

# 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/)

November 13, 2024

Aaron Bateman

President

Paragon Geophysical Services, Inc.

3500 N. Rock Rd., Bldg. 800, Ste B

Wichita, KS 67226

RE:    RED TRAIL ENERGY SASSA  
      GEOPHYSICAL EXPLORATION PERMIT #97-0343  
      STARK COUNTY  
      NON-EXPLOSIVE METHODS

Dear Mr. Bateman:

Be advised that your Geophysical Exploration permit is conditionally approved; effective for one year from November 13, 2024.

## **PERMIT STIPULATIONS:**

- **Paragon 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 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: [torstenson@nd.gov](mailto:torstenson@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 me at 701-328-8020, or Tom Torstenson at the number listed in paragraph 1.

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)



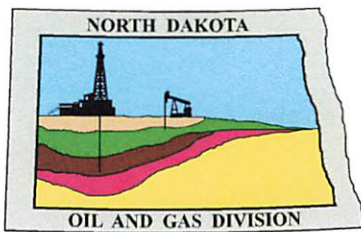
1) a. Company <b>Paragon Geophysical Services INC</b>		Address <b>3500 N Rock Road, Bldg 800 Suite B Wichita, KS 67226</b>			
Contact <b>Aaron Bateman</b>		Telephone <b>(316) 636-5552</b>		Fax <b>(316) 636-5572</b>	
Surety Company <b>Arch Insurance</b>		Bond Amount <b>\$50,000.00</b>		Bond Number <b>SU1135989</b>	
2) a. Subcontractor(s) <b>N/A</b>		Address		Telephone	
b. Subcontractor(s) <b>N/A</b>		Address		Telephone	
3) Party Manager <b>Pat Dooley</b>		Address (local)		Telephone (local) <b>(713) 306-4843</b>	
4) Project Name or Line Numbers <b>Red Trail Energy SASSA</b>					
5) Exploration Method (Shot Hole, Non-Explosive, 2D, 3D, Other) <b>Surface Orbital Vibrator (SOV)</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	Amt of Charge	Depth	Source points per sq. mi.	No. of sq. mi.	
3-D <b>N/A</b>			<b>2</b>	<b>3</b>	
Size of Hole	Amt of Charge	Depth	Source points per ln. mi.	No. of ln. mi.	
2-D <b>N/A</b>					
8) Approximate Start Date <b>October 21, 2024</b>			Approximate Completion Date <b>March 30, 2025</b>		
<b>Nov. 14 2024</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>9,10,11,12,13,14,15</b>	T.	<b>139</b>	R.	<b>92</b>
	Section		T.		R.	
	Section		T.		R.	
	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 <b>October 10, 2024</b>
Signature <i>Aaron Bateman</i>	Printed Name <b>Aaron Bateman</b>	Title <b>President</b>	
Email Address(es) <i>abateman@paragongeo.com</i>			

(This space for State office use)		<p align="center"><b>Permit Conditions</b></p> <ul style="list-style-type: none"> <li>* Permit in hand required at pre-program meeting with field inspector and be aware of all NDIC Rules and Regulations (i.e. distance restrictions).</li> <li>* See attached letter.</li> </ul>
Permit No. <b>97-0343</b>	Approval Date <b>11/13/2024</b>	
Approved by <i>Jodi L. Hill</i>	Title <b>Mineral Resources Permit Manager</b>	



# Oil and Gas Division

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

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

November 13, 2024

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

RE:    Geophysical Exploration  
      Permit #97-0343

Dear Ms. Richard:

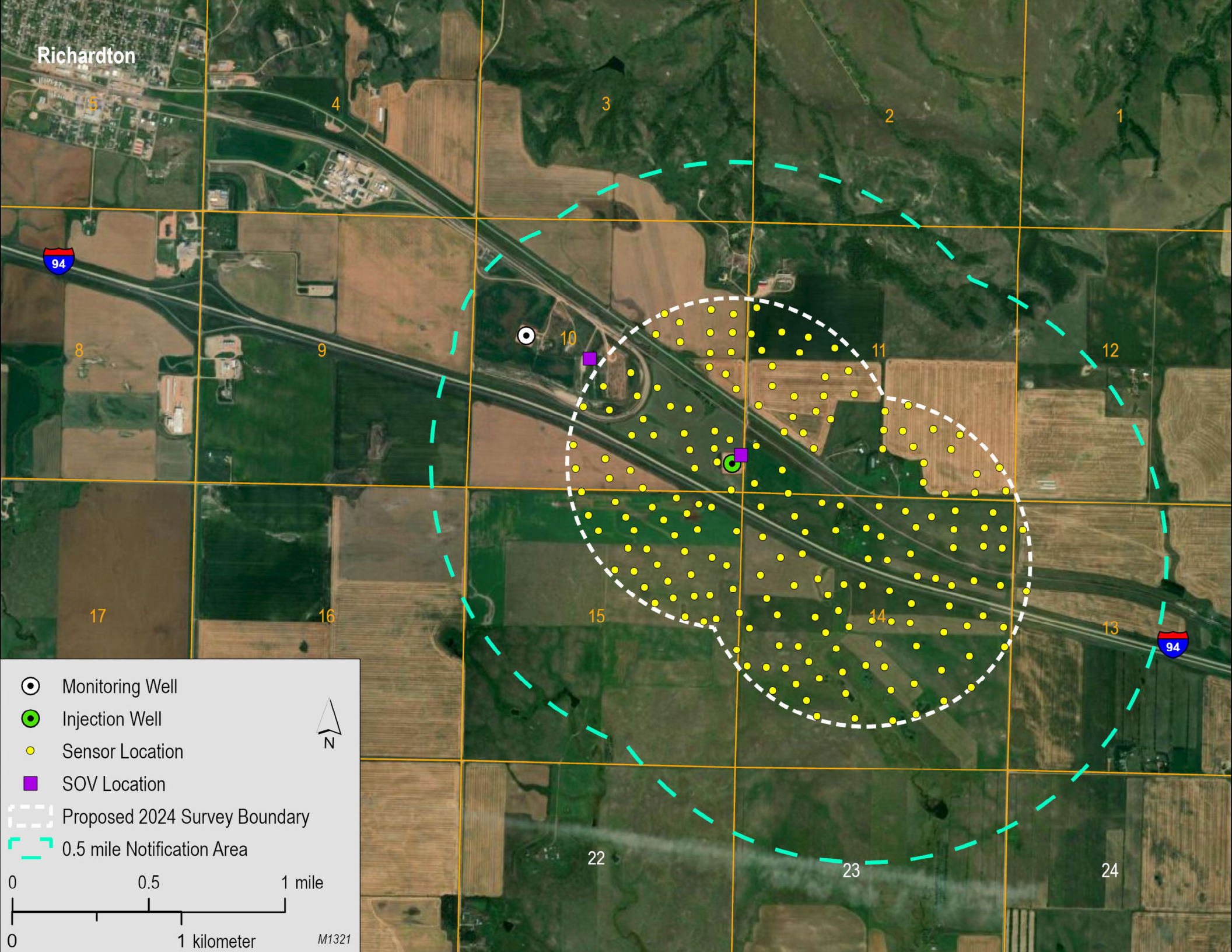
Pursuant to Section 38-08.1-04.2 of the North Dakota Century Code, please be advised that Paragon Geophysical Services, Inc. was issued the above captioned permit on November 13, 2024, and will remain in effect for a period of one year. The entire permit can be viewed on our website at: <https://www.dmr.nd.gov/oilgas/seismic/seismicstats.asp>

Should you have any questions, please contact our office.

Sincerely,

Todd Holweger

Permit Manager/Geophysical Supervisor



Richardton



- Monitoring Well
- Injection Well
- Sensor Location
- SOV Location
- Proposed 2024 Survey Boundary
- 0.5 mile Notification Area



0 0.5 1 mile

0 1 kilometer

M1321



# RED TRAIL ENERGY, LLC

“Our Farms, Our Fuel, Our Future”

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

November 12<sup>th</sup>, 2024

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 Red Trail Energy SASSA seismic project have been notified of the approximate schedule and location of the project and provided a written copy of 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 Mayor Jesse Aman was provided notification of the project.

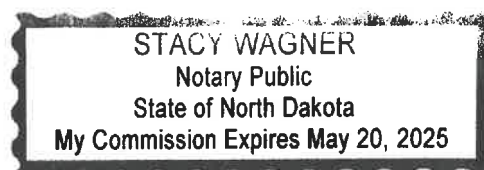
The proposed project will not place sensors on state roadways, railways, and associated rights-of-way.

The project's tentative start date is November 14<sup>th</sup>, 2024. 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 [daveb@redtrailenergy.com](mailto:daveb@redtrailenergy.com)

Sincerely,

David Burns  
Regulatory & Compliance Manager  
Red Trail Energy, LLC



**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

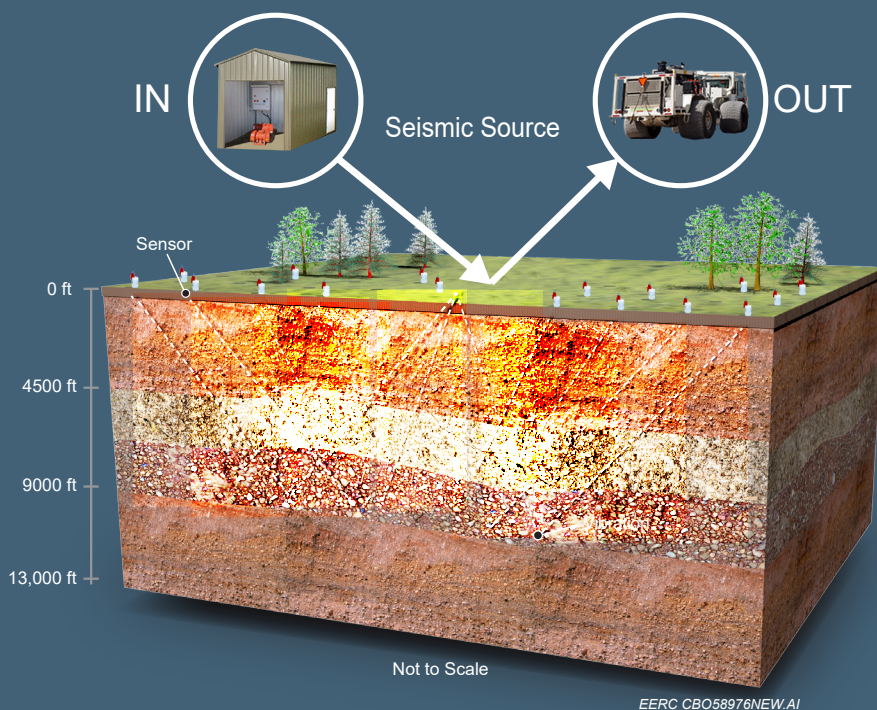
In late 2021, the Energy & Environmental Research Center (EERC) began a new 3–5-year research project around the Red Trail Energy (RTE) site, east of Richardton, North Dakota. The purpose of the project is to explore a lower-cost, less invasive technique that could potentially replace the large-scale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

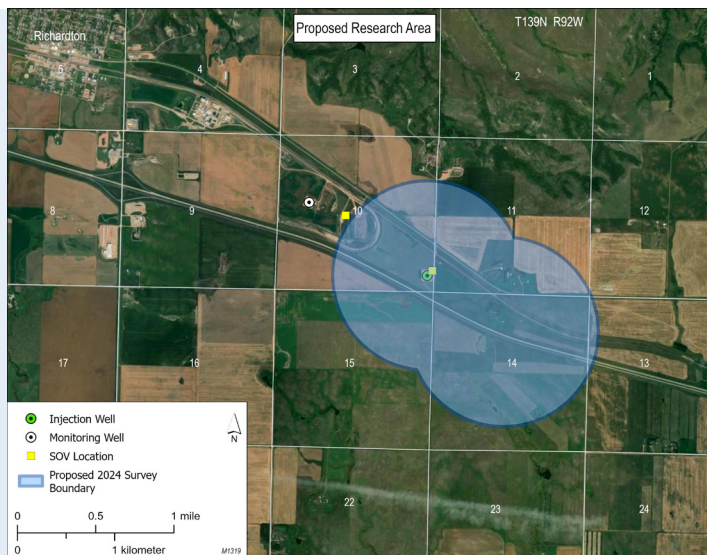
Drones were used early in the project to collect aerial images of land use to help establish possible sensor locations for the second phase of the project. All Federal Aviation Administration and state drone operation requirements were followed, some of which include obtaining permission to fly over 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.

## 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/>

