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/

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 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)

RECEIVED
FEB 19 2025
N.D. INDUSTRIAL COMMISSION

1) a. Company Paragon Geophysical Services	Address 3500 N Rock Road, Bldg 600 Suite B Wichita KS ~~67266~~ 67226	
Contact Aaron Bateman	Telephone (316) 636-5552	Fax (316) 636-5572
Surety Company Arch Insurance	Bond Amount $50,000.00	Bond Number SU1135989
2) a. Subcontractor(s) N/A	Address	Telephone
b. Subcontractor(s) N/A	Address	Telephone
3) Party Manager Jimmy Blackstone	Address (local)	Telephone (local) (806) 471-9340

4) Project Name or Line Numbers
RITE/RTE Monitor 3 VSP

5) Exploration Method (Shot Hole, Non-Explosive, 2D, 3D, Other)
Non Explosive Vibroseis

6) Distance Restrictions (Must check all that apply)

- [x] 300 feet - NonExplosive - Distance setbacks apply to water wells, buildings, underground cisterns, pipelines, and flowing springs.
- [ ] 660 feet - Shot Hole - Distance setbacks apply to water wells, buildings, underground cisterns, pipelines, and flowing springs.

7) Size of Hole 3-D N/A	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 February 24, 2025	Approximate Completion Date March 4, 2025

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

9) Location of Proposed Project - County
Stark

Section(s), Township(s) & Range(s)	Section 4	T. 139	R. 92
	Section 9	T. 139	R. 92
	Section 10	T. 139	R. 92
	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 Ra Bateman	Printed Name Aaron Bateman	Title President

Email Address(es)
abateman@paragongeo.com

(This space for State office use)

Permit No. 97-0344	Approval Date 2/21/2025
Approved by	
Title Mineral Resources Permit Manager	

Permit Conditions

* Permit in hand required at pre-program meeting with field inspector and be aware of all NDIC Rules and Regulations (i.e. distance restrictions).
* See attached letter.

*See Instructions On Reverse Side

Oil and Gas Division

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

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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

Sincerely,

David Burns

David Burns
Regulatory & Compliance Officer
Richardton CCS, LLC

STACY WAGNER
Notary Public
State of North Dakota
My Commission Expires May 20, 2025

Stacy Wagner
May 20, 2025

PARAGON
GEOPHYSICAL SERVICES, INC

Richardton 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 Richardton, North Dakota, beginning February _ –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 Richardton 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.

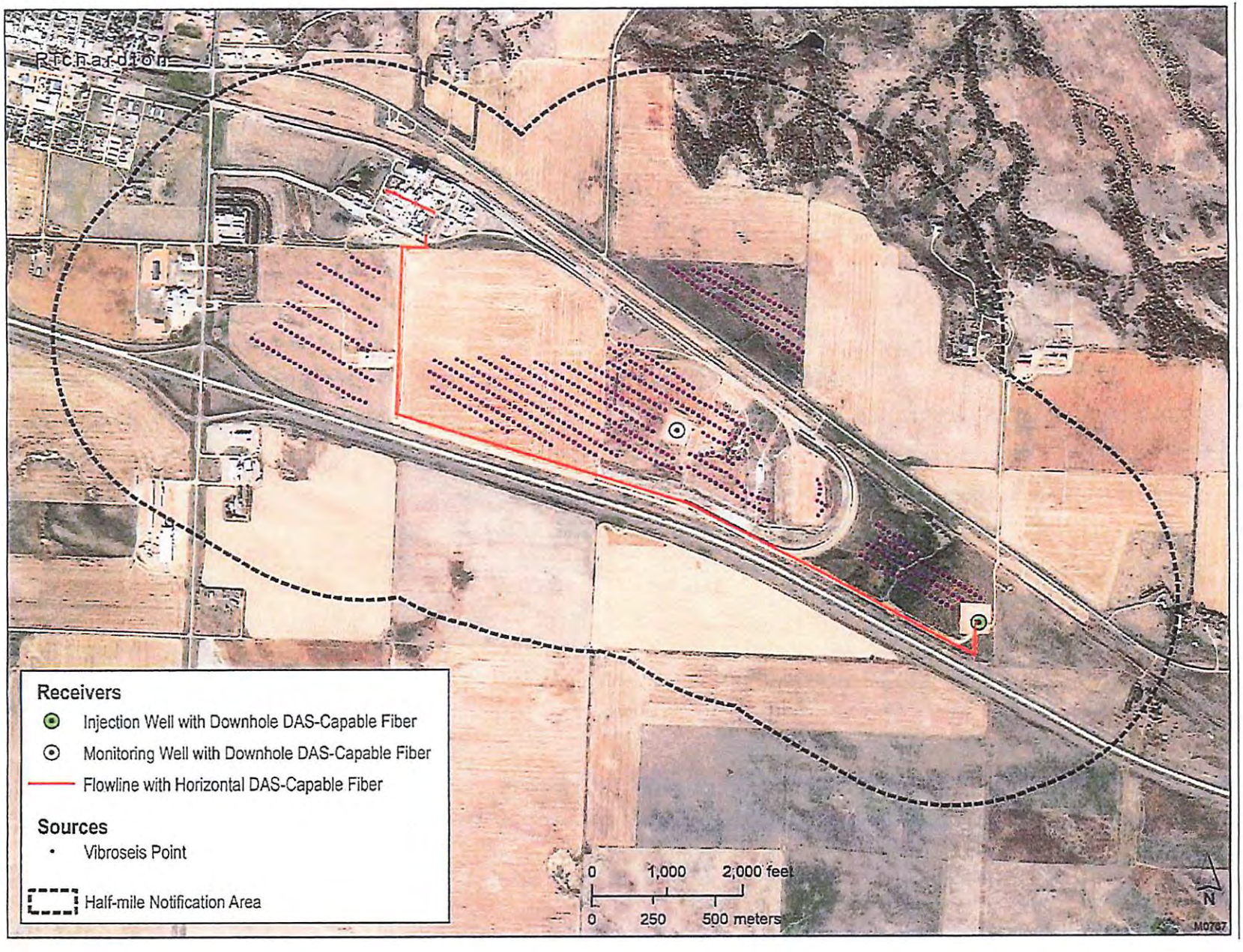
The survey will encompass about 1 square mile of RTE land surrounding the ethanol plant, avoiding railroad and highway rights-of-way. The test involves a network of previously installed sensors and two source trucks (called vibroseis trucks). The survey crew will drive the trucks in parallel lines on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

R a Bateman


Richardton
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
0 1,000 2,000 feet
0 250 500 meters
N
M0787

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

Richardton CCS, LLC

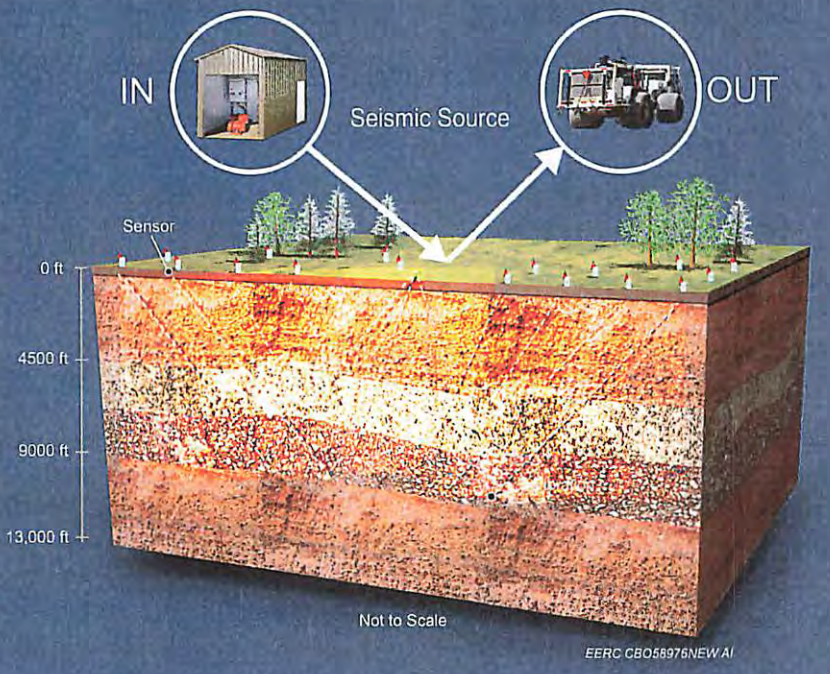
In late 2021, the Energy & Environmental Research Center (EERC) began a new 3–5-year research project around the ~~Red Trail Energy~~ (RTE) site, east of Richardton, North Dakota. The purpose of the project is to explore a lower-cost, less invasive technique that could potentially replace the large-scale 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_2 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_2 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.

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

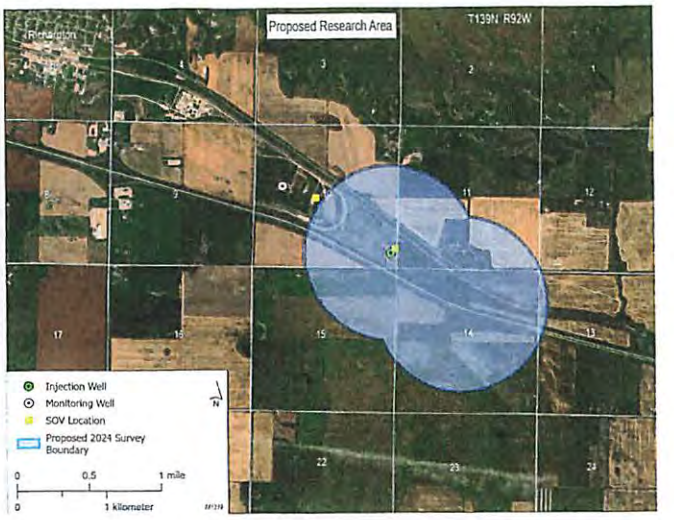
The research is happening in two phases within the same 8-square-mile area investigated as part of the March 2019 geophysical survey.

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_2 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, 701.777.5000

David Burns, CCS Regulatory and Compliance Manager, RTE, daveb@redtrailenergy.com, 701.974.3308

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