



# GEOPHYSICAL EXPLORATION COMPLETION REPORT - FORM GE 6A

INDUSTRIAL COMMISSION OF NORTH DAKOTA  
OIL AND GAS DIVISION  
600 EAST BOULEVARD DEPT 405  
BISMARCK, ND 58505-0840  
SFN 51456 (03-2011)

# RECEIVED

MAR 12 2025

ND Oil & Gas

Division

Permit No. <b>97-0344</b>	
Shot Hole Operations <b>N/A</b>	*Non-Explosive Operations <b>Vibroseis</b>

### SECTION 1

Geophysical Contractor <b>Paragon Geophysical Services, Inc.</b>	
Project Name and Number <b>RITE/RTE Monitor 3 VSP</b>	County(s) <b>Stark</b>
Township(s) <b>139 North</b>	Range(s) <b>92 West</b>
Drilling and Plugging Contractors <b>N/A</b>	
Date Commenced <b>February 25, 2025</b>	Date Completed <b>February 26, 2025</b>

### SECTION 2

First S.P. # <b>N/A</b>	Last S.P. #
Loaded Holes (Undetonated Shot Points)	
S.P.#'s	
Charge Size	
Depth	
Reasons Holes Were Not Shot	

### SECTION 3

Flowing Holes and/or Blowouts S.P.#'s
Procedure for Plugging Flowing Holes and/or Blowouts <b>N/A</b>
Include a 7.5 minute USGS topographic quadrangle map or a computer generated post-plot facsimile of the approximate scale displaying each individual shot hole, SP #, line #, and legal location.

\*Non-Explosive Operations - Complete Section 1 and Affidavit (Form GE 6B).



**GEOPHYSICAL EXPLORATION AFFIDAVIT OF COMPLETION REPORT - FORM GE 6B**  
 INDUSTRIAL COMMISSION OF NORTH DAKOTA  
 OIL AND GAS DIVISION  
 600 EAST BOULEVARD DEPT 405  
 BISMARCK, ND 58505-0840  
 SFN 51456 (03-2011)

**RECEIVED**

MAR 12 2025

**ND Oil & Gas  
 Division**

PERMIT NAME (Required): \_\_\_\_\_ RITE /RTE Monitor 3 VSP

PERMIT NUMBER: \_\_\_\_\_ 97-0344

**AFFIDAVIT OF COMPLETION (GEOPHYSICAL CONTRACTOR)**

STATE OF Kansas )

)

COUNTY OF Sedgwick )

Before me, Elena Valdes, a Notary Public in and for the said

County and State, this day personally appeared Aaron Bateman

who being first duly sworn, deposes and says that (s)he is employed by Paragon

Geophysical Services, INC, that (s)he has read North Dakota

Century Code Section 38-08.1, that the foregoing seismic project has been completed in

accordance with North Dakota Administrative Code Rule 43-02-12 and that the statements on

the reverse side of this document are true.

Ra Bateman  
 Geophysical Contractor Representative

Subscribed in my presence and sworn before me this 12 day of March, 2025.



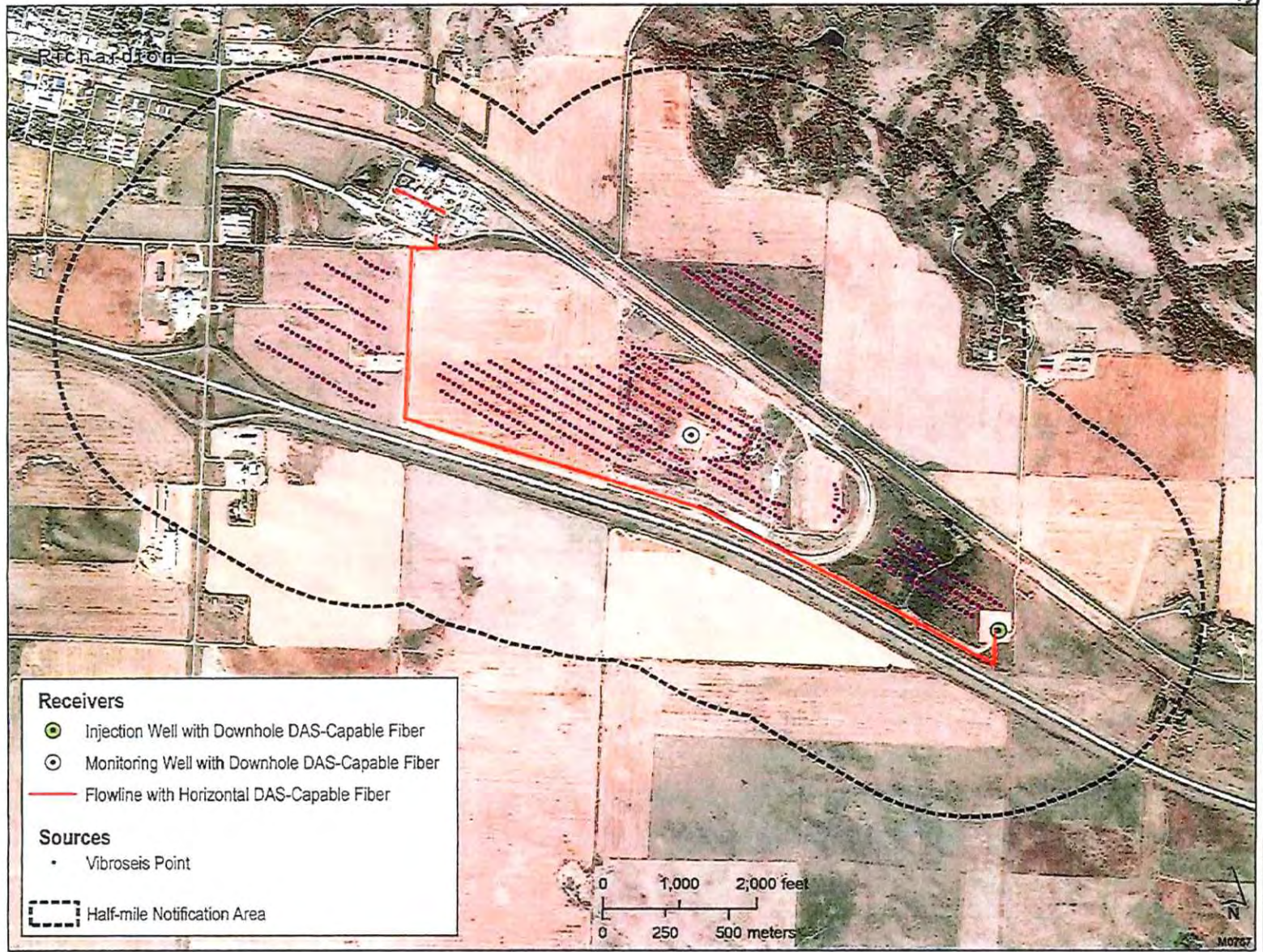
Notary Public Elena Valdes

My Commission Expires 7/6/27

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MAR 12 2025

ND Oil & Gas  
Division



# RTE VSP 3-D

Date: 2/9/2022

RECEIVED

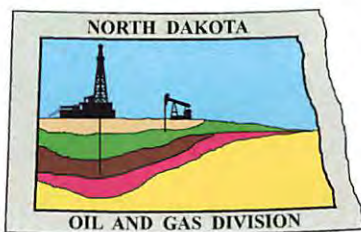
MAR 12 2025

ND Oil & Gas



• RTE_Post_VSP_NAD83M	— NewFlwLine
— RedTrailEnergy_lines	■ NAD_83_MERGE_BUFFER_Dissolve
• MonitorWell	□ Outline
• InjecWell	





# Oil and Gas Division

Nathan D. Anderson-Director      Mark F. Bohrer - Assistant Director

**North Dakota Industrial Commission**

**Department of Mineral Resources**

Nathan D. Anderson-Director

[www.dmr.nd.gov/oilgas/](http://www.dmr.nd.gov/oilgas/)

February 21, 2025

Aaron Bateman  
President  
Paragon Geophysical Services, Inc.  
3500 N. Rock Rd., Bldg 800, Ste B  
Wichita, KS 67226

RE: RITE/RTE MONITOR 3 VSP  
GEOPHYSICAL EXPLORATION PERMIT #97-0344  
STARK COUNTY  
NON-EXPLOSIVE METHOD

Dear Mr. Bateman:

Be advised that your Geophysical Exploration permit is conditionally approved; effective for one year from February 21, 2025.

## **PERMIT STIPULATIONS:**

- **Paragon Geophysical Services, Inc., must contact seismic inspector Tom Torstenson at (701) 290-1546 72 hours prior, to arrange a start-up meeting. Also, a copy of the entire permit is required for all contractors at the start up meeting.**
- **Paragon Geophysical Services, Inc., must contact Tom Torstenson at (701) 290-1546 24 hours prior to conducting any geophysical activities.**
- **Pursuant to NDAC 43-02-12-05 (DISTANCE RESTRICTION) Non-explosive exploration methods may not be conducted less than 300 feet from water wells, buildings, underground cisterns, pipelines, and flowing springs.**
- **In addition, pursuant to NDAC 43-02-12-06 (NOTIFICATION OF WORK PERFORMED), "The director is authorized to suspend operations of the entire geophysical project, or any portion thereof, if further activity will cause excessive damage to the surface of the land".**

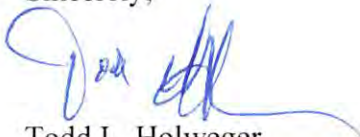
Review the following conditions for your permit:

1. All variances for distance restrictions are to be furnished, and a pre-plot map displaying any source points that do not comply with the distance restriction rule must be supplied to the inspector.
2. The following information must be submitted within 30 days of the completion of the project by the Geophysical Company:
  - a. Completion Report,

- b. Completion Affidavit,
  - c. Post Plot Map. It must show all water wells, buildings, underground cisterns, pipelines, and flowing springs that fall within the program area and within one half mile of the perimeter of the program.
  - d. Must provide a GIS layer using NAD83 in an Esri shape file format and an Image file (.img) on a Flash Drive or email: [ttorstenson@nd.gov](mailto:ttorstenson@nd.gov) with all source and receiver points,
3. The permit agent shall notify the operator of the land at least seven days before 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.
  4. Information regarding the location of water wells, springs, etc.; refer to the following ND State Water Commission Mapservice website, at: <http://mapservice.swc.state.nd.us/>
  5. The entire permit can be viewed, as well as the status of various seismic projects in the state, at: <https://www.dmr.nd.gov/oilgas/seismic/seismicstats.asp>

Should you have any questions regarding this matter, feel free to contact our office.

Sincerely,



Todd L. Holweger  
Permit Manager/Geophysical Supervisor



# GEOPHYSICAL EXPLORATION PERMIT - FORM GE 1

INDUSTRIAL COMMISSION OF NORTH DAKOTA  
 OIL AND GAS DIVISION  
 600 EAST BOULEVARD DEPT 405  
 BISMARCK, ND 58505-0840  
 SFN 51459 (03-2011)



1) a. Company <b>Paragon Geophysical Services</b>		Address <b>3500 N Rock Road, Bldg 600 Suite B Wichita KS 67266-67226</b>			
Contact <b>Aaron Bateman</b>		Telephone <b>(316) 636-5552</b>		Fax <b>(316) 636-5572</b>	
Surety Company <b>Arch Insurance</b>		Bond Amount <b>\$50,000.00</b>		Bond Number <b>SU1135989</b>	
2) a. Subcontractor(s) <b>N/A</b>		Address		Telephone	
b. Subcontractor(s) <b>N/A</b>		Address		Telephone	
3) Party Manager <b>Jimmy Blackstone</b>		Address (local)		Telephone (local) <b>(806) 471-9340</b>	
4) Project Name or Line Numbers <b>RITE/RTE Monitor 3 VSP</b>					
5) Exploration Method (Shot Hole, Non-Explosive, 2D, 3D, Other) <b>Non Explosive Vibroseis</b>					
6) Distance Restrictions (Must check all that apply)					
<input checked="" type="checkbox"/> 300 feet - NonExplosive - Distance setbacks apply to water wells, buildings, underground cisterns, pipelines, and flowing springs.					
<input type="checkbox"/> 660 feet - Shot Hole - Distance setbacks apply to water wells, buildings, underground cisterns, pipelines, and flowing springs.					
7) Size of Hole 3-D	Amt of Charge N/A	Depth N/A	Source points per sq. mi. 582	No. of sq. mi. .688sq ml	
Size of Hole 2-D	Amt of Charge	Depth	Source points per ln. mi.	No. of ln. mi.	
8) Approximate Start Date <b>February 24, 2025</b>			Approximate Completion Date <b>March 4, 2025</b>		

**THE COMMISSION MUST BE NOTIFIED AT LEAST 24 HOURS IN ADVANCE OF COMMENCEMENT OF GEOPHYSICAL OPERATIONS**

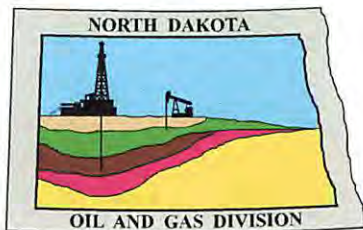
9) Location of Proposed Project - County <b>Stark</b>						
Section(s), Township(s) & Range(s)	Section	<b>4</b>	T.	<b>139</b>	R.	<b>92</b>
	Section	<b>9</b>	T.	<b>139</b>	R.	<b>92</b>
	Section	<b>10</b>	T.	<b>139</b>	R.	<b>92</b>
	Section		T.		R.	
	Section		T.		R.	
	Section		T.		R.	

I hereby swear or affirm that the information provided is true, complete and correct as determined from all available records. Date **2/17/25**

Signature <b>Ra Bateman</b>	Printed Name <b>Aaron Bateman</b>	Title <b>President</b>
--------------------------------	--------------------------------------	---------------------------

Email Address(es)  
**abateman@paragongeo.com**

(This space for State office use)		<p align="center"><b>Permit Conditions</b></p> <p>* Permit in hand required at pre-program meeting with field inspector and be aware of all NDIC Rules and Regulations (i.e. distance restrictions).</p> <p>* See attached letter.</p>
Permit No. <b>92-0344</b>	Approval Date <b>2/27/2025</b>	
Approved by <i>[Signature]</i>	Title <b>Mineral Resources Permit Manager</b>	



# Oil and Gas Division

Nathan D. Anderson-Director      Mark F. Bohrer - Assistant Director

**North Dakota Industrial Commission**

**Department of Mineral Resources**

Nathan D. Anderson-Director

[www.dmr.nd.gov/oilgas/](http://www.dmr.nd.gov/oilgas/)

February 21, 2025

The Honorable Karen Richard  
Stark County Auditor  
P.O. Box 130  
Dickinson, ND 58602-0130

RE:    Geophysical Exploration  
       Permit #97-0344

Dear Ms. Richard:

Pursuant to Section 38-08.1-04.2 of the North Dakota Century Code, please be advised that Paragon Geophysical Services, Inc. was issued the above captioned permit on February 21, 2025, and will remain in effect for a period of one year. The entire permit can be viewed on our website at: <https://www.dmr.nd.gov/oilgas/seismic/seismicstats.asp>

Should you have any questions, please contact our office.

Sincerely,

Todd Holweger  
Permit Manager/Geophysical Supervisor





*Richardton CCS, LLC storage facility*  
**RED TRAIL ENERGY, LLC**

**"Our Farms, Our Fuel, Our Future"**

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

February 18th, 2025

Mr. Todd L. Holweger  
Permit Manager/Geophysical Supervisor  
North Dakota Industrial Commission Oil and Gas Division  
600 East Boulevard Avenue, Department 405  
Bismarck, ND 58505

Dear Mr. Holweger:

Subject: Geophysical Exploration Permit Affidavit

All landowners within the proposed RITE/RTE Monitor 3 VSP project have been notified of the approximate schedule and location of the project and provided a written copy of the North Dakota Century Code (NDCC) Section 38-08.1 1-4.1 (Exploration Permit) and NDCC Chapter 38-11.1 (Oil & Gas Production Damage Compensation). As required by NDCC Section 38-08.1-4.1 (4), landowners within ½ mile of the proposed project area, were provided written copies of the required NDCC Sections which includes the Stark County Highway Department and BNSF Railway Company, which have authority over lands adjacent to study area. Richardton City Council President Jesse Aman was provided notification of the project.

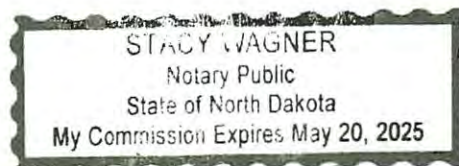
The proposed project will not place sensors on state roadways, railways, and associated rights-of-way. The RITE fiber on the injection wellbore is the sensor for the project.

The project's updated tentative start date after February 26th, 2025. If weather conditions or field conditions change the date may move.

Please contact me by phone with any questions at 701-226-8748 or email at [dburns@gevo.com](mailto:dburns@gevo.com)

Sincerely,

David Burns  
Regulatory & Compliance Officer  
Richardton CCS, LLC



*Stacy Wagner*  
*May 20, 2025*

RECEIVED

FEB 19 2025

N.D. INDUSTRIAL COMMISSION



*Richardson CCS, LLC  
Storage Facility*

A crew from Paragon Geophysical Services, Inc. will be collecting information on subsurface rock layers at the ~~Red Trail Energy (RTE) ethanol plant~~ near Richardson, North Dakota, beginning February 18-28. Paragon is working in cooperation with RTE under a state permit approved by the North Dakota Industrial Commission and with the knowledge of the Richardson City Commissioners. All work will be limited to land owned by RTE. Care will be taken to avoid or minimize any environmental impacts and maintain normal traffic flow.

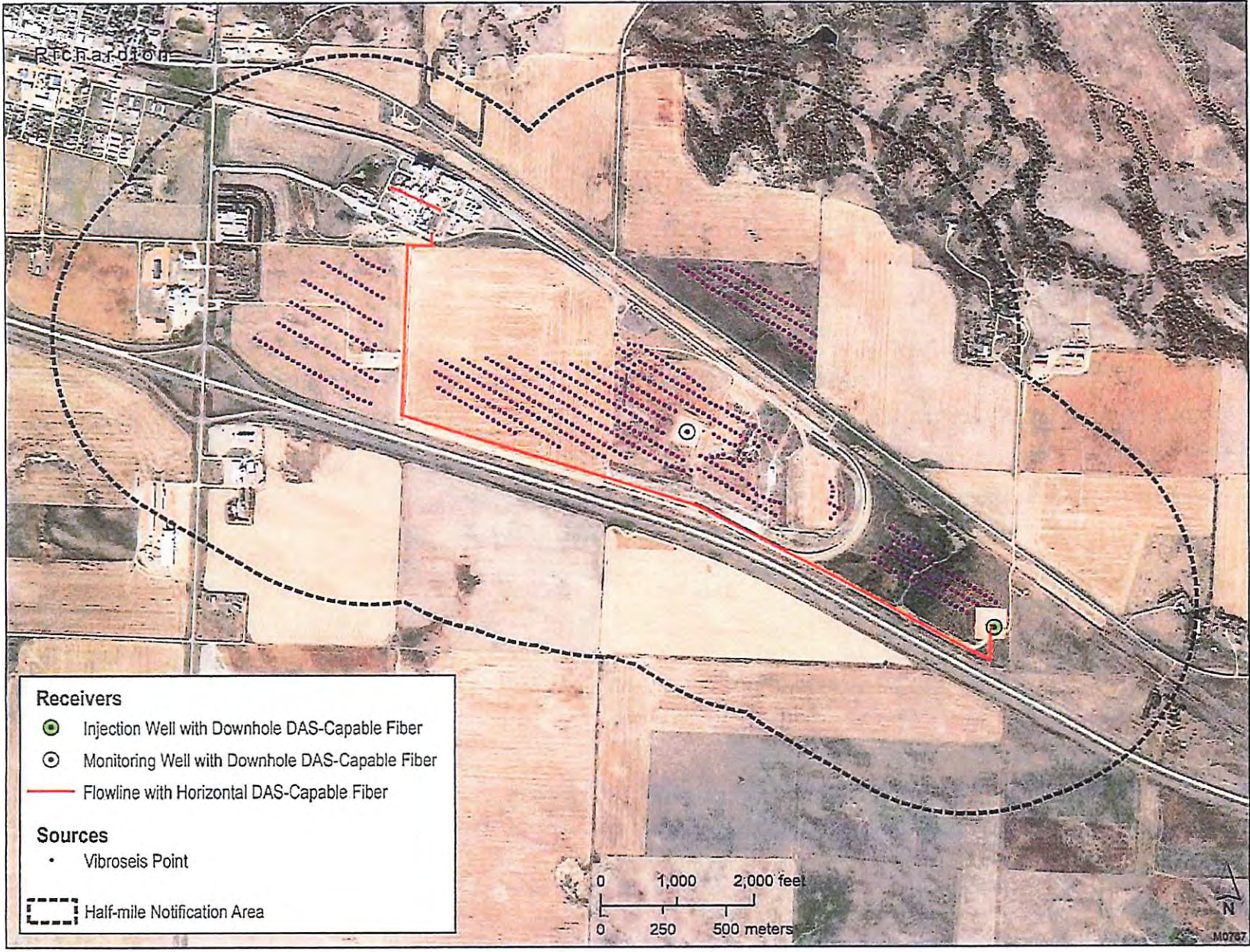
The survey will encompass about 1 square mile of RTE land surrounding the ethanol plant, avoiding railroad and highway rights-of-way. The test involves a network of previously installed sensors and two source trucks (called vibroseis trucks). The survey crew will drive the trucks in parallel lines on RTE land 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, including a previous survey carried out at this site in early 2019.

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 at the site is investigating the efficacy of low-impact techniques to monitor commercial-scale geologic storage for carbon dioxide. Engineers and scientists at the EERC will combine the geologic information collected in both geophysical surveys to establish baseline conditions for the monitoring data to be collected as part of the low-impact study.

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

The plan is to run the VSP annually until 1 million tonnes of CO2 is injected into storage.

*Rd Bateman*



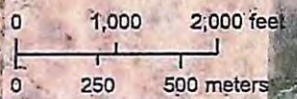
**Receivers**

- Injection Well with Downhole DAS-Capable Fiber
- ⊙ Monitoring Well with Downhole DAS-Capable Fiber
- Flowline with Horizontal DAS-Capable Fiber

**Sources**

- Vibroseis Point

⊞ Half-mile Notification Area



M0767

## RED TRAIL ENERGY CCS PROJECT

# ACTIVITY FAQs

FACT SHEET

INTEGRATED CARBON CAPTURE AND STORAGE FOR NORTH DAKOTA ETHANOL PRODUCTION

## Low-Impact Geophysical Research near Richardton, North Dakota

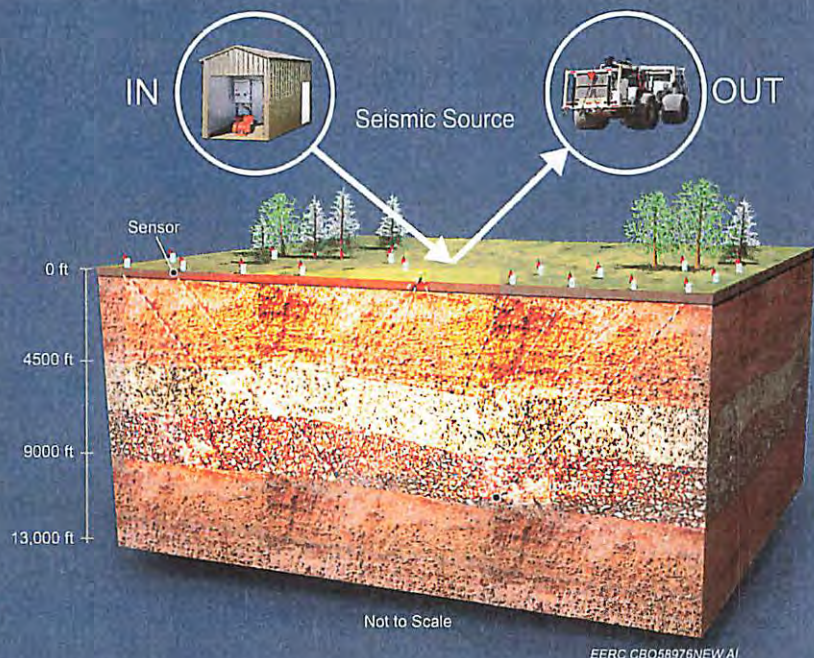
In late 2021, the Energy & Environmental Research Center (EERC) began a new 3-5-year research project around the Red Trail Energy (RTE) site, east of Richardton, North Dakota. The purpose of the project is to explore a lower-cost, less invasive technique that could potentially replace the large-scale geophysical survey carried out near RTE in 2019.

### Benefits to the Community

If the results are as anticipated, the primary benefit to landowners and communities near the site is that the new technique is much less invasive than the large-scale geophysical surveys sourced with vibroseis trucks. In addition, the technique is designed to enhance monitoring of the injected CO<sub>2</sub> because the network of sensors is capable of continuously recording reflected vibrations, which can be collected and analyzed frequently, adding a new element to an already rigorous monitoring system.

### New Versus Old

Rather than driving big vibroseis trucks through fields, this new system uses a stationary device called a surface orbital vibrator (SOV) that can be thought of as working similarly to an out-of-balance washing machine during the spin cycle. The vibrations travel deep into the earth from the SOV and are reflected back to the sensors on the surface. Geophysicists decipher these signals to learn about the subsurface rock layers and track the movement of CO<sub>2</sub> in the subsurface. The research will test whether a small number of sensors installed across the area (known as a sparse geophysical survey) will be adequate to replace the dense network of sensors that accompanies the vibroseis trucks. Although the sensors will be removed after 3 years for this research project, the SOVs and network of sensors would remain in place throughout the operation in an actual deployment.



### Taking to the Skies

Drones were used early in the project to collect aerial images of land use to help establish possible sensor locations for the second phase of the project. All Federal Aviation Administration and state drone operation requirements were followed, some of which include obtaining permission to fly over private land, keeping visual contact (line of sight), yielding to manned aircraft, and not flying over people or moving vehicles. With landowner permission, the field crew accessed private lands on foot within the study area only as needed to maintain visual contact with the drone at all times.

Richardton  
CCS, LLC

## Details for Landowners

Safety and courtesy are top priorities, and the field test is designed to minimize the disturbance to and impact on landowners. Project partner RTE will seek permission to place the sensors in unobtrusive locations that will not interfere with crop production. Field crews will access the sensors several times a year over the course of the 3–5-year project, using vehicles on established roadways and crossing land on foot to retrieve data and charge sensor batteries. If the SOV signals prove inadequate, research may investigate other vibrational sources and will contact any affected landowners separately for permissions related to that activity.

## Autumn 2024 Update

Starting in November 2024, researchers will collect another round of data using the SOVs. With landowner permission, sensors that measure vibrations will be placed within the survey boundary after harvest and picked up in spring 2025 before fieldwork begins.

## How the Research Will Be Conducted

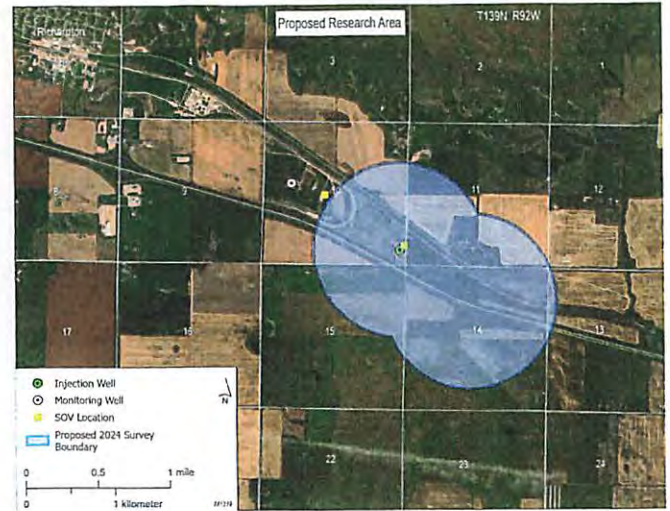
The research is happening in two phases within the same 8-square-mile area investigated as part of the March 2019 geophysical survey.

### Phase 1: Equipment Test

The project began in November 2021 with a 2-week test that determined the setup of the longer Phase 2 activity. SOVs were installed and operated to test a small network of vibration sensors. Researchers used aerial drones to collect the land-use images that guided selection of sensor locations for Phase 2.

### Phase 2: Long-Term Data Collection

The second phase of the project will last about 3 years. The project team will work with landowners to place sensors sparsely and in minimally disruptive locations throughout the study area to record the reflected vibration from daily/weekly SOV operation. Researchers will visit sensor locations throughout this phase at the rate determined during Phase 1 to retrieve data from sensors, charge batteries, and ensure they are still functioning. Sensors will be removed at the end of the study.



*Example of a sensor in position at a similar geophysical survey.*



*One of four sets of SOVs installed near the RTE plant.*

The **Red Trail Energy Carbon Capture and Storage (RTE CCS)** Project is the first integrated CCS system in North Dakota. Ongoing research at the RTE CCS site is led by the Energy & Environmental Research Center at the University of North Dakota, with support from Red Trail Energy and the U.S. Department of Energy. Technical partners in this research include the Plains CO<sub>2</sub> Reduction Partnership Initiative, the Research Institute of Innovative Technology for the Earth, and Class VI Solutions, Inc.

#### For More Information Contact:

EERC, [eercinfo@undeerc.org](mailto:eercinfo@undeerc.org), 701.777.5000

David Burns, CCS Regulatory and Compliance Manager, RTE, [daveb@redtrailenergy.com](mailto:daveb@redtrailenergy.com), 701.974.3308

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

