



February 28, 2020

Ms. Karlene Fine
Executive Director
North Dakota Industrial Commission
600 East Boulevard Avenue
State Capitol, 14th Floor
Bismarck, ND 58505-0310

Dear Ms. Fine:

Subject: Deliverable (D) 3 for Integrated Carbon Capture and Storage for North Dakota Ethanol
Production Phase III; Contract No. R-038-047; EERC Fund 23627

Attached is the D3: Public Outreach Package for the subject project. As described in the subject contract, the Energy and Environmental Research Center compiled the steps conducted for the outreach activities executed and the materials developed for each project activity, to serve as a guide for Carbon Capture and Storage efforts, particularly in rural North Dakota communities. If you have any questions, please contact me by phone at (701) 777-5013, by fax at (701) 777-5181, or by e-mail at kleroux@undeerc.org.

Sincerely,

A handwritten signature in black ink, appearing to read "Kerryanne M. Leroux", is written over a printed name and title.

Kerryanne M. Leroux
Principal Engineer

KML/bjr

Attachment

PUBLIC OUTREACH PACKAGE FOR CARBON CAPTURE AND STORAGE IN NORTH DAKOTA

**Integrated Carbon Capture and Storage for North Dakota Ethanol
Production – Phase III
Task 5 – Deliverable D3**

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PUBLIC OUTREACH PACKAGE FOR CARBON CAPTURE AND STORAGE IN NORTH DAKOTA

EXECUTIVE SUMMARY

The Energy & Environmental Research Center (EERC), in partnership with Red Trail Energy, LLC (RTE), a North Dakota ethanol producer; the North Dakota Industrial Commission (NDIC); and the U.S. Department of Energy (DOE), is conducting a feasibility and implementation study for carbon capture and storage (CCS). The 64-million-gallon dry mill RTE ethanol facility, which emits an average 180,000 metric tons of CO₂ annually, is the subject of this case study to investigate secure, permanent, geologic CO₂ storage in western North Dakota. This document delineates the steps recommended for coordinating outreach events and the materials developed to serve as a guide for CCS efforts, particularly in rural communities.

RTE, the project developer and operator, was the public face for all events, such as commission meetings and community open houses. The outreach plan¹ developed in collaboration with RTE served as the basis for audience identification, engagement strategies, production and dissemination of informational materials, a system to track engagement activities and acquire feedback, and frequent progress assessment. Stakeholder groups targeted for engagement included landowners, residents, educators, and media within the RTE region as well as city, county, and state officials with authority over project and CCS activities.

Outreach engagement efforts in 2019 leveraged venues such as monthly city and county commission meetings, traditional and social media, and websites, in addition to facilitating community open houses and individual landowner communication to convey information about project-specific activities and overall RTE CCS status. All encounters included verbal information sharing on project activities and progress, providing the opportunity to ask questions, and supplying written materials and contact information as an invitation to learn more. A cache of project activity and CCS-focused fact sheets, posters, hands-on displays, and a project webpage (undeerc.org/RedTrailEnergy) was generated for meetings, informational packets, community open houses, landowner interactions, and other events such as media interviews. Materials summarizing the near-surface monitoring (groundwater and soil gas sampling) and characterization (geophysical/seismic survey) activities conducted were generated to inform and engage landowners and the community as well as support local public acceptance of North Dakota CCS. To date, feedback from the audiences has been generally neutral to positive, and overall, interactions have been constructive.

¹ Leroux, K.M.; Klapperich, R.J.; Kalenze, N.S.; Jensen, M.D.; Daly, D.J.; Crocker, C.R.; Ayash, S.C.; Azzolina, N.A.; Crossland, J.L.; Doll, T.A.; Gorecki, C.D.; Stevens, B.G.; Botnen, B.W.; Foerster, C.L.; Schlasner, S.M.; Hamling, J.A.; Nakles, D.V.; Peck, W.D.; Glazewski, K.A.; Harju, J.A.; Piggott, B.D.; Vance, A.E. *Integrated Carbon Capture and Storage for North Dakota Ethanol Production – Phase II; Final Report* (Nov 1, 2017 – July 31, 2018) for North Dakota Industrial Commission Contract No. R-034-043; EERC Publication 2018-EERC-07-11; Energy & Environmental Research Center: Grand Forks, ND, July 2018.

Recommended practices for CCS outreach efforts include the following:

- Keep messages consistent across all target audiences.
- Share information with all stakeholders in advance of any field activities; the greater the visibility, the more broadly the information should be shared.
- Provide opportunities for audience questions.
- Anticipate questions and concerns, and have responses ready.
- Ensure all individuals engaged with project development understand anticipated concerns and how they are being addressed.
- Prepare press packets for every occasion.
- Develop good relationships with media.
- Consider multipurpose uses of outreach materials (provide resource conservation and message consistency).
- Treat every encounter as a chance to make a good impression.
- Provide regular updates on activity status and progress to landowners, local officials, and state regulators – it will be continually appreciated.

In general, messaging needs to help audiences understand how the technology can be implemented safely, and every encounter with the public—positive and negative—makes an impression. Encounters can occur anywhere, anytime, ranging from planned events (e.g., an open house) to casual conversation (e.g., local café, gas station, etc.). Given the rural close-knit communities near the RTE study region, encounters are shared among community members. Concerns to date have centered on human safety, groundwater and environmental protection, clarity and disclosure regarding the process, transparency as the process moves forward, and the trustworthiness of the project team and regulatory oversight. Outreach activities provide an opportunity for community members to learn about the project and be heard and reveal important concerns to be addressed as this first-of-its-kind facility in this region moves forward.

PUBLIC OUTREACH PACKAGE FOR CARBON CAPTURE AND STORAGE IN NORTH DAKOTA – PHASE III

INTRODUCTION

Early, proactive public outreach with stakeholders is a pillar in the success of first-of-its-kind infrastructure development. The Energy & Environmental Research Center (EERC), in partnership with Red Trail Energy, LLC (RTE), a North Dakota ethanol producer; the North Dakota Industrial Commission (NDIC); and the U.S. Department of Energy (DOE), is conducting a feasibility and implementation study for carbon capture and storage (CCS) since 2016. Outreach is considered an integral part of project-related activities that have public contact or exposure.

This document covers the outreach conducted thus far to serve as a guide for other emerging CCS efforts, particularly in rural communities. The 64-million-gallon dry mill RTE ethanol facility, which emits an average 180,000 metric tons of CO₂ annually, is being used as a case study to investigate secure, permanent, geologic CO₂ storage in western North Dakota. The RTE facility is located approximately a half mile southeast of the town of Richardton in eastern Stark County, southwestern North Dakota (Figure 1).

The goal of project outreach is to engage stakeholders and create an environment that allows them to make informed community decisions regarding the project. Effective outreach plans create informed team members who can act as knowledgeable spokespeople for the project. Outreach is triggered by project-related activities that have public contact or exposure. This includes actions by the outreach team on behalf of the project, project management, the technical team, or partners. For the RTE CCS project, RTE acted as the public face for all events, with support from EERC technical and communications staff.

Outreach actions were geared to generate trust, a primary element in building good relationships, in the RTE CCS project among a variety of audiences through engagement, information sharing, and transparency. At the heart of these efforts was providing accurate information that responded to audience needs. The RTE CCS research effort required interaction with various stakeholders where value was provided through a dedicated and systematic outreach effort. Outreach and communication efforts were developed for research activities, coordinated with and supported by the field-based research teams, and provided informational and educational materials related to the proposed characterization and monitoring activities. Outreach activities included broad regional engagement and focused engagement with target audiences, including local and regional officials, landowners, and the community.

Outreach activities were a coordinated effort that encompassed 1) the project technical team (e.g., RTE, EERC, Trimeric Corporation), 2) partner outreach beyond the technical team (e.g., RTE employees and board, EERC employees, and other project partners), and 3) external outreach (e.g., local/regional officials, landowners, etc.).



Figure 1. RTE ethanol facility located in Stark County, North Dakota, near Richardton and less than a mile north of Interstate Highway 94.

External outreach was triggered by project-related activities that had public contact or exposure. This included actions on behalf of the project by the outreach team, by project management, the technical team, or partners.

RTE CCS outreach was informed by prior expertise developed, in part, through the EERC's Plains CO₂ Reduction (PCOR) Partnership Program, part of the DOE's Regional Carbon Sequestration Partnerships (RCSP) Initiative (e.g., Daly and others, 2009; Daly and others 2016; Daly and others, 2018), and the RCSP Outreach Best Practice Manual (U.S. Department of Energy National Energy Technology Laboratory, 2017). These efforts built upon the collective outreach experience of the DOE RCSP Initiative, DOE Carbon Storage Assurance Facility Enterprise (CarbonSAFE) Initiative, outreach experiences for geologic CO₂ injection projects (e.g., Sacuta and others, 2016), and knowledge from commercial practices such as the models for evaluating public relations actions developed by Jim Macnamara (Macnamara, 2016).

OUTREACH PLAN

An outreach plan provides details on target audiences, messages, and engagement strategies for key relationships and materials to support project development. Effective outreach addresses five key questions, shown in Table 1. The outreach plan answers these questions by defining goals, identifying audiences and engagement strategies, and laying out the time line for activities. This living document is frequently updated to respond to feedback and new information over the course of the project.

Table 1. Relating Outreach Plan Content to Key Project Story Questions

Outreach Development Questions		RTE CCS Outreach Plan
1	What are we trying to achieve and how do we best work together to achieve it?	<ul style="list-style-type: none">• Goal, approach, and success measures• Partners' roles• Audiences• Implementation considerations and guidelines
2	What is our story?	<ul style="list-style-type: none">• Outreach narrative, themes, and messages
3	How will audiences hear our story?	<ul style="list-style-type: none">• Engagement strategies• Outreach tool kit
4	When do we need to tell the story?	<ul style="list-style-type: none">• Outreach time line matched to technical time line and partner considerations
5	Who heard the story, and what do they think about it?	<ul style="list-style-type: none">• Success measures/tracking/review and assessment

An outreach plan was developed in collaboration with RTE prior to initiating field activities (Leroux and others, 2018). The following is a summary of key elements.

Social Characterization

Social characterization was undertaken as a baseline assessment of stakeholders for the RTE CCS project to help define, quantify, and provide context to the social picture in the RTE area; develop the outreach approach; and identify elements influencing the social feasibility of CCS in the region. Research focused on Stark County within the context of the surrounding counties and state of North Dakota. Although natural energy resources (oil production and unmined coal) exist in western Stark County, the RTE CCS region comprises rural, agriculture-based communities.

Target Audiences

Several target audience categories were identified for engagement, including project partners, media, elected officials and regulators, the education community, the general public, technical (peer-to-peer) personnel, and environmental nongovernment organizations (NGOs). For the RTE CCS project, landowners are a critical subgroup under general public.

Project Narrative, Themes, and Messages

Generation of a single coherent story is essential for effective, informed team members to be knowledgeable spokespeople for the project. The story needs to be consistent whether presented as a one-sentence sound bite, a paragraph synopsis, or a project fact sheet. These messages provide a foundation for expansion and customization over the course of the project. Social characterization research, known concerns, and audience attitudes and perceptions were key inputs to message development. For example, the RTE CCS project one-sentence sound bite was derived as the following:

The RTE CCS effort is looking to address environmental concerns and strengthen the local economy by investigating the feasibility of and business case for secure, permanent, geologic storage of carbon dioxide from ethanol production.

Tracking and Assessment Techniques

Tracking and assessment practices were based on existing and practiced EERC outreach protocols (e.g., Daly and others, 2009; Daly and others 2016; Daly and others, 2018). Outreach encounters, materials distribution, stories in the media, and webpage visits were tracked. Assessment involved evaluation of quantitative data and qualitative feedback from outreach encounters. To date, feedback from the audiences has been generally neutral to positive, and overall interactions have been constructive.

Engagement Strategies

The engagement strategies used to reach target audiences comprise three categories: 1) in-person, one-on-one conversations and small group presentations; 2) mass communications via mailings, traditional print and broadcast media, social media, and Internet interactions; and 3) indirect engagement through RTE, EERC and other project partner (e.g., NDIC, DOE) communication activities. Within each category, strategies were customized for specific audiences and the objective of the communication. In the case of the RTE CCS project, the open house and board meeting settings as well as interactions with governmental stakeholders facilitated one-on-one and small group engagement. Details on the engagement strategies are included in the audience relations sections under General Approach.

Materials Development

Outreach materials development involves preparing information necessary to understand the basics of CCS technologies and the RTE CCS project activities, particularly translating jargon and technical information into verbiage both familiar and relevant to the audience. These may include but are not limited to fact sheets (general project or activity-focused), posters, infographics, press releases, and bulleted talking points.

GENERAL APPROACH

As a project conducts publicly visible activities, such as a geophysical (seismic) survey acquisition or environmental sampling, outreach should become more interactive by matching research event schedules with the sequence of outreach audiences, strategies, activities, and materials development that must precede them. The RTE CCS project started a fast-paced outreach effort in February 2019 to introduce the project and the geophysical survey acquisition to key stakeholders. General nontechnical communication such as a press release(s), project fact sheet(s), and webpage(s) gave numerous opportunities for a wide audience to learn the basics of the project in a short time frame.

CCS Outreach Materials

Target audience and engagement strategy drove outreach materials development. Project materials were optimized through an iterative process of QA/QC reviews involving technical team members, project partners, and editing vetted through leadership teams. Content was developed from EERC technical materials, research and technical staff, social characterization, partner communications, and the experience of the outreach and graphic design teams. Example products developed to date for the RTE CCS effort are provided in Appendix A.

Local and Regional Official Relations

Two of the target audiences of public outreach for 2019 project activities were the Stark County Commission and Richardton City Commission, which includes the mayor of Richardton. As these boards meet monthly and accept presentations, the county and city commission meetings provide an ideal venue to engage local officials, share project information, learn about any potential approval(s) needed, gather feedback, and show goodwill toward the community and region. County and city administrative personnel attend the meetings, which allows each appearance to effectively inform and engage many county and city government departments, disseminating widespread information more effectively and efficiently into the communities.

RTE attended and presented at commission meetings in advance of and as follow-up to the major field activities of the project, including the geophysical survey, environmental sampling, geophysical survey results, and plans to submit a permit to drill application. Stark County and Richardton auditors were contacted 2 weeks in advance of published meeting dates (generally the first Tuesday and second Monday, respectively) to obtain a place on the meeting agenda. An overall provisional CCS time line was presented at each initial meeting. At each appearance, commissioners received an informational packet containing a project fact sheet and relevant activity-specific frequently asked questions (activities FAQs) fact sheets, presenter(s) business card(s), and, when applicable, an open house invitation and activity time line. Similar packets with a press release were prepared for media. In advance of each appearance, the outreach team developed talking points highlighting current status and future activities, relevant dates, pertinent results, and any critical information to be conveyed. Commissioners expressed appreciation for information in advance of activities.

The NDIC Department of Mineral Resources (DMR) Oil and Gas Division, a crucial stakeholder for the RTE CCS project, also received copies of the informational packets following each meeting. As the state regulatory entity overseeing all subsurface activity in North Dakota, DMR is the permitting authority for North Dakota's geologic CO₂ injection and storage program (North Dakota Industrial Commission, 2013) and is recognized as a "go-to source" by media for information of this type. Supplying DMR with up-to-date information regarding the project and public engagement 1) generated more efficient future meetings and 2) ensured DMR was aware of project progress and information in advance of potential media inquiries. Therefore, not only were good relations maintained, the interaction provided effective dissemination of project progress and information.

Landowner Relations

Positive relations with local landowners are a critical component to the success of any project field activities and, ultimately, the overall CCS effort. The RTE CCS project field activities conducted in 2019 involved testing on privately owned land, such as the geophysical survey and environmental sampling. In North Dakota, surface landowners also hold the pore space rights needed for permanent geologic CO₂ storage; therefore, building and maintaining positive relations is important for potential CCS implementation.

Direct contact proved the most effective and efficient engagement strategy. RTE hand-carried request-for-access letters to landowners when possible. Landowners living outside North Dakota were contacted via telephone as well as mail. This action facilitated the following:

- Face-to-face communication for trust- and relationship-building
- Opportunities for landowners to express concerns, receive immediate answers to questions, and provide feedback
- Timely responses to access requests

State regulations for geophysical survey acquisition require notification to landowners within a half-mile perimeter of the survey. Rural landowners were contacted via letter packet. City residents and other landowners were notified via public notice in local and regional newspapers (*Richardton Merchant* and *Dickinson Free Press*).

All content was developed for nontechnical audiences. Notification and cover letters were concise, with clear statement of purpose, easy-to-follow structure, commonly used verbiage, bullets and white space to encourage reading, invitation to learn more at the project website, and RTE contact information. In addition to material required by the geophysical survey permit (i.e., copies of the regulatory codes), every letter included the RTE CCS project fact sheet, relevant activity FAQs, and when applicable, a map and/or open house invitation. At the heart of landowner contact were:

- Facilitating communication.
- Keeping landowners informed.
- Dealing fairly and equitably with neighbors.
- Demonstrating trustworthiness, respect, and transparency.
- Showing that RTE is part of the local community.

Landowners received follow-up contact after field activities occurred—thank yous for cooperating with fieldwork, assessment of damages (required by the geophysical survey permit), and a report of the survey or sampling results. Landowners also received personal written and verbal invitation to the open houses (discussed further in the following section).

Community Relations

Maintaining the trust of the community is crucial to project and/or activity success. RTE is a visible member of the Richardton community given its location between the Interstate 94 exit and the City of Richardton (Figure 1). The RTE ethanol facility depends on local farmers for its corn feedstock. Thus showing transparency and providing opportunities for community information-sharing is vital to RTE's sustainability and the CCS effort.

The community was defined mainly as Richardton area residents. Nearby communities were also included in outreach efforts (via print and broadcast media) because of the rural nature of the area:

- Richardton, 557 population (U.S. Census Bureau, 2018)
- Dickinson (Stark County seat, 26 miles west of Richardton), 22,739 population
- Hebron (18 miles east of Richardton), 675 population

The defined community was invited (in addition to landowners) to attend two RTE CCS project open houses, in March 2019 and December 2019, providing general project information, activity status, and results. The geophysical survey conducted in March 2019 was the first fieldwork event for the CCS effort, presenting an opportunity to create a positive tone for future community interaction, transparency, and trust. The survey was a highly visible activity covering an ~8-square-mile area directly east of Richardton, with several field crews on ATVs and vibroseis trucks operating over several weeks, and community notification requirements (discussed in the previous section). RTE obtained a permit to drill on December 2, 2019, to drill a stratigraphic test hole in early 2020, providing an excellent opportunity to engage with the community for a second open house. This event focused on results from the geophysical survey, information regarding the upcoming drilling effort, and overall project outlook moving forward. Appendix A contains materials related to the survey and drilling.

The open houses were advertised in regional newspapers, flyers hung around local businesses in Richardton and Hebron, a digital sign at city limits, and word of mouth. Community members within a half-mile of the geophysical survey boundaries received an invitation in their notification letters. Project information and an open house invitation were shared with the school district office and letters to teachers as 1) the path of the geophysical survey vehicles took fieldwork within sight of the school and 2) another means of getting information into the public should teachers decide to share information with their students. The procedure developed for coordinating and executing the open houses is provided in Appendix B.

Media Relations

Developing relationships with local journalists and those within the energy “beat” is crucial to ensure that accurate information about the project gets to the public. Technical projects can be difficult to portray accurately in the media because they cannot be easily boiled down to a sound bite or short article. The communications and outreach team worked with all project partners to develop key messages about the RTE CCS project. Those messages were used in developing news releases and communicating with local media (including both television and radio interviews). Each journalist assigned to reporting on the project has different needs in understanding the project based on their goals and experience. For example, an energy reporter for a trade publication may be well-versed in writing about CCS. A journalist for a general publication covering diverse topics may need more context to aid in understanding the topic. Proactively developing relationships with local journalists establishes a communication channel for media to get accurate information from the project team.

The communications team sought opportunities to be proactive in providing information and engage with area journalists. A general rule of thumb in media relations is that if they do not receive the information from the project contact, they will find it from somewhere else and it may be inaccurate or outdated. In developing relationships with journalists, the project benefits most from a communications team that is helpful to media contacts in accomplishing their jobs.

Establishing relationships with influential media in the area facilitates dissemination of accurate information. Having relationships with media reduces the likelihood of misinformation because the reporters come to the source for clarification on key facts. In addition, having those relationships establishes a communication channel to address misinformation as soon as possible. Print and broadcast media in the project area included local, county-size, and statewide components.

Print media targeted for communications included the following:

- *Richardton Merchant*, 983 biweekly circulation
- *Hebron Herald*, 764 weekly circulation
- *Dickinson Free Press*, 4970 daily circulation
- *Bismarck Tribune*, 16,861 daily circulation

Broadcast media included the following:

- Bismarck TV station KFYY (market share unavailable)
- Radio station 1100AM The Flag’s weekly radio show, “Energy Matters,” with approximately 45,000 weekly listeners (broadcast and live streaming)

Both local newspapers, the *Hebron Herald* and *Richardton Merchant*, run out of the same office. The editor was willing to cover RTE CCS open house events and fieldwork in the publications. Because of the small staff, a rapport was easy to establish, allowing accurate information to be provided during story/article development.

The RTE CCS project was featured on the 1100 AM radio show “Energy Matters” three times during the reporting period. The show is a source of energy-related information statewide and has approximately 45,000 weekly listeners. The host of the show is well-versed in energy topics and skillfully asks questions that help get information out to the show’s audience, which is a wide array of statewide listeners, from general public to experts in energy. Statewide exposure about the project elevates its importance and helps connect it to other CCS projects across North Dakota.

RECOMMENDATIONS

Every outreach activity should be treated as an opportunity to assess and improve. The EERC continues to establish and strengthen connections with media outlets as an objective “go-to source” for project-specific questions as well as relevant geology and CCS concepts. In addition, media packets are now generated for each commission meeting, on hand at the RTE main office, and given to DMR.

Personal contact and communication lead to measurable benefits. Direct landowner interaction and communication by RTE led to greater participation at the open houses. About 30 community visitors attended each event, expressing positivity and curiosity regarding the overall RTE CCS effort, creating positive buzz about the project, and building community rapport and trust.

Advanced planning and teamwork are essential. EERC field crews for the geophysical survey and environmental sampling activities were briefed on the RTE CCS project and carried copies of the project fact sheet and activity FAQs to share with individuals curious about the activity, the RTE CCS project, or CCS in general. EERC field crews drove and worked from easily identifiable vehicles, were polite and friendly, were respectful of private property, and were conspicuous consumers of the local economy (e.g., took meals in the local café).

Sharing project and activity information, communicating to convey understanding, demonstrating transparency, and showing respect are critical elements to building the trust needed for community support of a CCS effort. Public perception is an aspect that can make or break any first-of-a-kind effort, regardless of how technically and environmentally sound. Key recommendations for the RTE CCS outreach efforts included the following:

- Keep messages consistent across all target audiences.
- Share information with all stakeholders in advance of any field activities; the greater the visibility, the more broadly the information should be shared.
- Provide opportunities for audience questions.
- Anticipate questions and how they can be addressed.
- Ensure all individuals engaged with project development understand anticipated concerns and how they are being addressed.
- Prepare press packets for every occasion.
- Develop good relationships with media.

- Consider multipurpose uses of outreach materials (provide resource conservation and message consistency).
- Treat every encounter as a chance to make a good impression.
- Provide regular updates on activity status and progress to landowners, local officials, and state regulators – it will be continually appreciated.

Messaging needs to help audiences understand how the technology can be implemented safely, and every encounter with the public—positive and negative—makes an impression. Encounters can occur anywhere anytime ranging from planned events (e.g., an open house) to casual conversation (e.g., local café, gas station, etc.). Given the rural close-knit communities near the RTE study region, all encounters will likely be shared among community members. Concerns to date have centered on human safety, groundwater and environmental protection, clarity and full disclosure regarding the process, transparency as the process moves forward, and the trustworthiness of the project team and regulatory oversight. Providing opportunities for community members to feel heard not only generates positive attitudes toward the project team, but also reveals important concerns to be discussed as this first-of-its-kind facility in this region moves forward.

FUTURE OUTREACH EFFORTS

Public outreach activities will continue throughout CCS implementation, particularly any time a project-related activity has potential for public contact or exposure. Examples of subsequent RTE CCS efforts may include (certainly not limited to) the following:

- Permitting and drilling a stratigraphic test hole
- North Dakota CO₂ storage facility permit application (approval process includes a public hearing)
- Construction of a CO₂ capture facility
- Drilling and construction of the CO₂ injection and monitoring wells
- Ribbon cutting on the CCS facilities (i.e., start of operations)
- Monitoring activities for permit compliance such as environmental sampling, geophysical surveys, etc.

Increasing educational outreach would help teachers educate the future generation of decision-makers to engage in problem-solving in their backyard, in their state, in their region, to go beyond the focus on problem identification. Informal education opportunities using displays and demonstrations at county and state fairs, career fairs, STEM Night at the baseball game, etc., could be effective at informing and engaging learners of all ages.

A documentary film showcasing how CCS research culminates into a commercial facility could bring value to the local economy and North Dakota. When North Dakota's lower-carbon ethanol is sold, the broader reach of video brings the story to a larger audience and provides context to help national viewers understand its significance.

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APPENDIX A

**RED TRAIL ENERGY CCS PROJECT 2019
OUTREACH MATERIALS**

RED TRAIL ENERGY CCS PROJECT 2019 OUTREACH MATERIALS

FACT SHEETS

CCS Project Fact Sheet, Red Trail Energy CCS Project
Activity FAQs, Completed Geophysical Survey near Richardton, N.D.
Activity FAQs, Water and Soil Gas Sampling near Richardton, North Dakota
Activity FAQs, Geology Study – Drilling Down at Red Trail Energy
Results of the March 2019 Geophysical Survey near Richardton, North Dakota

RTE CCS PROJECT OPEN HOUSE ADVERTISING AND COMMUNICATION MATERIALS

March 6, 2019 Open House Invitation (graphic also used for newspaper advertisement)
December 11, 2019 Open House Invitation (graphic also used for newspaper advertisement)
Richardton Digital Sign
Landowner – Geophysical Survey Participant (thank you and invitation)
Nearby Landowners, Commissioners, Legislators Invitation
Educators Invitation
Sign-In Sheet
Comment Card
Welcome
Post-Event Press Release (March 2019)
Post-Event Press Release (December 2019)
Post-Event Thank You Card (image)

RTE CCS PROJECT OPEN HOUSE POSTERS – MARCH

RTE Building on Success
RTE CCS Project Time Line
RTE CCS Project: Lower Carbon – Higher Value Fuel
RTE CCS Project Concept: Ensuring Safety and Protecting the Environment
RTE CCS Project Phase III: EERC Research Investigations
Geophysical Survey Near Richardton, North Dakota

RTE CCS PROJECT OPEN HOUSE POSTER – DECEMBER

Capturing CO₂ Emissions Helps Secure Red Trail Energy's Future
RTE CCS Project Moves to Phase IV
Geophysical Survey and Environmental Sampling Pave the Way to the Next Phase
Detailed Plans and Process Ensure Human Safety and Protect the Environment
Drilling for Data: Steps for a Test Hole
RTE CCS Project Will Ensure Human Safety and Protect the Environment

RED TRAIL ENERGY CARBON CAPTURE AND STORAGE PROJECT: PHASE III COMMISSION MEETING TALKING POINTS

Stark County February 5, 2019

Stark County April 2, 2019

Stark County October 1, 2019

Stark County December 3, 2019

Richardton City December 18, 2019

GEOPHYSICAL SURVEY DOCUMENTS

Landowner in the Geophysical Survey Area Notification Packet

Nearby Landowner Notification for the Geophysical Survey Packet

Geophysical Survey Sample Q&A for Landowner Contact February 2019

Public Notice RTE Project Field Work Begins February 26, 2019

RTE CCS Project Continues Field Work Through 2019 (news release)

Results of Geophysical Survey – March 2019: landowner survey results with cover letter

March 2019 RTE Geophysical Survey Results Talking Points – August 14, 2019

GROUNDWATER AND SOIL GAS SAMPLING DOCUMENTS

Landowner access request packet for groundwater sampling

Landowner access request packet for soil gas sampling

RTE CCS Project Phase III Talking Points May 2019 Permission for Sampling Landowner Contract

Landowner groundwater results

Landowner soil gas results

MEDIA INQUIRIES

EERC and Red Trail Energy Continue to Reduce Carbon Dioxide Emissions

FACT SHEETS

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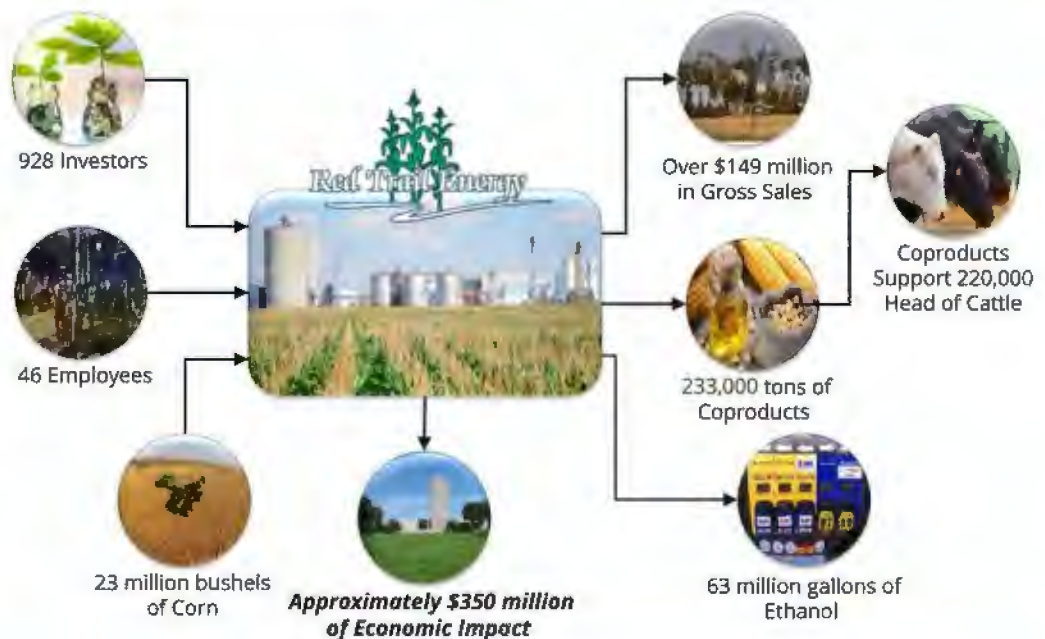
Red Trail Energy CCS Project

Red Trail Energy, an ethanol production plant in Richardton, North Dakota, is seeking to make its ethanol more valuable by integrating carbon capture and storage, or CCS, to reduce carbon dioxide emissions from ethanol production. This reduction in carbon emissions will make Red Trail Energy's ethanol more desirable to states that have low-carbon fuel programs, such as California. Keeping CO₂ out of the atmosphere could qualify for federal tax credits to offset some of the cost of integrating and operating CCS.



Buliding on Success

Since 2007, Red Trail Energy has been producing corn-based ethanol and distillers grains at its investor-owned plant in Richardton North Dakota. The ethanol plant provides an alternative market to farmers in 32 counties in the region and creates tax revenue in eastern Stark County. Integration of CO₂ capture and geologic storage will position North Dakota as a national leader in developing reduced-carbon ethanol with a strategic first-to-market advantage over other states. The ability to command premium pricing and diversity product markets will help secure Red Trail Energy's future, providing stability in a volatile, commodity-driven market.



What Is Carbon Capture and Storage?

CCS is the practice of capturing CO₂ emissions from an industrial facility instead of releasing them to the atmosphere. Once captured, the CO₂ is transported to a site for injection and safe, permanent storage deep underground. Carbon dioxide injection is currently practiced in over 100 locations in the United States, typically for extending the life of older oil fields.

"Integrating carbon capture and storage ensures the long-term viability of Red Trail Energy."

First of It's Kind

The integrated CCS project is a first of its kind. Incorporating CO₂ capture into the ethanol facility can be done with existing commercial technology. The real challenge is what to do with the CO₂ once it has been captured. Captured CO₂ could be injected deep underground and permanently stored or potentially sold as a commodity to oilfield operators to increase production in aging wells. Red Trail Energy must ensure that the CO₂ is never emitted to the atmosphere in order to meet the low-carbon fuel requirement. North Dakota has well-suited geology for safe, permanent CO₂ storage, a regulatory framework to oversee all aspects of such projects, and authority from the federal government to do so.

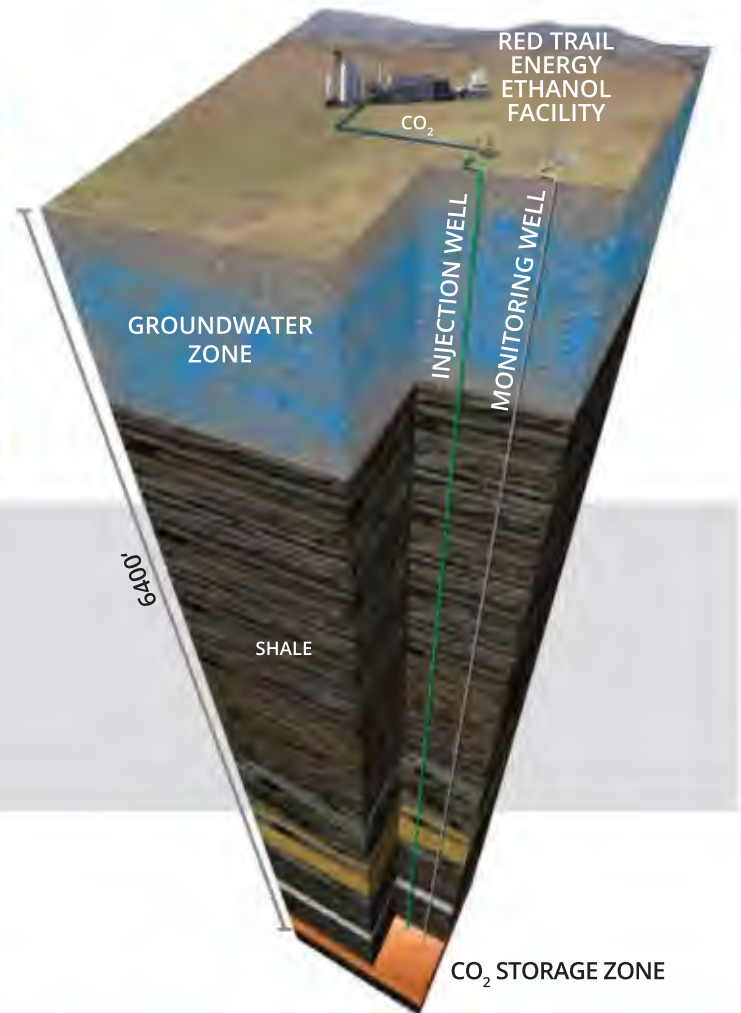


"We are very excited to continue working with the Energy & Environmental Research Center to investigate CCS as an economical option for meeting low-carbon fuel program markets in other states."

Gerald Bachmeier, Red Trail Energy Chief Executive Officer

Collaboration with Experts

Geologic CO₂ storage requires a deep porous layer to hold CO₂ and overlying impermeable rock layers as seals to keep the CO₂ in place. Red Trail Energy is collaborating with the Energy & Environmental Research Center at the University of North Dakota, a global leader in CCS research. The EERC's proven approach features characterization, modeling, and simulations to ensure the efficacy and safety of injecting CO₂ into a suitable geologic container more than a mile deep.



Multiphase Path to a Commercial Venture

Investigation of CCS integration with the Red Trail Energy ethanol plant has been ongoing since 2016. Preliminary technical and economic feasibility has been successfully demonstrated. Current activities are focused on facilities design, geologic characterization, and public outreach.

Project Partners



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redtrailenergyllc.com

RED TRAIL ENERGY CCS PROJECT

ACTIVITY FAQs

INTEGRATED CARBON CAPTURE AND STORAGE FOR NORTH DAKOTA ETHANOL PRODUCTION

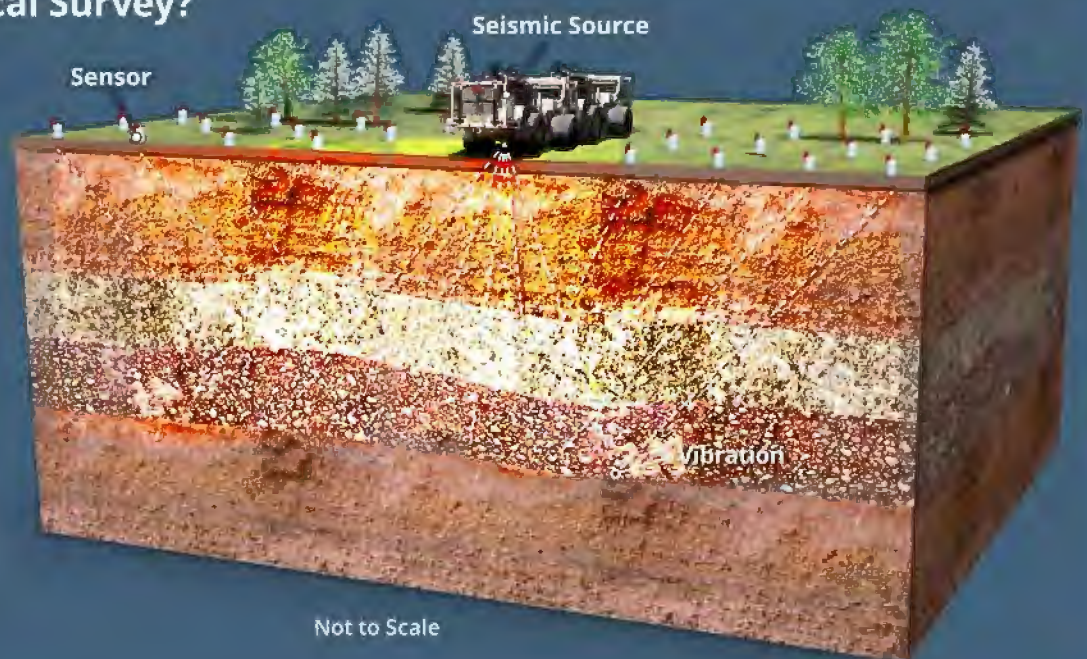
Completed Geophysical Survey near Richardton, N.D.

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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RED TRAIL ENERGY CCS PROJECT

ACTIVITY FAQs

INTEGRATED CARBON CAPTURE AND STORAGE FOR NORTH DAKOTA ETHANOL PRODUCTION

Water and Soil Gas Sampling near Richardton, North Dakota

In spring, summer, and fall 2019, field crews from the Energy & Environmental Research Center, (EERC) collected groundwater and soil gas samples near Richardton to learn about natural changes in levels of carbon dioxide and other related components. The data gathering is part of the Red Trail Energy carbon capture and storage (CCS) research effort, which is investigating the feasibility of safe, permanent, commercial-scale geologic storage of CO₂ integrated with ethanol production. The groundwater and soil gas samples provide regional data on natural cycles prior to potential CO₂ storage in the project area.

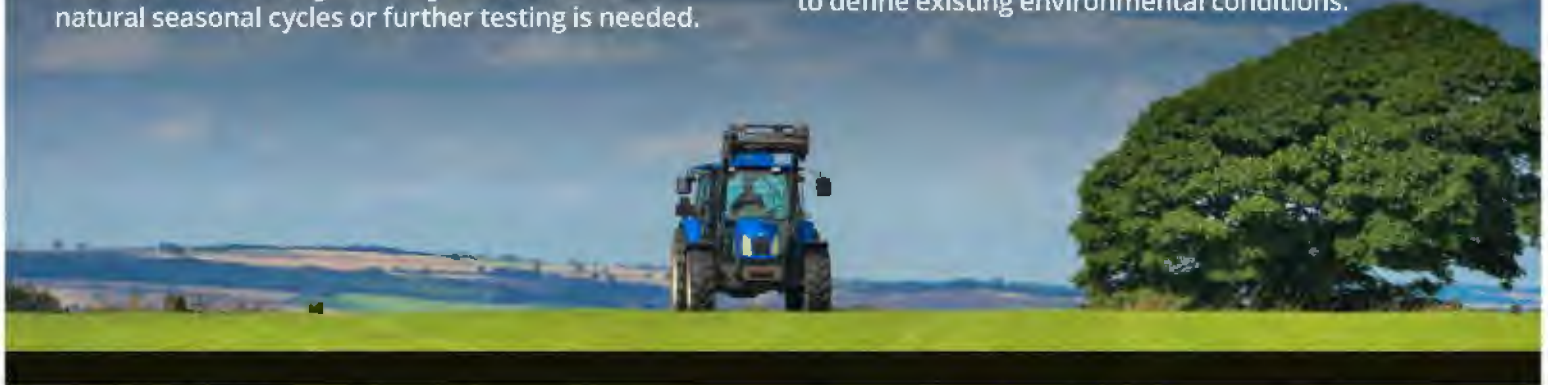
Why Did We Sample?

Samples collected and analyzed before potential operations help determine the normal or natural environmental conditions within the project area. If the project advances, North Dakota regulations will require groundwater and soil gas monitoring as part of an extensive monitoring and safety program for sites where CO₂ may be permanently stored deep underground. These data would also help determine whether future changes in CO₂ levels come from natural seasonal cycles or further testing is needed.

For groundwater, the chemical makeup in freshwater aquifers depends on the rocks through which it moves and anything else that filters into the aquifer.

Soil gas comes from the biological activity of the soil's plant, animal, and microbial communities.

As part of the natural carbon cycle of these ecosystems, seasonal changes in CO₂ are being studied to define existing environmental conditions.



What Is the Benefit of Water and Soil Gas Sampling?

Healthy soil and groundwater are vital, and ensuring that the environment is not negatively impacted by this project is a top priority for Red Trail Energy. Understanding CO₂ behavior in the natural environment before any development occurs helps the operators design an effective monitoring plan as required by the permits prior to potential CO₂ storage. Establishing the natural levels and seasonal changes in CO₂ is also helpful when assessing future monitoring results.

What Was the Community Impact?

Safety and courtesy are top priorities. Care was taken to protect the environment during sampling activities. Three 2-day activities took place in spring, summer, and fall 2019. Crews used one pickup on existing roadways. Persons near sampling sites could hear a generator or hammer drill as soil gas samples were collected.

What Do Landowners Need to Know?

Red Trail Energy appreciates the cooperation of landowners participating in this research effort. The 2019 sampling effort has been completed. Sample analysis is underway, and participating landowners will receive the results of the groundwater and soil gas analyses approximately 3 months after the sampling event.

Where Did We Sample?

Conditions permitting, three water wells and 11 soil gas locations were sampled during each seasonal event. All locations were near the Red Trail Energy facility and Richardton.



Technicians take some water measurements onsite before collecting groundwater to be analyzed in the laboratory.

How Was Sampling Carried Out?

Water samples were collected from existing wells using procedures that have no impact to the well or groundwater system. Soil gas sampling required placement of temporary flags to mark the location that was tested each season. Sample collection at each site took 30 minutes to an hour, with the entire event lasting approximately 2 days.



Soil gas is collected with a probe driven into the ground 3.5 feet during each sampling event.

What Are the Next Steps?

Information on project progress and other potential field activities is available on the EERC's website. An open house showcasing results is planned for winter 2019. The final report will be available to the public 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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RED TRAIL ENERGY CCS PROJECT

ACTIVITY FAQs

INTEGRATED CARBON CAPTURE AND STORAGE FOR NORTH DAKOTA ETHANOL PRODUCTION

Geology Study – Drilling Down at Red Trail Energy

A test hole drilled on Red Trail Energy property east of Richardton, North Dakota, will provide rock samples (called core) and geologic data as part of the Red Trail Energy carbon capture and storage (CCS) project. Field preparations began in December 2019, and drilling is expected to occur in early 2020, pending tool and rig availability.

What Is the Benefit of Drilling a Test Hole?

Information collected from this research activity will be added to results from the geophysical survey and existing information to help scientists verify that the deep rock formations underlying the study area will safely and permanently store CO₂ from the local ethanol plant. In addition, this information is necessary to prepare the required state permits for CO₂ injection and storage.

The next step in determining whether the potential storage zones are suitable for permanent CO₂ storage is drilling a 1.3-mile-deep test hole on Red Trail Energy property east of the ethanol plant. Under this research activity, permits were obtained from state, county, and local officials to perform the test.



What Are the Impacts to the Community?

Safety and courtesy are top priorities. Business will increase for the month when drilling personnel travel to and from the job site for food, fuel, and other amenities. During drilling, the land and groundwater resources are protected by impermeable barriers (illustrated at right).

What Are the Next Steps?

Over several months following the drilling activity, the rock cores, geologic fluids, and wireline logging data will be analyzed and incorporated into the computer model of the subsurface developed with the geophysical survey. Geologists will use the results to determine if the rock layers meet the criteria for safe, permanent geologic storage of CO₂ from the ethanol plant.

What Is Carbon Capture and Storage or CCS?

CCS captures CO₂ from industrial processes before it is emitted by the plant, transports the CO₂ to an injection site, and injects the CO₂ deep underground for safe, permanent storage in a suitable rock layer. CCS is best-suited for large stationary facilities such as ethanol plants, coal-fired power plants, cement plants, oil and gas refineries, and agricultural processing plants.



As required under the permit to drill, groundwater resources are protected during drilling by freshwater drilling mud, then isolated with layers of steel casing and concrete. The casing and cement remain as permanent protection for groundwater; see "Drill the Hole" on the back page for more details.

What Are the Basic Steps for This Activity?

Drilling, sampling, and data collection will follow the same practices and procedures used to characterize the geology of hydrocarbons, coal, and water resources in North Dakota.

Obtain Permits – Drilling a test hole for geologic research requires a permit from the North Dakota Industrial Commission Oil & Gas Division. The permit helps ensure that proper steps are taken to protect groundwater. The permit for drilling was granted in December 2019.

Prepare Drill Site – Pad preparation entails leveling and laying aggregate on an area of land ~400 × 400 ft to make a flat, stable work area for drilling equipment. The pad creates an impermeable barrier to protect the land and groundwater and takes about 5–7 days to complete.

Drill the Hole – Drilling takes place in four stages. Stage 1 involves digging a hole 90 ft deep, which is lined with steel pipe (conductor casing) and coated with concrete to the surface. Step 2 involves drilling a hole to 100 feet below the bottom of the freshwater zone (~1950 feet). Using freshwater drilling mud prevents groundwater contamination. The hole is fitted with steel pipe (surface casing), the outside of which is cemented from the bottom to the surface to isolate and protect drinking water during subsurface activities. Stage 3 continues drilling to a depth of nearly 5000 ft (into the overlying shale seal above the



Wireline logging will collect data about the rock layers, their fluids, and their pressures.

potential zone for storage). Stage 4, the coring stage, involves about 550 ft of the hole where multiple cylinders of rock called cores are cut using a special hollowed-out drill bit. Stages 3 and 4 are repeated for the second target zone, yielding a total of about 1000 feet of core.

Gather Downhole Data – After the core samples are removed, a truck with specialized instruments will run sensors into the hole, a technique called wireline logging. This standard drilling industry practice will collect data about the rock layers, their fluids, and their pressures.

Close the Hole – After data collection is completed, the test hole will be sealed temporarily to maintain integrity while awaiting data and rock core analysis.



Multiple cylindrical rock samples called cores will be retrieved from the bottom 2000 ft of the hole using a specialized coring drill bit.

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RED TRAIL ENERGY CCS PROJECT

RESULTS OF THE MARCH 2019 GEOPHYSICAL SURVEY NEAR RICHARDTON, NORTH DAKOTA

INTEGRATED CARBON CAPTURE AND STORAGE FOR NORTH DAKOTA ETHANOL PRODUCTION

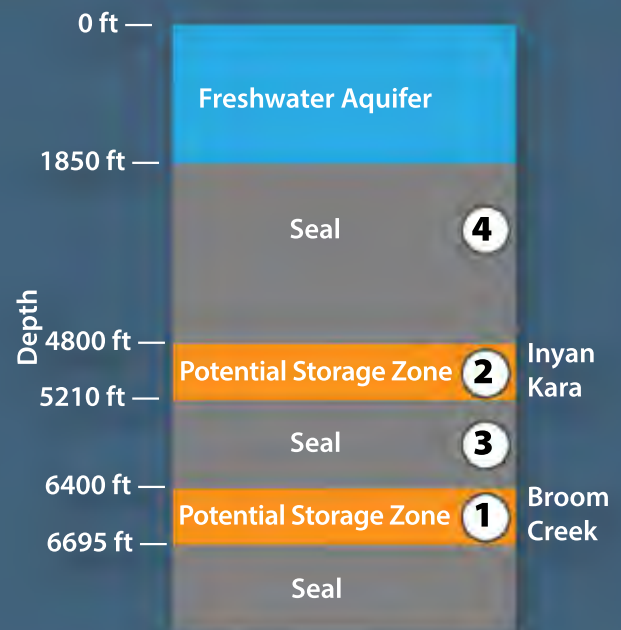
Over the period March 6–28, 2019, a field crew conducted an 8-mi² geophysical survey near Richardton, North Dakota, to learn about rock layers in the deep subsurface. The data gathering was part of the Red Trail Energy Carbon Capture and Storage (CCS) research effort, which is investigating the feasibility of safe, permanent, commercial-scale geologic storage for carbon dioxide integrated with ethanol production. The geologic information collected was assessed by engineers and scientists at the Energy & Environmental Research Center to help determine the potential for CO₂ storage in the area.

What Did We Learn?

The data from the geophysical survey helped evaluate the rock layers more than a mile below the surface.

Possible Injection Zones: The data show that one **potential storage zone (1)**, the Broom Creek Formation, lies at a depth of about 6400 feet, with an average thickness of 295 feet, and contains sand dune features that may be good CO₂ injection targets. A second **potential storage zone (2)**, the Inyan Kara Formation, lies at a depth of about 4800 feet, is roughly 410 feet thick, and contains several sand intervals that may be good injection targets.

Geologic Seals That Protect Drinking Water: The survey showed that impermeable rock formations make up 1200 feet of the layers between the potential CO₂ injection zones **(3)** that will act as a seal between the Broom Creek and the Inyan Kara Formations. The survey data also confirmed an additional ~3000 feet of impermeable rocks above the Inyan Kara **(4)** that will act as a seal between the CO₂ injection zone and the deepest freshwater aquifer.



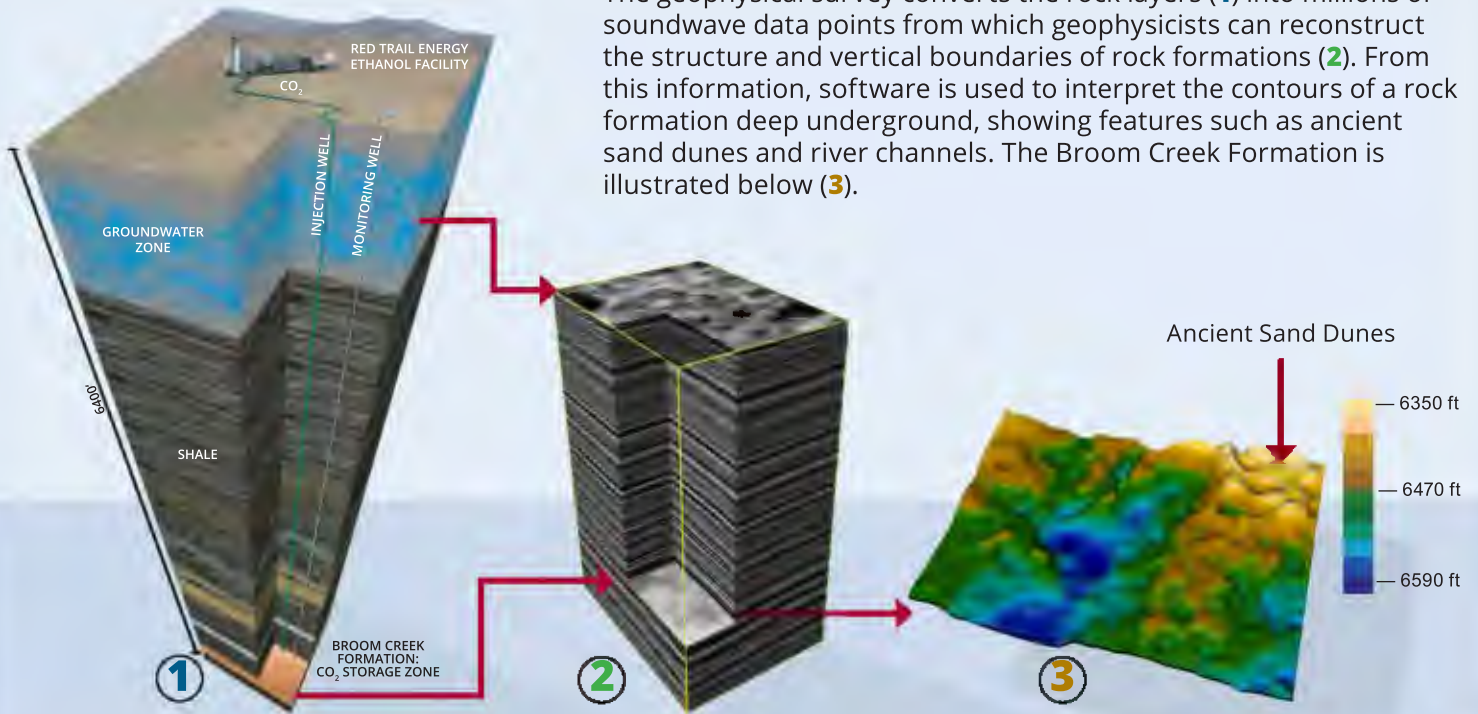
How Are We Using the Survey Data?

The survey data were incorporated into an existing 3-D computer model of the subsurface to improve its accuracy. The model is used to simulate movement of CO₂ in the storage zone, evaluate the suitability of the storage zone to contain CO₂, and determine the best location for a test well to learn more about the potential storage and seal rock layers. The information gained from the geophysical data will help with the state-required permit application for permanent geologic storage. Future geophysical surveys could be used to monitor and map injected CO₂ should a commercial CCS project begin operation.

What Are the Next Steps?

A community open house will share the geophysical survey results and future activities. The next phase of the project includes drilling a test well to collect rock and fluid samples from the two potential storage formations and to collect downhole data using established techniques. This information will help determine the best injection well location, select the best storage zone, and confirm that it will provide safe, permanent CO₂ storage.

The geophysical survey converts the rock layers (1) into millions of soundwave data points from which geophysicists can reconstruct the structure and vertical boundaries of rock formations (2). From this information, software is used to interpret the contours of a rock formation deep underground, showing features such as ancient sand dunes and river channels. The Broom Creek Formation is illustrated below (3).



Vibroseis trucks generated vibrations every 165 feet along straight paths throughout the study area, avoiding buildings and infrastructure.

A network of battery-powered sensors and Wi-Fi transmitters at 165-ft intervals collected data.



QUICK FACTS

23 Days	20 Man Crew
3600 SENSORS	8 miles square
FOUR Vibroseis Trucks	



Survey Area:
Township 139N Range 02W
Section Numbers Displayed
Sections (1 mile x 1 mile)

Geophysical Survey
[Yellow dashed line] Permitted Geophysical Survey

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RTE CCS PROJECT OPEN HOUSE ADVERTISING AND COMMUNICATION MATERIALS

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December 11, 2019 Open House Invitation (graphic also used for newspaper advertisement)
Richardton Digital Sign
Landowner – Geophysical Survey Participant (thank you and invitation)
Nearby Landowners, Commissioners, Legislators Invitation
Educators Invitation
Sign-In Sheet
Comment Card
Welcome
Post-Event Press Release (March 2019)
Post-Event Press Release (December 2019)
Post-Event Thank You Card (image)

Red Trail Energy

Carbon Capture & Storage Project

OPEN HOUSE

March 6, 2019

6:30 to 8:30 p.m. MST

American Legion Post 180

*122 North Avenue West
Richardton, North Dakota*

Please join us for an open house event for the Red Trail Energy CCS Project. Scientists from the Energy & Environmental Research Center and Red Trail Energy personnel will be on-site to provide information on the project and its current activities through displays and one-on-one conversations. Refreshments will be provided. We look forward to seeing you!





Carbon Capture & Storage Project **OPEN HOUSE**

Wednesday, December 11, 2019

6:00 to 8:00 p.m. MST

American Legion Post 180

122 North Avenue West
Richardton, North Dakota

Please join us for an open house event for the Red Trail Energy CCS Project. Scientists from the Energy & Environmental Research Center and Red Trail Energy personnel will be on-site to provide information on the project and its current activities through displays and one-on-one conversations. A presentation by Gerald Bachmeier, Red Trail Energy CEO, will begin at 6:30 p.m. Refreshments will be provided. We look forward to seeing you!



Richardton Digital Sign

Suzy's Stash coordinates the signage

118 North Ave E

Richardton, North Dakota

(701) 974-7899

suzyssstash@ndsupernet.com

Pay with cash or check. Owned by the Lion's Club; will invoice—or we can pay when we're out for the open house.

March 2019 Open House Message

What we sent, which is a lot; might be on two slides
Open House for Red Trail Energy CCS Project
Wednesday, March 6
6:30 to 8:30 PM MST
American Legion Post 180, Richardton
Come learn about the big trucks!
Can't come: Visit undeerc.org/RedTrailEnergy

December 2019 Open House Message

What we sent, which is a lot; might be on two slides
Open House for Red Trail Energy CCS Project
Wednesday, December 11
6:00 to 8:00 PM MST
American Legion Post 180, Richardton
Come learn about the drilling test!
Can't come: Visit undeerc.org/RedTrailEnergy



RED TRAIL ENERGY, LLC

“Our Farms, Our Fuel, Our Future”

PO Box 11 Richardton, ND 58652 (701)-974-3308 FAX (701)-974-3309

February 28, 2019

«FULLNAME»

«ADDRESS»

«CITY», «STATE» «ZIP_CODE»

Dear «FULLNAME»:

Subject: Open House Invitation

Thank you for granting access to your property for our geophysical survey!

Red Trail Energy is excited to share information about the current geophysical survey, the overall RTE CCS project, and the positive impact it will have on the region!

Please see the enclosed invitation to join Red Trail Energy for refreshments and more information on the RTE CCS Project at an open house this Wednesday evening, March 6, from 6:30 to 8:30 p.m. MST at the American Legion in Richardton. I hope to see you there!

Sincerely,

Dustin Willett
Chief Operating Officer

DW
Enclosure



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Dear «FULLNAME»:

Subject: Open House Invitation

Red Trail Energy (RTE) is excited to share information about the current geophysical survey, the overall RTE CCS project, and the positive impact it will have on the region!

Please join us for refreshments and more information on the RTE CCS project at an open house Wednesday , March 6, from 6:30 to 8:30 p.m. MST at the American Legion in Richardton. Enclosed are an invitation and facts about the project. I hope to see you there!

Should you have any immediate questions or concerns, please contact me by phone at (701) 974-3308 or by e-mail at dustin@redtrailenergy.com.

Sincerely,

Dustin Willett
Chief Operating Officer

DW

Enclosures



RED TRAIL ENERGY, LLC

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PO Box 11 Richardton, ND 58652 (701) 974-3308 FAX (701) 974-3309

March 1, 2019

«FULLNAME»

«ADDRESS»

«CITY», «STATE» «ZIP_CODE»

Dear «FULLNAME»:

Subject: Open House Invitation

Red Trail Energy (RTE) is using science to sustain our energy future. Field crews are performing a geophysical survey east of Richardton through mid-March as part of a carbon capture and storage (CCS) investigation. We are excited to share information about the current geophysical survey, the overall RTE CCS project, and the positive impact it will have on the region.

Join us for refreshments and more information on the RTE CCS project at an open house this Wednesday evening, March 6, from 6:30 to 8:30 p.m. MST at the American Legion in Richardton. Enclosed are an invitation and facts about the project. Please share this information with your students and interested colleagues as you see fit. We hope to see you there!

We are also available to visit your classroom to speak directly with you and students about the project. Please contact Charlene Crocker, a research scientist at the Energy & Environmental Research Center involved in the project, to plan a visit. She can be reached by phone at (701) 777-5018 or by e-mail at ccrocker@undeerc.org. You may contact me as well at (701) 974-3308 or at dustin@redtrailenergy.com with any questions.

Sincerely,

Dustin Willett
Chief Operating Officer

DW

Enclosures

RED TRAIL ENERGY CARBON CAPTURE & STORAGE PROJECT OPEN HOUSE

[illegible]

Questions or comments about the *Red Trail Energy CCS* project?

Tell us!

[illegible]

E-Mail Address (optional) _____

Questions or comments about the **Red Trail Energy CCS** project?

Tell us!

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins or other markings on the paper.

E-Mail Address (optional)



Red Trail Energy

Carbon Capture & Storage Project
OPEN HOUSE

Welcome



RICHARDTON, N.D. – [Red TrailEnergy, LLC](#) (RTE) recently hosted an open house event at the American Legion in Richardton. Approximately 40 community members attended. Scientists and engineers from the University of North Dakota (UND) Energy & Environmental Research Center (EERC) joined RTE staff and provided information to attendees on a local carbon capture and storage project.

With the support of the North Dakota Industrial Commission (NDIC) and the U.S. Department of Energy (DOE), RTE is investigating carbon capture, utilization, and storage (CCUS) technology as a way to reduce the carbon dioxide emissions associated with ethanol production. Reducing emissions enables energy producers to sell ethanol to states that have low-carbon fuel programs, such as California. CCUS technology captures and permanently stores carbon dioxide emissions.

“We are very excited to continue working with the EERC to investigate CCUS as an economical option for meeting low-carbon fuel program markets in other states,” said Gerald Bachmeier, RTE Chief Executive Officer. “Our community has been supportive of the effort, and we appreciate their time to attend our open house.”

Questions about the project can be directed to:

Dustin Willett, RTE Chief Operating Officer
(701) 974-3308, dustin@redtrailenergy.com

Nikki Massmann, EERC Communications Director
(701) 777-5428, nmassmann@undeerc.org

RICHARDTON, N.D. – Red Trail Energy, LLC (RTE) recently hosted an open house event at the American Legion in Richardton. Approximately 40 community members attended to hear about the latest developments on a local carbon capture and storage (CCS) project.

With the support of the North Dakota Industrial Commission (NDIC) and the U.S. Department of Energy (DOE), RTE is investigating CCS technology as a way to reduce the carbon dioxide emissions associated with ethanol production. Reducing emissions enables ethanol producers to be more competitive in states that have low-carbon fuel programs, such as California. CCS technology captures and permanently stores carbon dioxide emissions.

RTE CEO Gerald Bachmeier gave a presentation about the project and answered questions from community members. Scientists and engineers from the University of North Dakota (UND) Energy & Environmental Research Center (EERC) provided information about RTE's seismic survey results and the suitability of the geology at the site to permanently store carbon dioxide.

"Using CCS to reduce the carbon dioxide emissions of our ethanol ensures the long-term viability of RTE in a highly competitive global market," said Bachmeier. "We are excited to continue our partnership with the EERC in this investigation, and we are very appreciative of the community support thus far."

Next steps for the RTE CCS Project involve further studying the deep rock layers at the RTE site and obtaining necessary permits and regulatory compliance for safe and permanent carbon dioxide storage.

Questions about the project can be directed to:

Dustin Willett, RTE Chief Operating Officer
(701) 974-3308, dustin@redtrailenergy.com

Nikki Massmann, EERC Communications Director
(701) 777-5428, nmassmann@undeerc.org

Red Trail Energy

Carbon Capture & Storage Project

OPEN HOUSE

Thank You!



RTE CCS PROJECT OPEN HOUSE POSTERS – MARCH

RTE Building on Success

RTE CCS Project Time Line

RTE CCS Project: Lower Carbon – Higher Value Fuel

RTE CCS Project Concept: Ensuring Safety and Protecting the Environment

RTE CCS Project Phase III: EERC Research Investigations

Geophysical Survey Near Richardton, North Dakota

RED TRAIL ENERGY

CCS PROJECT FACT SHEET

INTEGRATED CARBON CAPTURE AND STORAGE FOR NORTH DAKOTA ETHANOL PRODUCTION

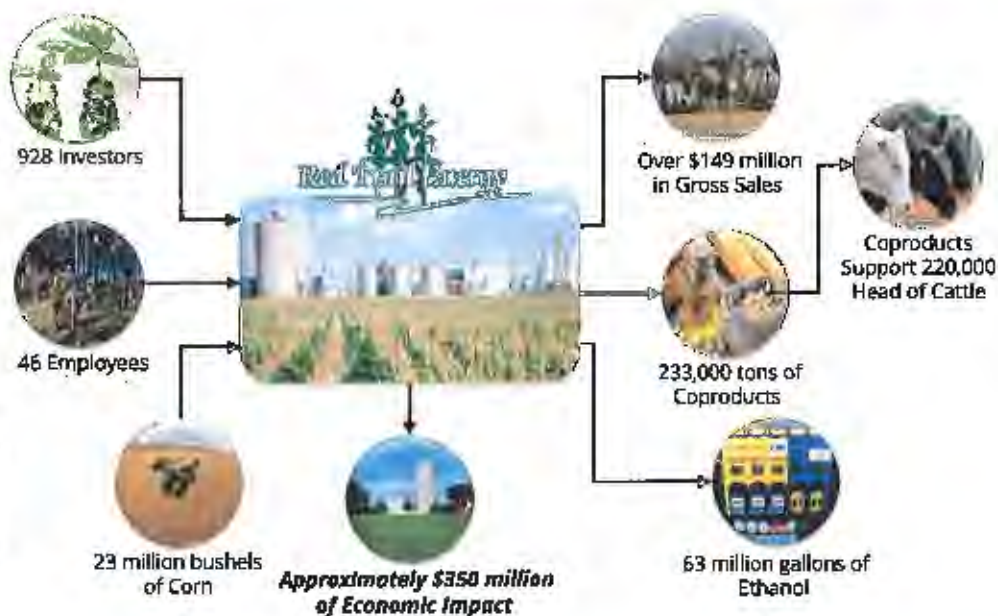
Red Trail Energy CCS Project

Red Trail Energy, an ethanol production plant in Richardton, North Dakota, is seeking to make its ethanol more valuable by integrating carbon capture and storage, or CCS, to reduce carbon dioxide emissions from ethanol production. This reduction in carbon emissions will make Red Trail Energy's ethanol more desirable to states that have low-carbon fuel programs, such as California. Keeping CO₂ out of the atmosphere could qualify for federal tax credits to offset some of the cost of integrating and operating CCS.



Buliding on Success

Since 2007, Red Trail Energy has been producing corn-based ethanol and distillers grains at its investor-owned plant in Richardton, North Dakota. The ethanol plant provides an alternative market to farmers in 32 counties in the region and creates tax revenue in eastern Stark County. Integration of CO₂ capture and geologic storage will position North Dakota as a national leader in developing reduced-carbon ethanol with a strategic first-to-market advantage over other states. The ability to command premium pricing and diversity product markets will help secure Red Trail Energy's future, providing stability in a volatile, commodity-driven market.

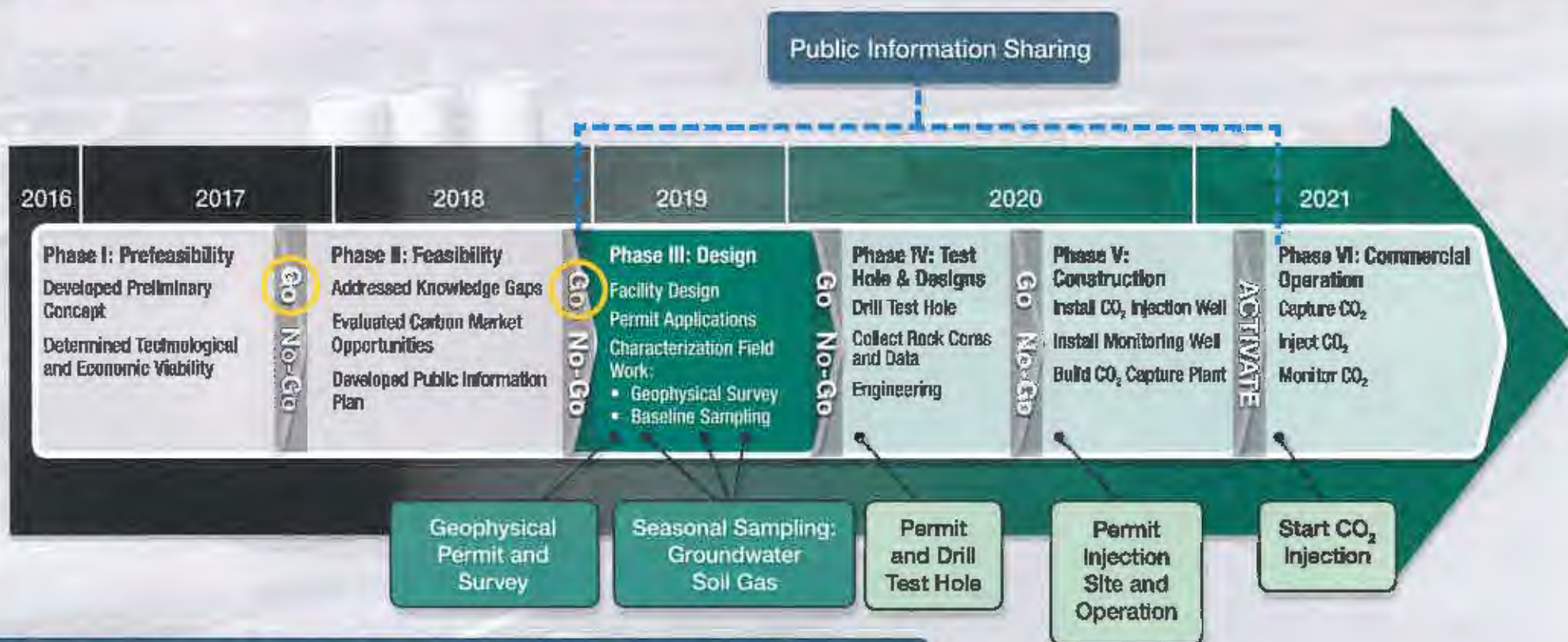


What Is Carbon Capture and Storage?

CCS is the practice of capturing CO₂ emissions from an industrial facility instead of releasing them to the atmosphere. Once captured, the CO₂ is transported to a site for injection and safe, permanent storage deep underground. Carbon dioxide injection is currently practiced in over 100 locations in the United States, typically for extending the life of older oil fields.

"Integrating carbon capture and storage ensures the long-term viability of Red Trail Energy."

RTE CCS PROJECT TIME LINE



The North Dakota Industrial Commission CO₂ injection permitting process requires a public hearing and opportunity to take written comments.

The Red Trail Energy (RTE) carbon capture and storage (CCS) project is investigating the integration of CCS with RTE's ethanol facility near Richardson, North Dakota.

For more information, contact:

Dustin Willett, Chief Operating Officer, RTE, dustin@redtrailenergy.com, 701-774-3305, or Charles Gorecki, Director of Subsurface R&D, EERC, cgorecki@undeeerc.org, 701-777-5355.

For more information on the project and CCS, visit the Web site: www.undeeerc.org/RedTrailEnergy



RTE CCS PROJECT

LOWER CARBON – HIGHER VALUE FUEL



Decreasing the carbon footprint of Red Trail Energy's ethanol makes it even more valuable to states that have low-carbon fuel programs, such as California.

Keeping CO₂ out of the atmosphere could also qualify for federal tax credits to offset some of the cost of integrating and operating carbon capture and storage, or CCS.

Integrating CCS into the Richardton plant operation could accomplish this.

What Is Carbon Capture and Storage?

CCS is the practice of capturing CO₂ emissions from an industrial facility instead of releasing them to the atmosphere. Once captured, the CO₂ is transported to a site for injection and safe, permanent storage deep underground. Carbon dioxide injection is currently practiced in over 100 locations in the United States, typically for extending the life of older oil fields.

The Red Trail Energy (RTE) carbon capture and storage (CCS) project is investigating the integration of CCS with RTE's ethanol facility near Richardton, North Dakota.

For more information, contact:

Dustin Willett, Chief Operating Officer RTE: dustin@redtrailenergy.com, 701-844-3308; or

Charles Gorecki, Director of Subsurface R&D, EERC: cgorecki@undeerc.org, 701-777-5355.

For more information on the project and CCS, visit the Web site: www.undeerc.org/RedTrailEnergy



RTE CCS PROJECT CONCEPT

Ensuring Safety and Protecting the Environment

Compliant with State Regulations

- The RTE CCS Project is governed by state and federal regulations that require permits and (employer) approval for project activities.
- In the current phase, this includes geophysical survey work and any monitoring well drilling.
- In future phases, all drilling, monitoring, and potential injection activities will need state and local approval.

1 Protection of Human Health and Environment

Groundwater resources are important, and we make sure that they are protected. So does the state through its regulatory and permitting process.

2 Drinking Water Protection

State regulations govern all subsurface activities. All drilling and well use is regulated to protect groundwater resources. Typical: three layers of steel (casing and tubing) and two layers of durable, long-lasting cement isolate the freshwater aquifers, protecting them from drilling fluids, saltwater from deep layers, and injected CO₂.

3 Storage Zone

The storage zone for the RTE CCS Project is a 500-foot thick sandstone layer more than a mile beneath the RTE facility. The sandstone layer holds very salty water and has no oil.

4 Nature's Seals

Some thick ground rock layers make excellent barriers to prevent flow of fluids. These cap rocks make efficient traps for oil, water, natural gas, and CO₂. Cap rocks are usually shale and salt. Beneath the surface at RTE, thousands of feet of shale and other impermeable rock layers already protect the fresh groundwater from the only source of the target storage zone.

5 Tracking the CO₂

Confirming that the CO₂ stays in the storage layer is critical and requires many techniques. Some involve monitoring the location, monitoring conditions in the container (pressure and overlying rock), and tracking the CO₂ through observation well. Other measures, shown that CO₂ has not moved beyond the storage container.



RTE CCS PROJECT PHASE III

EERC RESEARCH INVESTIGATIONS



Geophysical Survey

- Collect data over broad area.
- Identify different rock layers.
- Determine rock layer thicknesses and depths.
- Execute in a noninvasive, environmentally friendly manner.



Example of a sensor location showing the sensor, battery pack, and Wi-Fi transmitter at a similar geophysical survey in Montana.



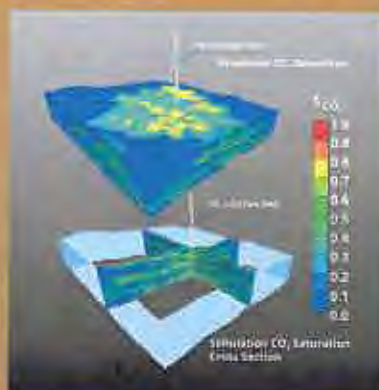
Geophysicists decipher the data from the survey and learn about the rock layers underground.

Modeling and Simulation

Completed: Model developed using preliminary data.

Current Activities: Update the model using data from the geophysical survey.

Simulate CO₂ injection and subsequent behavior in storage zone.



Baseline Sampling

Purpose is to investigate natural seasonal changes in existing CO₂ levels, collect samples, conduct analyses, and investigate the results.

Soil Gas

- Samples a few feet below ground surface.
- Measures the chemical processes that cause changes to natural CO₂.
- May be required as part of future permit applications.

Groundwater

- Samples from existing wells within the project area.
- Measures seasonal changes in groundwater related to naturally occurring CO₂.
- Types first step in monitoring program development.



Preparing Major Permit Applications

Gathering information for future permits. If the project goes forward.

Before CO₂ operation, North Dakota Industrial Commission – Dept. of Mineral Resources, Oil & Gas Division requires a CO₂ Storage Facility Permit and an Injection Permit.

Includes several plans to ensure safe operations and preparations to fix any potential issues.

Plans included in a CO₂ Storage Facility Permit:

- Corrosion Monitoring and Prevention Plan
- Well Casing and Cementing Program
- Testing and Monitoring Plan
- Emergency and Remedial Response Plan
- Worker Safety Plan
- Leak Detection and Reporting Plan
- Area of Review and Corrective Action Plan
- Well-Plugging Plan
- Demonstration of Financial Responsibility
- Postinjection Site Care and Facility Closure Plan

Other permits required include approval by the City of Richardson and Stark County before CCS operation may start.



GEOPHYSICAL SURVEY NEAR RICHARDTON, NORTH DAKOTA

The geophysical survey, taking place February 26 to mid-March 2019, encompasses about 8 square miles around the Red Trail Energy plant east of Richardton.

Survey Area:

Township 139N Range 92W
Section numbers displayed
Sections (1 mile x 1 mile)



Geophysical Survey

 Permitted Geophysical Survey

The Red Trail Energy (RTE) carbon capture and storage (CCS) project is investigating the integration of CCS with RTE's ethanol facility near Richardton, North Dakota.

For more information, contact:

Dustin Willett, Chief Operating Officer, RTE, dustin@redtrailenergy.com, 701-974-3300 or
Charles Gorecki, Director of Subsurface R&D, EERC, cgorecki@undeerc.org, 701-777-5355.

For more information on the project and CCS, visit the Web site: www.undeerc.org/RedTrailEnergy.



RTE CCS PROJECT OPEN HOUSE POSTER – DECEMBER

Capturing CO₂ Emissions Helps Secure Red Trail Energy's Future

RTE CCS Project Moves to Phase IV

Geophysical Survey and Environmental Sampling Pave the Way to the Next Phase

Detailed Plans and Process Ensure Human Safety and Protect the Environment

Drilling for Data: Steps for a Test Hole

RTE CCS Project Will Ensure Human Safety and Protect the Environment

CAPTURING CO₂ EMISSIONS HELPS SECURE RED TRAIL ENERGY'S FUTURE

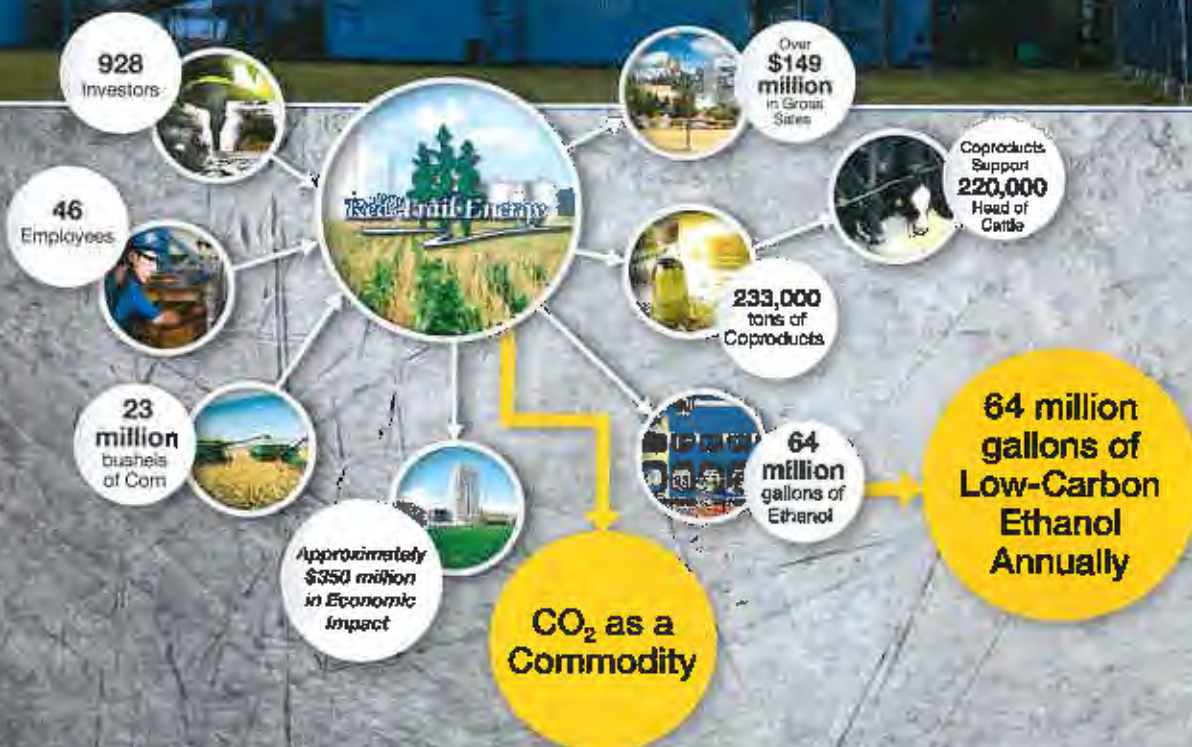
BUILDING ON SUCCESS

RED TRAIL ENERGY

- Investor-owned plant in Richardton, North Dakota, since 2007
- Produces corn-based ethanol and distillers' grains
- Provides an alternative market to farmers in 32 counties in the region
- Creates tax revenue in eastern Stark County

INTEGRATING CO₂ CAPTURE AND PERMANENT GEOLOGIC STORAGE WILL:

- Command premium pricing
- Diversify product markets
- Provide stability in a volatile, commodity-driven market
- Make North Dakota a national leader in developing reduced-carbon ethanol



PROJECT PARTNERS



GEOPHYSICAL SURVEY AND ENVIRONMENTAL SAMPLING PAVE THE WAY TO THE NEXT PHASE.

GEOPHYSICAL SURVEY: A PICTURE OF THE ROCK LAYERS DOWN TO 7000 FT DEEP

The 8-square-mile 3-D geophysical survey verified the following (east of Richardson in March 2019):

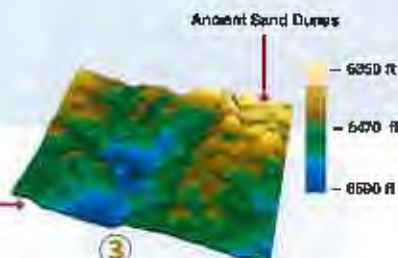
- Two potential CO₂ storage layers (in orange)
- Several geologic seals—cap rocks more than ½ mile thick—that protect drinking water (in gray)

Results are being incorporated into the geologic model to determine location for a future test hole to collect data, rock samples, and formation water from those potential injection and cap rock layers.



TURNING SOUND WAVES INTO MODELS

The geophysical survey converts the rock layers (1) into millions of soundwave data points from which geophysicists can reconstruct the structure and vertical boundaries of rock formations (2). From this information, software is used to interpret the contours of a rock formation deep underground, showing features such as ancient sand dunes and river channels. The Broom Creek Formation is illustrated below (3).



Soil gas is collected with a probe driven into the ground 3-5 feet during each sampling event. Typical soil gas contains nitrogen and oxygen with a little carbon dioxide (CO₂) and occasionally methane (CH₄) increases during the growing season, displacing some O₂.

SEASONAL CHANGES RELATED TO THE LOCAL NATURAL CARBON CYCLE

As part of the natural carbon cycle of these ecosystems, seasonal changes in CO₂ are being studied to define existing environmental conditions:

- For groundwater, the chemical makeup in freshwater aquifers depends on the rocks through which it moves and anything else that filters into the aquifer.
- Soil gas comes from the biological activity of the soil's plant, animal, and microbial communities.
- All three planned soil gas- and groundwater-sampling events were completed in May, August, and November 2019 (i.e., spring, summer, and fall).



Groundwater monitoring (e.g., temperature, pH, TDS, etc.) is occurring in the field before the water is analyzed in the laboratory (metals, nutrients, and water quality tests).

The Red Trail Energy (RTE) carbon capture and sequestration (CCS) project is investigating the integration of CCS with RTE's ethanol facility near Richardson, North Dakota.

For more information, contact:

Dustin Willett, Chief Operating Officer, RTE, dustin.willett@redtrailenergy.com, 301.874.9182 or
Nikki Messmann, Director of Communications, EERC, nikki.messmann@eerc.org, 701.773.5403

For more information on the project and CCS, visit the website: www.uncc.edu.org/RedTrailEnergy



EERC
NORTH DAKOTA

DETAILED PLANS AND PROCESS ENSURE HUMAN SAFETY AND PROTECT THE ENVIRONMENT.

PREPARING MAJOR PERMIT APPLICATIONS

NORTH DAKOTA INDUSTRIAL COMMISSION (DEPT. OF MINERAL RESOURCES, OIL & GAS DIVISION) REQUIRES A CO₂ STORAGE FACILITY PERMIT AND AN INJECTION PERMIT BEFORE OPERATION.

REQUIREMENTS FOR A CO₂ STORAGE FACILITY PERMIT:

- Technical Evaluation (geologic system, pore space, etc.)
- Corrosion Monitoring and Prevention Plan
- Well Casing and Cementing Program
- Testing and Monitoring Plan
- Emergency and Remedial Response Plan
- Worker Safety Plan
- Leak Detection and Reporting Plan
- Area of Review and Corrective Action Plan
- Well-Plugging Plan
- Postinjection Site Care and Facility Closure Plan
- Demonstration of Financial Responsibility

Additional city and county requirements are not listed.



The Red Trail Energy (RTE) carbon capture and storage (CCS) project is demonstrating the integration of CCS with RTE's ethanol facility near Dickinson, North Dakota.

For more information, contact:

Dustin Walcott, Chief Operating Officer, RTE, dwalcott@redtrailenergy.com, 701.424.3308

Nikki Mayhew, Director of Communications, EERC, nmayhew@ndeerc.org, 701.777.5428

For more information on the project and CCS, visit the website: www.ndeerc.org/RedTrailEnergy



EERC
NORTH DAKOTA

DRILLING FOR DATA: STEPS FOR A TEST HOLE

STEP 1: BUILD A WELL PAD

STEP 2: BRING IN A DRILL RIG

- Drill beyond the freshwater zone; line the hole with casing and cement to protect freshwater resources.
- Drill to depth (about a mile).
- Collect rock samples from potential storage and sealing layers (called core).
- Collect fluids from target layers.
- Collect data—such as pressure, temperature, fluid salinity—along all of the layers (called wireline logging).
- Install temperature and pressure gauges in the target formations to establish natural conditions.
- Close the hole temporarily to enable future data-sampling capability.

STEP 3: BEGIN BASELINE DATA COLLECTION

- Collect temperature and pressure data from gauges installed near the end of Step 2.
- Determine the natural conditions in the target storage zone and seals.

WHY DRILL A TEST HOLE?

Along with the geophysical survey results, the data and rock samples from the test hole are critical to:

- Confirm that the target storage zone has no natural leaks.
- Improve the computer models that researchers use to:
 - Prove the suitability of the storage site for permanent CO₂ storage.
 - Develop safe operation and contingency plans.
 - Prepare permit applications for all aspects of the CCS operation.



DRINKING WATER PROTECTION
Strict regulations govern all drilling activities and protect groundwater resources. A layer of steel casing and a layer of durable, long-lasting cement isolate the freshwater aquifers, protecting them from drilling fluids and saltwater from deeper layers.

CORING

Cylinders of rock will be extracted from the target formation and the overlying seal at two depths. These samples will be analyzed to determine if they meet the criteria for safe, permanent, geologic storage of CO₂.

This fact sheet was prepared by the Western Canadian Centre for Carbon Capture (WCCC) in partnership with the Alberta Centre for Carbon Capture (ACCC) and the Alberta Centre for Carbon Capture (ACCC).

For more information, contact:

Dustin Willett, Chief Operating Officer, WCCC (dustin.willett@wccc.ca)
Neil Meisner, Director of Communications, EERC (neil.meisner@eerc.ca)
or visit our website at www.wccc.ca or www.eerc.ca



RTE CCS PROJECT WILL ENSURE HUMAN SAFETY AND PROTECT THE ENVIRONMENT.

Compliant with State Regulations

- The RTE CCS project is governed by state and federal regulations that require permits and landowner approval for project activities.
- In the current phase, this includes geophysical survey work and any drilling.
- In future phases, all drilling, monitoring, and potential injection activities will need state and local approval.

Protection of Human Health and Environment

Groundwater resources are important, and we make sure that they are protected—so does the state through its regulatory and permitting process.

Drinking Water Protection

Strict regulations govern all subsurface activities. All drilling and wells are engineered to protect groundwater resources. Typically, three layers of steel (casing and tubing) and two layers of double long-boring cement isolate the freshwater aquifers, protecting them from drilling fluids, saltwater from deep rock layers, and injected CO₂.

Storage Zone

The storage zone target for the RTE CCS project is a 300-foot-thick sandstone layer more than 3 miles beneath the RTE facility. The sandstone layer holds very salty water and has no oil.

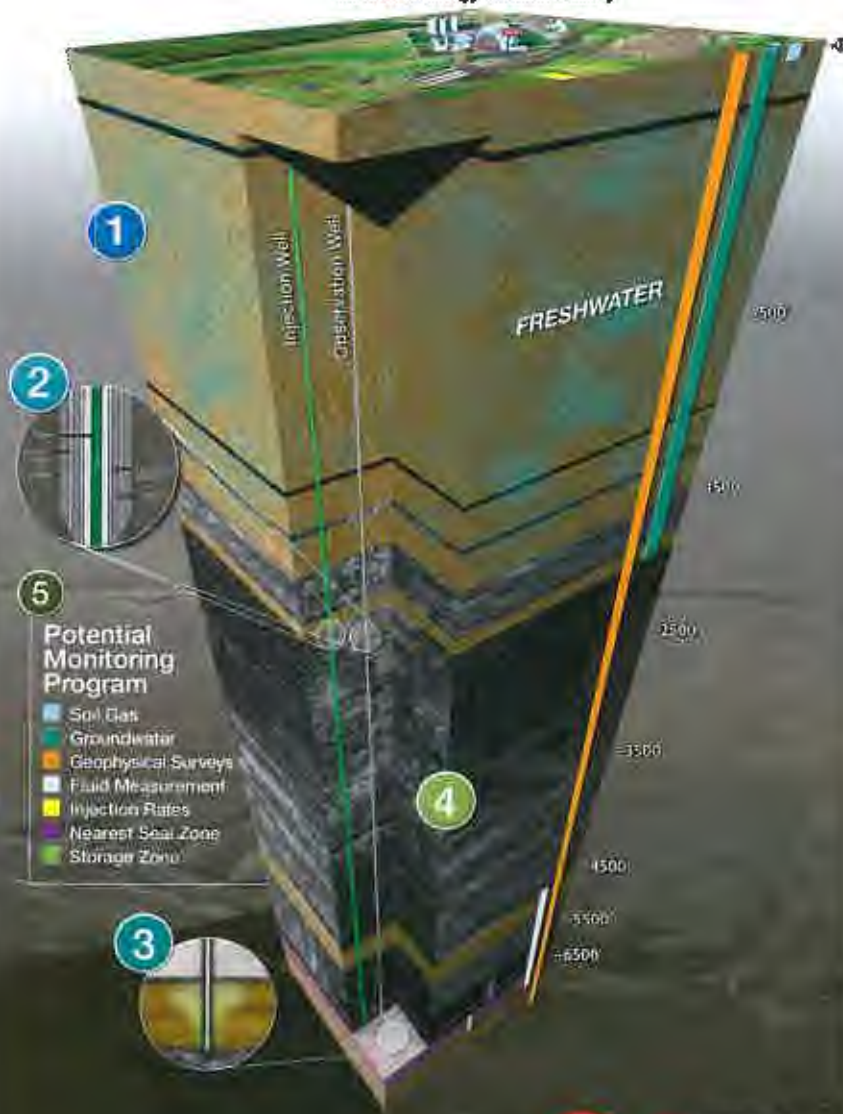
Nature's Seal

Some underground rock layers make excellent barriers to upward flow of fluids. These can rocks make effective traps for oil, water, natural gas, and CO₂. Cap rocks are usually shales and salts. Beneath the surface at RTE, thousands of feet of shales and other impermeable rock layers already protect the fresh groundwater from the salty water of the storage zone.

Ensuring Safety

Confirming that the CO₂ stays in the storage layer is critical to the CCS project. Techniques include controlling the injection, monitoring conditions in the container (storage and overlying seals), and tracking the CO₂ movement in the reservoir from an observation well. Other measures show that CO₂ has not moved beyond the storage container and is not affecting groundwater at the surface environment.

Red Trail Energy Ethanol Facility



EERC
NORTH DAKOTA

**RED TRAIL ENERGY CARBON CAPTURE AND STORAGE PROJECT: PHASE III
COMMISSION MEETING TALKING POINTS**

Stark County February 5, 2019

Stark County April 2, 2019

Stark County October 1, 2019

Stark County December 3, 2019

Richardton City December 18, 2019

Red Trail Energy Carbon Capture and Storage Project: Phase III Talking Points
February 5, 2019 Stark County Commission Meeting

Red Trail Energy is:

- Looking for ways to ensure the sustainability of the company and the market for our ethanol into the future (*see fact sheet in the packet*).
- Working with the Energy & Environmental Research Center at the University of North Dakota to determine whether carbon capture and storage at the Richardton facility would be safe and economically feasible.
- Hiring a data acquisition company to perform a geophysical survey over about 8 square miles east of Richardton as an early step in investigating safe, permanent geologic storage of carbon dioxide (*see FAQs in the packet*).
- The geophysical survey does not require county permission, but we wanted you to know what we are planning.

The draft survey (*in the packet*) will involve the following:

1. Permit application submitted to the North Dakota Industrial Commission – Department of Mineral Resources, Oil and Gas Division for a geophysical (seismic) survey (February 2019).
2. NDIC–DMR issues the permit and notifies Stark County Auditor of the permit being granted (February–March 2019).
3. Data acquisition company initiates landowner contact (within 7 days of permit approval).
4. Geophysical survey around Red Trail Energy ethanol facility near Richardton, ND (April 2019) (*map in the FAQs sheet in the packet*).

The EERC will:

- Use the data to evaluate the suitability of the rocky layers as a container for safe, permanent storage of CO₂ from the ethanol plant (May–December 2019).
- Prepare a report discussing the results (available to the public spring 2020).

Public Engagement [*or Outreach*]:

- We are also willing to provide periodic updates to you and city officials as the project progresses.
- Initial contact and follow-up meeting with affected landowners (February–March 2019).
- Community information session (March 2019).
- Periodic updates through the EERC's Web page, social media, and print media (May–December 2019).

For more information, contact me (see my card in the packet)

Red Trail Energy Carbon Capture and Storage Project: Phase III Talking Points
April 2, 2019 Stark County Commission Meeting

Red Trail Energy is:

- Looking for ways to ensure the sustainability of the company and the market for its ethanol into the future (*see fact sheet in the packet*).
- Working with the Energy & Environmental Research Center (EERC) at the University of North Dakota to determine whether carbon capture and storage at the Richardton facility would be safe and economically feasible.
- Completed the geophysical survey over about 8 square miles east of Richardton as an early step in investigating safe, permanent geologic storage of carbon dioxide (*see FAQs in the packet*).
 - The survey successfully completed accessing only lands where permission was granted—including limited access to county road ditches.
 - Next steps for the geophysical data will be data processing and evaluation to better understand the subsurface rock layers, such as depths, thickness, and other properties, specific to this area (expected to take several months).
- Planning a series of groundwater- and soil gas-sampling events, which do not require county permission; however, we wanted you to be aware.

The draft sampling activities (*in the packet*) will involve the following:

- Healthy soil and groundwater are vital, and ensuring that the environment is not negatively impacted by this project is a top priority for Red Trail Energy.
- Three 2-day sampling events are expected to take place spring, summer, and fall 2019.
- Groundwater samples are to be drawn from existing wells with landowner permission. We anticipate six wells may be sampled from the well spigot.
- Soil gas samples will be collected from about 3 feet below the surface using a temporary probe and battery-operated pump. A pickup-mounted generator will be used to drive the probe into the ground. We anticipate 12 locations may be accessed with landowner permission and near existing roads and field crossings; however, the majority will likely be on RTE property.
- Sampling locations are still under consideration, but all will be near the Red Trail Energy ethanol facility and Richardton, North Dakota, study area.

The EERC will:

- Use the geophysical survey data to evaluate the suitability of the rocky layers as a container for safe, permanent storage of CO₂ from the ethanol plant (April–December 2019).
- Perform laboratory analysis on the collected groundwater and soil gas samples and evaluate results to understand the natural CO₂ behavior in the local environment and determine the natural seasonal variation before any potential projects take place.

Red Trail Energy Carbon Capture and Storage Project: Phase III Talking Points
October 1, 2019 Stark County Commission Meeting

Red Trail Energy:

- Looking for ways to ensure the sustainability of the company and the market for its ethanol into the future (*see fact sheet in the packet*).
- Working with the Energy & Environmental Research Center (EERC) at the University of North Dakota to determine whether carbon capture and storage at the Richardton facility would be safe and economically feasible.
- Completed the geophysical survey over about 8 square miles east of Richardton as an early step in investigating safe, permanent geologic storage of carbon dioxide (*see FAQs in the packet*).
 - The survey was successfully completed accessing only lands where permission was granted—including limited access to county road ditches.
 - The geophysical data were processed and evaluated. The results were reported to landowners individually (*see Geophysical Survey Results in the packet*).
 - The survey and data collection were a success!
 - The survey company Breckenridge submitted the completion report to the North Dakota Industrial Commission. The company's surety bond with the state will stay in place for several more years.
 - RTE worked with landowners and the state inspector to complete reclamation work for damages to private gravel roadways and cropland related to the geophysical exploration survey. The state inspector has since been to the site to check how crops are growing and has commented that he did not observe any negative impact to crop growth in the areas where the trucks drove for the survey.
 - The data from the survey helped evaluate the rock layers more than a mile below the surface around the RTE facility. We learned that:
 - Two layers might serve as permanent CO₂ storage zones: the Inyan Kara at just under a mile deep, and the Broom Creek at 6400 ft deep—our original target layer.
 - Both layers are sealed by more than 1000 ft of cap rock, through which gases and liquid do not flow.
 - About 3000 ft of impermeable sealing rock isolates these saltwater layers from the deepest drinking water aquifer.

The next step in determining whether the potential storage zones are suited for permanent CO₂ storage is to drill a test well to collect rock samples (cores), pressure information, and other data.

- We are finalizing a test well spot.
- We anticipate drilling in the spring, pending funding and state permit acquisition.

- We will keep you informed as the effort progresses and plan to hold an open house in Richardton to provide details to the community.

The groundwater- and soil gas-sampling activities (*in the packet*) continue.

- Healthy soil and groundwater are vital. Ensuring that the environment is not negatively impacted by this project is a top priority for Red Trail Energy.
- Three 2-day sampling events are planned. Two were completed in May and August. The third is planned for November 2019.
- Groundwater samples are to be drawn from existing wells with landowner permission. Three wells are being sampled, all from the well spigot.
- Soil gas samples are being collected from about 3.5 feet below the surface using a temporary probe and battery-operated pump. A pickup-mounted generator and rotary hammer drive the probe into the ground. Weather permitting, we are collecting soil gas at 11 locations accessed with landowner permission and near existing roads and field crossings. Six are on RTE property.
- All sites are near the Red Trail Energy ethanol facility and Richardton, North Dakota, study area.
- Landowners have received the results of the May 2019 water and soil gas sampling events.

The EERC will:

- Perform laboratory analysis on the collected groundwater and soil gas samples and evaluate results to understand the natural CO₂ behavior in the local environment and determine the natural seasonal variation before any potential projects take place.
- Share the sampling results with landowners.
- Prepare a report discussing the project results (available to the public spring 2020).

Public Engagement [*for Public Outreach*]:

- We held a community open house on March 6 in Richardton, introducing the project and these activities.
- We contacted landowners to obtain permission for sampling access permissions (April 2019) and let them know ahead of each sampling event.
- We will continue to provide periodic updates to you and city officials as the project progresses.
- Periodic updates will also be available through the EERC's Web page, social media, and print media (May–December 2019).

For more information, contact me (see my card in the packet).

Red Trail Energy Carbon Capture and Storage Project: Phase III Talking Points
December 3, 2019 Stark County Commission Meeting

Red Trail Energy:

- Looking for ways to ensure the sustainability of the company and the market for its ethanol into the future (*see fact sheet in the packet*).
- Working with the Energy & Environmental Research Center (EERC) at the University of North Dakota to determine whether carbon capture and storage at the Richardton facility would be safe and economically feasible.
- Completed the geophysical survey
 - The survey and data collection were a success! (*see Geophysical Survey Results in the packet*)

The next step in determining whether the potential storage zones are suited for permanent CO₂ storage is to drill a test well to collect rock samples (cores), pressure information, and other data.

- RTE finalized the test hole location on RTE property and plans to drill through the Broom Creek Formation, 1.3 miles deep.
- Richardton City Planner was notified of the location by RTE via Special Use Permit Application, submitted on Nov 21, 2019.
- We submitted a permit application to drill to the NDIC, Department of Mineral Resources Division of Oil & Gas on Nov 25.
- NDIC DMR approved our test hole application by awarding a permit on Monday, Dec. 02, 2019.
- We have started building the well pad and anticipate drilling the test hole in late winter or early spring, pending drilling tools and rig availability.
- We will keep you informed as the effort progresses.
- An open house is scheduled for December 11, 6 to 8 PM at the American Legion, in Richardton to provide details to the community. Gerald Bachmeier, RTE's CEO, will speak about the project at 6:30 PM. (*see invitation in the packet*)

The groundwater- and soil gas-sampling activities (*in the packet*) wrapped up for the year.

- Healthy soil and groundwater are vital. Ensuring that the environment is not negatively impacted by this project is a top priority for Red Trail Energy.
- Three 2-day sampling events were completed in May, August, and November 2019.

- Groundwater samples were drawn from existing wells with landowner permission. Three wells were sampled, all from the well spigot.
- Soil gas samples were collected from about 3.5 feet below the surface using a temporary probe and battery-operated pump. A pickup-mounted generator and rotary hammer drive the probe into the ground. Weather permitting, we collected soil gas at 11 locations accessed with landowner permission and near existing roads and field crossings. Six are on RTE property.
- All sites are near the Red Trail Energy ethanol facility and Richardton, North Dakota, study area.
- Landowners have received the results of the May and August 2019 water and soil gas sampling events. November results will be compiled and sent out about February 2020.

The EERC will:

- Perform laboratory analysis on the collected groundwater and soil gas samples and evaluate results to understand the natural CO₂ behavior in the local environment and determine the natural seasonal variation before any potential projects take place.
- Share the sampling results with landowners.
- Prepare a report discussing the project results (available to the public spring 2020).

Public Engagement *[or Public Outreach]*:

- We held a community open house on March 6 in Richardton, introducing the project and 2019 activities.
- We contacted landowners to obtain permission for sampling access permissions (April 2019) and let them know ahead of each sampling event.
- We will continue to provide periodic updates to you and city officials as the project progresses.
- Periodic updates will also be available through the EERC's Web page, social media, and print media (May–December 2019).

For more information, contact me (see my card in the packet).

For Reference:

Items in the packets:

- *RTE fact sheet*
- *Geophysical Survey Results*
- Sampling FAQs
- Open house *invitation*
- Dustin's card

Details of the geophysical survey:

- Completed the geophysical survey over about 8 square miles east of Richardton as an early step in investigating safe, permanent geologic storage of carbon dioxide (*see FAQs in the packet*).
 - The survey was successfully completed accessing only lands where permission was granted—including limited access to county road ditches.
 - The geophysical data were processed and evaluated. The results were reported to landowners individually (*see Geophysical Survey Results in the packet*).
 - The survey and data collection were a success!
 - The survey company Breckenridge submitted the completion report to the North Dakota Industrial Commission. The company's surety bond with the state will stay in place for several more years.
 - RTE worked with landowners and the state inspector to complete reclamation work for damages to private gravel roadways and cropland related to the geophysical exploration survey. The state inspector has since been to the site to check how crops are growing and has commented that he did not observe any negative impact to crop growth in the areas where the trucks drove for the survey.
 - The data from the survey helped evaluate the rock layers more than a mile below the surface around the RTE facility. We learned that:
 - Two layers might serve as permanent CO₂ storage zones: the Inyan Kara at just under a mile deep, and the Broom Creek at 6400 ft deep—our original target layer.
 - Both layers are sealed by more than 1000 ft of cap rock, through which gases and liquid do not flow.
 - About 3000 ft of impermeable sealing rock isolates these saltwater layers from the deepest drinking water aquifer.

Red Trail Energy Carbon Capture and Storage Project: Phase III Talking Points
December 18, 2019 Richardton City Commission Meeting

Red Trail Energy:

- Looking for ways to ensure the sustainability of the company and the market for its ethanol into the future (*see fact sheet in the packet*).
- Working with the Energy & Environmental Research Center (EERC) at the University of North Dakota to determine whether carbon capture and storage at the Richardton facility would be safe and economically feasible.
- Completed the geophysical survey
 - The survey and data collection were a success! (*see Geophysical Survey Results in the packet*)

The next step in determining whether the potential storage zones are suited for permanent CO₂ storage is to drill a test well to collect rock samples (cores), pressure information, and other data.

- RTE finalized the test hole location on RTE property and plans to drill through the Broom Creek Formation, 1.3 miles deep.
- Richardton City Planner was notified of the location by RTE via Special Use Permit Application, submitted on Nov 21, 2019.
- We submitted a permit application to drill to the NDIC, Department of Mineral Resources Division of Oil & Gas on Nov 25.
- NDIC DMR approved our test hole application by awarding a permit on Monday, Dec. 02, 2019.
- We have started building the well pad and anticipate drilling the test hole in late winter or early spring, pending drilling tools and rig availability.
- We will keep you informed as the effort progresses.
- We invited the community to an open house last Wednesday, December 11, at the American Legion, in Richardton to provide details to the community. Gerald Bachmeier, RTE's CEO, spoke about the project. The EERC geophysicist Amanda Livers shared the results of the geophysical survey. The open house was well attended with about 30 community members participating. We appreciated the interest and opportunity to engage with the community.

The groundwater- and soil gas-sampling activities (*in the packet*) wrapped up for the year.

- Healthy soil and groundwater are vital. Ensuring that the environment is not negatively impacted by this project is a top priority for Red Trail Energy.

- Three 2-day sampling events were completed in May, August, and November 2019.
- Groundwater samples were drawn from existing wells with landowner permission. Three wells were sampled, all from the well spigot.
- Soil gas samples were collected from about 3.5 feet below the surface using a temporary probe and battery-operated pump. A pickup-mounted generator and rotary hammer drive the probe into the ground. Weather permitting, we collected soil gas at 11 locations accessed with landowner permission and near existing roads and field crossings. Six are on RTE property.
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- We contacted landowners to obtain permission for sampling access permissions (April 2019) and let them know ahead of each sampling event.
- We will continue to provide periodic updates to you and city officials as the project progresses.
- Periodic updates will also be available through the EERC's Web page, social media, and print media (May–December 2019).

For more information, contact me (see my card in the packet).

For Reference:

Items in the packets:

- *RTE fact sheet*
- *Geophysical Survey Results*
- Sampling FAQs

- Open house *invitation*
- Dustin's card

Details of the geophysical survey:

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 - The survey company Breckenridge submitted the completion report to the North Dakota Industrial Commission. The company's surety bond with the state will stay in place for several more years.
 - RTE worked with landowners and the state inspector to complete reclamation work for damages to private gravel roadways and cropland related to the geophysical exploration survey. The state inspector has since been to the site to check how crops are growing and has commented that he did not observe any negative impact to crop growth in the areas where the trucks drove for the survey.
 - The data from the survey helped evaluate the rock layers more than a mile below the surface around the RTE facility. We learned that:
 - Two layers might serve as permanent CO₂ storage zones: the Inyan Kara at just under a mile deep, and the Broom Creek at 6400 ft deep—our original target layer.
 - Both layers are sealed by more than 1000 ft of cap rock, through which gases and liquid do not flow.
 - About 3000 ft of impermeable sealing rock isolates these saltwater layers from the deepest drinking water aquifer.

GEOPHYSICAL SURVEY DOCUMENTS

Landowner in the Geophysical Survey Area Notification Packet
Nearby Landowner Notification for the Geophysical Survey Packet
Geophysical Survey Sample Q&A for Landowner Contact February 2019
Public Notice RTE Project Field Work Begins February 26, 2019
RTE CCS Project Continues Field Work Through 2019 (news release)
Results of Geophysical Survey – March 2019: landowner survey results with cover letter
March 2019 RTE Geophysical Survey Results Talking Points – August 14, 2019



RED TRAIL ENERGY, LLC

“Our Farms, Our Fuel, Our Future”

PO Box 11 Richardton, ND 58652 (701)-974-3308 FAX (701)-974-3309

February 22, 2019

STARK COUNTY HIGHWAY DEPT
PO BOX 130
DICKINSON, ND 58602-0130

Dear STARK COUNTY HIGHWAY DEPT:

Subject: Notice of Upcoming Geophysical Survey – Acknowledgment

Please read through all of the information provided in this packet, sign this letter where indicated on page 2 to confirm acknowledgment of this notification, scan, and return the letter via email to dustin@redtrailenergy.com. A field crew contracted by Red Trail Energy, LLC (“RTE”) will be conducting a geophysical survey near Richardton, North Dakota, between late February and April. Based on a review of Stark County, RTE has identified you as the owner(s) of the following property:

–SEE ATTACHED PLAT MAP–

Section 38-08.1-04.1 of the North Dakota Century Code (“N.D.C.C.”) requires that all landowners within 1/2 mile of the proposed geophysical survey boundary be provided notice at least 7 days before the commencement of any geophysical exploration activity. This letter is to notify you, as the landowner or operator of the land, that a geophysical survey is being conducted under permit from the North Dakota Industrial Commission with the knowledge of the Stark County Commissioners and government officials in Richardton. The geophysical survey is intended to provide scientific data for the RTE CCS (carbon capture and storage) project. As required by N.D.C.C. Section 38-08.1-04.1(4), I have enclosed the following:

- A copy of N.D.C.C Section 38-08.1-04.1 (Exploration Permit); and
- A copy of N.D.C.C. Chapter 38-11.1 (Oil and Gas Production Damage Compensation).

I have also enclosed two additional items that provide more information about the geophysical survey that will be taking place in the area of your property and why it is important to us and the community:

- A Geophysical Survey FAQ (frequently asked questions) for this activity; and
- An RTE CCS project fact sheet.

Before acquiring the geophysical survey, RTE personnel will contact you to coordinate around any sensitive areas and/or activities on your property, then an RTE-contracted field crew will be accessing your land over a 2–3-week period during the time span from late February to April for the purpose of conducting the following research activities:

- Locating infrastructure such as underground pipelines and drinking water wells;
- Marking source and receiver points with a stake or flag;
- Deploying and retrieving equipment, including sensors, battery packs, and Wi-Fi transmitters; and
- Acquiring a 3-D geophysical survey using vibroseis trucks.

Should you have any questions or concerns, please contact me, by phone at (701) 974-3308 or by e-mail at dustin@redtrailenergy.com. We welcome the opportunity to discuss the geophysical survey with you further and appreciate your kind consideration.

Sincerely,

Dustin Willett
Chief Operating Officer

Acknowledgment of Notification by:

Landowner Print Name Date

Landowner Print Name Date

Landowner Signature

Landowner Signature

Phone Number

Phone Number

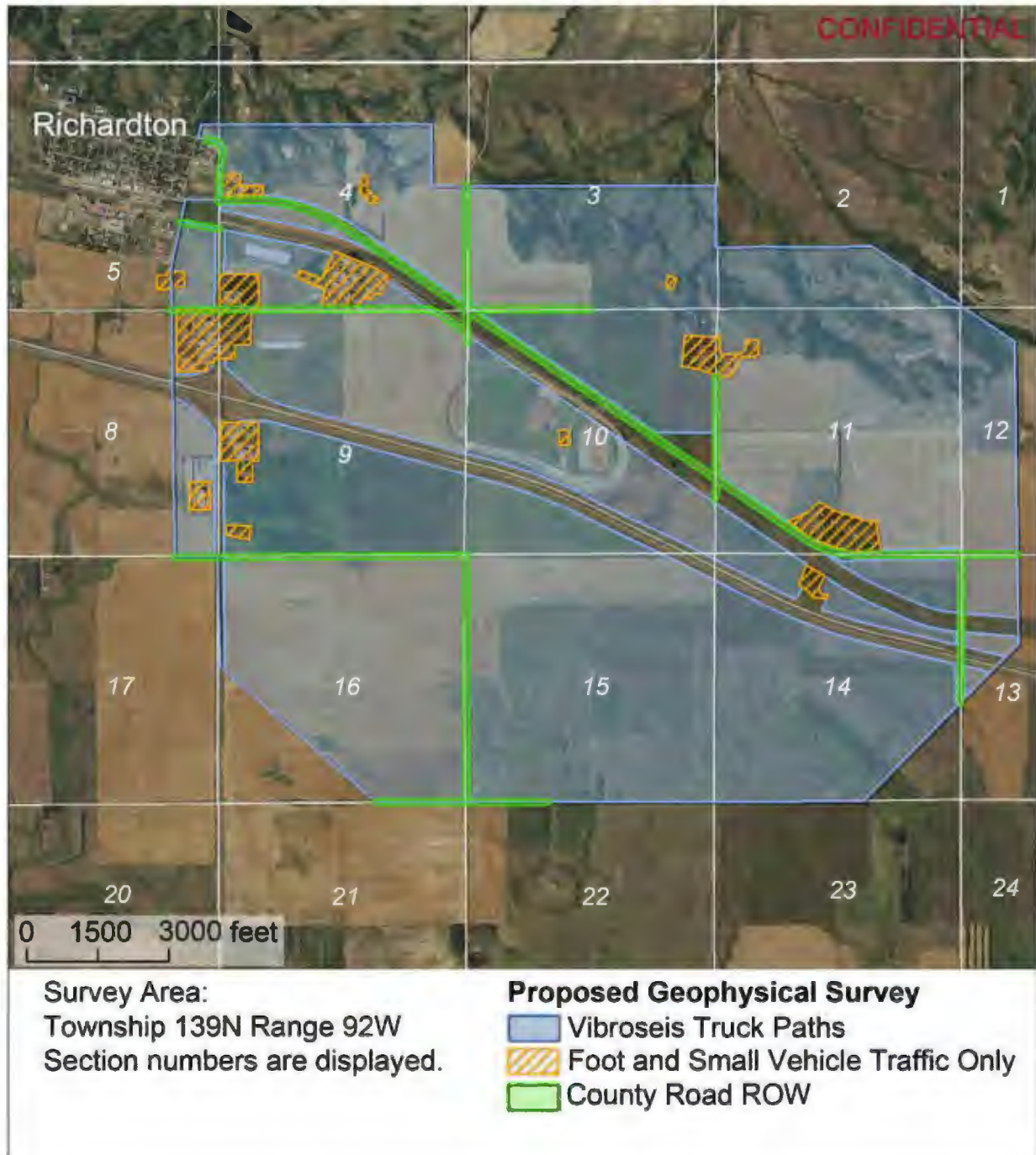
DW
Enclosures

RED TRAIL ENERGY CCS PROJECT

GEOPHYSICAL SURVEY NEAR RICHARDTON, NORTH DAKOTA

INTEGRATED CARBON CAPTURE AND STORAGE FOR NORTH DAKOTA ETHANOL PRODUCTION

Plat map for STARK COUNTY ROAD DEPARTMENT and proposed survey



February 22, 2019

CHAPTER 38-08.1

GEOPHYSICAL EXPLORATION REQUIREMENTS

38-08.1-01. Definitions.

As used in this chapter, unless the context requires otherwise:

1. "Commission" means the industrial commission.
2. "Geophysical exploration" means any method of obtaining petroleum-related geophysical surveys.
3. "Operator of the land" means the surface owner or the surface owner's tenant of the land upon or within one-half mile [.80 kilometer] of the land on which geophysical operations are to be conducted.
4. "Permitting agent" means a person who secures a permit from an operator of the land to conduct geophysical exploration activities.
5. "Person" means and includes any natural person, corporation, limited liability company, association, partnership, receiver, trustee, executor, administrator, guardian, fiduciary, or other representative of any kind, and includes any department, agency, or instrumentality of the state or of any governmental subdivision thereof.

38-08.1-02. Enforcement by commission - Persons required to comply with chapter.

Notwithstanding any other provision of this chapter, the commission is the primary enforcement agency governing geophysical exploration in this state. Any person in this state engaged in geophysical exploration or engaged as a subcontractor of a person engaged in geophysical exploration shall comply with this chapter; provided, however, that compliance with this chapter by a crew or its employer constitutes compliance herewith by that person who has engaged the service of the crew, or its employer, as an independent contractor.

38-08.1-03. Deemed doing business within state - Resident agent.

A person must be deemed doing business within this state when engaged in geophysical exploration within the boundaries of this state, and shall, if not already qualified to do business within the state under chapter 10-19.1, 10-32.1, 45-10.2, 45-22, or 45-23 prior to such exploration, file with the secretary of state an authorization provided under the governing statute of the organization.

38-08.1-03.1. Surety bond - Certificate - Release.

1. A geophysical exploration contractor desiring to engage in geophysical exploration in this state shall file with the commission a good and sufficient surety bond in the amount of fifty thousand dollars if the contractor intends to conduct shot hole operations or in the amount of twenty-five thousand dollars if the contractor intends to use any other method of geophysical exploration. Each subcontractor engaged by the geophysical exploration contractor for the drilling or plugging of seismic shot holes must file with the commission a good and sufficient surety bond in the amount of ten thousand dollars. The bond must be in a form prescribed by the commission and must indemnify all owners of property within the state, including the state and its political subdivisions, against physical damages to property which may result from geophysical exploration and the plugging of drill holes. The bond must cover all geophysical exploration and plugging operations conducted within one year of the date the bond is issued and must be automatically renewed unless the commission and the person covered by the bond receive notice sixty days before any anniversary date of the surety's intent not to renew the bond. If the surety does not renew the geophysical exploration contractor's bond, the surety's liability under the bond ceases six years from the date that geophysical exploration or reclamation covered by the bond was last conducted in the state. If the surety does not renew the drilling or plugging bond, the surety's liability under the bond ceases two years from the date the drilling and plugging covered by the bond was last conducted in this state. A person required to

- post a bond under this subsection may post cash or a certificate of deposit in lieu of the bond under rules adopted by the commission.
2. The aggregate liability of the surety on the bond may in no event exceed the amount of the bond.
 3. Upon filing the bond required by this section and presenting a certificate of authority to transact business in this state issued under section 10-19.1-136, a certificate of incorporation issued under chapter 10-19.1, or some other certificate issued by the secretary of state showing the name of the person designated as resident agent for service of process, the commission shall issue to the person desiring to engage in geophysical exploration or plugging operations or any subcontractor of that person a certificate showing that the bond has been filed and showing the name and address of the surety company and the name of the person designated resident agent for service of process.
 4. The proceeds of a surety bond become the property of the commission or the cash or certificate of deposit posted in lieu of a surety bond may not be returned to that person if the principal or person posting the bond, cash, or certificate of deposit fails to comply with this chapter and rules adopted by the commission under this chapter. This must be determined by the commission after notice and hearing in accordance with rules adopted by the commission. Notice of the hearing must be given to the principal and surety on the bond or to the person posting the cash or certificate of deposit by mailing a copy of the notice of hearing and a copy of a complaint, stating the grounds for forfeiture to them, filed by the commission. This must be done by certified mail, return receipt requested, and addressed to their last-known address listed with the commission. If the principal or surety or person posting the cash or certificate of deposit has a defense to, or otherwise wishes to contest the complaint of the commission, that person must file a written statement or answer setting forth the defense with the commission at least three business days before the commission hearing. Any defense or reason for contesting the complaint is waived if that person fails to do so. The commission may treat the failure to file a defense or reason to contest the complaint or the failure to appear at the hearing as default by the party. If the commission determines the principal on the bond or the person posting the cash or certificate of deposit as security has complied with this chapter and rules adopted by the commission under this chapter, including the proper plugging of wells and seismic holes and reclamation of the surrounding affected area, with respect to all operations secured by the bond, the commission shall release the obligation of the bond or return the cash or certificate of deposit upon its next anniversary date.

38-08.1-04. Application for permit to engage in geophysical exploration.

Any person desiring to engage in geophysical exploration before actually engaging in the exploration shall file an application for a permit to engage in geophysical exploration with the commission. The application for a permit for geophysical exploration must include the following:

1. The name, address, and telephone number of the person intending to engage in geophysical exploration or plugging operations and the name and telephone number of any local representative who may be contacted by the commission concerning geophysical exploration activities.
2. The name, address, and telephone number of any subcontractors, including drilling and plugging subcontractors, to be employed by the person intending to conduct geophysical exploration or plugging operations.
3. The name and address of the resident agent for service of process of the person intending to engage in geophysical exploration.
4. The date upon which geophysical exploration is to begin.
5. The approximate number and depth of any drill holes and the specific location of any drill holes or a description of the property on which the geophysical exploration is to be conducted described by township, range, section, and quarter section.
6. A fee of up to one hundred dollars.

The person making application for a geophysical exploration permit shall file an amended application whenever there is any new information or a change in the information contained in the application on file with the commission.

38-08.1-04.1. Exploration permit.

1. Upon filing a complete application for permit to explore pursuant to section 38-08.1-04, the commission may issue to any person desiring to engage in geophysical exploration a "geophysical exploration permit". A person may not engage in geophysical exploration activities in this state without having first obtained a geophysical exploration permit from the commission.
2. The permit must show, at a minimum:
 - a. The name of the person.
 - b. The name and address of the resident agent for service of process.
 - c. That an application to engage in geophysical exploration has been duly filed.
 - d. That a good and sufficient surety bond has been filed by the person, naming the surety company and giving its address.
3. The permit must be signed by the director of the commission's oil and gas division or the director's designee. The permit is valid for one year.
4. Within seven days of initial contact between the permitting agent and the operator of the land, the permitting agent shall provide the operator of the land and each landowner owning land within one-half mile [.80 kilometer] of the land on which geophysical exploration activities are to be conducted a written copy of section 38-08.1-04.1 and chapter 38-11.1.
5. The permitting agent shall notify the operator of the land at least seven days before the commencement of any geophysical exploration activity, unless waived by mutual agreement of both parties. The notice must include the approximate time schedule and the location of the planned activity.
6. The permit or a photostatic copy thereof must be carried at all times by a member of the crew during the period of geophysical exploration and must be exhibited upon demand of the landowner or tenant operator or county or state official.
7. The permit holder shall notify the county auditor or the auditor's designee at least twenty-four hours, excluding Saturdays and holidays, before the permit holder commences geophysical exploration in the county. Notice must include the approximate time schedule and location of the planned activity.

38-08.1-04.2. Notification of issuance of permit - Revocation - Suspension.

The commission shall immediately forward notice of the issuance of a permit to the board of county commissioners of the county in which the lands are located. The commission may revoke the permit of any person engaging in geophysical exploration upon a showing that that person has violated any applicable requirement pertaining to geophysical exploration. The commission shall notify that person, by the most effective written means, of the permit revocation. Upon notification, the person engaging in geophysical exploration may, within fifteen days, request a hearing before the commission on the matter. The commission shall either affirm, modify, or deny the permit revocation. The commission may also suspend the permit temporarily in those cases where climate and physical conditions are such as to cause harm, damage, or undue stress to roads, bridges, pastures, crops, or other physical features. For these same reasons, a board of county commissioners, upon notice to the permit holder and the commission, also may suspend, for not longer than forty-eight hours, a permit for operations within the county.

38-08.1-05. Duty to file record showing where work performed.

Within thirty days following any calendar month in which geophysical exploration is begun by any person within this state, such person shall file with the commission and shall send to the owner or occupier of any land upon which work is begun, a record showing the township, range, section, and quarter section in the county in which such work was performed and the date upon

which such work was commenced. The notice also must include the actual shot point location and the amount of explosive charge, if any, in each drill hole.

38-08.1-06. Duty to plug drill holes.

1. Drill holes must be plugged and abandoned as required by this section.
2. The seismic company responsible for the plugging and abandonment of seismic shot holes shall notify the commission in writing that it intends to plug and abandon the drill hole. The required notice must be received by the commission at least twenty-four hours before the time plugging activities are scheduled to begin. The notice must include the date and time the activities are expected to commence, the location by section, township, and range of the holes to be plugged, and the name and telephone number of the person in charge of the plugging operations. A copy of the notice must be sent to the landowner or lessee at the same time it is sent to the commission. The seismic company shall notify the commission in writing upon completion of the plugging operation.
3. All seismic shot holes must be plugged as soon after being used as reasonably is practicable; however, they may not remain unplugged for a period of more than thirty days unless, upon application, the commission grants an extension which may not exceed ninety days. All seismic shot holes must be temporarily capped during the period between drilling and final plugging.
4. The plug must have permanently affixed to it a durable nonrusting metal or plastic tag or plate imprinted with the name of the operator responsible for the plugging of the hole and the operator's permit number.
5. The surface around each seismic shot hole must be restored to its original condition insofar as restoration is practicable and all stakes, markers, cables, ropes, wires, primacord, cement or mud stacks, and any other debris or material not native to the area must be removed from the drill site and lawfully disposed of.

38-08.1-06.1. Plugging requirements - Rules - Liability for damage.

All seismic holes must be plugged in accordance with rules adopted by the commission. The commission shall review and revise its rules governing plugging requirements as technology in the field evolves. The seismic company is liable for all damages resulting from failure to comply with rules adopted by the commission pursuant to this section.

38-08.1-07. Civil and criminal penalties.

1. A person who violates any provision of this chapter or commission rule or order is subject to a civil penalty imposed by the commission not to exceed one thousand dollars for each offense, and each day's violation is a separate offense. A penalty imposed under this section, if not paid, may be recovered by the commission in the district court of the county in which the defendant resides, or in which any defendant resides if there is more than one defendant, or in the district court of any county in which the violation occurred. Payment of the penalty does not legalize the activity for which the penalty was imposed, or relieve the person upon whom the penalty was imposed from liability to any other person for damage caused by the violation.
2. Notwithstanding this section, a person who willfully violates any provision of this chapter or a commission rule or order is guilty of a class C felony.

38-08.1-08. Commission to adopt rules.

The commission may adopt and enforce rules to implement this chapter.

CHAPTER 38-11.1

OIL AND GAS PRODUCTION DAMAGE COMPENSATION

38-11.1-01. Legislative findings.

The legislative assembly finds the following:

1. It is necessary to exercise the police power of the state to protect the public welfare of North Dakota which is largely dependent on agriculture and to protect the economic well-being of individuals engaged in agricultural production.
2. Exploration for and development of oil and gas reserves in this state interferes with the use, agricultural or otherwise, of the surface of certain land.
3. Owners of the surface estate and other persons should be justly compensated for injury to their persons or property and interference with the use of their property occasioned by oil and gas development.

38-11.1-02. Purpose and interpretation.

It is the purpose of this chapter to provide the maximum amount of constitutionally permissible protection to surface owners and other persons from the undesirable effects of development of minerals. This chapter is to be interpreted in light of the legislative intent expressed herein. Sections 38-11.1-04 and 38-11.1-04.1 must be interpreted to benefit surface owners, regardless of whether the mineral estate was separated from the surface estate and regardless of who executed the document which gave the mineral developer the right to conduct drilling operations on the land. Sections 38-11.1-06 through 38-11.1-10 must be interpreted to benefit all persons.

38-11.1-03. Definitions.

In this chapter, unless the context or subject matter otherwise requires:

1. "Agricultural production" means the production of any growing grass or crop attached to the surface of the land, whether or not the grass or crop is to be sold commercially, and the production of any farm animals, including farmed elk, whether or not the animals are to be sold commercially.
2. "Drilling operations" means the drilling of an oil and gas well and the production and completion operations ensuing from the drilling which require entry upon the surface estate and which were commenced after June 30, 1979, and oil and gas geophysical and seismograph exploration activities commenced after June 30, 1983.
3. "Mineral developer" means the person who acquires the mineral estate or lease for the purpose of extracting or using the minerals for nonagricultural purposes.
4. "Mineral estate" means an estate in or ownership of all or part of the minerals underlying a specified tract of land.
5. "Minerals" means oil and gas.
6. "Surface estate" means an estate in or ownership of the surface of a particular tract of land.
7. "Surface owner" means any person who holds record title to the surface of the land as an owner.

38-11.1-03.1. Inspection of well site.

Upon request of the surface owner or adjacent landowner, the state department of health shall inspect and monitor the well site on the surface owner's land for the presence of hydrogen sulfide. If the presence of hydrogen sulfide is indicated, the state department of health shall issue appropriate orders under chapter 23-25 to protect the health and safety of the surface owner's health, welfare, and property.

(Contingent effective date - See note) Inspection of well site. Upon request of the surface owner or adjacent landowner, the department of environmental quality shall inspect and monitor the well site on the surface owner's land for the presence of hydrogen sulfide. If the presence of hydrogen sulfide is indicated, the department of environmental quality shall issue

appropriate orders under chapter 23.1-06 to protect the health and safety of the surface owner's health, welfare, and property.

38-11.1-04. Damage and disruption payments.

The mineral developer shall pay the surface owner a sum of money equal to the amount of damages sustained by the surface owner and the surface owner's tenant, if any, for lost land value, lost use of and access to the surface owner's land, and lost value of improvements caused by drilling operations. The amount of damages may be determined by any formula mutually agreeable between the surface owner and the mineral developer. When determining damage and disruption payments, consideration must be given to the period of time during which the loss occurs and the surface owner must be compensated for harm caused by exploration only by a single sum payment. The payments contemplated by this section only cover land directly affected by drilling operations. Payments under this section are intended to compensate the surface owner for damage and disruption; any reservation or assignment of such compensation apart from the surface estate except to a tenant of the surface estate is prohibited. In the absence of an agreement between the surface owner and a tenant as to the division of compensation payable under this section, the tenant is entitled to recover from the surface owner that portion of the compensation attributable to the tenant's share of the damages sustained.

38-11.1-04.1. Notice of operations.

1. Before the initial entry upon the land for activities that do not disturb the surface, including inspections, staking, surveys, measurements, and general evaluation of proposed routes and sites for oil and gas drilling operations, the mineral developer shall provide at least seven days' notice by registered mail or hand delivery to the surface owner unless waived by mutual agreement of both parties. The notice must include:
 - a. The name, address, telephone number, and, if available, the electronic mail address of the mineral developer or the mineral developer's designee;
 - b. An offer to discuss and agree to consider accommodating any proposed changes to the proposed plan of work and oil and gas operations before commencement of oil and gas operations; and
 - c. A sketch of the approximate location of the proposed drilling site.
2. Except for exploration activities governed by chapter 38-08.1, the mineral developer shall give the surface owner written notice by registered mail or hand delivery of the oil and gas drilling operations contemplated at least twenty days before commencement of drilling operations unless mutually waived by agreement of both parties. If the mineral developer plans to commence drilling operations within twenty days of the termination date of the mineral lease, the required notice under this section may be given at any time before commencement of drilling operations. The notice must include:
 - a. Sufficient disclosure of the plan of work and operations to enable the surface owner to evaluate the effect of drilling operations on the surface owner's use of the property;
 - b. A plat map showing the location of the proposed well; and
 - c. A form prepared by the director of the oil and gas division advising the surface owner of the surface owner's rights and options under this chapter, including the right to request the state department of health to inspect and monitor the well site for the presence of hydrogen sulfide.
3. The notice required by this section must be given to the surface owner at the address shown by the records of the county treasurer's office at the time the notice is given and is deemed to have been received seven days after mailing by registered mail or immediately upon hand delivery.
4. If a mineral developer fails to give notice as provided in this section, the surface owner may seek appropriate relief in the court of proper jurisdiction and may receive punitive as well as actual damages.

(Contingent effective date - See note) Notice of operations.

1. Before the initial entry upon the land for activities that do not disturb the surface, including inspections, staking, surveys, measurements, and general evaluation of proposed routes and sites for oil and gas drilling operations, the mineral developer shall provide at least seven days' notice by registered mail or hand delivery to the surface owner unless waived by mutual agreement of both parties. The notice must include:
 - a. The name, address, telephone number, and, if available, the electronic mail address of the mineral developer or the mineral developer's designee;
 - b. An offer to discuss and agree to consider accommodating any proposed changes to the proposed plan of work and oil and gas operations before commencement of oil and gas operations; and
 - c. A sketch of the approximate location of the proposed drilling site.
2. Except for exploration activities governed by chapter 38-08.1, the mineral developer shall give the surface owner written notice by registered mail or hand delivery of the oil and gas drilling operations contemplated at least twenty days before commencement of drilling operations unless mutually waived by agreement of both parties. If the mineral developer plans to commence drilling operations within twenty days of the termination date of the mineral lease, the required notice under this section may be given at any time before commencement of drilling operations. The notice must include:
 - a. Sufficient disclosure of the plan of work and operations to enable the surface owner to evaluate the effect of drilling operations on the surface owner's use of the property;
 - b. A plat map showing the location of the proposed well; and
 - c. A form prepared by the director of the oil and gas division advising the surface owner of the surface owner's rights and options under this chapter, including the right to request the department of environmental quality to inspect and monitor the well site for the presence of hydrogen sulfide.
3. The notice required by this section must be given to the surface owner at the address shown by the records of the county treasurer's office at the time the notice is given and is deemed to have been received seven days after mailing by registered mail or immediately upon hand delivery.
4. If a mineral developer fails to give notice as provided in this section, the surface owner may seek appropriate relief in the court of proper jurisdiction and may receive punitive as well as actual damages.

38-11.1-05. Notice of drilling operations.

Repealed by S.L. 2011, ch. 265, § 7.

38-11.1-06. Protection of surface and ground water - Other responsibilities of mineral developer.

If the domestic, livestock, or irrigation water supply of any person who owns an interest in real property within one-half mile [804.67 meters] of where geophysical or seismograph activities are or have been conducted or within one mile [1.61 kilometers] of an oil or gas well site has been disrupted, or diminished in quality or quantity by the drilling operations and a certified water quality and quantity test has been performed by the person who owns an interest in real property within one year preceding the commencement of drilling operations, the person who owns an interest in real property is entitled to recover the cost of making such repairs, alterations, or construction that will ensure the delivery to the surface owner of that quality and quantity of water available to the surface owner prior to the commencement of drilling operations. Any person who owns an interest in real property who obtains all or a part of that person's water supply for domestic, agricultural, industrial, or other beneficial use from an underground source has a claim for relief against a mineral developer to recover damages for disruption or diminution in quality or quantity of that person's water supply proximately caused from drilling operations conducted by the mineral developer. Prima facie evidence of injury

under this section may be established by a showing that the mineral developer's drilling operations penetrated or disrupted an aquifer in such a manner as to cause a diminution in water quality or quantity within the distance limits imposed by this section. An action brought under this section when not otherwise specifically provided by law must be brought within six years of the time the action has accrued. For purposes of this section, the claim for relief is deemed to have accrued at the time it is discovered or might have been discovered in the exercise of reasonable diligence.

A tract of land is not bound to receive water contaminated by drilling operations on another tract of land, and the owner of a tract has a claim for relief against a mineral developer to recover the damages proximately resulting from natural drainage of waters contaminated by drilling operations.

The mineral developer is also responsible for all damages to person or property resulting from the lack of ordinary care by the mineral developer or resulting from a nuisance caused by drilling operations. This section does not create a cause of action if an appropriator of water can reasonably acquire the water under the changed conditions and if the changed conditions are a result of the legal appropriation of water by the mineral developer.

38-11.1-07. Notification of injury - Statute of limitations.

Any person, to receive compensation, under sections 38-11.1-08 and 38-11.1-09, shall notify the mineral developer of the damages sustained by the person within two years after the injury occurs or would become apparent to a reasonable person. Any claim for relief for compensation brought under this chapter must be commenced within the limitations period provided in section 28-01-16.

38-11.1-08. Agreement - Offer of settlement.

Unless both parties provide otherwise by written agreement, at the time the notice required by subsection 2 of section 38-11.1-04.1 is given, the mineral developer shall make a written offer of settlement to the person seeking compensation for damages when the notice required by subsection 2 of section 38-11.1-04.1 is given. The person seeking compensation may accept or reject any offer so made.

38-11.1-08.1. Loss of production payments.

The mineral developer shall pay the surface owner a sum of money equal to the amount of damages sustained by the surface owner and the surface owner's tenant, if any, for loss of agricultural production and income caused by oil and gas production and completion operations. The amount of damages may be determined by any formula mutually agreeable between the surface owner and the mineral developer. When determining damages for loss of production, consideration must be given to the period of time during which the loss occurs and the damages for loss of production must be paid annually unless the surface owner elects to receive a single lump sum payment. Payments under this section are intended to compensate the surface owner for loss of production. Any reservation or assignment of such compensation apart from the surface estate, except to a tenant of the surface estate, is prohibited. In the absence of an agreement between the surface owner and a tenant as to the division of compensation payable under this section, the tenant is entitled to recover from the surface owner that portion of the compensation attributable to the tenant's share of the damages sustained.

38-11.1-09. Rejection - Legal action - Fees and costs.

If the person seeking compensation rejects the offer of the mineral developer, that person may bring an action for compensation in the court of proper jurisdiction. If the amount of compensation awarded by the court is greater than that which had been offered by the mineral developer, the court shall award the person seeking compensation reasonable attorney's fees, any costs assessed by the court, and interest on the amount of the final compensation awarded by the court from the day drilling is commenced. The rate of interest awarded must be the prime rate charged by the Bank of North Dakota on the date of the judgment.

38-11.1-09.1. Mediation of disputes.

Within one year after a compensation offer made under section 38-11.1-08 is rejected, either the mineral developer or surface owner may involve the North Dakota mediation service or other civil mediator. Involvement of a mediator may comply with Rule 8.8 of the North Dakota Rules of Court for purposes of alternative dispute resolution compliance. The cost of the mediator must be mediated between the parties. If the parties are unable to reach an agreement regarding the cost of the mediator through mediation, each party shall pay an equal portion of the mediator's compensation. If the mediation is provided by the North Dakota mediation service, compensation of the mediator must be the actual cost of the mediator to the North Dakota mediation service.

38-11.1-09.2. Mediation service.

The North Dakota mediation service may mediate disputes related to easements for oil and gas-related pipelines and associated facilities.

38-11.1-10. Application of chapter.

The remedies provided by this chapter do not preclude any person from seeking other remedies allowed by law. This chapter does not apply to the operation, maintenance, or use of a motor vehicle upon the highways of this state as these terms are defined in section 39-01-01.

RED TRAIL ENERGY CCS PROJECT

ACTIVITY FAQs

INTEGRATED CARBON CAPTURE AND STORAGE FOR NORTH DAKOTA ETHANOL PRODUCTION

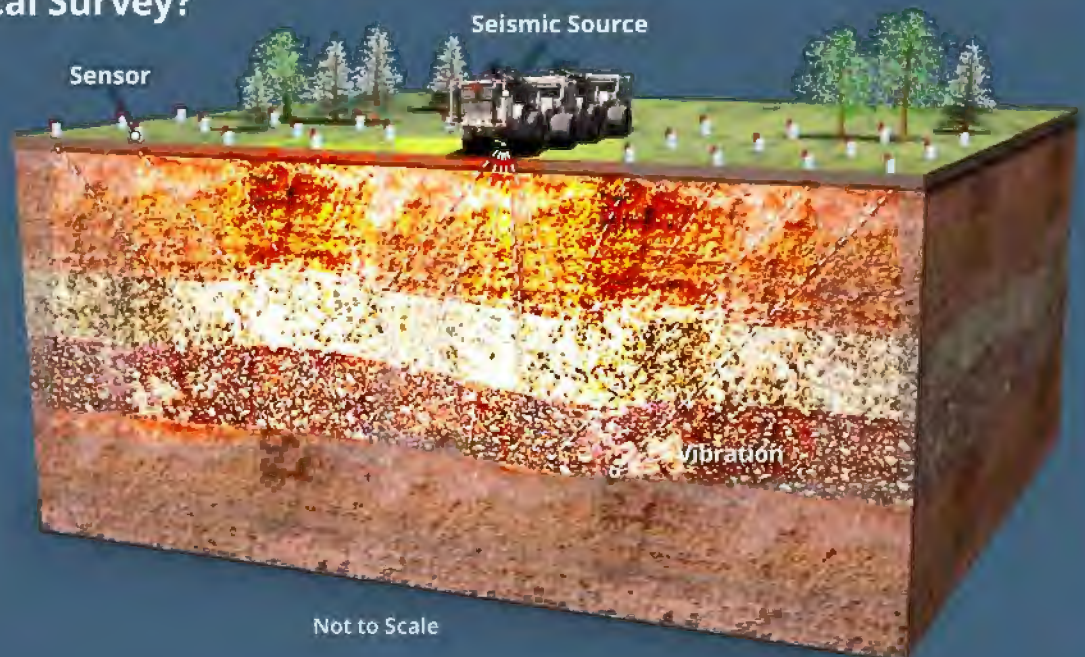
Geophysical Survey near Richardton, North Dakota

In late winter or early spring 2019, a field crew will conduct a geophysical survey near Richardton, North Dakota, to learn about rock layers in the deep subsurface. The data gathering is part of the Red Trail Energy Carbon Capture and Storage research effort, which is investigating the feasibility of developing 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 (EERC) 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 Is the Community Impact?

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

What Do Landowners on the Route Need to Know?

The goal is to complete the work before planting season begins. Red Trail Energy will contact landowners before the survey work to request permission to drive vehicles and place sensors on their land. The sensors will be pressed into the ground by hand by field crew walking and driving pickups or ATVs. Once installed, the sensors remain in place up to 2 weeks, as the vibroseis trucks travel through the survey area along lines spaced 660 feet apart, until the survey is finished. The testing area excludes the city and avoids buildings and other infrastructure such as drinking water wells, pipelines, and the interstate highway. Red Trail Energy will work with landowners to minimize inconveniences.

Where Will the Survey Be Conducted?

The proposed survey encompasses about 8 square miles of rural land around the Red Trail Energy facility east of Richardton.



How Will the Survey Be Carried Out?

The test involves a network of vibrational sensors and two source trucks (called vibroseis trucks). Sensors will be 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 will drive the large vibroseis trucks along lines spaced 660 feet apart. At 165-foot intervals along lines, the trucks will stop and vibrate the ground for 1–2 minutes. The trucks will 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.



Example of a sensor location showing the sensor, battery pack, and Wi-Fi transmitter at a similar geophysical survey in Montana.

What Are the Next Steps?

A community open house will introduce the project in spring 2019. Information on project progress and other potential field activities will be available on the EERC's Web site. A second open house showcasing results is planned for summer 2020. The final report will also be available to the public 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 at the University of North Dakota, with support from Red Trail Energy, 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.

For More Information Contact:

Kerryanne Leroux, Principal Engineer, Subsurface R&D, EERC, kleroux@undeerc.org 701-777-5013

Charles Gorecki, Director of Subsurface R&D, EERC, cgorecki@undeerc.org, 701-777-5355

Nicole Massmann, Director of Communications, EERC, nmassmann@undeerc.org, 701-777-5428

Dustin Willett, Chief Operating Officer, RTE, dustin@redtrailenergy.com, 701-974-3308

Learn more at <https://undeerc.org/RedTrailEnergy/>



RED TRAIL ENERGY

CCS PROJECT FACT SHEET

INTEGRATED CARBON CAPTURE AND STORAGE FOR NORTH DAKOTA ETHANOL PRODUCTION

Red Trail Energy CCS Project

Red Trail Energy, an ethanol plant in Richardton, North Dakota, is seeking to make its facility more sustainable by integrating carbon capture and storage, or CCS, to reduce carbon dioxide emissions from ethanol production. This reduction in CO₂ emissions will make Red Trail Energy's ethanol more valuable to states that have low-carbon fuel programs, such as California. Keeping CO₂ out of the atmosphere could also qualify for federal tax credits to offset some of the cost of integrating and operating CCS.



Building on Success

Since 2007, Red Trail Energy has been producing corn-based ethanol and distillers grains at its investor-owned plant in Richardton, North Dakota. The ethanol plant provides an alternative market to farmers in 32 counties in the region and creates tax revenue in eastern Stark County. Integration of CO₂ capture and geologic storage will position North Dakota as a national leader in developing reduced-carbon ethanol. The ability to command premium pricing and diversify product markets will help secure Red Trail Energy's future, providing stability in a volatile, commodity-driven market.



What Is Carbon Capture and Storage?

CCS is the practice of capturing CO₂ emissions from an industrial facility instead of releasing them to the atmosphere. Once captured, the CO₂ is transported to a site for injection and safe, permanent storage deep underground. Carbon dioxide injection is currently practiced in over 100 locations in the United States, typically for extending the life of older oil fields.

"Integrating carbon capture and storage ensures the long-term viability of Red Trail Energy."

Gerald Bachmeier, Red Trail Energy Chief Executive Officer

First of Its Kind

The integrated CCS project is a first of its kind in North Dakota. Incorporating CO₂ capture into the ethanol facility can be done with existing technology. The next step is what to do with the CO₂ once it has been captured. Captured CO₂ could be injected deep underground and permanently stored or potentially sold as a commodity to oilfield operators to increase production in aging wells. Red Trail Energy must ensure that the CO₂ is never emitted to the atmosphere in order to meet new CCS qualifications for low-carbon fuel and tax credit programs. North Dakota has well-suited geology for safe, permanent CO₂ storage; a regulatory framework to oversee all aspects of such projects; and authority from the federal government to do so.

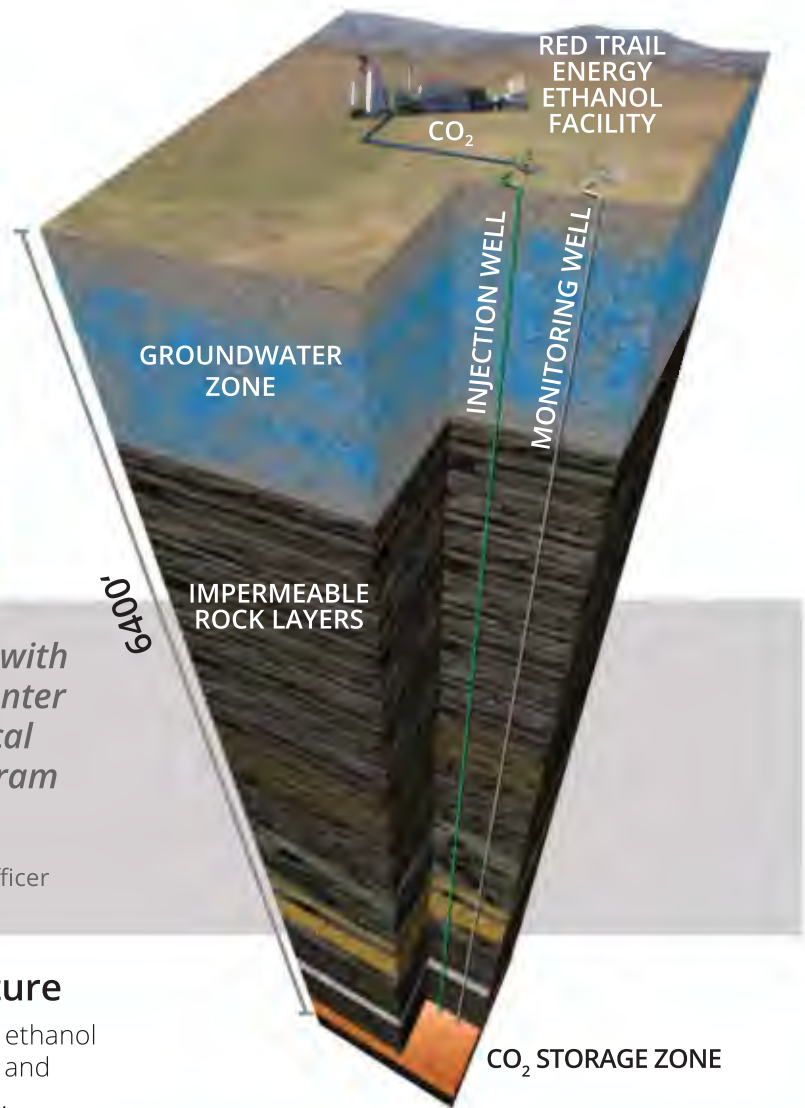


“We are very excited to continue working with the Energy & Environmental Research Center (EERC) to investigate CCS as an economical option for meeting low-carbon fuel program markets in other states.”

Gerald Bachmeier, Red Trail Energy Chief Executive Officer

Collaboration with Experts

Geologic CO₂ storage requires a deep porous layer to hold CO₂ and overlying impermeable rock layers as seals to keep the CO₂ in place. Red Trail Energy is collaborating with the EERC at the University of North Dakota, a global leader in CCS research. The EERC's proven approach features monitoring, characterization, modeling, and simulations to ensure the safety of injecting CO₂ into a suitable geologic container more than a mile deep.



Multiphase Path to a Commercial Venture

Investigation of CCS integration with the Red Trail Energy ethanol plant has been ongoing since 2016. Preliminary technical and economic feasibility has been successfully demonstrated. Current activities are focused on facility design, geologic characterization, and public outreach.

For More Information, Contact:

Dustin Willett
Chief Operating Officer
701.974.3308
dustin@redtrailenergy.com

Red Trail Energy LLC
Richardton, ND 58652
redtrailenergyllc.com

PROJECT PARTNERS



U.S. DEPARTMENT OF
ENERGY





RED TRAIL ENERGY, LLC

“Our Farms, Our Fuel, Our Future”

PO Box 11 Richardton, ND 58652 (701)-974-3308 FAX (701)-974-3309

February 22, 2019

<NAME>
<ADDRESS>
<CITY, STATE ZIP>

NOTICE OF GEOPHYSICAL EXPLORATION ACTIVITIES

Dear <NAME>:

Please read through all of the information provided in this packet. Sign this letter where indicated on page 2 to confirm acknowledgment of this notification, and return it via e-mail to dustin@redtrailenergy.com.

This letter serves to notify you, as the landowner or operator of the land, that a field crew contracted by Red Trail Energy, LLC (“RTE”) will be conducting a geophysical survey near Richardton, North Dakota, starting February 26 and running through mid-March. The North Dakota Century Code (“N.D.C.C.”), Section 38-08.1-04.1 requires that all landowners within 1/2 mile of the proposed geophysical survey boundary be provided this notice at least 7 days before the commencement of any geophysical exploration activity. While your land is not located within the survey area, you have been identified as a landowner requiring such notice. Moreover, N.D.C.C. Section 38-08.1-04.1(4) requires RTE to enclose the following documents:

- A copy of N.D.C.C. Section 38-08.1-04.1 (Exploration Permit); and
- A copy of N.D.C.C. Chapter 38-11.1 (Oil and Gas Production Damage Compensation).

I have also enclosed three additional items that provide more information about the geophysical survey that will be taking place in the area of your property and why it is important to us and the community:

- A map of the survey;
- A Geophysical Survey FAQ (frequently asked questions) for this activity; and
- A RTE CCS (carbon capture and storage) project fact sheet.

The geophysical survey is being conducted under permit from the North Dakota Industrial Commission and with the knowledge of the Stark County Commissioners and government officials in Richardton. The geophysical survey is intended to provide scientific data for the RTE CCS Project. A public event will be held this spring to provide more information on the RTE CCS project—we hope you can attend.

We look forward to working with the residents of Stark County to enable the continued use of North Dakota’s resources in a safe, efficient, and environmentally responsible manner. Should you

have any immediate questions or concerns, please contact me by phone at (701) 974-3308 or by e-mail at dustin@redtrailenergy.com.

Sincerely,

Dustin Willett
Chief Operating Officer

Acknowledgment of Notification by:

Landowner Print Name Date

Landowner Print Name Date

Landowner Signature

Landowner Signature

Phone Number

Phone Number

DW
Enclosures

CHAPTER 38-08.1

GEOPHYSICAL EXPLORATION REQUIREMENTS

38-08.1-01. Definitions.

As used in this chapter, unless the context requires otherwise:

1. "Commission" means the industrial commission.
2. "Geophysical exploration" means any method of obtaining petroleum-related geophysical surveys.
3. "Operator of the land" means the surface owner or the surface owner's tenant of the land upon or within one-half mile [.80 kilometer] of the land on which geophysical operations are to be conducted.
4. "Permitting agent" means a person who secures a permit from an operator of the land to conduct geophysical exploration activities.
5. "Person" means and includes any natural person, corporation, limited liability company, association, partnership, receiver, trustee, executor, administrator, guardian, fiduciary, or other representative of any kind, and includes any department, agency, or instrumentality of the state or of any governmental subdivision thereof.

38-08.1-02. Enforcement by commission - Persons required to comply with chapter.

Notwithstanding any other provision of this chapter, the commission is the primary enforcement agency governing geophysical exploration in this state. Any person in this state engaged in geophysical exploration or engaged as a subcontractor of a person engaged in geophysical exploration shall comply with this chapter; provided, however, that compliance with this chapter by a crew or its employer constitutes compliance herewith by that person who has engaged the service of the crew, or its employer, as an independent contractor.

38-08.1-03. Deemed doing business within state - Resident agent.

A person must be deemed doing business within this state when engaged in geophysical exploration within the boundaries of this state, and shall, if not already qualified to do business within the state under chapter 10-19.1, 10-32.1, 45-10.2, 45-22, or 45-23 prior to such exploration, file with the secretary of state an authorization provided under the governing statute of the organization.

38-08.1-03.1. Surety bond - Certificate - Release.

1. A geophysical exploration contractor desiring to engage in geophysical exploration in this state shall file with the commission a good and sufficient surety bond in the amount of fifty thousand dollars if the contractor intends to conduct shot hole operations or in the amount of twenty-five thousand dollars if the contractor intends to use any other method of geophysical exploration. Each subcontractor engaged by the geophysical exploration contractor for the drilling or plugging of seismic shot holes must file with the commission a good and sufficient surety bond in the amount of ten thousand dollars. The bond must be in a form prescribed by the commission and must indemnify all owners of property within the state, including the state and its political subdivisions, against physical damages to property which may result from geophysical exploration and the plugging of drill holes. The bond must cover all geophysical exploration and plugging operations conducted within one year of the date the bond is issued and must be automatically renewed unless the commission and the person covered by the bond receive notice sixty days before any anniversary date of the surety's intent not to renew the bond. If the surety does not renew the geophysical exploration contractor's bond, the surety's liability under the bond ceases six years from the date that geophysical exploration or reclamation covered by the bond was last conducted in the state. If the surety does not renew the drilling or plugging bond, the surety's liability under the bond ceases two years from the date the drilling and plugging covered by the bond was last conducted in this state. A person required to

- post a bond under this subsection may post cash or a certificate of deposit in lieu of the bond under rules adopted by the commission.
2. The aggregate liability of the surety on the bond may in no event exceed the amount of the bond.
 3. Upon filing the bond required by this section and presenting a certificate of authority to transact business in this state issued under section 10-19.1-136, a certificate of incorporation issued under chapter 10-19.1, or some other certificate issued by the secretary of state showing the name of the person designated as resident agent for service of process, the commission shall issue to the person desiring to engage in geophysical exploration or plugging operations or any subcontractor of that person a certificate showing that the bond has been filed and showing the name and address of the surety company and the name of the person designated resident agent for service of process.
 4. The proceeds of a surety bond become the property of the commission or the cash or certificate of deposit posted in lieu of a surety bond may not be returned to that person if the principal or person posting the bond, cash, or certificate of deposit fails to comply with this chapter and rules adopted by the commission under this chapter. This must be determined by the commission after notice and hearing in accordance with rules adopted by the commission. Notice of the hearing must be given to the principal and surety on the bond or to the person posting the cash or certificate of deposit by mailing a copy of the notice of hearing and a copy of a complaint, stating the grounds for forfeiture to them, filed by the commission. This must be done by certified mail, return receipt requested, and addressed to their last-known address listed with the commission. If the principal or surety or person posting the cash or certificate of deposit has a defense to, or otherwise wishes to contest the complaint of the commission, that person must file a written statement or answer setting forth the defense with the commission at least three business days before the commission hearing. Any defense or reason for contesting the complaint is waived if that person fails to do so. The commission may treat the failure to file a defense or reason to contest the complaint or the failure to appear at the hearing as default by the party. If the commission determines the principal on the bond or the person posting the cash or certificate of deposit as security has complied with this chapter and rules adopted by the commission under this chapter, including the proper plugging of wells and seismic holes and reclamation of the surrounding affected area, with respect to all operations secured by the bond, the commission shall release the obligation of the bond or return the cash or certificate of deposit upon its next anniversary date.

38-08.1-04. Application for permit to engage in geophysical exploration.

Any person desiring to engage in geophysical exploration before actually engaging in the exploration shall file an application for a permit to engage in geophysical exploration with the commission. The application for a permit for geophysical exploration must include the following:

1. The name, address, and telephone number of the person intending to engage in geophysical exploration or plugging operations and the name and telephone number of any local representative who may be contacted by the commission concerning geophysical exploration activities.
2. The name, address, and telephone number of any subcontractors, including drilling and plugging subcontractors, to be employed by the person intending to conduct geophysical exploration or plugging operations.
3. The name and address of the resident agent for service of process of the person intending to engage in geophysical exploration.
4. The date upon which geophysical exploration is to begin.
5. The approximate number and depth of any drill holes and the specific location of any drill holes or a description of the property on which the geophysical exploration is to be conducted described by township, range, section, and quarter section.
6. A fee of up to one hundred dollars.

The person making application for a geophysical exploration permit shall file an amended application whenever there is any new information or a change in the information contained in the application on file with the commission.

38-08.1-04.1. Exploration permit.

1. Upon filing a complete application for permit to explore pursuant to section 38-08.1-04, the commission may issue to any person desiring to engage in geophysical exploration a "geophysical exploration permit". A person may not engage in geophysical exploration activities in this state without having first obtained a geophysical exploration permit from the commission.
2. The permit must show, at a minimum:
 - a. The name of the person.
 - b. The name and address of the resident agent for service of process.
 - c. That an application to engage in geophysical exploration has been duly filed.
 - d. That a good and sufficient surety bond has been filed by the person, naming the surety company and giving its address.
3. The permit must be signed by the director of the commission's oil and gas division or the director's designee. The permit is valid for one year.
4. Within seven days of initial contact between the permitting agent and the operator of the land, the permitting agent shall provide the operator of the land and each landowner owning land within one-half mile [.80 kilometer] of the land on which geophysical exploration activities are to be conducted a written copy of section 38-08.1-04.1 and chapter 38-11.1.
5. The permitting agent shall notify the operator of the land at least seven days before the commencement of any geophysical exploration activity, unless waived by mutual agreement of both parties. The notice must include the approximate time schedule and the location of the planned activity.
6. The permit or a photostatic copy thereof must be carried at all times by a member of the crew during the period of geophysical exploration and must be exhibited upon demand of the landowner or tenant operator or county or state official.
7. The permitholder shall notify the county auditor or the auditor's designee at least twenty-four hours, excluding Saturdays and holidays, before the permitholder commences geophysical exploration in the county. Notice must include the approximate time schedule and location of the planned activity.

38-08.1-04.2. Notification of issuance of permit - Revocation - Suspension.

The commission shall immediately forward notice of the issuance of a permit to the board of county commissioners of the county in which the lands are located. The commission may revoke the permit of any person engaging in geophysical exploration upon a showing that that person has violated any applicable requirement pertaining to geophysical exploration. The commission shall notify that person, by the most effective written means, of the permit revocation. Upon notification, the person engaging in geophysical exploration may, within fifteen days, request a hearing before the commission on the matter. The commission shall either affirm, modify, or deny the permit revocation. The commission may also suspend the permit temporarily in those cases where climate and physical conditions are such as to cause harm, damage, or undue stress to roads, bridges, pastures, crops, or other physical features. For these same reasons, a board of county commissioners, upon notice to the permitholder and the commission, also may suspend, for not longer than forty-eight hours, a permit for operations within the county.

38-08.1-05. Duty to file record showing where work performed.

Within thirty days following any calendar month in which geophysical exploration is begun by any person within this state, such person shall file with the commission and shall send to the owner or occupier of any land upon which work is begun, a record showing the township, range, section, and quarter section in the county in which such work was performed and the date upon

which such work was commenced. The notice also must include the actual shot point location and the amount of explosive charge, if any, in each drill hole.

38-08.1-06. Duty to plug drill holes.

1. Drill holes must be plugged and abandoned as required by this section.
2. The seismic company responsible for the plugging and abandonment of seismic shot holes shall notify the commission in writing that it intends to plug and abandon the drill hole. The required notice must be received by the commission at least twenty-four hours before the time plugging activities are scheduled to begin. The notice must include the date and time the activities are expected to commence, the location by section, township, and range of the holes to be plugged, and the name and telephone number of the person in charge of the plugging operations. A copy of the notice must be sent to the landowner or lessee at the same time it is sent to the commission. The seismic company shall notify the commission in writing upon completion of the plugging operation.
3. All seismic shot holes must be plugged as soon after being used as reasonably is practicable; however, they may not remain unplugged for a period of more than thirty days unless, upon application, the commission grants an extension which may not exceed ninety days. All seismic shot holes must be temporarily capped during the period between drilling and final plugging.
4. The plug must have permanently affixed to it a durable nonrusting metal or plastic tag or plate imprinted with the name of the operator responsible for the plugging of the hole and the operator's permit number.
5. The surface around each seismic shot hole must be restored to its original condition insofar as restoration is practicable and all stakes, markers, cables, ropes, wires, primacord, cement or mud stacks, and any other debris or material not native to the area must be removed from the drill site and lawfully disposed of.

38-08.1-06.1. Plugging requirements - Rules - Liability for damage.

All seismic holes must be plugged in accordance with rules adopted by the commission. The commission shall review and revise its rules governing plugging requirements as technology in the field evolves. The seismic company is liable for all damages resulting from failure to comply with rules adopted by the commission pursuant to this section.

38-08.1-07. Civil and criminal penalties.

1. A person who violates any provision of this chapter or commission rule or order is subject to a civil penalty imposed by the commission not to exceed one thousand dollars for each offense, and each day's violation is a separate offense. A penalty imposed under this section, if not paid, may be recovered by the commission in the district court of the county in which the defendant resides, or in which any defendant resides if there is more than one defendant, or in the district court of any county in which the violation occurred. Payment of the penalty does not legalize the activity for which the penalty was imposed, or relieve the person upon whom the penalty was imposed from liability to any other person for damage caused by the violation.
2. Notwithstanding this section, a person who willfully violates any provision of this chapter or a commission rule or order is guilty of a class C felony.

38-08.1-08. Commission to adopt rules.

The commission may adopt and enforce rules to implement this chapter.

CHAPTER 38-11.1 OIL AND GAS PRODUCTION DAMAGE COMPENSATION

38-11.1-01. Legislative findings.

The legislative assembly finds the following:

1. It is necessary to exercise the police power of the state to protect the public welfare of North Dakota which is largely dependent on agriculture and to protect the economic well-being of individuals engaged in agricultural production.
2. Exploration for and development of oil and gas reserves in this state interferes with the use, agricultural or otherwise, of the surface of certain land.
3. Owners of the surface estate and other persons should be justly compensated for injury to their persons or property and interference with the use of their property occasioned by oil and gas development.

38-11.1-02. Purpose and interpretation.

It is the purpose of this chapter to provide the maximum amount of constitutionally permissible protection to surface owners and other persons from the undesirable effects of development of minerals. This chapter is to be interpreted in light of the legislative intent expressed herein. Sections 38-11.1-04 and 38-11.1-04.1 must be interpreted to benefit surface owners, regardless of whether the mineral estate was separated from the surface estate and regardless of who executed the document which gave the mineral developer the right to conduct drilling operations on the land. Sections 38-11.1-06 through 38-11.1-10 must be interpreted to benefit all persons.

38-11.1-03. Definitions.

In this chapter, unless the context or subject matter otherwise requires:

1. "Agricultural production" means the production of any growing grass or crop attached to the surface of the land, whether or not the grass or crop is to be sold commercially, and the production of any farm animals, including farmed elk, whether or not the animals are to be sold commercially.
2. "Drilling operations" means the drilling of an oil and gas well and the production and completion operations ensuing from the drilling which require entry upon the surface estate and which were commenced after June 30, 1979, and oil and gas geophysical and seismograph exploration activities commenced after June 30, 1983.
3. "Mineral developer" means the person who acquires the mineral estate or lease for the purpose of extracting or using the minerals for nonagricultural purposes.
4. "Mineral estate" means an estate in or ownership of all or part of the minerals underlying a specified tract of land.
5. "Minerals" means oil and gas.
6. "Surface estate" means an estate in or ownership of the surface of a particular tract of land.
7. "Surface owner" means any person who holds record title to the surface of the land as an owner.

38-11.1-03.1. Inspection of well site.

Upon request of the surface owner or adjacent landowner, the state department of health shall inspect and monitor the well site on the surface owner's land for the presence of hydrogen sulfide. If the presence of hydrogen sulfide is indicated, the state department of health shall issue appropriate orders under chapter 23-25 to protect the health and safety of the surface owner's health, welfare, and property.

(Contingent effective date - See note) Inspection of well site. Upon request of the surface owner or adjacent landowner, the department of environmental quality shall inspect and monitor the well site on the surface owner's land for the presence of hydrogen sulfide. If the presence of hydrogen sulfide is indicated, the department of environmental quality shall issue

appropriate orders under chapter 23.1-06 to protect the health and safety of the surface owner's health, welfare, and property.

38-11.1-04. Damage and disruption payments.

The mineral developer shall pay the surface owner a sum of money equal to the amount of damages sustained by the surface owner and the surface owner's tenant, if any, for lost land value, lost use of and access to the surface owner's land, and lost value of improvements caused by drilling operations. The amount of damages may be determined by any formula mutually agreeable between the surface owner and the mineral developer. When determining damage and disruption payments, consideration must be given to the period of time during which the loss occurs and the surface owner must be compensated for harm caused by exploration only by a single sum payment. The payments contemplated by this section only cover land directly affected by drilling operations. Payments under this section are intended to compensate the surface owner for damage and disruption; any reservation or assignment of such compensation apart from the surface estate except to a tenant of the surface estate is prohibited. In the absence of an agreement between the surface owner and a tenant as to the division of compensation payable under this section, the tenant is entitled to recover from the surface owner that portion of the compensation attributable to the tenant's share of the damages sustained.

38-11.1-04.1. Notice of operations.

1. Before the initial entry upon the land for activities that do not disturb the surface, including inspections, staking, surveys, measurements, and general evaluation of proposed routes and sites for oil and gas drilling operations, the mineral developer shall provide at least seven days' notice by registered mail or hand delivery to the surface owner unless waived by mutual agreement of both parties. The notice must include:
 - a. The name, address, telephone number, and, if available, the electronic mail address of the mineral developer or the mineral developer's designee;
 - b. An offer to discuss and agree to consider accommodating any proposed changes to the proposed plan of work and oil and gas operations before commencement of oil and gas operations; and
 - c. A sketch of the approximate location of the proposed drilling site.
2. Except for exploration activities governed by chapter 38-08.1, the mineral developer shall give the surface owner written notice by registered mail or hand delivery of the oil and gas drilling operations contemplated at least twenty days before commencement of drilling operations unless mutually waived by agreement of both parties. If the mineral developer plans to commence drilling operations within twenty days of the termination date of the mineral lease, the required notice under this section may be given at any time before commencement of drilling operations. The notice must include:
 - a. Sufficient disclosure of the plan of work and operations to enable the surface owner to evaluate the effect of drilling operations on the surface owner's use of the property;
 - b. A plat map showing the location of the proposed well; and
 - c. A form prepared by the director of the oil and gas division advising the surface owner of the surface owner's rights and options under this chapter, including the right to request the state department of health to inspect and monitor the well site for the presence of hydrogen sulfide.
3. The notice required by this section must be given to the surface owner at the address shown by the records of the county treasurer's office at the time the notice is given and is deemed to have been received seven days after mailing by registered mail or immediately upon hand delivery.
4. If a mineral developer fails to give notice as provided in this section, the surface owner may seek appropriate relief in the court of proper jurisdiction and may receive punitive as well as actual damages.

(Contingent effective date - See note) Notice of operations.

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 - c. A form prepared by the director of the oil and gas division advising the surface owner of the surface owner's rights and options under this chapter, including the right to request the department of environmental quality to inspect and monitor the well site for the presence of hydrogen sulfide.
3. The notice required by this section must be given to the surface owner at the address shown by the records of the county treasurer's office at the time the notice is given and is deemed to have been received seven days after mailing by registered mail or immediately upon hand delivery.
4. If a mineral developer fails to give notice as provided in this section, the surface owner may seek appropriate relief in the court of proper jurisdiction and may receive punitive as well as actual damages.

38-11.1-05. Notice of drilling operations.

Repealed by S.L. 2011, ch. 265, § 7.

38-11.1-06. Protection of surface and ground water - Other responsibilities of mineral developer.

If the domestic, livestock, or irrigation water supply of any person who owns an interest in real property within one-half mile [804.67 meters] of where geophysical or seismograph activities are or have been conducted or within one mile [1.61 kilometers] of an oil or gas well site has been disrupted, or diminished in quality or quantity by the drilling operations and a certified water quality and quantity test has been performed by the person who owns an interest in real property within one year preceding the commencement of drilling operations, the person who owns an interest in real property is entitled to recover the cost of making such repairs, alterations, or construction that will ensure the delivery to the surface owner of that quality and quantity of water available to the surface owner prior to the commencement of drilling operations. Any person who owns an interest in real property who obtains all or a part of that person's water supply for domestic, agricultural, industrial, or other beneficial use from an underground source has a claim for relief against a mineral developer to recover damages for disruption or diminution in quality or quantity of that person's water supply proximately caused from drilling operations conducted by the mineral developer. Prima facie evidence of injury

under this section may be established by a showing that the mineral developer's drilling operations penetrated or disrupted an aquifer in such a manner as to cause a diminution in water quality or quantity within the distance limits imposed by this section. An action brought under this section when not otherwise specifically provided by law must be brought within six years of the time the action has accrued. For purposes of this section, the claim for relief is deemed to have accrued at the time it is discovered or might have been discovered in the exercise of reasonable diligence.

A tract of land is not bound to receive water contaminated by drilling operations on another tract of land, and the owner of a tract has a claim for relief against a mineral developer to recover the damages proximately resulting from natural drainage of waters contaminated by drilling operations.

The mineral developer is also responsible for all damages to person or property resulting from the lack of ordinary care by the mineral developer or resulting from a nuisance caused by drilling operations. This section does not create a cause of action if an appropriator of water can reasonably acquire the water under the changed conditions and if the changed conditions are a result of the legal appropriation of water by the mineral developer.

38-11.1-07. Notification of injury - Statute of limitations.

Any person, to receive compensation, under sections 38-11.1-08 and 38-11.1-09, shall notify the mineral developer of the damages sustained by the person within two years after the injury occurs or would become apparent to a reasonable person. Any claim for relief for compensation brought under this chapter must be commenced within the limitations period provided in section 28-01-16.

38-11.1-08. Agreement - Offer of settlement.

Unless both parties provide otherwise by written agreement, at the time the notice required by subsection 2 of section 38-11.1-04.1 is given, the mineral developer shall make a written offer of settlement to the person seeking compensation for damages when the notice required by subsection 2 of section 38-11.1-04.1 is given. The person seeking compensation may accept or reject any offer so made.

38-11.1-08.1. Loss of production payments.

The mineral developer shall pay the surface owner a sum of money equal to the amount of damages sustained by the surface owner and the surface owner's tenant, if any, for loss of agricultural production and income caused by oil and gas production and completion operations. The amount of damages may be determined by any formula mutually agreeable between the surface owner and the mineral developer. When determining damages for loss of production, consideration must be given to the period of time during which the loss occurs and the damages for loss of production must be paid annually unless the surface owner elects to receive a single lump sum payment. Payments under this section are intended to compensate the surface owner for loss of production. Any reservation or assignment of such compensation apart from the surface estate, except to a tenant of the surface estate, is prohibited. In the absence of an agreement between the surface owner and a tenant as to the division of compensation payable under this section, the tenant is entitled to recover from the surface owner that portion of the compensation attributable to the tenant's share of the damages sustained.

38-11.1-09. Rejection - Legal action - Fees and costs.

If the person seeking compensation rejects the offer of the mineral developer, that person may bring an action for compensation in the court of proper jurisdiction. If the amount of compensation awarded by the court is greater than that which had been offered by the mineral developer, the court shall award the person seeking compensation reasonable attorney's fees, any costs assessed by the court, and interest on the amount of the final compensation awarded by the court from the day drilling is commenced. The rate of interest awarded must be the prime rate charged by the Bank of North Dakota on the date of the judgment.

38-11.1-09.1. Mediation of disputes.

Within one year after a compensation offer made under section 38-11.1-08 is rejected, either the mineral developer or surface owner may involve the North Dakota mediation service or other civil mediator. Involvement of a mediator may comply with Rule 8.8 of the North Dakota Rules of Court for purposes of alternative dispute resolution compliance. The cost of the mediator must be mediated between the parties. If the parties are unable to reach an agreement regarding the cost of the mediator through mediation, each party shall pay an equal portion of the mediator's compensation. If the mediation is provided by the North Dakota mediation service, compensation of the mediator must be the actual cost of the mediator to the North Dakota mediation service.

38-11.1-09.2. Mediation service.

The North Dakota mediation service may mediate disputes related to easements for oil and gas-related pipelines and associated facilities.

38-11.1-10. Application of chapter.

The remedies provided by this chapter do not preclude any person from seeking other remedies allowed by law. This chapter does not apply to the operation, maintenance, or use of a motor vehicle upon the highways of this state as these terms are defined in section 39-01-01.

RED TRAIL ENERGY CCS PROJECT

GEOPHYSICAL SURVEY NEAR RICHARDTON, NORTH DAKOTA

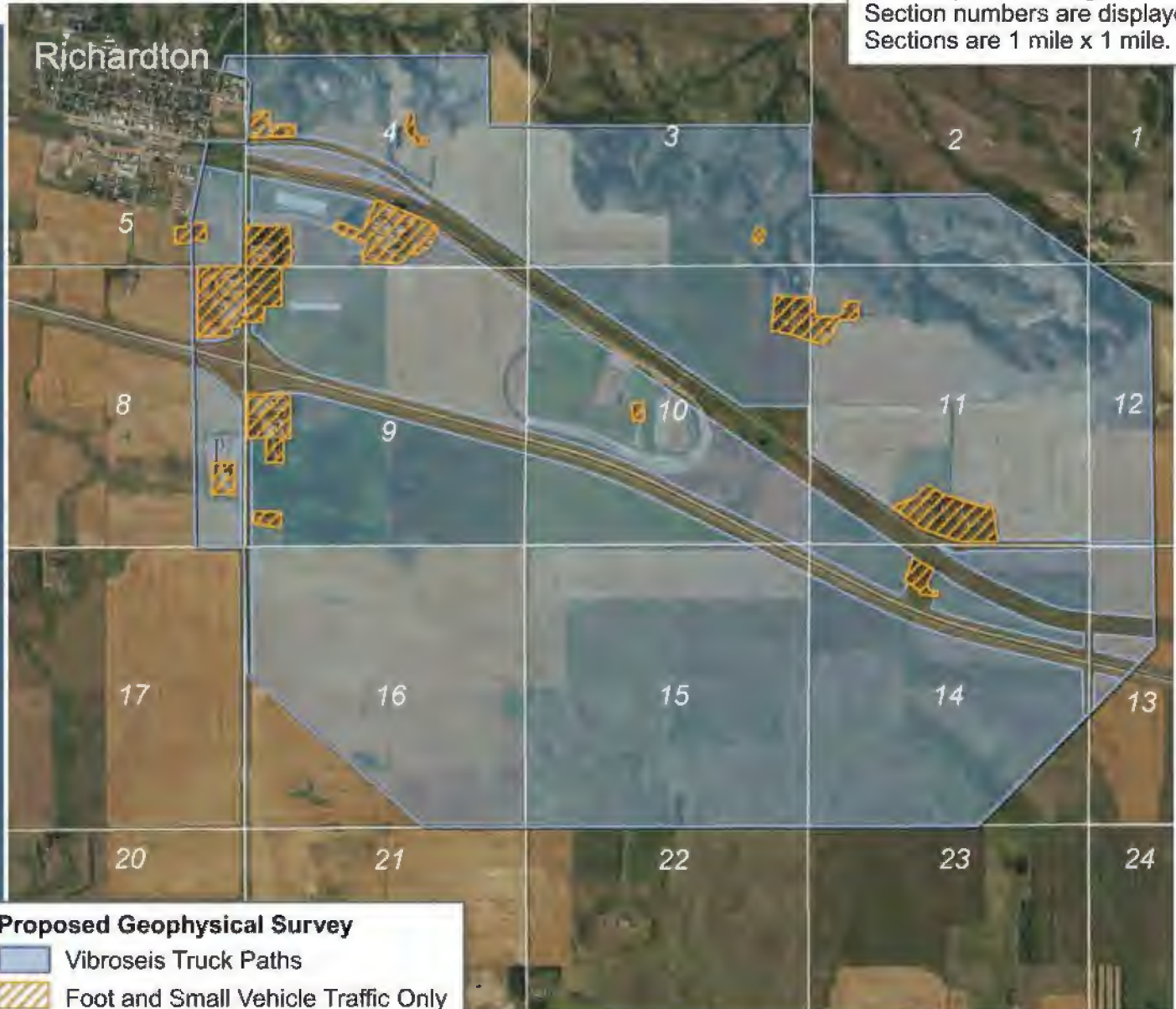
INTEGRATED CARBON CAPTURE AND STORAGE FOR NORTH DAKOTA ETHANOL PRODUCTION

Proposed Survey

Encompasses about 8 square miles around the Red Trail Energy Plant east of Richardton.

Survey Area

Township 139N Range 92W
Section numbers are displayed.
Sections are 1 mile x 1 mile.



Proposed Geophysical Survey

- Vibroseis Truck Paths
- Foot and Small Vehicle Traffic Only

For More Information Contact:

Kerryanne Leroux, Principal Engineer, Subsurface R&D, EERC, kleroux@undeerc.org, 701-777-5013

Charles Gorecki, Director of Subsurface R&D, EERC, cgorecki@undeerc.org, 701-777-5355

Nicole Massmann, Director of Communications, EERC, nmassmann@undeerc.org, 701-777-5428

Dustin Willett, Chief Operating Officer, RTE, dustin@redtrailenergy.com, 701-974-3308

Learn more at <https://undeerc.org/RedTrailEnergy/>



RED TRAIL ENERGY CCS PROJECT

ACTIVITY FAQs

INTEGRATED CARBON CAPTURE AND STORAGE FOR NORTH DAKOTA ETHANOL PRODUCTION

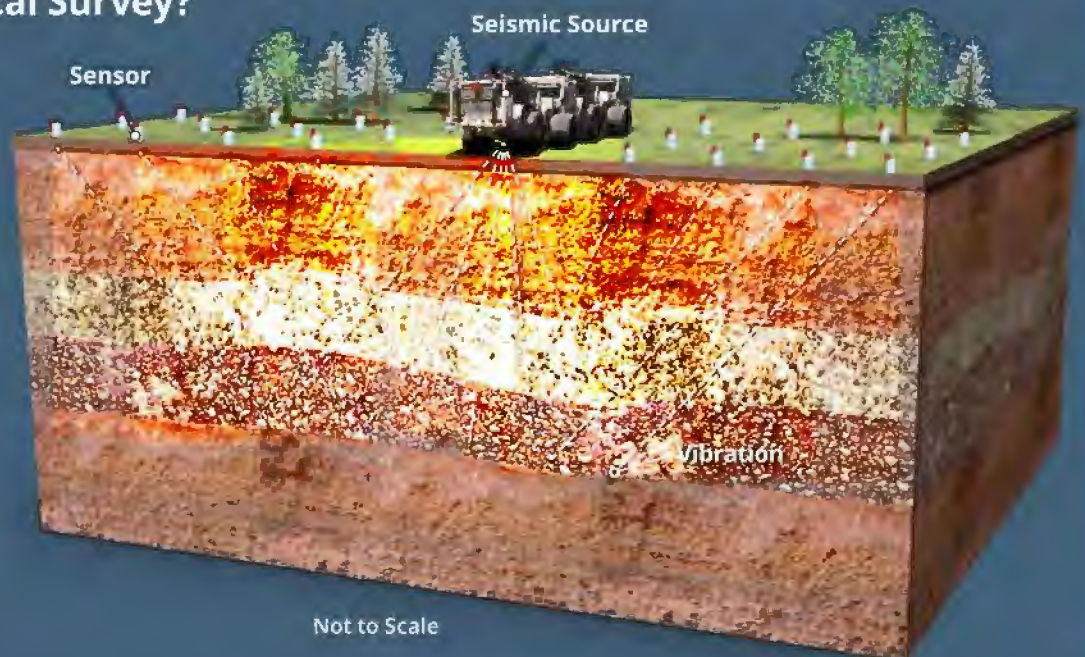
Geophysical Survey near Richardton, North Dakota

In late winter or early spring 2019, a field crew will conduct a geophysical survey near Richardton, North Dakota, to learn about rock layers in the deep subsurface. The data gathering is part of the Red Trail Energy Carbon Capture and Storage research effort, which is investigating the feasibility of developing 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 (EERC) 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 Is the Community Impact?

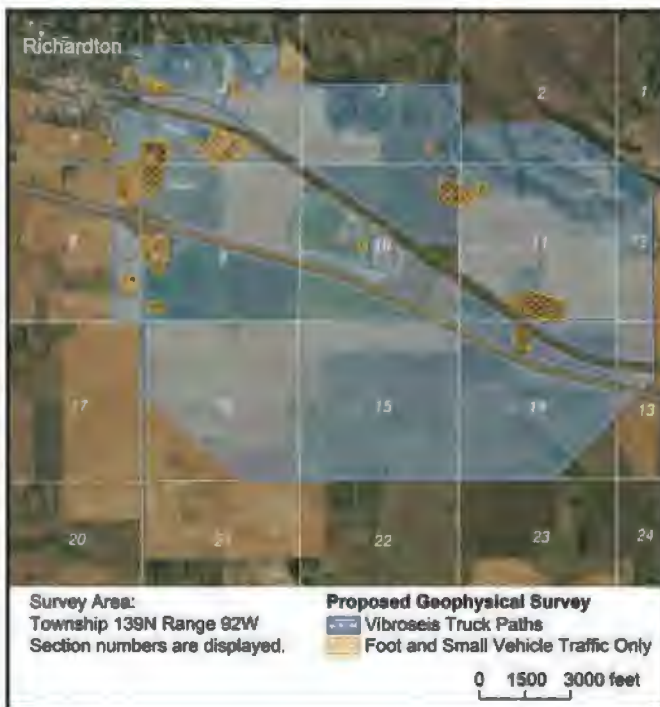
Safety and courtesy are top priorities during this survey. A low-level noise similar to that of a passing truck will be generated at each location from the vibrating truck-mounted plates. A person standing 100 feet from the source will not feel ground vibration. Care will be taken to avoid or minimize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

What Do Landowners on the Route Need to Know?

The goal is to complete the work before planting season begins. Red Trail Energy will contact landowners before the survey work to request permission to drive vehicles and place sensors on their land. The sensors will be pressed into the ground by hand by field crew walking and driving pickups or ATVs. Once installed, the sensors remain in place up to 2 weeks, as the vibroseis trucks travel through the survey area along lines spaced 660 feet apart, until the survey is finished. The testing area excludes the city and avoids buildings and other infrastructure such as drinking water wells, pipelines, and the interstate highway. Red Trail Energy will work with landowners to minimize inconveniences.

Where Will the Survey Be Conducted?

The proposed survey encompasses about 8 square miles of rural land around the Red Trail Energy facility east of Richardton.



How Will the Survey Be Carried Out?

The test involves a network of vibrational sensors and two source trucks (called vibroseis trucks). Sensors will be 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 will drive the large vibroseis trucks along lines spaced 660 feet apart. At 165-foot intervals along lines, the trucks will stop and vibrate the ground for 1–2 minutes. The trucks will 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.



Example of a sensor location showing the sensor, battery pack, and Wi-Fi transmitter at a similar geophysical survey in Montana.

What Are the Next Steps?

A community open house will introduce the project in spring 2019. Information on project progress and other potential field activities will be available on the EERC's Web site. A second open house showcasing results is planned for summer 2020. The final report will also be available to the public 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 at the University of North Dakota, with support from Red Trail Energy, 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.

For More Information Contact:

Kerryanne Leroux, Principal Engineer, Subsurface R&D, EERC, kleroux@undeerc.org 701-777-5013

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Dustin Willett, Chief Operating Officer, RTE, dustin@redtrailenergy.com, 701-974-3308

Learn more at <https://undeerc.org/RedTrailEnergy/>



RED TRAIL ENERGY

CCS PROJECT FACT SHEET

INTEGRATED CARBON CAPTURE AND STORAGE FOR NORTH DAKOTA ETHANOL PRODUCTION

Red Trail Energy CCS Project

Red Trail Energy, an ethanol plant in Richardton, North Dakota, is seeking to make its facility more sustainable by integrating carbon capture and storage, or CCS, to reduce carbon dioxide emissions from ethanol production. This reduction in CO₂ emissions will make Red Trail Energy's ethanol more valuable to states that have low-carbon fuel programs, such as California. Keeping CO₂ out of the atmosphere could also qualify for federal tax credits to offset some of the cost of integrating and operating CCS.



Building on Success

Since 2007, Red Trail Energy has been producing corn-based ethanol and distillers grains at its investor-owned plant in Richardton, North Dakota. The ethanol plant provides an alternative market to farmers in 32 counties in the region and creates tax revenue in eastern Stark County. Integration of CO₂ capture and geologic storage will position North Dakota as a national leader in developing reduced-carbon ethanol. The ability to command premium pricing and diversify product markets will help secure Red Trail Energy's future, providing stability in a volatile, commodity-driven market.



What Is Carbon Capture and Storage?

CCS is the practice of capturing CO₂ emissions from an industrial facility instead of releasing them to the atmosphere. Once captured, the CO₂ is transported to a site for injection and safe, permanent storage deep underground. Carbon dioxide injection is currently practiced in over 100 locations in the United States, typically for extending the life of older oil fields.

"Integrating carbon capture and storage ensures the long-term viability of Red Trail Energy."

Gerald Bachmeier, Red Trail Energy Chief Executive Officer

First of Its Kind

The integrated CCS project is a first of its kind in North Dakota. Incorporating CO₂ capture into the ethanol facility can be done with existing technology. The next step is what to do with the CO₂ once it has been captured. Captured CO₂ could be injected deep underground and permanently stored or potentially sold as a commodity to oilfield operators to increase production in aging wells. Red Trail Energy must ensure that the CO₂ is never emitted to the atmosphere in order to meet new CCS qualifications for low-carbon fuel and tax credit programs. North Dakota has well-suited geology for safe, permanent CO₂ storage; a regulatory framework to oversee all aspects of such projects; and authority from the federal government to do so.

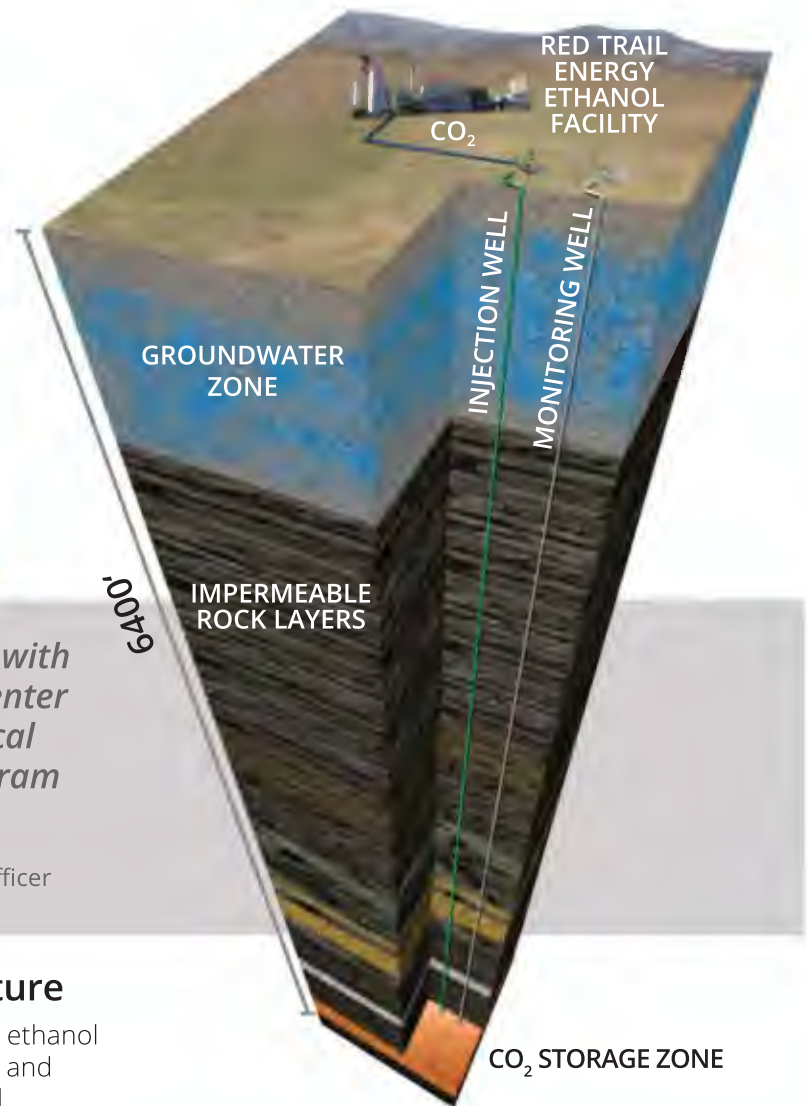


“We are very excited to continue working with the Energy & Environmental Research Center (EERC) to investigate CCS as an economical option for meeting low-carbon fuel program markets in other states.”

Gerald Bachmeier, Red Trail Energy Chief Executive Officer

Collaboration with Experts

Geologic CO₂ storage requires a deep porous layer to hold CO₂ and overlying impermeable rock layers as seals to keep the CO₂ in place. Red Trail Energy is collaborating with the EERC at the University of North Dakota, a global leader in CCS research. The EERC's proven approach features monitoring, characterization, modeling, and simulations to ensure the safety of injecting CO₂ into a suitable geologic container more than a mile deep.



Multiphase Path to a Commercial Venture

Investigation of CCS integration with the Red Trail Energy ethanol plant has been ongoing since 2016. Preliminary technical and economic feasibility has been successfully demonstrated. Current activities are focused on facility design, geologic characterization, and public outreach.

For More Information, Contact:

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Chief Operating Officer
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Red Trail Energy LLC
Richardton, ND 58652
redtrailenergyllc.com

PROJECT PARTNERS



U.S. DEPARTMENT OF
ENERGY



Geophysical Survey Sample Q&A for Landowner Contact February 2019

Below is a list of additional landowner questions or concerns that may not be addressed on the fact sheet or notification letter. Landowners can use the comment section on the agreement to specify any restrictions such as *do not enter my fenced yard, no vibroseis trucks allowed on my farmstead, contact me 2 days before people will be on my land, or no ATV use allowed on my farmstead.*

Question: When will work start?

Answer: Crews may be onsite as early as February 25, 2019 to start marking sensor location points and locating utilities and infrastructure such as buildings, pipelines, and water wells. Equipment may begin arriving on site shortly afterward. The permit requires that landowners be notified at least 7 days prior to people accessing their land.

Question: What damages can I expect?

Answer: Damages would occur only in the blue-shaded areas of the map where the vibroseis truck and, potentially, snowplows will operate. Typical ground damage includes ruts, depressions, and crushing vegetation from driving over the land. See questions below for more information. Snowplowing routes for the trucks may also be required which may also cause ruts and depressions. In densely vegetated areas, a bulldozer may be used to clear a path for the trucks. Acquisition companies may define tree rows as densely vegetated areas, so please specify in the comments section and point out on the map areas where bulldozers shouldn't be used.

Question: Will the vibroseis trucks damage my house/buildings etc.?

Answer: No, the survey is being performed under a state permit that mandates that the trucks not operate within 300 feet of infrastructure. State regulators have determined that this is a safe distance.

Question: Will vibroseis trucks drive through my farmstead?

Answer: The portion of your farmstead within 300 feet from your buildings and other infrastructure is off-limits to the vibroseis trucks in accordance with the state permit. For parts of your farmstead beyond the 300-foot buffer around buildings, you can specify in the comments section of the agreement that you don't want the trucks to operate or drive through those sections of your farmstead.

Question: What does foot and small vehicle traffic on the maps mean?

Answer: This means the big vibroseis trucks won't operate in these areas. Crews still need to access the area to place sensor equipment. They may walk or drive pick-ups or ATVs. You can specify in the comments section of the agreement any specific restrictions to these operations.

Question: Will the vibroseis trucks drive over my fence or through my tree line/shelter belt?

Answer: The trucks will drive around fence lines, but may drive through tree line/shelter belts and other woody areas if there is a wide enough area that doesn't contain mature trees. You should specify in the comments section of the agreement if you don't want the trucks to drive through your woody areas.

Question: How will this affect my drinking water, animals, or family?

Answer: The vibrations being created are very small and pose no health threat to humans, animals or drinking water. The state permit requires that vibroseis trucks not be used within 300 feet from any structure, wells or water lines. This distance was chosen by the state as a means to protect these structures from any potential physical damage.

Public Notice
RTE Project field work begins February 26, 2019

GRAND FORKS, N.D. (February 22, 2019) - A crew from Breckenridge Geophysical will be collecting information on subsurface rock layers near Richardton, North Dakota, beginning February 26. Breckenridge Geophysical is working in cooperation with Red Trail Energy (RTE) and local landowners in Richardton under a state permit approved by the North Dakota Industrial Commission and with the knowledge of the Stark County and Richardton City Commissioners. RTE has acquired permission from local landowners to access their property. Care will be taken to avoid or minimize any environmental impacts and maintain normal traffic flow.

The survey will encompass about 8 square miles east of Richardton, avoiding railroad and highway right-of-ways. The test involves a network of vibrational sensors and source trucks (called vibroseis trucks). Sensors will be placed on the ground in a grid pattern to record reflected vibrations generated during the survey. The survey crew will drive the trucks in the grid and stop at intervals to vibrate the ground for 1-2 minutes. A person standing 100 feet from the source will not feel ground vibration. The trucks will not operate within 300 feet of buildings and other infrastructure in accordance with the state permit. Geophysical surveys are a common data collection tool and have been used in every county in western North Dakota.

The geophysical survey is being conducted as part of the RTE CCS (carbon capture and storage) Project to make its ethanol more valuable by investigating techniques to reduce carbon dioxide emissions from ethanol production. RTE is working on the project with the University of North Dakota's Energy & Environmental Research Center (EERC), whose research is investigating the feasibility of developing safe, permanent, commercial-scale geologic storage for carbon dioxide in the region. Engineers and scientists at the EERC will assess the geologic information collected in the RTE-funded geophysical survey as part of this effort. A community open house will also be held later in March where community members will have a chance to learn more about this activity and the overall RTE CCS Project.

More information about the RTE CCS Project is available at:
<https://undeerc.org/RedTrailEnergy/>

RTE Contact:
Dustin Willett, Chief Operating Officer
(701) 974-3308, dustin@redtrailenergy.com

EERC Contact:
Nikki Massmann, Director of Communications
(701) 777-5428, nmassmann@undeerc.org

(PUBLISHED: February 26, 2019)

RTE CCS Project continues field work through 2019

(written May 2019)

GRAND FORKS, N.D.– Red Trail Energy (RTE) is working on a project with the University of North Dakota's Energy & Environmental Research Center (EERC) to investigate the feasibility of developing safe, permanent, commercial-scale geologic storage for carbon dioxide in the region.

In March 2019, RTE conducted a geophysical survey within an 8-square-mile area surrounding its ethanol plant east of Richardton, North Dakota, to study deep rock layers from the surface. Engineers and scientists at the EERC will assess the geologic information collected in the survey as part of this effort.

RTE and the EERC will also be conducting a series of groundwater and soil gas sampling events this spring, summer and fall. Healthy soil and groundwater are vital, and ensuring that the environment is not negatively impacted by this project is a top priority for RTE.

Results of the soil and water sampling, as well as the geophysical survey, will be shared with the landowners.

The geophysical survey and sampling are conducted as part of the RTE CCS (carbon capture and storage) Project to make its ethanol more valuable by investigating techniques to reduce carbon dioxide emissions from ethanol production.

“Integrating CCS may be an economical option through low-carbon fuel programs to ensure the long-term viability of Red Trail Energy,” said Gerald Bachmeier, RTE CEO.

A community open house was held March 6, 2019, providing community members a chance to learn more about this activity and the overall RTE CCS Project. A second open house showcasing results is planned for late 2019 or early 2020. The final report will be available in summer 2020.

More information about the RTE CCS Project is available at <https://undeerc.org/RedTrailEnergy/>.

RTE Contact:

Dustin Willett, Chief Operating Officer
(701) 974-3308, dustin@redtrailenergy.com

EERC Contact:

Nikki Massmann, Director of Communications
(701) 777-5428, nmassmann@undeerc.org



RED TRAIL ENERGY, LLC

“Our Farms, Our Fuel, Our Future”

PO Box 11 Richardton, ND 58652 (701)-974-3308 FAX (701)-974-3309

August 15, 2019

«FULLNAME»

«ADDRESS»

«CITY», «STATE» «ZIP_CODE»

Dear «FULLNAME»:

Subject: Results of Geophysical Survey – March 2019

Field crews contracted by Red Trail Energy conducted an 8-mi² geophysical survey near Richardton, North Dakota, to collect scientific data about rock layers in the deep subsurface as part of the Red Trail Energy Carbon Capture and Storage research effort. The data have been analyzed, and the enclosed report provides information on what we learned. Also enclosed is a fact sheet on the geophysical survey itself.

We appreciate your willingness to work with Red Trail Energy and the Energy & Environmental Research Center (EERC) on this research project. Should you have any questions, please do not hesitate to contact me by phone at (701) 974-3308 or by e-mail at dustin@redtrailenergy.com.

Sincerely,

Dustin Willett
Chief Operating Officer

DW

Enclosures

c: Paul Arnason, EERC

RED TRAIL ENERGY CCS PROJECT

RESULTS OF THE MARCH 2019 GEOPHYSICAL SURVEY NEAR RICHARDTON, NORTH DAKOTA

INTEGRATED CARBON CAPTURE AND STORAGE FOR NORTH DAKOTA ETHANOL PRODUCTION

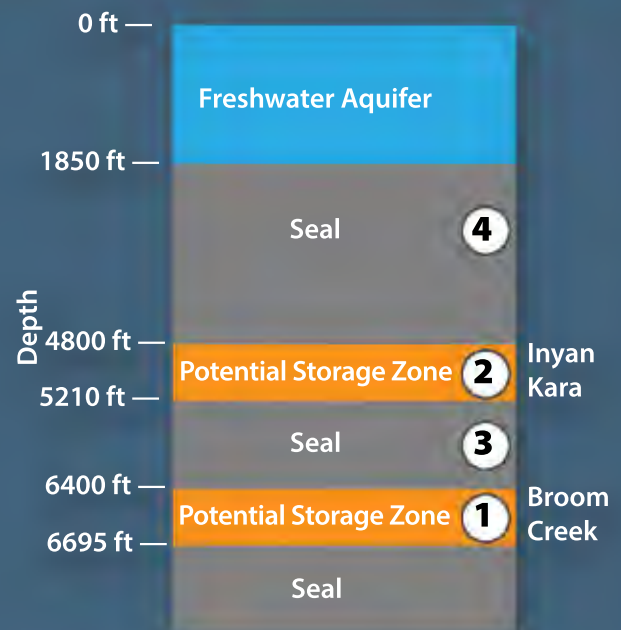
Over the period March 6–28, 2019, a field crew conducted an 8-mi² geophysical survey near Richardton, North Dakota, to learn about rock layers in the deep subsurface. The data gathering was part of the Red Trail Energy Carbon Capture and Storage (CCS) research effort, which is investigating the feasibility of safe, permanent, commercial-scale geologic storage for carbon dioxide integrated with ethanol production. The geologic information collected was assessed by engineers and scientists at the Energy & Environmental Research Center to help determine the potential for CO₂ storage in the area.

What Did We Learn?

The data from the geophysical survey helped evaluate the rock layers more than a mile below the surface.

Possible Injection Zones: The data show that one **potential storage zone (1)**, the Broom Creek Formation, lies at a depth of about 6400 feet, with an average thickness of 295 feet, and contains sand dune features that may be good CO₂ injection targets. A second **potential storage zone (2)**, the Inyan Kara Formation, lies at a depth of about 4800 feet, is roughly 410 feet thick, and contains several sand intervals that may be good injection targets.

Geologic Seals That Protect Drinking Water: The survey showed that impermeable rock formations make up 1200 feet of the layers between the potential CO₂ injection zones **(3)** that will act as a seal between the Broom Creek and the Inyan Kara Formations. The survey data also confirmed an additional ~3000 feet of impermeable rocks above the Inyan Kara **(4)** that will act as a seal between the CO₂ injection zone and the deepest freshwater aquifer.



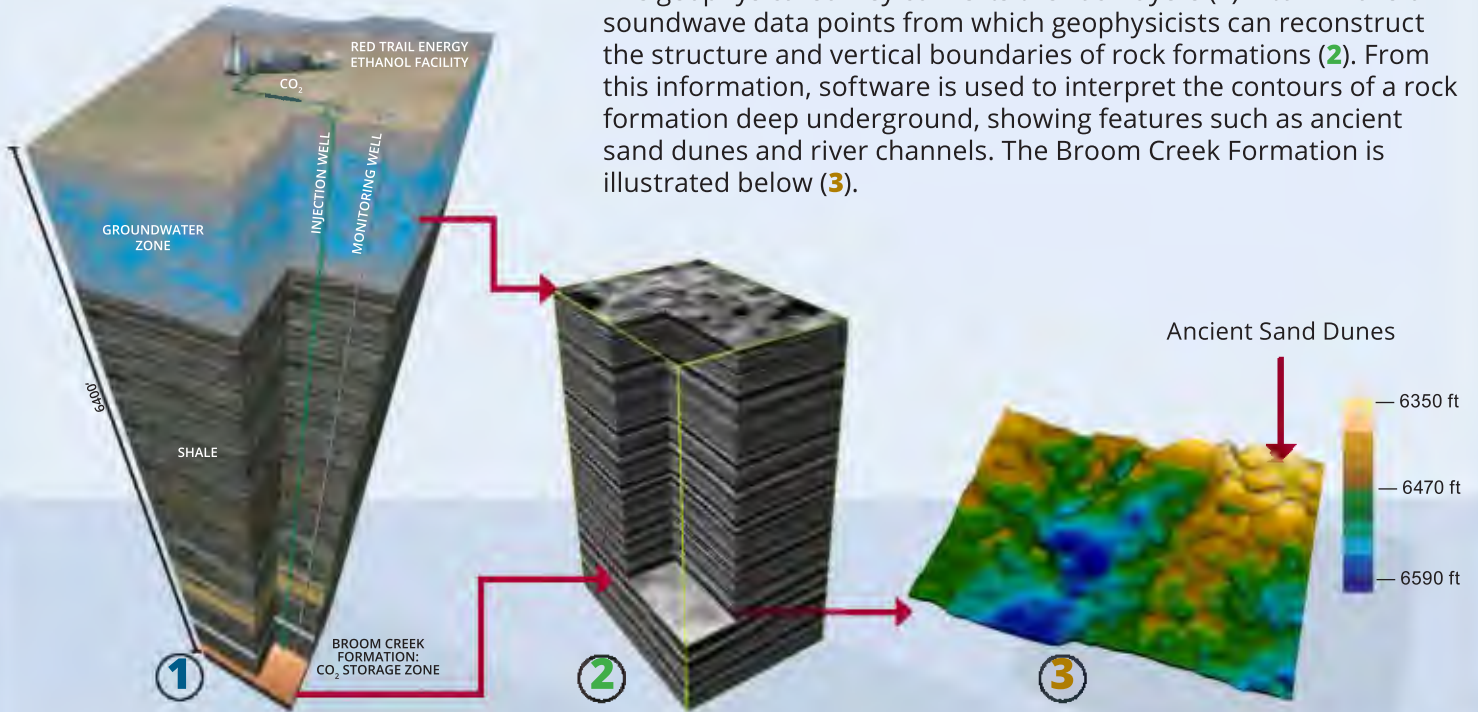
How Are We Using the Survey Data?

The survey data were incorporated into an existing 3-D computer model of the subsurface to improve its accuracy. The model is used to simulate movement of CO₂ in the storage zone, evaluate the suitability of the storage zone to contain CO₂, and determine the best location for a test well to learn more about the potential storage and seal rock layers. The information gained from the geophysical data will help with the state-required permit application for permanent geologic storage. Future geophysical surveys could be used to monitor and map injected CO₂ should a commercial CCS project begin operation.

What Are the Next Steps?

A community open house will share the geophysical survey results and future activities. The next phase of the project includes drilling a test well to collect rock and fluid samples from the two potential storage formations and to collect downhole data using established techniques. This information will help determine the best injection well location, select the best storage zone, and confirm that it will provide safe, permanent CO₂ storage.

The geophysical survey converts the rock layers (1) into millions of soundwave data points from which geophysicists can reconstruct the structure and vertical boundaries of rock formations (2). From this information, software is used to interpret the contours of a rock formation deep underground, showing features such as ancient sand dunes and river channels. The Broom Creek Formation is illustrated below (3).



Vibroseis trucks generated vibrations every 165 feet along straight paths throughout the study area, avoiding buildings and infrastructure.

A network of battery-powered sensors and Wi-Fi transmitters at 165-ft intervals collected data.



QUICK FACTS

23 Days	20 Man Crew
3600 SENSORS	8 miles square
FOUR Vibroseis Trucks	



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 at the University of North Dakota, with support from Red Trail Energy, 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.

For More Information Contact:

Dustin Willett, Chief Operating Officer, RTE, dustin@redtrailenergy.com, (701) 974-3308

Nicole Massmann, Director of Communications, EERC, nmassmann@undeerc.org, (701) 777-5428

Learn more at <https://undeerc.org/RedTrailEnergy/>



March 2019 RTE Geophysical Survey Results Talking Points

- The geophysical survey was successful!
- Trucks were not operated within 300 feet of pipeline, water wells, and buildings in accordance with state regulations. When trucks were in areas with these structures, special devices were used to monitor the vibrations from the trucks to ensure that 300 feet was in fact a safe distance for the trucks to operate so as to not cause damage. No wells or pipelines were damaged during the survey.
- The state seismic inspector was on-site to assess rut repairs in March and has made visits out to the site this summer to see how crops are growing.
- RTE really appreciates the cooperation of landowners for this geophysical survey!
- This geophysical survey collected the first known 3-D seismic data of this area, so EERC researchers learned a lot about the subsurface rock layers, especially those protecting freshwater aquifers and drinking water sources
 - Identified two potential CO₂ storage zones.
 - Confirmed the presence of thick geologic seals—unbroken layers of rock impermeable to CO₂ that extend far beyond the CO₂ storage zone.
 - Acquired insight into test well location.
- The survey was a baseline effort over a broad area, much broader than may be needed for a potential CO₂ storage project at RTE, in order to select the ideal location of injection and monitoring wells for either potential storage zone.
 - Secondary (if asked to elaborate): Should the project advance to the CO₂ storage phase, a detailed monitoring program will be developed as part of the state-required permit, i.e., potential and timing for future surveys have yet to be determined.
- These results will be part of an open house this fall/winter and shared with the county and city commissions, on the project webpage, and in project reports.
- The next step will be drilling a test well on RTE property to collect rock samples and other data to evaluate both potential storage zones and their seals to confirm that they are suitable for safe, permanent CO₂ storage. The information will help RTE select a storage zone, with help from EERC researchers, and develop a potential long-term monitoring program and ensure safe, permanent CO₂ storage deep underground near the RTE ethanol plant should the project advance.
 - Secondary (if asked to elaborate): Should the project advance to commercial CO₂ storage phase, the test well data will also help to select the injection and monitor well locations and complete all permit applications required for the permanent geologic storage of CO₂ under state and federal regulations.

GROUNDWATER AND SOIL GAS SAMPLING DOCUMENTS

Landowner access request packet for groundwater sampling

Landowner access request packet for soil gas sampling

RTE CCS Project: Phase III Talking Points May 2019 Permission for Sampling Landowner Contract

Landowner groundwater results

Landowner soil gas results



RED TRAIL ENERGY, LLC

“Our Farms, Our Fuel, Our Future”

PO Box 11 Richardton, ND 58652 (701)-974-3308 FAX (701)-974-3309

May 1, 2019

«FULLNAME»

«ADDRESS»

«CITY», «STATE» «ZIP_CODE»

Dear «FULLNAME»:

Subject: Permission to Access Uncultivated Land for Groundwater Study

A field crew from the University of North Dakota Energy & Environmental Research Center (EERC) is working with Red Trail Energy, LLC to conduct a study of natural changes in the levels of CO₂ found in the soil and groundwater near Richardton. The study is looking for existing groundwater wells that are accessible by a pickup during spring, summer, and fall. Based on a review of Stark County, a well on the parcel *Township «TNSP» N Range «RNG» W Section «SCTN»*, which you own, fits that description. The potential sampling location is marked on the enclosed map. This location is based on State Water Commission records.

We respectfully request permission to access your property three to four times from May through November 2019 for the research activities listed below. We will provide advance notice of when we plan to be on your property.

- Investigate the potential well to be sampled.
- Collect groundwater samples once each season (spring, summer, and fall) by drawing water from existing spigots. More information on this activity is included on the enclosed Sampling FAQs (frequently asked questions).

If you are willing to grant access for groundwater sampling, please sign this letter where indicated on page 2, confirm or mark the sampling location on the enclosed map, and provide any specific instructions such as preferred access route(s).

This effort is part of the larger RTE carbon capture and storage research effort. I have enclosed a fact sheet that provides more information about the study and the overall project.

We look forward to working with you and appreciate your kind consideration. Should you have any questions, please do not hesitate to contact me by phone at (701) 974-3308 or by e-mail at dustin@redtrailenergy.com.

Sincerely,

Dustin Willett
Chief Operating Officer

Permission Granted by:

Landowner Date

Landowner Date

Specific Instructions (e.g., preferred access route(s), etc.):

DW

Enclosures

c: Paul Arnason, EERC

RED TRAIL ENERGY CCS PROJECT

GROUNDWATER SAMPLING NEAR RICHARDTON, NORTH DAKOTA

INTEGRATED CARBON CAPTURE AND STORAGE FOR NORTH DAKOTA ETHANOL PRODUCTION

Section map for «FULLNAME» and proposed sampling location



Township 139 N
Range 92 W
Section 5



● Proposed Water Well for Sampling
Landowner: City of Richardton

May 1, 2019



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PO Box 11 Richardton, ND 58652 (701)-974-3308 FAX (701)-974-3309

May 1, 2019

«FULLNAME»

«ADDRESS»

«CITY», «STATE» «ZIP_CODE»

Dear «FULLNAME»:

Subject: Permission to Access Uncultivated Land for Soil Gas Study

A field crew from the University of North Dakota Energy & Environmental Research Center (EERC) is working with Red Trail Energy, LLC to conduct a study of natural changes in the levels of CO₂ found in the soil and groundwater near Richardton. The study is looking for sampling locations that are uncultivated and are accessible by a pickup during spring, summer, and fall. Based on a review of Stark County, parts of the parcel *Township «TNSP» N Range «RNG» W Section «SCTN»*, which you own, fit that description. A potential sampling location is marked on the enclosed map.

We respectfully request permission to access your property three to four times from May through November 2019 for the research activities listed below. We will provide advance notice of when we plan to be on your property.

- Scout the potential sampling locations, marking the chosen site with a small orange flag for the duration of the study.
- Collect soil gas samples once each season (spring, summer, and fall) by driving a 1-inch-diameter probe 3 feet into the ground, collecting the sample with a vacuum pump, and removing the probe. More information on this activity is included in the enclosed Sampling FAQs (frequently asked questions).

If you are willing to grant access to the sampling location shown on the enclosed map, please sign this letter where indicated on page 2 and provide any specific instructions such as preferred access route(s). If you are amenable but need the location moved, please contact me to determine an alternative location.

This effort is part of the larger RTE carbon capture and storage research effort. I have enclosed a fact sheet that provides more information about the study and the overall project.

We look forward to working with you and appreciate your kind consideration. Should you have any questions, please do not hesitate to contact me by phone at (701) 974-3308 or by e-mail at dustin@redtrailenergy.com.

Sincerely,

Dustin Willett
Chief Operating Officer

Permission Granted by:

Landowner Date

Landowner Date

Specific Instructions (e.g., preferred access route(s), etc.):

DW

Enclosures

c: Paul Arnason, EERC

RED TRAIL ENERGY CCS PROJECT

SOIL GAS SAMPLING NEAR RICHARDTON, NORTH DAKOTA

INTEGRATED CARBON CAPTURE AND STORAGE FOR NORTH DAKOTA ETHANOL PRODUCTION

Section map for «FULLNAME» and proposed sampling location(s)



Township 139 N
Range 92 W
Sections 9 & 10



● Proposed Soil Gas Sample Location

Landowner: Red Trail Energy

May 1, 2019

Red Trail Energy Carbon Capture and Storage Project: Phase III Talking Points
May 2019 Permission for Sampling Landowner Contact

Red Trail Energy is:

- Looking for ways to ensure the sustainability of the company and the market for its ethanol into the future (*see fact sheet in the packet*).
- Working with the Energy & Environmental Research Center (EERC) at the University of North Dakota to determine whether carbon capture and storage at the Richardton facility would be safe and economically feasible.
- Completed the geophysical survey over about 8 square miles east of Richardton as an early step in investigating safe, permanent geologic storage of carbon dioxide (*see FAQs in the packet*).
 - The survey successfully completed accessing only lands where permission was granted—including limited access to county road ditches.
 - Next steps for the geophysical data are data processing and evaluation to better understand the subsurface rock layers, such as depths, thickness, and other properties, specific to this area (expected to take several months).
- Conducting a series of groundwater- and soil gas-sampling events, which do not require county or city permission; however, permission to access lands is required and was granted.

The draft sampling activities (*in the packet*) will involve the following:

- Healthy soil and groundwater are vital, and ensuring that the environment is not negatively impacted by this project is a top priority for Red Trail Energy.
- Three 2-day sampling events are taking place in May and planned to repeat summer and fall 2019.
- Groundwater samples are to be drawn from existing wells with landowner permission. We plan to sample six wells, all from the well spigot.
- Soil gas samples will be collected from about 3 feet below the surface using a temporary probe and battery-operated pump. A pickup-mounted generator will be used to drive the probe into the ground. Eleven locations will be accessed with landowner permission. All are on uncultivated land accessible by existing farmroads or trails; six are on RTE property.
- Sampling locations are near the Red Trail Energy ethanol facility and Richardton, North Dakota, study area.

The EERC will:

- Use the geophysical survey data to evaluate the suitability of the rocky layers as a container for safe, permanent storage of CO₂ from the ethanol plant (April–December 2019).

- Perform laboratory analysis on the collected groundwater and soil gas samples and evaluate results to understand the natural CO₂ behavior in the local environment and determine the natural seasonal variation before any potential projects take place.
- Share the sampling results with landowners.
- Prepare a report discussing the project results (available to the public spring 2020).

Public Engagement [*or Public Outreach*]:

- We held a community open house on March 6 in Richardton, introducing the project and these activities.
- We contacted identified landowners in early May regarding potential sampling locations and access permissions .
- We plan to provide periodic updates to county and city officials as the project progresses.
- Periodic updates will also be available through the EERC's Web page, social media, and print media (May–December 2019).

For more information, contact Dustin Willett (see my card in the packet)



RED TRAIL ENERGY, LLC

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PO Box 11 Richardton, ND 58652 (701)-974-3308 FAX (701)-974-3309

August 19, 2019

«FULLNAME»

«ADDRESS»

«CITY», «STATE» «ZIP_CODE»

Dear «FULLNAME»:

Subject: Results of Private Well Sampling for Groundwater Study – May 2019

A field crew from the University of North Dakota Energy & Environmental Research Center (EERC) is collecting seasonal samples of well water as part of a study of natural changes in the soil and groundwater chemistry near Richardton. In total, three groundwater wells are being sampled in May, August, and fall 2019.

The enclosed report is based on the «MaySampling» sampling event from a well on the parcel *Township «TNSP» N Range «RNG» W Section «SCTN»* (see enclosed map). The analytical results indicated that the water quality for the sampled water is within the established limits set forth by the North Dakota Department of Health. Human consumption of the well water is not recommended without further testing as not all critical drinking water parameters were measured.

We appreciate your willingness to work with Red Trail Energy and the EERC on this research project. Should you have any questions, please do not hesitate to contact me by phone at (701) 974-3308 or by e-mail at dustin@redtrailenergy.com.

Sincerely,

Dustin Willett
Chief Operating Officer

DW

Enclosures

c: Paul Arnason, EERC

RED TRAIL ENERGY CCS PROJECT

GROUNDWATER SAMPLING NEAR RICHARDTON, NORTH DAKOTA

INTEGRATED CARBON CAPTURE AND STORAGE FOR NORTH DAKOTA ETHANOL PRODUCTION

Section map for «FULLNAME» with sampling location



Township 139 N
Range 92 W
Section 5



● Proposed Water Well for Sampling

Landowner:

INTERPRETING GROUNDWATER RESULTS

Groundwater occupies the spaces between soil particles and rock grains below the landscape. Groundwater comes from precipitation that infiltrates the ground. Groundwater resources are called aquifers. Many of the characteristics and chemical constituents of groundwater come from the rocks that make up the aquifer.

Water quality parameters were selected to understand the natural seasonal changes in groundwater. Table 1 describes the typical water quality characteristics unrelated to human health. Table 2 focuses on typical chemical components, some of which are regulated based on concerns for human health. The U.S. Environmental Protection Agency (EPA) publishes primary and secondary drinking water regulations that govern municipal drinking water sources. These regulations are provided here for comparison.

EPA's National Primary Drinking Water Regulations are legally enforceable primary standards and treatment techniques that apply to public water systems. The maximum contaminant level allowed is listed as **E1** in the tables.

EPA's National Secondary Drinking Water Regulations set nonmandatory water quality standards for 15 parameters. These secondary levels establish guidelines to assist public water systems in managing their drinking water for aesthetic considerations (taste, color, smell, etc.), rather than risk to human health. This source is listed as **E2** in the tables.

North Dakota State University (NDSU) Extension Service publishes guidelines for private wells which are not subject to federal and state regulations. This source is listed as **NDSU** in the tables.

Table 1. Water Characteristics of Well No. «WellNo». Test Results above Drinking Water Recommendations Indicate Possible Taste or Material Issues, not Risk to Human Health.

<i>Sample ID:</i> <i>Water Type:</i>		<i>Collection Date:</i> <i>Collection Time:</i>			
<i>Parameter</i>		Results	Units ¹	Drinking Water Recommendations	Source
Alkalinity, as bicarbonate (HCO_3^-)			mg/L	NR ²	
Alkalinity, as carbonate (CO_3^{2-})			mg/L	NR	
Alkalinity, as hydroxide (OH^-)			mg/L	NR	
Alkalinity, total as CaCO_3			mg/L	>150 relates to scaling	
Carbon, total inorganic			mg/L	NR	
Carbon, total organic			mg/L	NR	
Conductivity			$\mu\text{S}/\text{cm}$	<0.85	NDSU
pH				6.5–8.5	E2
Total dissolved solids at 180°C			mg/L	<500 (<1500)	E2 (NDSU)
Water temperature			°C		

¹ mg/L means milligrams per liter, equivalent to parts per million or ppm.

$\mu\text{S}/\text{cm}$ means microseimens per centimeter.

² Not included in federal or state drinking water regulations.

Table 2. Chemical Analysis for Well No. «WellNo», Reported as mg/L, with State and Federal Drinking Water Guidelines

<i>Sample ID:</i>		Collection Date:			
<i>Water Type:</i>		Collection Time:			
		Filtered Sample	Unfiltered Sample	Drinking Water Limit or Recommendations	Source
<i>Parameter</i>	Aluminum			<0.2	E2
	Antimony			<0.006	E1
	Arsenic			<0.010	E1
	Barium			<2	E1
	Beryllium			<0.004	E1
	Bismuth			NR ¹	
	Boron			NR	
	Bromide		NA ²	NR	
	Cadmium			<0.005	E1
	Calcium			NR	
	Chloride		NA	<250	E2
	Chromium			<0.1	E1
	Cobalt			NR	
	Copper			<1.3 (<1.0)	E1 (E2)
	Fluoride		NA	<4.0 (<2.0)	E1 (E2)
	Iron			<0.3	E2
	Lead			<0.015	E1
	Lithium			NR	
	Magnesium			NR	
	Manganese			<0.05	E2
	Mercury			<0.002	E1
	Molybdenum			NR	
	Nickel			NR	
	Phosphorus			NR	
	Potassium			NR	
	Selenium			<0.05	E1
	Silicon			NR	
	Silver			<0.1	E2
	Sodium			<100	NDSU
	Strontium			NR	
	Sulfate		NA	<250	E2
	Sulfide	NA		NR	
	Thallium			<0.002	E1
	Thorium			NR	
	Uranium			<0.03	E1
	Vanadium			NR	
	Zinc			<5	E2

¹ Not included in federal or state drinking water regulations.

² Not analyzed.

For more information:

EPA National Primary Drinking Water Regulations: www.epa.gov/ground-water-and-drinking-water/national-primary-drinking-water-regulations (accessed August 11, 2019).

EPA Secondary Drinking Water Standards: Guidance for Nuisance Chemicals: www.epa.gov/dwstandardsregulations/secondary-drinking-water-standards-guidance-nuisance-chemicals (accessed August 11, 2019).

NDSU Drinking Water Quality: Testing and Interpreting Your Results: www.ag.ndsu.edu/publications/environment-natural-resources/drinking-water-quality-testing-and-interpreting-your-results#section-22 (accessed August 11, 2019).



RED TRAIL ENERGY, LLC

“Our Farms, Our Fuel, Our Future”

PO Box 11 Richardton, ND 58652 (701)-974-3308 FAX (701)-974-3309

August 19, 2019

«LANDOWNER»

«ADDRESS»

«CITY», «STATE» «ZIP_CODE»

Dear «SALUTATION»:

Subject: Results of Sampling for Soil Gas – May 2019

A field crew from the University of North Dakota Energy & Environmental Research Center (EERC) is collecting seasonal samples of soil gas as part of a study of natural changes in the levels of CO₂ found in the soil and groundwater near Richardton. In total, 11 soil gas sites are being sampled in May, August, and fall 2019.

The enclosed report is based on the «SAMPLE_MONTH» sampling event from the uncultivated «NOLOCATIONS» on the parcel *Township «TNSP» N Range «RNG» W Section «SCTN»* noted on the enclosed map. The analytical results fall within the normal range of soil gas composition.

We appreciate your willingness to work with Red Trail Energy and the EERC on this research project. Should you have any questions, please do not hesitate to contact me by phone at (701) 974-3308 or by e-mail at dustin@redtrailenergy.com.

Sincerely,

Dustin Willett
Chief Operating Officer

DW

Enclosures

c: Paul Arnason, EERC

RED TRAIL ENERGY CCS PROJECT

SOIL GAS SAMPLING NEAR RICHARDTON, NORTH DAKOTA

INTEGRATED CARBON CAPTURE AND STORAGE FOR NORTH DAKOTA ETHANOL PRODUCTION

Section map for «LANDOWNER» with «SGNo» sampling «NOLOCATIONS»



Township 139 N
Range 92 W
Section 9 & 10



● Soil Gas Sample Location
Landowner: Red Trail Energy

INTERPRETING SOIL GAS RESULTS

Soil gas occupies the spaces between soil particles above the water table. Just as in the atmosphere, the natural composition of soil gas is mainly nitrogen gas (N₂) and oxygen gas (O₂). While O₂ in the soil gas is critical to plant health for respiration and to soil microbes for plant decay, the N₂ is available only to nitrogen-fixing plants and bacteria. Because of microbial and plant respiration, soil gas typically contains much more carbon dioxide than the atmosphere. Soil gas CO₂ and O₂ levels fluctuate during the growing season as plants grow, bloom, and die. In the natural system, as the CO₂ levels increase, O₂ levels decrease and vice versa.

Soil gas parameters were selected to understand natural seasonal changes in soil. As this is the initial sampling event in the screening activity, the results of the «SAMPLE_MONTH» sampling presented in Table 1 represent a starting point. It is anticipated that future sampling results will show increases in the CO₂ values and decreases in the O₂ values as plants and microbes become more active. No regulatory standards for soil gas exist.

Volatile organic compounds analyzed include propane, propylene, acetylene, carbonyl sulfide, hydrogen sulfide, n-butane, iso-butane, 1-butene, iso-butene, t-2-butene, c-2-butene, iso-pentane, n-pentane, 1,3-butadiene, ethylene, ethane, methane, and carbon monoxide.

Table 1. Soil Gas Composition at Site No. «SGNo».

Sample ID: «SGNo»		Collection Date: «COLLECTION_DATE»	
Collection Depth: 42 inches		Collection Time: «COLLECTION_TIME»	
		Results, %	Expected Seasonal Range
<i>Parameter</i>	Carbon Dioxide (CO ₂)	«CO2»	0.01%–17%
	Oxygen (O ₂)	«O2»	3%–21%
	Nitrogen (N ₂)	«N2»	~79%
	Volatile Organic Compounds	ND ¹	

¹ Not detected.

Table 1. Soil Gas Composition at Site No. «SGNo».

Sample ID:		SG10	SG11	
	Collection Depth:	42 inches	42 inches	
	Collection Date:	«COLLECTION_DATE»		
	Collection Time:	«COLLECTION_TIME»		
	Results, %			Expected Seasonal Range
<i>Parameter</i>	Carbon Dioxide (CO ₂)	«CO2»		0.01%–17%
	Oxygen (O ₂)	«O2»		3%–21%
	Nitrogen (N ₂)	«N2»		~79%
	Volatile Organic Compounds	ND ¹		

¹ Not detected.

Table 1. Soil Gas Composition at Site No. «SGNo».

<i>Sample ID:</i>		SG03	SG04	SG05	SG07	SG08	SG09	
	Collection Depth: 42 inches							
	Collection Date: «COLLECTION_DATE»							
	Collection Time:	«COLLECT ION_ TIME »						
	Results, %							Expected Seasonal Range
<i>Parameter</i>	Carbon Dioxide (CO ₂)	«CO 2»						0.01%–17%
	Oxygen (O ₂)	«O2»						3%–21%
	Nitrogen (N ₂)	«N2»						~79%
	Volatile Organic Compounds	ND ¹	ND ¹	ND ¹				

¹ Not detected.

MEDIA INQUIRIES

EERC and Red Trail Energy Continue to Reduce Carbon Dioxide Emissions

EERC and Red Trail Energy Continue to Reduce Carbon Dioxide Emissions

(written May 2019)

GRAND FORKS, N.D. – Red Trail Energy, LLC (RTE) and the University of North Dakota's Energy & Environmental Research Center (EERC) are beginning the next step in investigating carbon capture and storage (CCS) technology as a way to reduce the carbon dioxide emissions associated with ethanol production. This research began in 2016, with the support of the North Dakota Industrial Commission (NDIC) and the U.S. Department of Energy (DOE).

Reducing emissions enables energy producers to sell ethanol to states that have low-carbon fuel programs, such as California. CCS technology captures and permanently stores CO₂ emissions.

“Using CCS to reduce the carbon dioxide emissions of our ethanol ensures the long-term viability of Red Trail Energy,” said Gerald Bachmeier, RTE Chief Executive Officer. “We are very excited to continue our partnership with the EERC to investigate CCS as an economical option to be better environmental stewards.”

The next phase of research includes designing a system for capturing and storing carbon dioxide that works specifically with the RTE ethanol facility and the site's geology. This builds on the previous EERC work, which looked at the potential for integrating CCS with ethanol production. Using the RTE ethanol facility in Richardton, North Dakota, as a case study, EERC research successfully demonstrated both technical and economic feasibility of CCS technology with ethanol production.

“The activities of this phase will generate the data necessary to continue moving the effort toward potential implementation,” said project manager Kerryanne Leroux, EERC Principal Engineer and Systems Lead. “North Dakota ethanol producers are particularly well-situated for this opportunity because there is significant production capacity and excellent geology for carbon storage.”

Work has begun and will run through the spring of 2020.

More information about the RTE CCS Project is available at <https://undeerc.org/RedTrailEnergy/>.

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EERC Contact:

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APPENDIX B

OPEN HOUSE COMPONENTS AND PLANNER

OPEN HOUSE COMPONENTS AND PLANNER

Open House Planner with Time Line in Relation to Planned Event Date

Time Line	Action	Instruction	Outcome/Product/Notes
6–8 weeks prior	Request for open house assistance		Requested by client leadership or suggested by project begins
6–8 weeks prior	Establish open house working team	<ul style="list-style-type: none"> Consisting of project lead, researchers, outreach and communications team members, and an administrative assistant 	<ul style="list-style-type: none"> EERC: Project Manager, Outreach Lead, Lead, Geoscientist Lead, AA, Communication Coordinator, Photographer Client: Provided messaging assistance and
Weekly thereafter	Meet as necessary to discuss details and deliver updates to team	<ul style="list-style-type: none"> Choose location, date, and time Consider the availability of spaces in closest town, scheduling conflicts, and time zones 	<i>Examples:</i> <ul style="list-style-type: none"> Wednesday, December 11, 2019, 6:00–8:00 Richardton American Legion Called school district, checked sports schedule meeting schedules
6 weeks prior	Create message and engagement strategies for intended audience	<ul style="list-style-type: none"> Evaluate the current project stage and next stage-progress to determine the general public concerns that should be addressed Create posters that are helpful in gaining a deeper understanding of the project without explanation from an expert 	<ul style="list-style-type: none"> Discussed testing results, next steps in project Existing EERC graphics and language are modified if needed with assistance from in Graphics creates or revises poster files with elements
3 weeks prior	Create invitations and invitation lists, and distribute	<ul style="list-style-type: none"> Landowners, local and state officials, town and regional community, dependent on who is impacted most by new stage of project Mail, newspaper listings, digital signage (where available), social media 	<ul style="list-style-type: none"> Begin submitting to media sources at least best visibility to target audience <i>Examples: Richardton Merchant, Hebron Bismarck Tribune</i> were chosen for their reach Distribution frequencies range from daily vary for each <i>Examples:</i> Digital sign in Richardton is run Richardton – appendixes show submission capabilities

Open House Planner with Time Line in Relation to Planned Event Date (continued)

Time Line	Action	Instruction	Outcome/Product/Notes
3 weeks prior	Create invitations and invitation lists, and distribute	<ul style="list-style-type: none"> Landowners, local and state officials, town and regional community, dependent on who is impacted most by new stage of project Mail, newspaper listings, digital signage (where available), social media 	<ul style="list-style-type: none"> Begin submitting to media sources at least 3 weeks prior for best visibility to target audience <i>Examples: Richardton Merchant, Hebron Press, Bismarck Tribune</i> were chosen for their reach Distribution frequencies range from daily to weekly, vary for each <i>Examples: Digital sign in Richardton is run by local business</i> Richardton – appendices show submission requirements and capabilities
Week of Event	Prepare all materials and to travel to open house	<ul style="list-style-type: none"> Printed materials including posters, comment cards, sign-in sheets, handouts Food, beverages, and related items 	<i>Examples:</i> <ul style="list-style-type: none"> December 2019 open house required six people to prepare supporting handouts Assorted bars and apple cider, including vendors through UND Campus Catering
Day of Event	Execute open house	<ul style="list-style-type: none"> Follow time line for scheduled presentations, circulating to speak with researchers, final questions Discuss event outcomes with internal attendees and client leadership to determine successfulness and follow-up needs 	
1–2 weeks post	Track and record engagement through sign-in sheets, news items, etc.	<ul style="list-style-type: none"> Number of attendees, overall attitude of attendees, questions asked, any concerns to address moving forward 	All items should be recorded in TruServe for tracking over time
1–2 weeks post	Write and share postevent news release	<ul style="list-style-type: none"> News release has historically been written at the EERC and sent to client leadership for quotes and approvals Share on the EERC Solutions blog and sent as a news release to North Dakota news outlets 	Increases visibility/reach and support of client community about project events
As needed	Report on open house to necessary parties	<ul style="list-style-type: none"> Collect utilized materials for demonstration of efforts Compile responses to determine success level and necessary next-stage efforts 	Dependent on project specifications

*All final actions/decisions require approval from client.