

Nebraska Integrated Carbon Capture and Storage Pre-Feasibility Study

Award Number: DE-FE0029186

Project Summary:

The objective of this project was to explore the viability of a commercial-scale carbon capture and storage (CCS) project in western Nebraska. Specifically, this project aimed to (1) examine the challenges of commercial-scale CCS; (2) conduct high-level sub-basinal evaluations; and (3) perform a carbon dioxide (CO₂) source assessment at Gerald Gentleman Station (GGS) and other CO₂-emitting facilities. The expected outcome was the collection of sufficient information that will ultimately justify advancing the project toward the demonstration of a commercial-scale CCS target capable of storing at least 50 million metric tons (MMT) of CO₂.



Figure 1: Gerald Gentleman Station, near Sutherland, Nebraska.

Project Outcomes:

The project established a CCS team of both technical and nontechnical organizations and stakeholders that can help address challenges presented by a potential Nebraska CCS project. Additionally, the project examined various strategies to attain economic feasibility and public acceptance of a Nebraska CCS project. The project performed a sub-basinal geologic assessment that verified the suitability of the site for a commercial-scale CCS storage project, as well as the suitability of the source. The work undertaken in this study has shown that western Nebraska has potential to host a commercial-scale CCS project, including a dedicated storage “container” for 50 MMT of CO₂. However, the following key challenges would need to be overcome: (1) The business case for deploying CCS projects is uncertain; recently announced federal tax credits and sales of CO₂ for enhanced oil recovery may not cover the full costs of a CCS project at GGS, as estimated by this pre-feasibility study; (2) the potential 50 MMT CO₂ dedicated storage container defined in this pre-feasibility study should be regarded as having a relatively low level of readiness to support a CCS project; and (3) public outreach would be a vital element in western Nebraska, where sensitivities around such environmental issues as water resource protection and pipeline construction would need to be carefully addressed.

Presentations, Papers, and Publications

Final Report: [Nebraska Integrated Carbon Capture and Storage Pre-Feasibility Study](#) (June 2018)
Neil Wildgust, Kerryanna Leroux, Barry Botnen, Daniel Daly, Melanie Jensen, Kyle Glazewski, Nicholas Kalenze, Matthew Burton-Kelly, Chantsalmaa Dalkhaa, Jose Torres, Thomas Doll, Heidi Vettleson, William “Jib” Wilson, Charlene Crocker, Charles Gorecki

Prime Performer:
University of North Dakota Energy and Environmental Research Center (UNDEERC)

Principal Investigator:
Neil Wildgust

Project Duration:
1/1/2017 – 6/30/2018

Performer Location:
Grand Forks, North Dakota

Field Sites:
Western Nebraska

Program:
Carbon Transport & Storage