



**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): MESS HA-STATE

PERMIT NUMBER: 97-0277

**AFFIDAVIT OF COMPLETION (GEOPHYSICAL CONTRACTOR)**

STATE OF Colorado )

COUNTY OF Denver )

Before me, PAMELA 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.

[Signature]  
 Geophysical Contractor Representative

Subscribed in my presence and sworn before me this 28th day of March, 2017.

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

Notary Public [Signature]

My Commission Expires May 01, 2018



# 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>97-0277</b>	
Shot Hole Operations	*Non-Explosive Operations <b>Non-Explosive</b>

## SECTION 1

Geophysical Contractor <b>Halliburton Energy Services</b>	
Project Name and Number <b>Hess HA State</b>	County(s) <b>McKenzie</b>
Township(s) <b>152N</b>	Range(s) <b>95W</b>
Drilling and Plugging Contractors	
Date Commenced <b>February 28, 2017</b>	Date Completed <b>March 16, 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).

## Holweger, Todd L.

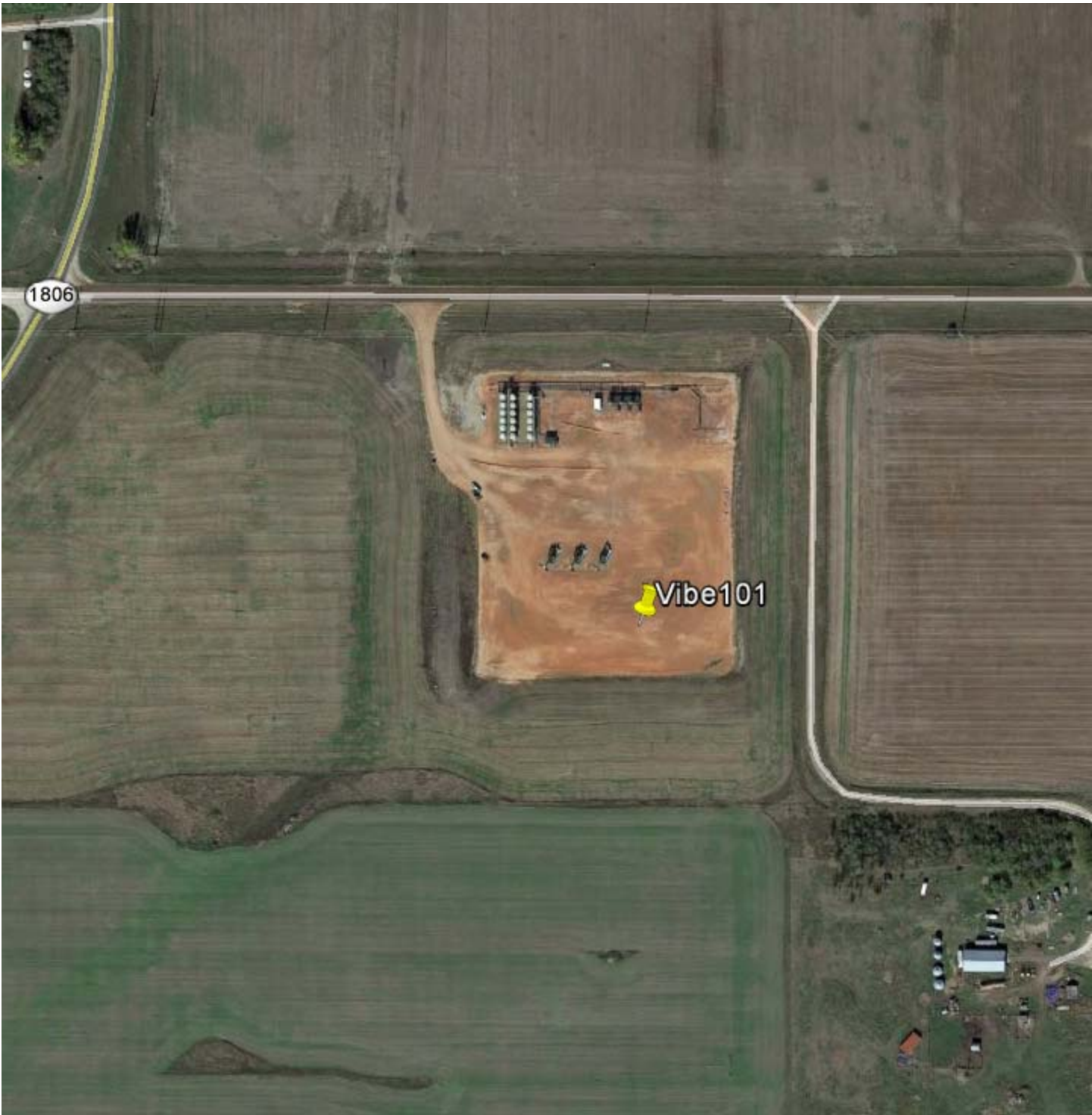
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**From:** Price Stark <Price.Stark@halliburton.com>  
**Sent:** Tuesday, March 28, 2017 11:13 AM  
**To:** Holweger, Todd L.  
**Subject:** Hess HA State Permit 97-0277 Completion Report  
**Attachments:** seismicformGE6A-completion.pdf; Hess HA-State - NDIC.kml; seismicformGE6B-affidavit.pdf

Todd,

Attached are the Form GE 6B, Form GE 6A, and KML file of the vibe locations.

Vibe Location 1



Vibe 2



Sincerely,  
Price

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**Price Stark**  
Business Development  
Pinnacle

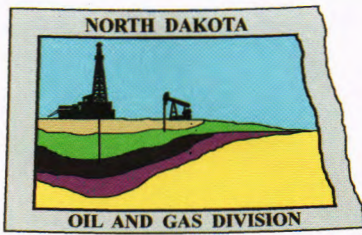
1125 17th Street Suite 1900  
Denver, CO 80202-2016  
Email: [price.stark@halliburton.com](mailto:price.stark@halliburton.com)  
Office: +1 303-899-4676  
Mobile: +1 303-579-2088

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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/)

February 14, 2017

The Honorable Linda Svihovec  
McKenzie County Auditor  
201 5th St NW Ste 543  
Watford City, ND 58854

RE:    Geophysical Exploration  
      Permit #97-0277

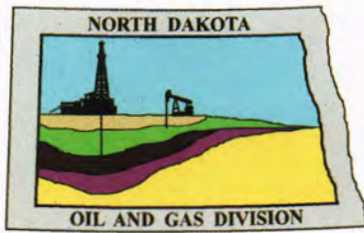
Dear Ms. Svihovec:

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 February 14, 2017 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



# 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/)

February 14, 2017

Mr. Simon Shaw  
Field Service Manager  
Halliburton Energy Services  
719 Hangar Dr.  
Acadina Regional Airport  
Houston, TX 77042

RE: HESS HA STATE  
GEOPHYSICAL EXPLORATION PERMIT #97-0277  
MCKENZIE COUNTY  
NON EXPLOSIVE METHOD

Dear Mr. Shaw:

Please be advised that we are in receipt of your Geophysical Exploration permit application and it is conditionally approved; effective for one year from February 14, 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:

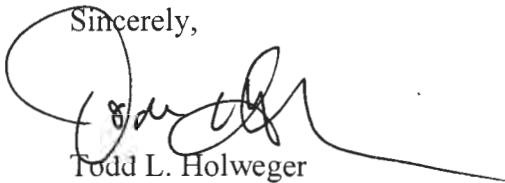
1. A pre-program meeting with state seismic inspector Tom Torstenson is required. You must contact him at 701-290-1546 (cell) or 701-227-7436 at least 24 hours prior to any exploration operations. Also, a copy of the entire permit is required for all contractors at the pre-program meeting.
2. All variances 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 2/14/2017)**
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 2/14/2017)**
  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

FEB 9 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>719 Hangar Dr Acadiana Regional Airport New Iberia LA 70560</b>			
Contact <b>Simon Shaw</b>		Telephone <b>(281) 782-9811</b>		Fax	
Surety Company <b>Westchester Fire Insurance Company</b>		Bond Amount <b>25000.00</b>		Bond Number <b>K08358977</b>	
2) a. Subcontractor(s)		Address		Telephone	
b. Subcontractor(s)		Address		Telephone	
3) Party Manager		Address (local)		Telephone (local)	
4) Project Name or Line Numbers <b>Hess HA State</b>					
5) Exploration Method (Shot Hole, Non-Explosive, 2D, 3D, Other) <b>Non-explosive, other</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 per in. mi.	No. of in. mi.	
2-D			<b>2</b>		
8) Approximate Start Date <b>February 16, 2017</b>			Approximate Completion Date <b>February 28, 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>McKenzie County</b>					
Section(s), Township(s) & Range(s)	Section	<b>5</b>	T.	<b>152N</b>	R. <b>95W</b>
	Section	<b>33</b>	T.	<b>152N</b>	R. <b>95W</b>
	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>February 6, 2017</b>
Signature 	Printed Name <b>Simon Shaw</b>	Title <b>Field Service Manager</b>	
Email Address(es) <b>simon.shaw@halliburton.com</b>			

(This space for State office use)		<b>Permit Conditions</b>	
Permit No. <b>97-0277</b>	Approval Date <b>2/14/17</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).	
Approved by 		* See attached letter.	
Title <b>Mineral Resources Permit Manager</b>			

\*See Instructions On Reverse Side

February 6, 2017

# Hess HA State Vibe Orientation

Operation Description

## **Table of Contents**

Vibe Orientation .....	2
Description.....	2
Downhole Microseismic .....	3
Project Completion.....	5

# Vibe Orientation

## Operational Description

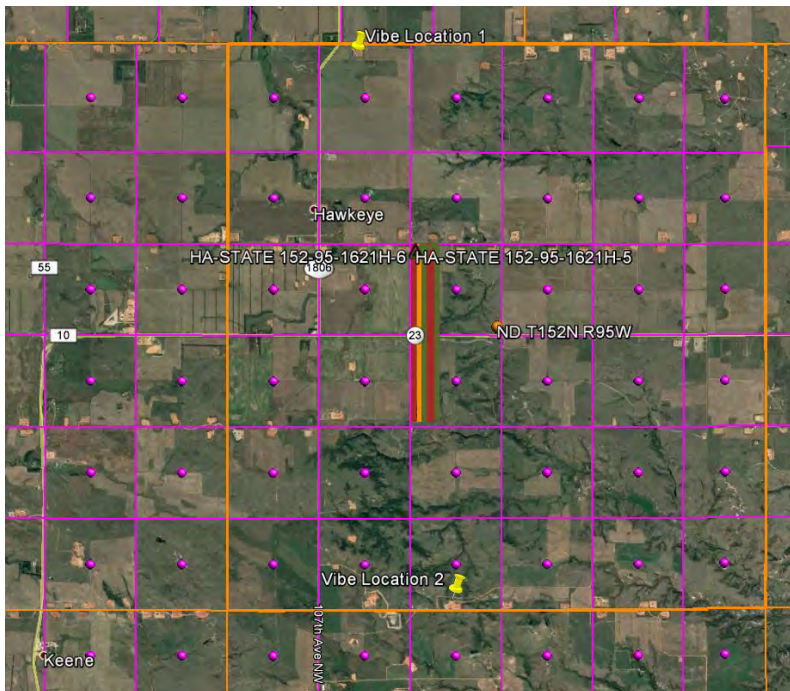
Todd Holweger  
NDIC  
tholweger@nd.gov

## Description

Pinnacle will be performing a series of geophysical exploration services for the upcoming treatment of the Hess HA State lateral well pad in McKenzie County, ND (S16, T152N, R95W). The expected timeframe for this operation is Feb 16<sup>th</sup> through 28<sup>th</sup> 2017.

Microseismic mapping of the HA State lateral wells will start with the hydraulic fracture treatment of the HA State 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 HA State 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**.



**Figure 1.** Hess Corporation HA State Pad and Vibe Locations

## Simon Shaw

*Field Service Manager*

*Halliburton*

*719 Hangar Dr Acadiana  
Regional Airport*

*New Iberia, LA 70560*

*Mobile: 281-782-9811*

*simon.shaw@halliburton.com*

Borehole Seismic



## Downhole Microseismic

### Deployment

Halliburton will tractor-deploy a geophone toolstring in the HA-State 152-95-1621H-9 lateral observation well from a surface wireline logging unit. This deployment is comparable to any wireline deployed toolstring. The geophone toolstring will be periodically repositioned in the lateral well during the fracture treatment and will be withdrawn upon its completion.

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 two distinct locations in the area. An image of the mini-vibroseis unit is provided in **Figure 2**. 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 2.** 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 3** and **Figure 4**. These locations are approximate depending on conditions in the field and accessibility.

Table 1 Vibe Locations

Location	Sec	Twn	Rng
1	5	152N	95W
2	33	152N	95W



**Figure 3.** Hess Corporation HA State Vibe Location 1



**Figure 4.** Hess Corporation HA State Vibe Location 2

### **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 at...

Sincerely,

A handwritten signature in black ink, appearing to read 'S. Shaw', with a stylized, cursive script.

Simon Shaw  
Field Service Manager North America  
Halliburton

Mobile: 281-782-9811  
Office: 281-871 -7149

# HALLIBURTON

February 14, 2017

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

DMR Permit Manager  
Oil & Gas Division  
North Dakota Industrial Commission  
Attn: Todd L. Holweger  
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 28-08.1-04.1 (Exploration Permit) and NDCC Chapter 38-11.1 (Oil and Gas Production Damage Compensation).

Please accept this letter as compliance.

Sincerely,  
Halliburton Energy Services



Price Stark  
Business Development

*State of Colorado*  
*County of Denver*

*The foregoing was acknowledged before me this  
14th day of February, 2017, by Price Stark.*

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

*Pamela M. Johnson*  
*Notary Public*





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

February 1, 2017

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

Ref: Distance Restriction Variance  
Hess HA-State Microseismic  
McKenzie County, North Dakota

Dear Mr. Holweger;

As part of the microseismic data collection to be done at Hess' operated HA-State location in February 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.

Bruce Davis  
Manager, Area Work Team South  
Hess Bakken

**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

**CORPORATE ACKNOWLEDGEMENT**

**STATE OF TEXAS**

**COUNTY OF HARRIS**

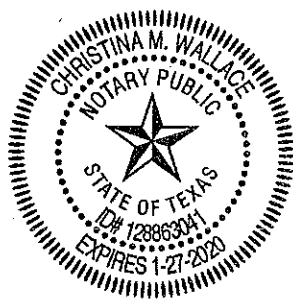
On this, the 6<sup>th</sup> day of February, 2016, before me a notary public, the undersigned officer, personally appeared Bruce Davis, who acknowledged himself to be the MANAGER of Hess Corporation.

Being authorized to do so, executed the foregoing instrument for the purposes therein contained by signing the name of the corporation by himself as MANAGER.

In witness whereof, I hereunto set my hand and official seal.

My commission Expires:

1.27.2020



Christina M. Wallace

Notary Public

Christina M. Wallace

Print Name