS projects throughout the United States. This can only be accomplished by testing and monitoring CO₂ in field projects, which help to validate simulation models and determine the effectiveness of the technologies needed to monitor CO₂ in the storage formations. The need to further understand CO₂ behavior in various formations and depositional environments has resulted in additional Carbon Storage Program research to support the following small-scale field projects:



Small-Scale CO₂ Injection Project Locations

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Small-Scale CO₂ Injection Project Details

	Project Name	State	Project Type	Injection Formation(s) (Reservoir)
1	University of Kansas Center for Research, Inc.	Kansas	Saline and EOR	Ozark Plateau; Arbuckle and Mississippian Formations
2	Virginia Polytechnic Institute and State University	Virginia	ECBM	Appalachian Basin; Sourwood or Oakwood CBM fields
3	Blackhorse Energy, LLC	Louisiana	EOR	Gulf Coast Basin; First Wilcox sand
4	CONSOL Energy, Inc.	West Virginia	ECBM	Appalachian Basin; Upper Freeport and Pittsburgh Coal Seams

In addition to the small-scale field tests described above, NETL is supporting the Weyburn-Midale CO₂ Monitoring and Storage Project. The project is an international collaboration which brings together Canada, the U.S., the European Community, and Japan, as well as numerous other industrial and government sponsors. The research initiative integrates large-scale commercial enhanced oil recovery (EOR) with carbon storage operations at the Weyburn and Midale oil fields in the Williston Basin, Saskatchewan, Canada. The project started in September of 2000, in which CO₂ has been transported from the Great Plains Synfuel Plant in North Dakota through a 315 mile pipeline and injected into the Weyburn and Midale oilfields. A substantial monitoring initiative has been designed to address both the long-term fate and the security of CO₂ storage in geologic formations as part of this project. NETL has supported the site characterization, wellbore integrity assessment, storage monitoring, and risk assessment components of this project. The results of these research initiatives were integrated into a Best Practice Manual for CO₂ EOR and storage.



CO₂ pipeline route from the Great Plains Synfuel Plant in Beulah, North Dakota to EOR and storage site in Saskatchewan, Canada