



**GEOPHYSICAL EXPLORATION COMPLETION REPORT** **RECEIVED**  
**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)

MAY 15 2024

N.D. INDUSTRIAL COMMISSION

Permit No.

**#97-0330**

Shot Hole Operations

**N/A**

\*Non-Explosive Operations

**Vibrosies**

**SECTION 1**

Geophysical Contractor

**Paragon Geophysical Services, Inc.**

Project Name and Number

**Starbuck VSP**

County(s)

**Bottineau**

Township(s)

**161N**

Range(s)

**Range 78 W ,**

Drilling and Plugging Contractors

**N/A**

Date Commenced

**April 28, 2024**

Date Completed

**April 29, 2024**

**SECTION 2**

First S.P. #

**N/A**

Last S.P. #

**N/A**

Loaded Holes (Undetonated Shot Points)

**N/A**

S.P.#s												
Charge Size												
Depth												

Reasons Holes Were Not Shot

**SECTION 3**

Flowing Holes and/or Blowouts

S.P.#s

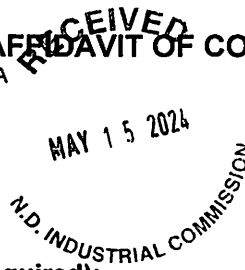
**N/A**

Procedure for Plugging Flowing Holes and/or Blowouts

**N/a**

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).



PERMIT NAME (Required): Starbuck VSP  
PERMIT NUMBER: #97-0330

**AFFIDAVIT OF COMPLETION (GEOPHYSICAL CONTRACTOR)**

STATE OF Kansas )  
 )  
COUNTY OF Sedgwick )

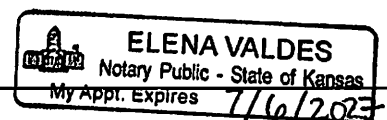
Before me, Elena Valdes, a Notary Public in and for the said  
County and State, this day personally appeared Aaron Bateman  
who being first duly sworn, deposes and says that (s)he is employed by Paragon  
Geophysical Services, Inc., that (s)he has read North Dakota  
Century Code Section 38-08.1, that 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.

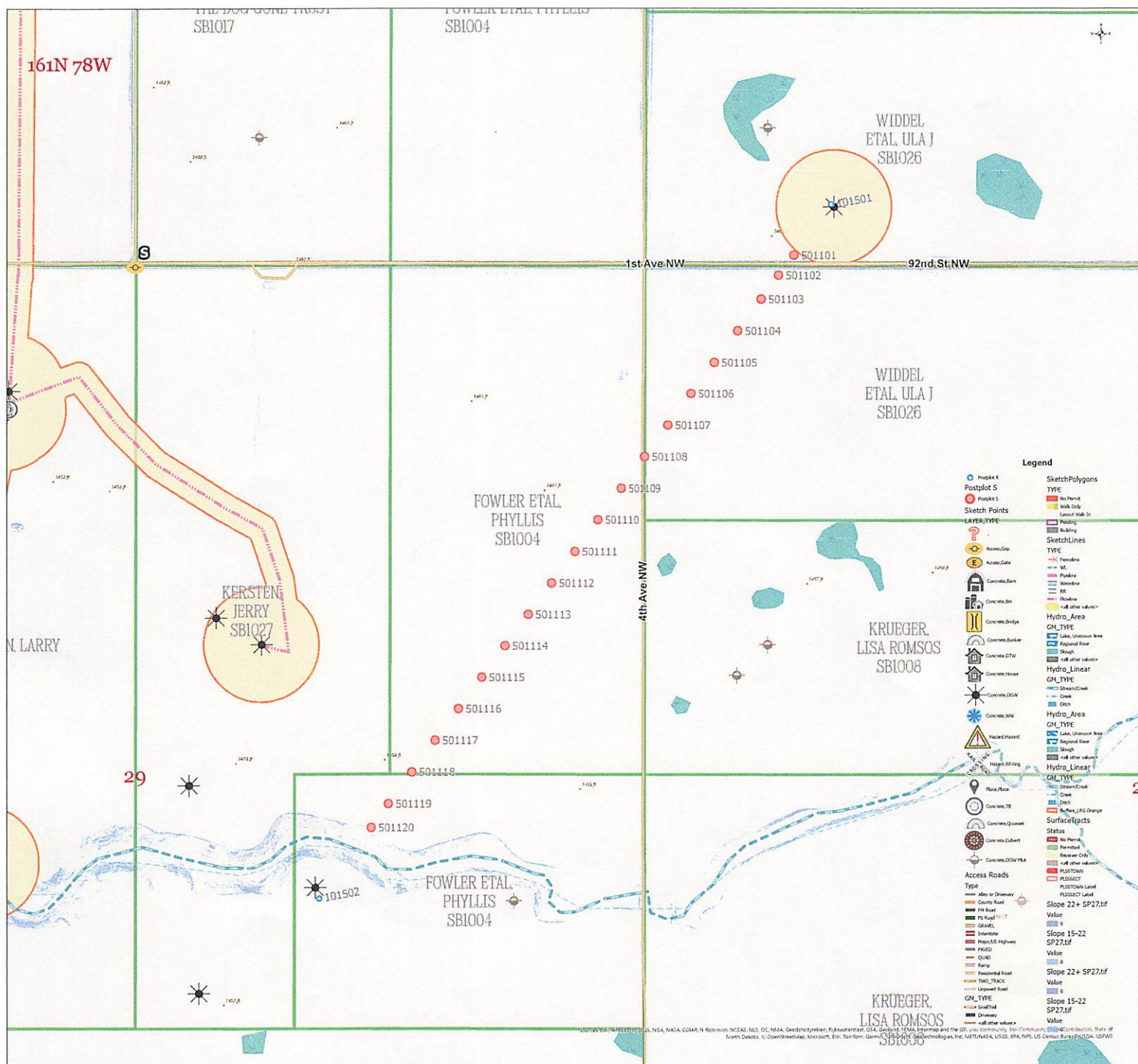
Ra Bateman  
Geophysical Contractor Representative

Subscribed in my presence and sworn before me this 8 day of May, 2024.

Notary Public Elena Valdes

My Commission Expires 7/6/2027





April 15, 2024

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

RE: STARBUCK VSP  
GEOPHYSICAL EXPLORATION PERMIT #97-0330  
BOTTINEAU COUNTY  
NON-EXPLOSIVE METHODS

Dear Mr. Bateman:

Be advised that your Geophysical Exploration permit is conditionally approved; effective for one year from April 15, 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: [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 me at 701-328-8020, or Tom Torstenson at the number listed in paragraph 1.

Sincerely,



Todd L. Holweger  
Permit Manager/Geophysical Supervisor

Received

APR 10 2024

ND Oil & Gas  
Division

## 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 North Rock Road, BLDG 800 Ste 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 <b></b>	
b. Subcontractor(s) <b>N/A</b>		Telephone <b></b>	
3) Party Manager <b>Joe Henry Villarreal</b>		Address (local) <b></b>	
		Telephone (local) <b>316.354.3170</b>	
4) Project Name or Line Numbers <b>Starbuck VSP</b>			
5) Exploration Method (Shot Hole, Non-Explosive, 2D, 3D, Other) <b>Non-Explosive - 2D</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 <b>3-D</b>	Amt of Charge <b>N/A</b>	Depth <b>N/A</b>	Source points per sq. mi. <b></b>
Size of Hole <b>2-D</b>	Amt of Charge <b>N/A</b>	Depth <b>N/A</b>	Source points per sq. mi. <b>20 Total</b>
8) Approximate Start Date <b>Survey April 15, 2024 / Recording April 20, 2024</b>		Approximate Completion Date <b>May 1, 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>Bottineau County</b>			
Section(s), Township(s) & Range(s)	Section <b>21-28-29</b>	T. <b>161</b>	R. <b>78</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>4.9.24</b>
Signature 	Printed Name <b>Bruce A Fulker</b>	Title <b>Authorized Agent For Paragon</b>	
Email Address(es) <b>bfulker@cougarlandservices.net</b>			

(This space for State office use)		<b>Permit Conditions</b>  * 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.
Permit No. <b>97-0330</b>	Approval Date <b>4/15/24</b>	
Approved by 		
Title <b>Mineral Resources Permit Manager</b>		

\*See Instructions On Reverse Side



## AFFIDAVIT OF NOTICE

BEFORE ME, the undersigned authority, personally appeared Bruce A. Fulker of Cougar Land Services, LLC., whose office address is located at 19901 SW Freeway, Suite 102, Sugar Land, TX. 77479 who being duly sworn, upon oath stated and affirmed that as an authorized agent for Paragon Geophysical Services, Inc. all landowners along the proposed Starbuck VSP project and the ½ mile halo area have been notified of the approximate schedule and location of the project and provided a written copy of North Dakota Century Code (NDCC) Section 38-08.1-04.1 (Exploration Permit) and NDCC Chapter 38-11.1 (Oil & Gas Production Damage Compensation).

Executed this 9<sup>th</sup> day of April 2024.

B. A. Fulker

Bruce A. Fulker

STATE OF ARKANSAS)

) ss

COUNTY OF WASHINGTON)

The foregoing instrument was acknowledged signed and subscribed to before me this 9<sup>th</sup> day of April 2024, by Bruce A. Fulker, who represented that he was duly authorized to execute the foregoing instrument for the uses and purposes set forth therein.

WITNESS my hand and official seal.

Michelle Garrett  
Notary Public  
Hot Spring County, Arkansas  
Commission No. 12709460  
COMM. EXP. 12/26/2029

Michelle Garrett  
Name: Michelle Garrett  
Notary Public  
State of Arkansas  
My commission expires: 12-26-2029



North Dakota Industrial Commission  
Department of Mineral Resources  
Oil & Gas Division

FORM GE 1  
FILING AUTHORIZATION

COMPANY NAME: Paragon Geophysical Services, Inc.

ADDRESS: 3500 N Rock Rd. Bldg. 800 Suite B

CITY: Wichita STATE: KS ZIP: 67266

This form authorizes the person(s) listed below to submit a NDIC Geophysical Exploration Permit – Form GE 1 for approval on behalf of the designated company as listed above.

A new authorization will be required if any changes are to be made to the authorized individuals on the form.

The data submitted from the authorized individuals listed below have been checked and conform to the standards and procedures set forth by the NDIC Department of Mineral Resources.

The authorized individual(s) will ensure that the company, as listed above, and party manager receive a copy of the approved Form GE 1

<u>Authorized Individuals</u>	<u>Phone Number</u>	<u>E-Mail Address</u>
Bruce Fulker	713-806-2024	bfulker@cougarlandservices.net

Company Authorized Signature: Aaron Bateman Date: 01/19/2023

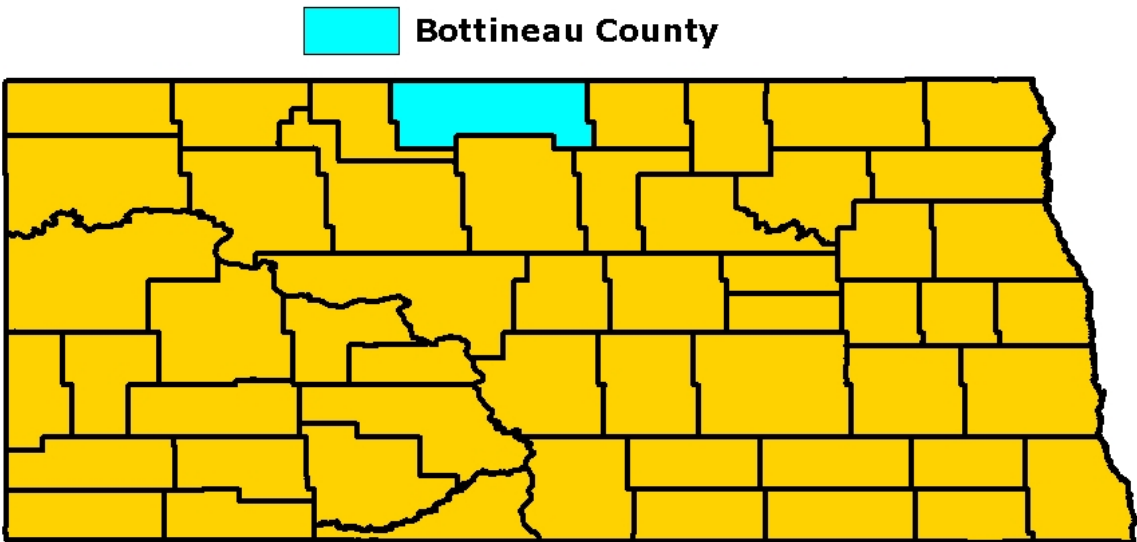
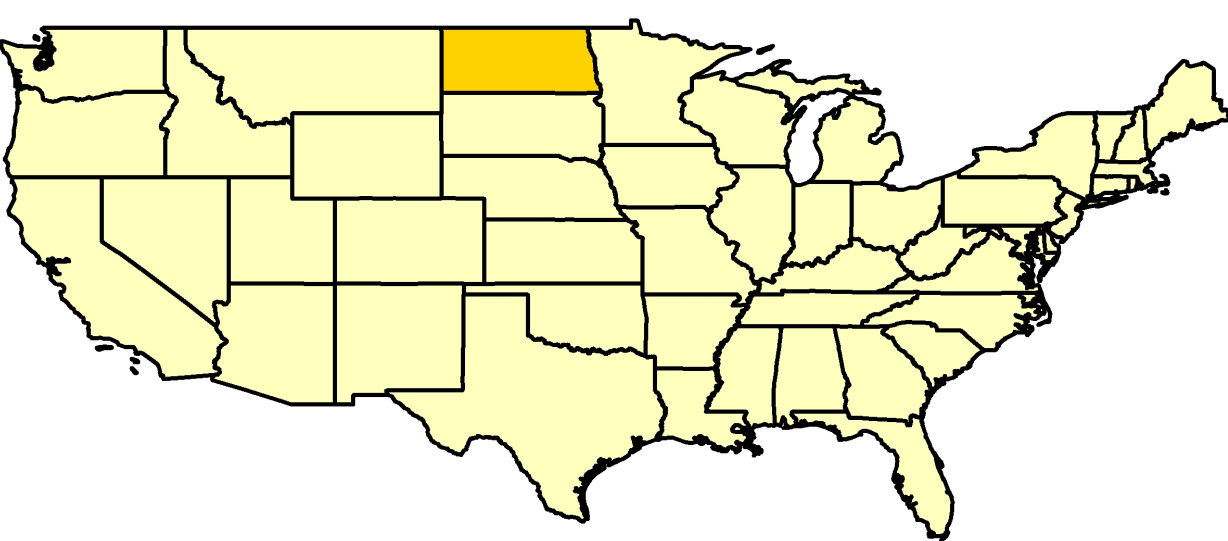
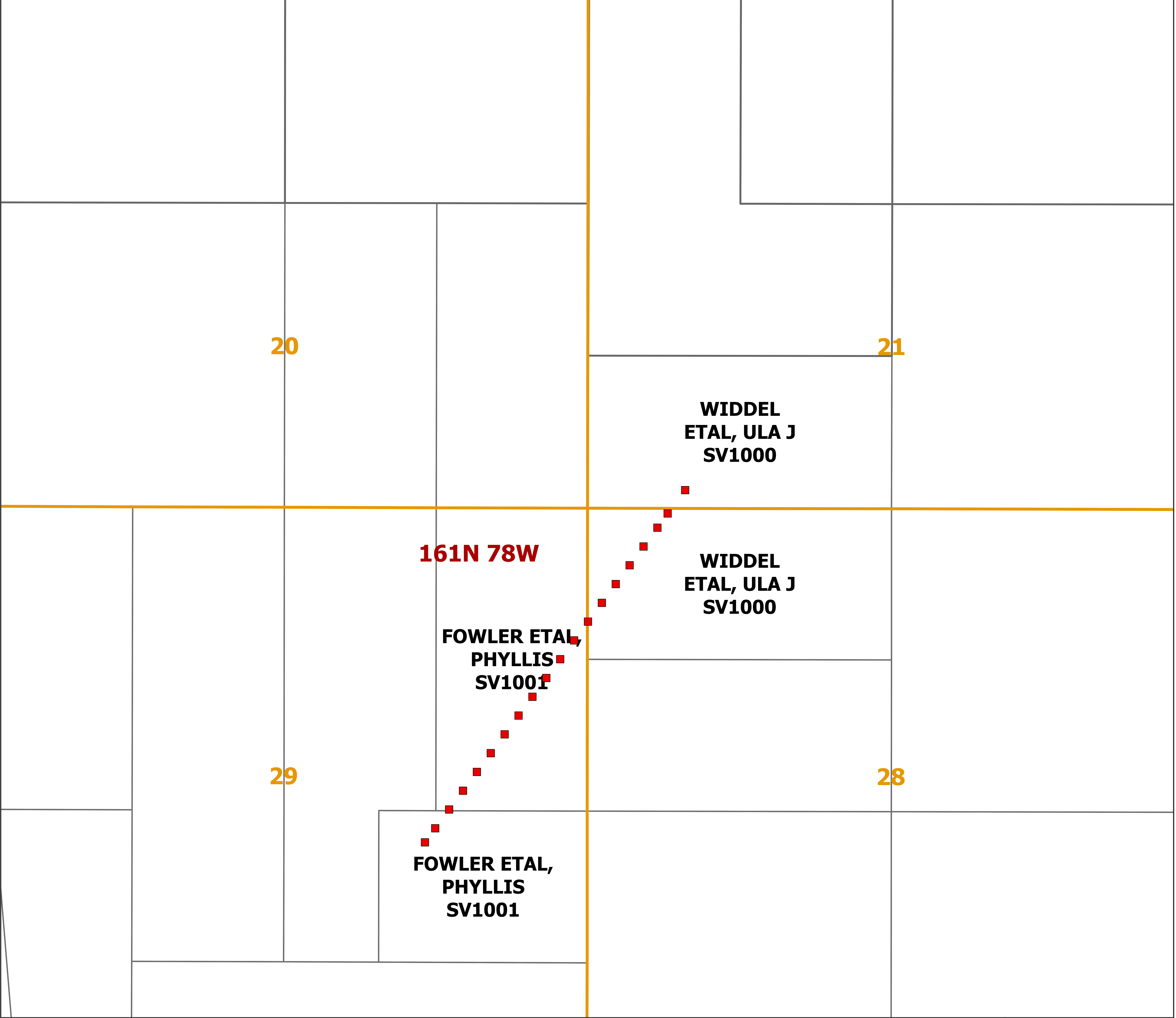
Printed Name: Aaron Bateman Title: President

Phone: 316-636-552 Email Address: abateman@paragongeo.com

Witness Signature: Erick Erwin Date: 1-19-23

Witness Printed Name: Erick Erwin





# Starbuck VSP

## Surface Map

April 08, 2024

Legend

•

Source

•

Receivers

—

Railroad

—

Roads

—

County Line

Townships

Sections

Permitted

No Permit

Problem Permit

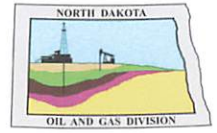


State Plane  
North Dakota North  
NAD 27  
Scale 1:3,000

Area Of Interest

0.72 Linear Miles  
Bottineau County  
North Dakota

This map has been carefully prepared from official records, maps, engineering data, photographs and/or other information, which is provided as a courtesy only. We make no warranties as to its completeness or accuracy, whether expressed or implied.



April 15, 2024

The Honorable Emily Deschamp  
Bottineau County Auditor  
314 W. 5<sup>th</sup> St. Ste 10  
Bottineau, ND 58318-1268

RE: Geophysical Exploration  
Permit #97-0330

Dear Ms. Deschamp:

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 April 15, 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,

A handwritten signature in blue ink, appearing to read "Todd L. Hokweger".

Todd L. Hokweger  
Permit Manager/Geophysical Supervisor

# "Slimhole" BSR Array System

## Miniaturized Multi-component Borehole Sonde String



### Digital Module Features:

- Slimhole BSR Array: **B**orehole **S**eismic **R**eceiver Array
- 24-Bit x 4-Channel Digitizer in each Shuttle
- Ultra Low Noise Digitizer enables recording of low amplitude microseismic events, 3D-VSP, Crosswell Seismic Imaging, etc
- Slim-hole sonde 1.6 inch OD (<41 mm)
- 3C Sensor Packages available: 3C Tri-axis Orthogonal Geophone
- OMNI-2400 High-output Geophone Sensors
- Machined stainless housing minimizes mechanical resonance for high resolution, high frequency recording
- Direct connection sub-arrays, armored Wireline, or Rigid Interconnects available with high-pressure multi-conductor booted connectors.
- Flexible or rigid interconnects may be connected "back-to-back" to form longer intervals
- Maximum Distance between sonde modules is 100 meters
- Maximum Temperature Rating 150 °C
- Maximum Pressure Rating 20,000 psi
- *Configurations for vertical, deviated, horizontal wellbore deployments*
- *Adaptable housing for user defined, application specific coupling devices*



# "Slimhole" BSR Array System

## Miniaturized Multi-component Borehole Sonde String

### MECHANICAL SPECIFICATIONS:

Outside Diameter	1.6 in	(<40.64 mm)		
Length	16 in	(406.4 mm)		
Tool Weight	5 lbs	(2.27kg)		
Anchoring System	Mechanical on each shuttle (bow spring/magnetic)	Tubing mandrel	Permanent (cemented)	
Anchor-to-Weight Ratio	7:1 (passive spring)			
Tool Anchoring Range	Custom adapters for dimension ranges	Sizes available upon request		
Points of Contact	5 points , including opposing clamp axis			
Sensor Package	3C w/ OMNI-2400, mutually orthogonal sensor set standard 2.26 Volts/Inch/Second Sensitivity			
Interconnect Options	Rigid Tubing	Flexible Armored Wireline Cable		
Standard Lengths	3, 6, 9 meters	9, 12, 15, 20 meters		
	Custom lengths up to 100 meters available upon request			
Maximum Temperature	150 °C			
Maximum Pressure	20,000 psi			

### Digital Module 4-CH x 24-Bit Digitizer SPECIFICATIONS:

Sampling Rates	1/4, 1/2 , 1, 2, and 4 ms				
Pre-amplifier Gains	<u>0 dB</u>	<u>8 dB</u>	<u>19 dB</u>	<u>31 dB</u>	<u>42 dB</u>
Equivalent Input Noise @ 2 ms	1.830µV rms	0.774 µV rms	0.304 µV rms	0.202 µV rms	0.202 µV rms
Maximum Input Signal	1.590 Vrms	0.635 Vrms	0.187 Vrms	0.045 Vrms	0.012 Vrms
Gain Accuracy	< 1%				
Frequency Response	3 to 1.6 KHz				
Anti-alias filter	80% Nyquist				
Instantaneous Dynamic Range @2ms	119 dB				
Cross-feed Isolation	>90 dB				
THD	0.0018%				
System Timing Accuracy	Better Than 1 PPM				

Note: All specifications subject to change  
at sole discretion of OYO Geospace



OYO GEOSPACE ♦ 7007 Pinemont ♦ Houston, Texas, 77040 U.S.A. ♦ [www.oyogeospace.com](http://www.oyogeospace.com)  
Tel: 713 986-4444 ♦ Fax: 713 986-4445

**GEOSPACE**  
TECHNOLOGIES

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ENGINEERING RESOURCES INTERNATIONAL

**GEOSPACE**  
OFFSHORE

**OYO** INSTRUMENTS, LP

#### Regional Offices

OYO Geospace Canada, Inc.  
2735-37 Avenue N.E.  
Calgary, Alberta, Canada T1Y 5R8  
403 250-9600

OYO Geo-Impulse International LLC  
Kirovogradskaya, 36  
Ufa, Baskortostan, Russia 450001  
011 (7) 3472 25 39 73

OYO Geospace China  
Room 700, 7th Floor, Lido Office Tower, Lido Place  
Jichang Road, Jiang Tai Road, Beijing, 100004, P.R.China  
011 (86) 10 643 78 758

OYO Instruments, Europe Ltd.  
F3 Bramingham Business Park, Enterprise Way, Luton  
Bedfordshire LU3 4BU, England  
011 44 (0) 1582 573 980



RE: Starbuck VSP Form GE1



Bruce Fulker <bfulker@cougarlandserv

To: Holweger, Todd L.

Cc: Aaron Bateman

Reply Reply All Forward

Wed 4/10/2024 9:43 AM

\*\*\*\*\* CAUTION: This email originated from an outside source. Do not click links or open attachments unless you know they are safe. \*\*\*\*\*

Todd: The primary goal for these surveys is to collect accurate time-depth information and to extract attributes to characterize the subsurface such as seismic velocities.

Bruce Fulker

President

Cougar Land Services, LLC

19001 Southwest Freeway | Suite 102 | Sugar Land, TX 77479

Office: (281) 242-2244 | Cell: (713) 806-2024

Mailing Address

Cougar Land Services, LLC.

PO Box 17447

Sugar Land, TX 77496-7447

Email: bfulker@cougarlandservices.net

Web: www.cougarlandservices.net



RE: Starbuck VSP Form GE1



Bruce Fulker <bfulker@cougarlandservice

To: Holweger, Todd L.

Cc: Aaron Bateman

Reply

From: Holweger, Todd L. <tholweger@nd.gov>

Sent: Tuesday, April 9, 2024 5:56 PM

To: Bruce Fulker <bfulker@cougarlandservices.net>

Cc: Aaron Bateman <abateman@paragongeo.com>

Subject: RE: Starbuck VSP Form GE1

Bruce,

What is the primary information goal in running the VSP on the SMU 14-21 and Eagle 29?

Thank you,

Todd L. Holweger

Permit Manager/Geophysical Supervisor, Oil & Gas Division

701.328.8024 (o) • tholweger@nd.gov • <https://www.dmr.nd.gov/oilgas/>

NORTH  
**Dakota** | Mineral Resources  
Be Legendary.™

file # 16897 file # 40449