

RED TRAIL ENERGY CCS PROJECT

ACTIVITY FAQS

INTEGRATED CARBON CAPTURE AND STORAGE FOR NORTH DAKOTA ETHANOL PRODUCTION

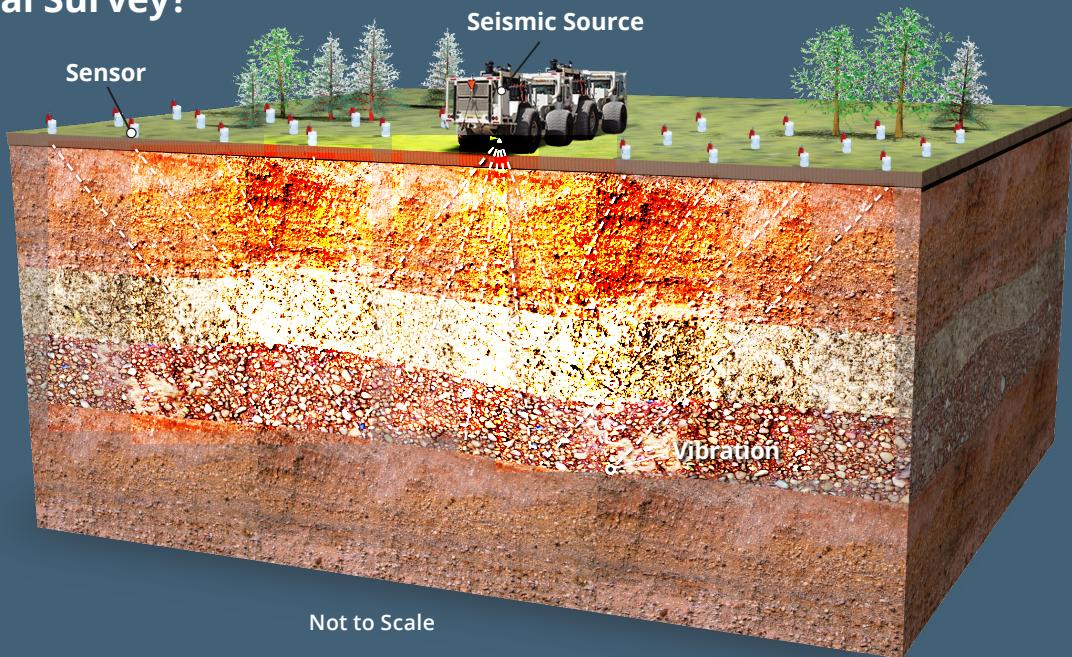
Completed Geophysical Survey near Richardton, N.D.

In March 2019, a field crew conducted a geophysical survey near Richardton, North Dakota, to learn about rock layers in the deep subsurface. The data gathering was part of the Red Trail Energy carbon capture and storage research effort, which is investigating the feasibility of safe, permanent, commercial-scale geologic storage for carbon dioxide, or CO₂, integrated with ethanol production. The geologic information collected will be assessed by engineers and scientists at the Energy & Environmental Research Center to help determine the potential for CO₂ storage in the project area.

What Is a Geophysical Survey?

A truck-mounted seismic source generates vibrations using a metal plate that lies on the ground and shakes side to side. The vibrations travel deep into the earth and are reflected back to the surface. Sensors at the surface record the reflected vibrations. Geophysicists decipher these signals to learn about the subsurface rock layers.

Geophysical surveys are a common data collection tool and have been used in every county in western North Dakota.



What Is the Benefit of the Survey?

The data from the geophysical survey help evaluate the rock layers more than a mile (6500 feet) below the surface, develop more accurate computer models to simulate where injected CO₂ might travel, evaluate the suitability of the storage zone, and determine the best location for injection and monitoring wells, help the permitting authority decide whether the geologic storage project can move forward, and ultimately map the movement of CO₂ in future surveys should the effort result in a commercial carbon capture and storage project.

What Was the Community Impact?

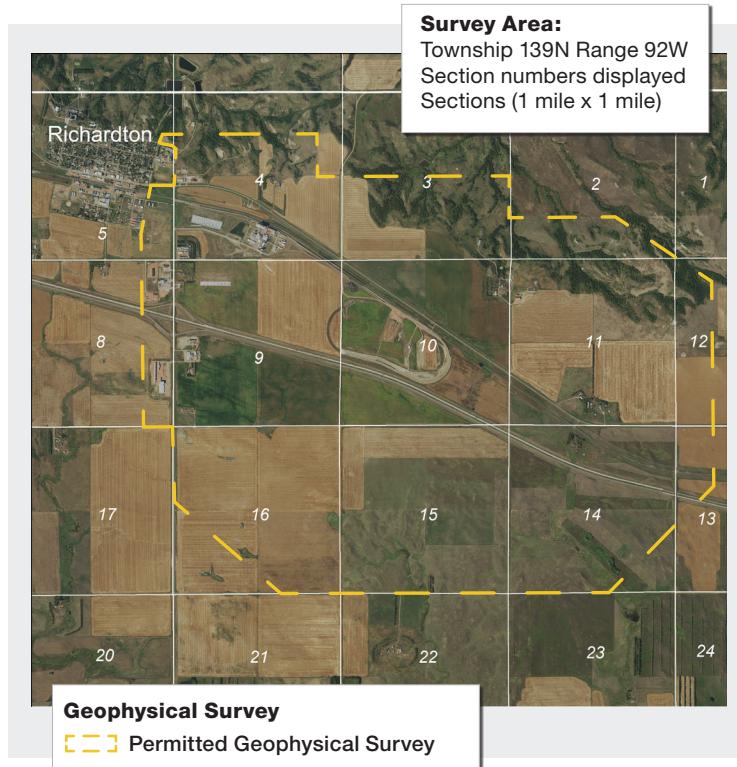
Safety and courtesy were top priorities during the geophysical survey work. A low-level noise similar to that of a passing truck was generated at each location from the vibrating truck-mounted plates. A person standing 100 feet from the source could not feel ground vibration. Care was taken to avoid or minimize any environmental impacts and maintain normal traffic flow. The work was carried out under a permit issued by the North Dakota Industrial Commission.

How Were Landowners Informed?

Red Trail Energy notified area landowners and the city via individual letters and newspaper before the survey began. For landowners within the survey area, Red Trail Energy requested permission to drive vehicles and place sensors on their land. The testing area excluded the city and avoided buildings and other infrastructure, such as drinking water wells, pipelines, and the interstate highway. Red Trail Energy worked with landowners to minimize inconveniences and address concerns. The work was completed before planting season.

Where Was the Survey Conducted?

The survey covered nearly 8 square miles of rural land around the Red Trail Energy facility east of Richardton.



How Is a Survey Carried Out?

The test involves a network of vibrational sensors and two source trucks (called vibroseis trucks). Sensors are inserted into the ground every 165 feet along lines that are spaced 330 feet apart to record reflected vibrations generated during the survey. The survey crew drives the large vibroseis trucks along lines spaced 660 feet apart. At 165-foot intervals along lines, the trucks stop and vibrate the ground for 1–2 minutes. The trucks do not vibrate the ground within 300 feet of buildings and other infrastructure.



Vibroseis trucks drive across the landscape, stopping to generate vibrations every 165 feet along a straight path throughout the study area, avoiding buildings and infrastructure.



Data were collected by a network of battery-powered sensors and Wi-Fi transmitters placed at 165-ft intervals.

What Are the Next Steps?

A community open house introduced the project on March 6, 2019. Information on project progress and other potential field activities will be available on the project's Web site. A second open house showcasing results is planned for early 2020. The final report will be available in summer 2020.

The ultimate goal of the **Red Trail Energy Carbon Capture and Storage (RTE CCS) Project**, a multiphase research and development effort, is to create the first integrated CCS system in North Dakota. Led by the Energy & Environmental Research Center (EERC) at the University of North Dakota, with support from RTE, the Industrial Commission of North Dakota Renewable Energy Program, and the U.S. Department of Energy, technical partners in this research include Trimeric Corporation, Schlumberger Carbon Services, and Computer Modelling Group.

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