



# 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)

Permit No. <b>97-0278</b>	
Shot Hole Operations	*Non-Explosive Operations <b>Non-Explosive</b>

## SECTION 1

Geophysical Contractor	
Project Name and Number	County(s) <b>McKENZIE</b>
Township(s) <b>1S2N</b>	Range(s) <b>95W</b>
Drilling and Plugging Contractors	
Date Commenced <b>5-1-2017</b>	Date Completed <b>5-9-2017</b>

## SECTION 2

First S.P. #	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
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)

PERMIT NAME (Required): Hess RS Nelson Farms  
 PERMIT NUMBER: 97-0278

**AFFIDAVIT OF COMPLETION (GEOPHYSICAL CONTRACTOR)**

STATE OF Colorado )  
 )  
 COUNTY OF Denver )

Before me, PAMELA M JOHNSON, a Notary Public in and for the said  
 County and State, this day personally appeared PRICE STARK

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

Price Stark  
 Geophysical Contractor Representative

Subscribed in my presence and sworn before me this 15th day of May, 2017.

**PAMELA M. JOHNSON**  
 NOTARY PUBLIC  
 STATE OF COLORADO  
 NOTARY ID 19874101186  
 MY COMMISSION EXPIRES MAY 01, 2018

Notary Public Pamela M Johnson

My Commission Expires May 01, 2018

## Holweger, Todd L.

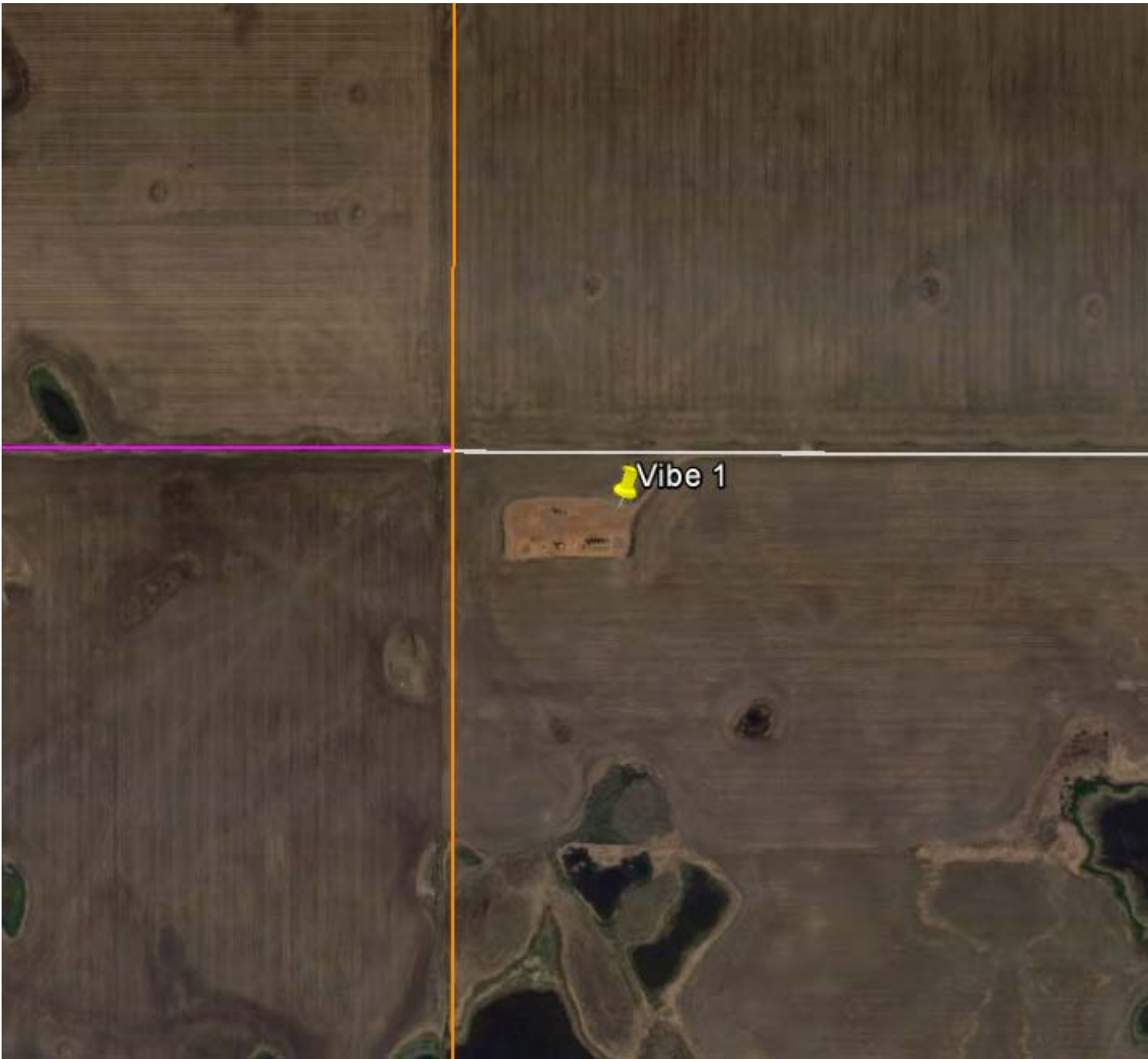
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**From:** Price Stark <Price.Stark@halliburton.com>  
**Sent:** Monday, May 15, 2017 2:19 PM  
**To:** Holweger, Todd L.  
**Subject:** Hess RS Nelson Farm 97-0278  
**Attachments:** NDIC GE6A and GE6B.pdf; Hess RS Nelson Farms Vibe Locations.kmz

Todd,

Attached are the GE 6A and GE 6B forms as well as a KMZ map file with the actual vibe locations from the field. Images below as well. Let me know if there is anything else to close out this permit.

Vibe 1



Vibe 2



Vibe 3



Vibe 4

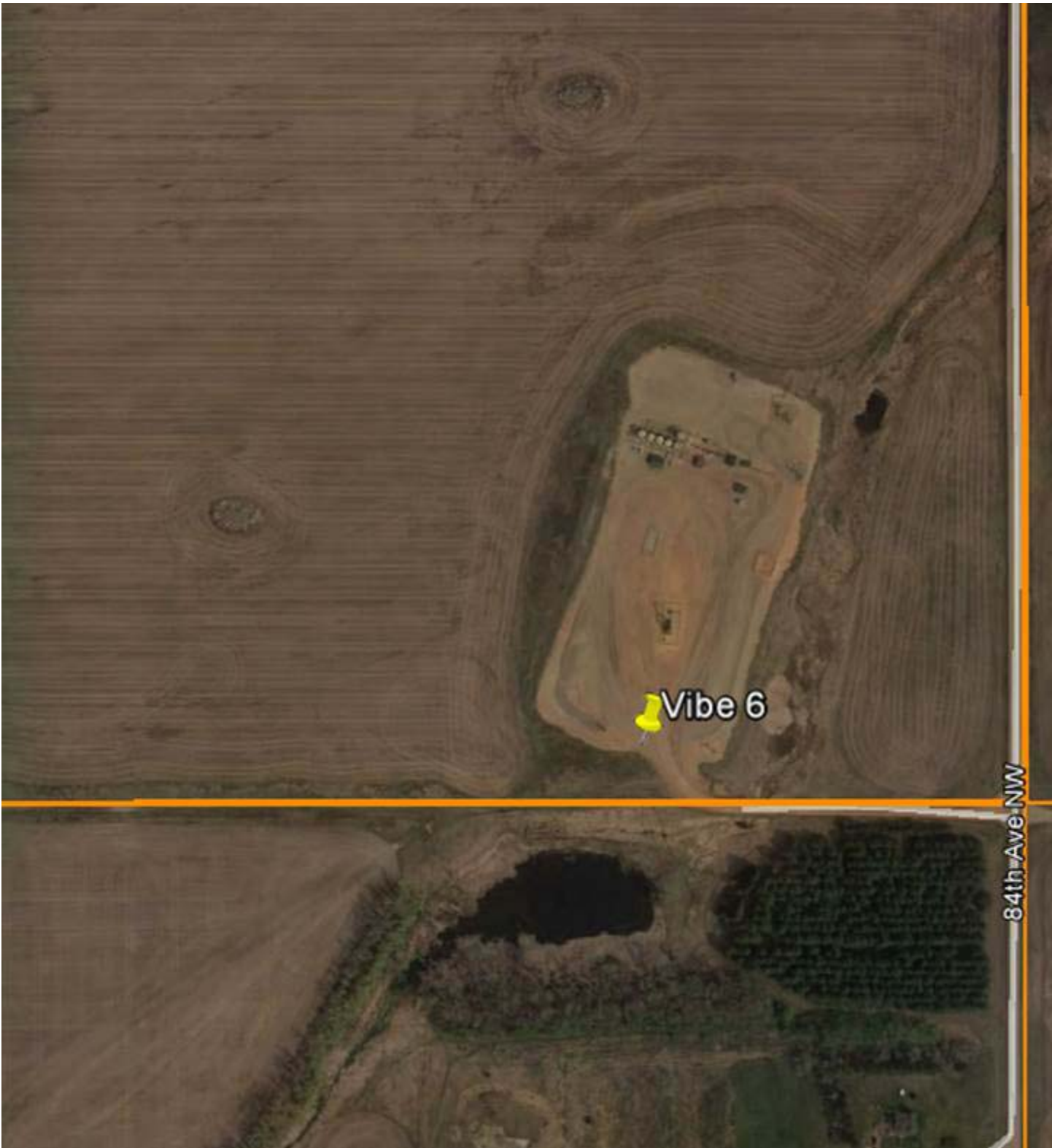


Vibe 5



Vibe 6





Sincerely,  
Price

---

## Price Stark

Sr. Business Development  
Pinnacle

1125 17th Street Suite 1900  
Denver, CO 80202-2016

Email: [price.stark@halliburton.com](mailto:price.stark@halliburton.com)

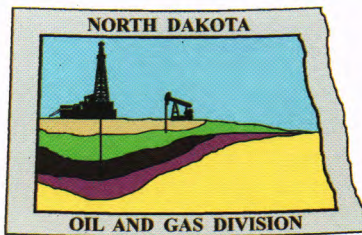
Office: +1 303-899-4676

Mobile: +1 303-579-2088

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**HALLIBURTON**



# Oil and Gas Division

Lynn D. Helms - Director      Bruce E. Hicks - Assistant Director

**Department of Mineral Resources**

Lynn D. Helms - Director

**North Dakota Industrial Commission**

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

April 27, 2017

Mr. Price Stark  
Sr. Business Development Manager  
Halliburton Energy Services  
1125 17<sup>th</sup> Street, Suite 1900  
Denver, CO 80202

RE: HESS RS-NELSON FARMS  
GEOPHYSICAL EXPLORATION PERMIT #97-0278  
MOUNTRAIL COUNTY  
NON EXPLOSIVE METHOD

Dear Mr. Stark:

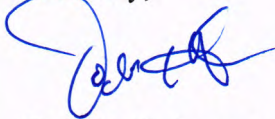
Please be advised that we are in receipt of your Geophysical Exploration permit application and it is conditionally approved; effective for one year from April 27, 2017. **PURSUANT TO NDAC 43-02-12-05 (DISTANCE RESTRICTION) non-explosive exploration method may not be conducted not less than 300 feet from a water well, building, underground cistern, pipelines, and flowing spring. 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. A pre-program meeting with state seismic inspector Tom Torstenson is required. You must contact him at 701-290-1546 (cell) or 701-227-7436 at least 24 hours prior to any exploration operations. Also, a copy of the entire permit is required for all contractors at the pre-program meeting.
2. 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.
3. 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,
  - e. Affidavit stating that the Geophysical Company has given all surface owner's a copy of the Section and Chapter of the NDCC as stated in paragraph 4. **(Received 4/27/2017)**
4. It is required that 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 of the land on which geophysical exploration activities are to be conducted a written copy of NDCC Section 38-08.1-04.1 (Exploration Permit) and NDCC Chapter 38-11.1 (Oil and Gas Production Damage Compensation). The permitting agent shall file an affidavit with this office confirming compliance with such notification. For your convenience, a copy of both Sections are enclosed. **(Received 4/27/2017)**
  5. 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.
  6. 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/>
  7. 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  
DMR Permit Manager

Received

APR 25 2017

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>Halliburton</b>		Address <b>1125 17th Street, Suite 1900 Denver CO 80202</b>			
Contact <b>Price Stark</b>		Telephone <b>(303) 579-2088</b>		Fax <b>(303) 573-7856</b>	
Surety Company <b>Westchester Fire Insurance Company</b>		Bond Amount <b>25,000</b>		Bond Number <b>K08358977</b>	
2) a. Subcontractor(s)		Address		Telephone	
b. Subcontractor(s)		Address		Telephone	
3) Party Manager <b>James White</b>		Address (local) <b>1125 17th Street, Suite 1900 Denver</b>		Telephone (local) <b>(303) 571-2088</b>	
4) Project Name or Line Numbers					
5) Exploration Method (Shot Hole, Non-Explosive, 2D, 3D, Other) <b>Hess RS-Nelson Farms</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					
Size of Hole	Amt of Charge	Depth	Source points <del>per sq. mi.</del>	No. of ln. mi.	
2-D			6		
8) Approximate Start Date <b>May 2, 2017</b>			Approximate Completion Date <b>May 16, 2017</b>		

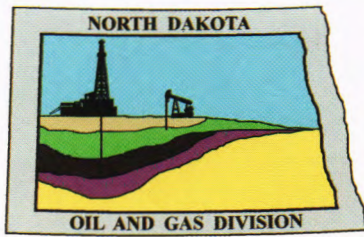
THE COMMISSION MUST BE NOTIFIED AT LEAST 24 HOURS IN ADVANCE OF COMMENCEMENT OF GEOPHYSICAL OPERATIONS

9) Location of Proposed Project - County <b>Mountrail County</b>						
Section(s), Township(s) & Range(s)	Section	<b>19</b>	T.	<b>156N</b>	R.	<b>91W</b>
	Section	<b>11</b>	T.	<b>156N</b>	R.	<b>92W</b>
	Section	<b>14</b>	T.	<b>156N</b>	R.	<b>92W</b>
	Section	<b>26</b>	T.	<b>156N</b>	R.	<b>92W</b>
	Section	<b>35</b>	T.	<b>156N</b>	R.	<b>92W</b>
	Section	<b>36</b>	T.	<b>156N</b>	R.	<b>92W</b>

I hereby swear or affirm that the information provided is true, complete and correct as determined from all available records.			Date <b>April 19, 2017</b>
Signature <i>Price Stark</i>	Printed Name <b>Price Stark</b>	Title <b>Sr. Business Development Manager</b>	
Email Address(es) <b>price.stark@halliburton.com</b>			

(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>970278</b>	Approval Date <b>4/27/17</b>	
Approved by <i>Tom [Signature]</i>	Title <b>Mineral Resources Permit Manager</b>	

\*See Instructions On Reverse Side



# Oil and Gas Division

Lynn D. Helms - Director      Bruce E. Hicks - Assistant Director

**Department of Mineral Resources**

Lynn D. Helms - Director

**North Dakota Industrial Commission**

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

April 27, 2017

The Honorable Stephanie Pappa  
Mountrail County Auditor  
P.O. Box 69  
Stanley, ND 58784-0069

RE:    Geophysical Exploration  
      Permit #97-0278

Dear Ms. Pappa:

Pursuant to Section 38-08.1-04.2 of the North Dakota Century Code, please be advised that Halliburton Energy Services was issued the above captioned permit on April 27, 2017 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 L. Holweger  
DMR Permit manager



Hess Bakken Investments II, LLC  
1501 McKinney Street  
Houston, TX 77010

April 24, 2017

North Dakota Industrial Commission  
Oil and Gas Division  
600 East Boulevard Dept. 405  
Bismark, North Dakota 58505-0840  
Attn: Todd L. Holweger

Ref: Distance Restriction Variance  
Hess Nelson Farms Microseismic  
Mountrail County, North Dakota

Dear Mr. Holweger;

As part of the microseismic data collection to be done at Hess' operated Ross Laydown Yard location in April of 2017, a vib truck will be used to assist with the orientation of the downhole geophones. Per NDIC rule 43-02-12-05. Distance restrictions, a non-explosive vib location must remain greater than 300 feet from existing infrastructure. This letter is intended to provide notice that Hess Bakken Investments II, LLC hereby gives Halliburton Company a variance to the 300 foot distance allowing them to be less than 300 feet from Hess' existing infrastructure.

Please accept this letter in compliance to NDIC rule 43-02-12-05 mentioned above.



*Christina M. Wallace*

**43-02-12-05. Distance restrictions –**

Shot hole operations - Nonexplosive methods.

Seismic shot hole operations may not be conducted less than six hundred sixty feet [201.17 meters] from water wells, buildings, underground cisterns, pipelines, and flowing springs.

Nonexplosive exploration methods may not be conducted less than three hundred feet [91.44 meters] from water wells, buildings, underground cisterns, pipelines, and flowing springs.

Variances may be granted to this section by written agreement between the permitholder and the owner of the subject property and must be available to the director upon request. History: Effective December 1, 1997; amended effective September 1, 2000; May 1, 2004. General Authority: NDCC 38-08.1 Law Implemented: NDCC 38-08.1-08 43-02-12-06. Notification of work



Hess Bakken Investments II, LLC  
1501 McKinney Street  
Houston, TX 77010

April 24, 2017

North Dakota Industrial Commission  
Oil and Gas Division  
600 East Boulevard Dept. 405  
Bismark, North Dakota 58505-0840  
Attn: Todd L. Holweger

Ref: Distance Restriction Variance  
Hess Nelson Farms Microseismic  
Mountrail County, North Dakota

Dear Mr. Holweger;

As part of the microseismic data collection to be done at Hess' operated RS-Nelson Farms 11-19 location in April of 2017, a vib truck will be used to assist with the orientation of the downhole geophones. Per NDIC rule 43-02-12-05. Distance restrictions, a non-explosive vib location must remain greater than 300 feet from existing infrastructure. This letter is intended to provide notice that Hess Bakken Investments II, LLC hereby gives Halliburton Company a variance to the 300 foot distance allowing them to be less than 300 feet from Hess' existing infrastructure.

Please accept this letter in compliance to NDIC rule 43-02-12-05 mentioned above.



*Christina M. Wallace*

**43-02-12-05. Distance restrictions –**

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# HALLIBURTON

1125 17th Street, Suite 1900  
Denver, CO 80202  
Direct: 303-899-4700 • Fax: 720-904-0222

April 24, 2017

Todd L Holweger  
Oil & Gas Division  
North Dakota Industrial Commission  
600 East Boulevard Dept. 405  
Bismarck, ND 58505-0840

Dear Mr Holweger:

The intent of this letter is to notify you that Halliburton Energy Services has done its due diligence and provided the operator of the land and each landowner within one-half mile of the land on which geophysical exploration activities will be conducted a written copy of NDCC Section 38-08.1-04.1 (Exploration Permit) and NDCC Chapter 38-11.1 (Oil and Gas Production Damage Compensation).

Please accept this letter as compliance.

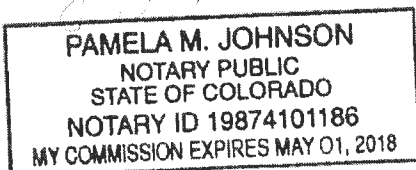
Sincerely,



Price Stark  
Sr. Business Development

*State of Colorado  
County of Denver*

*The foregoing was acknowledged before me this 24th day of April, 2017, by Price Stark.*



*Pamela M. Johnson  
Notary Public*

# Hess RS-Nelson Farms Vibe Orientation

Operation Description

## **Table of Contents**

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# Vibe Orientation

## Operational Description

Todd Holweger  
NDIC  
tholweger@nd.gov

---

## Description

Pinnacle will be performing a series of geophysical exploration services for the upcoming treatment of the Hess RS-Nelson Farms No. 156-92-24V-1 vertical well in McKenzie County, ND (S24, T156N, R92W). The expected timeframe for this operation is May 4th through 18<sup>th</sup> 2017.

Microseismic mapping of the RS-Nelson Farms lateral wells will start with the hydraulic fracture treatment of the RS-Nelson Farms wells, currently anticipated to begin February 16<sup>th</sup>. Details about the deployment of the microseismic geophones are provided in **Downhole Microseismic**.

A single downhole array will be used to map the upcoming hydraulic fracture treatment of the Hess RS-Nelson Farms pad. We plan to measure the hydraulic fracture treatment using microseismic monitoring in order to determine fracture geometry and treatment extent. In order to calibrate the orientation of our downhole geophones we will perform a series of vibroseis sweeps at two known surface locations. A map view of the project pad, wells, and vibe locations is provided in **Figure 1**.

## Price Stark

*Senior Business Development*

*Halliburton*

*1125 17<sup>th</sup> Street, Suite 1900*

*Denver CO, 80202*

*Mobile: 303-579-2088*

*price.stark@halliburton.com*

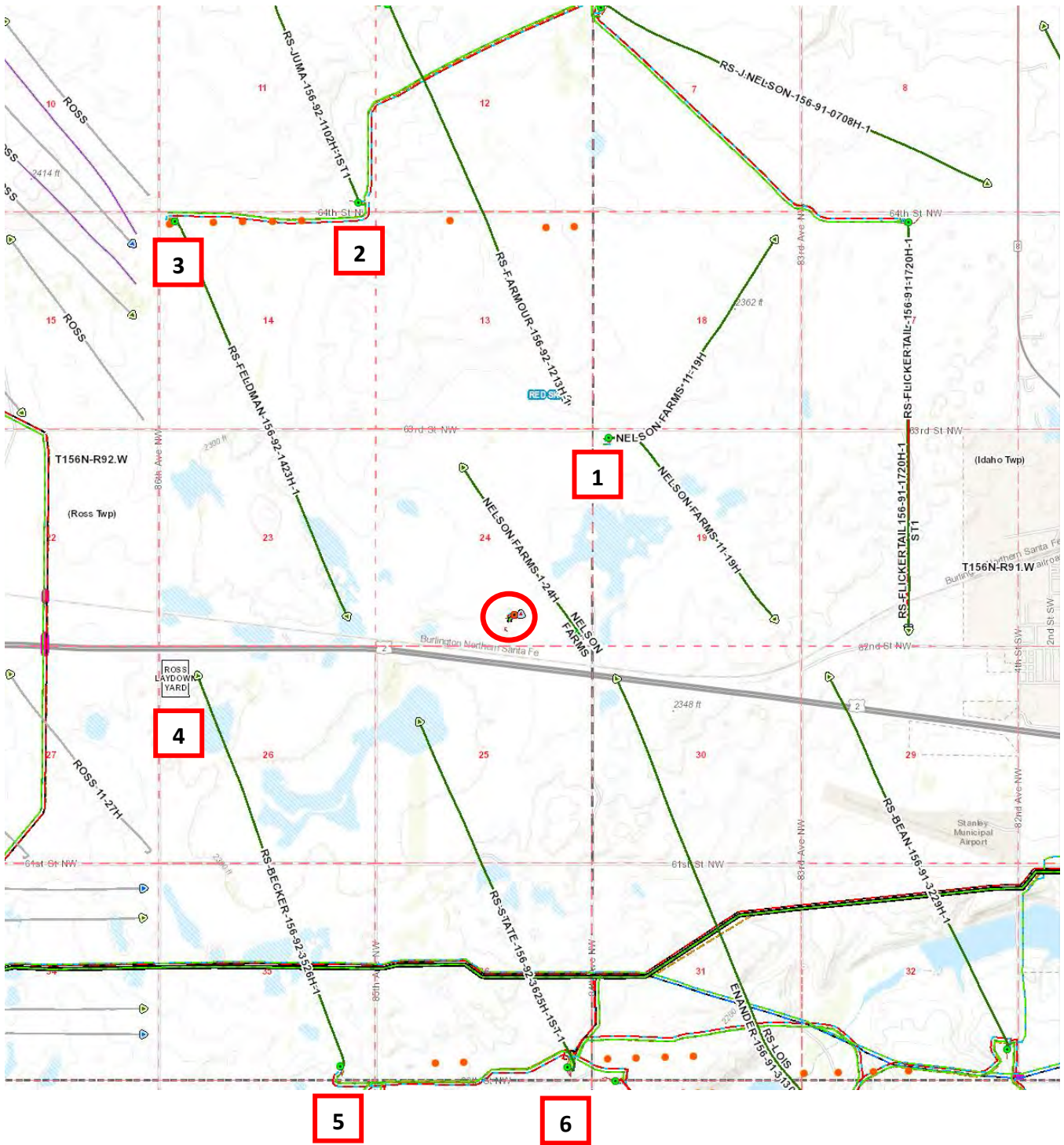


Figure 1. Hess Corporation RS-Nelson Farms Pad and Vibe Locations



**Figure 2.** Hess Corporation RS-Nelson Farms Pad and Vibe Locations

### **Downhole Microseismic**

#### **Deployment**

Halliburton will deploy a geophone toolstring in the RS-Nelson Farms No. 156-92-24V-2 vertical observation well from a surface wireline logging unit. This deployment is comparable to any wireline deployed toolstring.

These geophones require a known signal source to orient themselves to the physical world around them which will be accomplished using a surface vibroseis signals.

## Vibe Operation

This orientation process will involve the use of a mini-vibroseis unit to perform a series of 10 second sweeps at three to six distinct locations in the area. An image of the mini-vibroseis unit is provided in **Figure 3**. For the purposes of this project all vibe locations are on existing well pads which Hess Corporation currently has access. These vibe locations and their relative positions are provided in **Table 1**.



**Figure 3.** Halliburton Mini-vibroseis Unit

Due to the unknown nature of field operations the vibroseis orientation may need to be repeated during the fracture treatment if mechanical issues force the geophone toolstring to be replaced and reoriented.

The vibe operation will be conducted in accordance with the rules and restrictions for a non-explosive exploration method. A variance has been obtained from Hess Corporation in regards to rule 43-02-12-05 regarding distance restrictions. A notarized copy of this variance will be delivered to the NDIC with the permit request. Images of the vibe locations are provided below in **Figure 4** through **Figure 9**. These locations are approximate depending on conditions in the field and accessibility.

Table 1 Vibe Locations

Location	Sec	Twn	Rng
1	19	156N	91W
2	11	156N	92W
3	14	156N	92W
4	26	156N	92W
5	35	156N	92W
6	36	156N	92W



**Figure 4.** Hess Corporation RS-Nelson Farms Vibe Location 1

NDIC File no. 16394





**Figure 5.** Hess Corporation RS-Nelson Farms Vibe Location 2

NDIC File no. 16984



**Figure 6.** Hess Corporation RS-Nelson Farms Vibe Location 3

NDIC File no. 17696

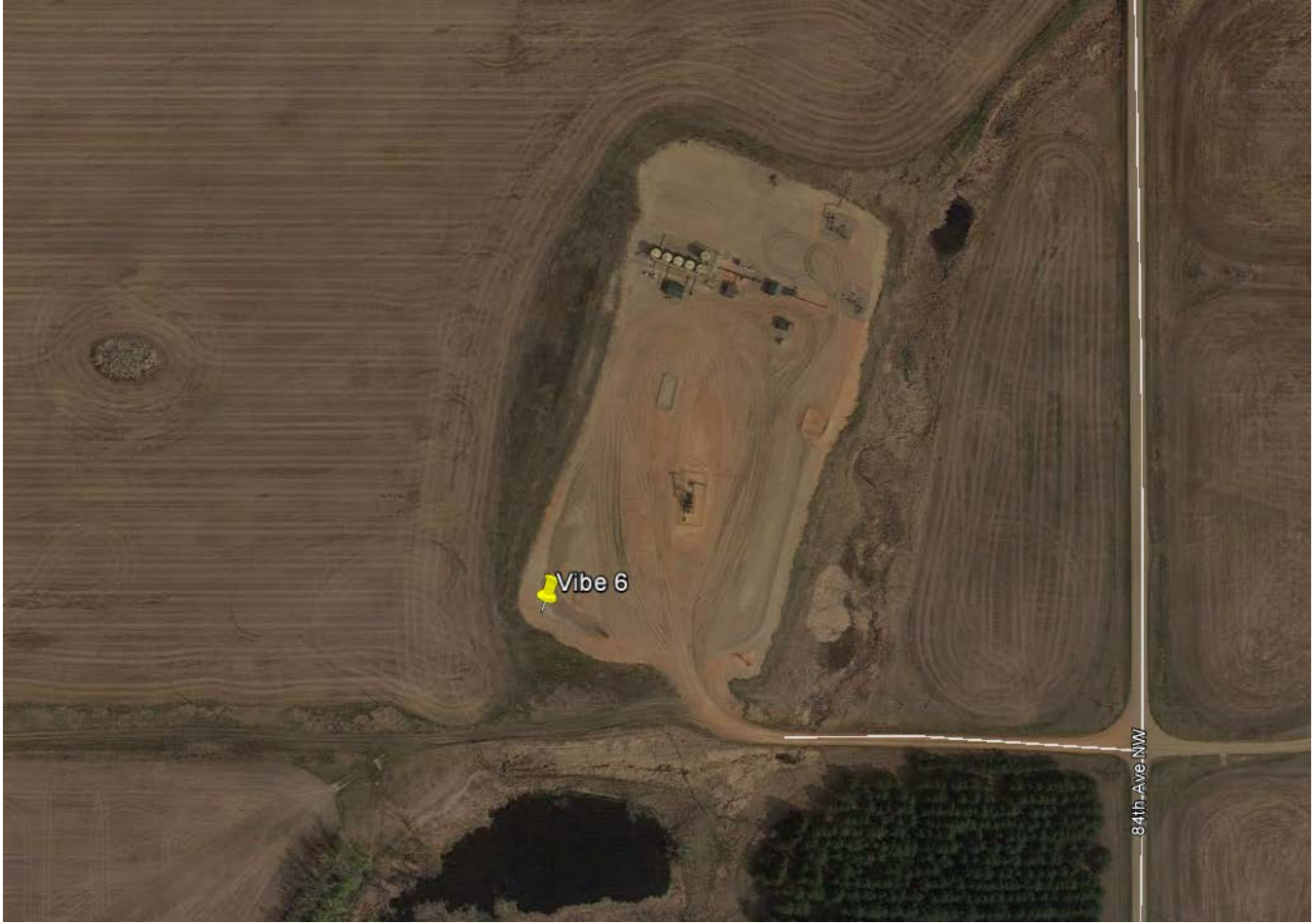


**Figure 7.** Hess Corporation RS-Nelson Farms Vibe Location 4



**Figure 8.** Hess Corporation RS-Nelson Farms Vibe Location 5

NDIC File no. 17190



**Figure 9.** Hess Corporation RS-Nelson Farms Vibe Location 6

NDIC File no. 16800

## Project Completion

At the completion of the fracture treatment, the downhole geophones will be retrieved on wireline and the logging unit will leave the area. Notifications will be provided of the completion of the project and the (form) will be submitted to the NDIC.

### Related Documents

- Geophysical Exploration Permit – Form GE1
- Hess Corporation Notification of Variance
- Letter of Landowner Notification
- A plot map showing actual monitoring locations
- Geophysical Exploration Completion Report – Form GE 6B

If there are any questions or concerns please feel free to contact us.

Sincerely,

A handwritten signature in black ink that reads "Price Stark". The signature is written in a cursive style with a large, stylized initial "P".

Price Stark  
Sr Business Development Manager  
Halliburton

Mobile: 303-579-2088  
Office: 303-899-4676