

# 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/)

October 11, 2017

Ms. Sandy Connors  
Borehole Seismic Sales  
Schlumberger Technology Corporation  
333 Clay Street  
Allen Center 3, Suite 1900  
Houston TX, 77002

RE: HESS BW HEDSTROM  
GEOPHYSICAL EXPLORATION PERMIT #97-0283  
MCKENZIE COUNTY  
NON EXPLOSIVE METHOD

Dear Ms. Connors:

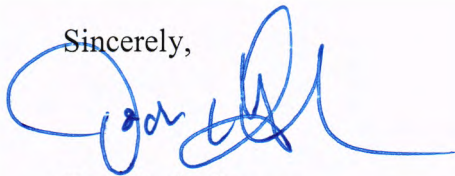
Please be advised that we are in receipt of your Geophysical Exploration permit application and it is conditionally approved; effective for one year from October 11, 2017. **PURSUANT TO NDAC 43-02-12-05 (DISTANCE RESTRICTION) non-explosive exploration method may not be conducted not less than 300 feet 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, **(Must re-file when project is completed)**
  - 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: [tstorstenson@nd.gov](mailto:tstorstenson@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 10/4/2017)**
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 10/4/2017)**
  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  
Permit Manager



# 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

OCT - 4 2017

ND Oil & Gas

1) a. Company <b>Schlumberger Technology Corporatio</b>		Address <b>333 Clay Street, Allen Center 3, Suite 1900, Houston, TX 77002</b>			
Contact <b>Sandy Conners</b>		Telephone <b>832-415-7595</b>		Fax	
Surety Company <b>Liberty Mutual Insurance</b>		Bond Amount <b>\$25,000</b>		Bond Number <b>16036783</b>	
2) a. Subcontractor(s)		Address		Telephone	
b. Subcontractor(s)		Address		Telephone	
3) Party Manager <b>Luis Gonzalez</b>		Address (local) <b>713 Market Street, Oklahoma City, OK</b>		Telephone (local) <b>832-520-8640</b>	
4) Project Name or Line Numbers <b>Hess Bw Hedstrom</b>					
5) Exploration Method (Shot Hole, Non-Explosive, 2D, 3D, Other) <b>Non-Explosive Vibroseis</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>5</b>		
Size of Hole	Amt of Charge	Depth	Source points per ln. mi.	No. of ln. mi.	
2-D					
8) Approximate Start Date <b>October 26, 2017</b>			Approximate Completion Date <b>November 10, 2017</b>		

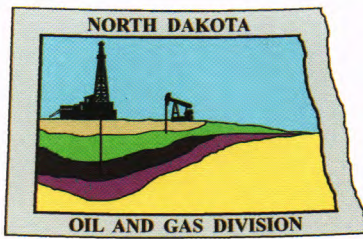
THE COMMISSION MUST BE NOTIFIED AT LEAST 24 HOURS IN ADVANCE OF COMMENCEMENT OF GEOPHYSICAL OPERATIONS

9) Location of Proposed Project - County <b>McKenzie County, ND</b>					
Section(s), Township(s) & Range(s)	Section	<b>2</b>	T.	<b>149N</b>	R. <b>100W</b>
	Section	<b>6</b>	T.	<b>149N</b>	R. <b>99W</b>
	Section	<b>17</b>	T.	<b>149N</b>	R. <b>99W</b>
	Section	<b>10</b>	T.	<b>149N</b>	R. <b>100W</b>
	Section	<b>23</b>	T.	<b>149N</b>	R. <b>100W</b>
	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 4, 2017</b>
Signature 	Printed Name <b>Sandy Conners</b>	Title <b>Borehole Seismic Sales</b>	
Email Address(es) <b>sconners@slb.com</b>			

(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>97-0283</b>	Approval Date <b>10/11/17</b>	
Approved by 	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/)

October 11, 2017

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

RE:    Geophysical Exploration  
       Permit #97-0283

Dear Ms. Johnsrud:

Pursuant to Section 38-08.1-04.2 of the North Dakota Century Code, please be advised that Schlumberger Technology Corporation was issued the above captioned permit on October 11, 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  
Permit Manager

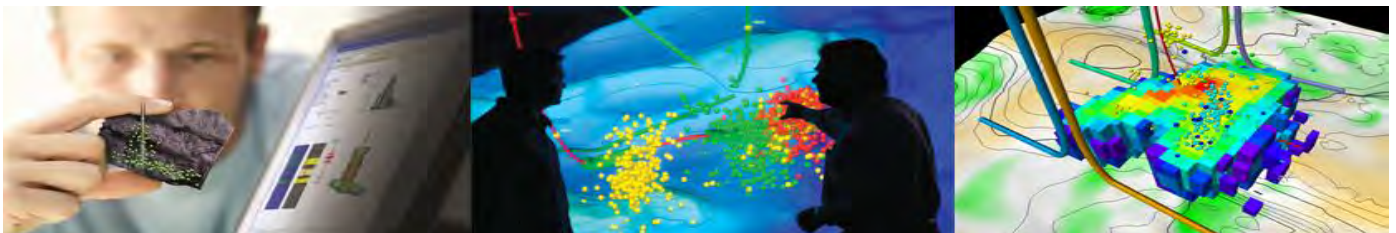
# Schlumberger

Vibe Orientation  
BW-Hedstrom  
Planned for October, 2017

By Schlumberger Technology Company

October 4, 2017

Schlumberger-  
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## Operational Description

Schlumberger will be performing a series of geophysical exploration services for the upcoming monitoring project of the BW-Hedstrom 149-100-1201H-5 well in McKenzie County, ND. The expected timeframe for this operation is October 26th through November 10, 2017. Most of the vibrator use will be early in the project.

A single downhole array will be used to map the upcoming hydraulic fracture treatment of the BW-Hedstrom pad. In order to calibrate the orientation of our downhole geophones we will perform a series of vibroseis sweeps at up to 5 known surface locations. A map view of the projected pad and vibe locations is provided in Figure 1.



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Figure 1. Hess Corporation BW-Hedstrom pad and Vibe Locations indicated by Green Stars

## Downhole Seismic Deployment

### Deployment

Schlumberger will deploy a geophone toolstring in the BW-Hedstrom 149-100-1201H-5 horizontal observation well from a surface wireline logging unit. The deployment is comparable to any wireline deployed toolstring conveyed with a downhole tractor.

These geophones require a known signal source to orient themselves to so that each of the 3 axis in the toolstring are known for the duration of the job.

## Vibe Operation

The orientation process will involve the use of a vibrator unit to perform a series of 10-14 second sweeps at up to five locations in the area. An image of a typical vibroseis unit is provided in Figure 2. All of the vibe locations are on roads and well pads which Hess has previously gained approval for access. These vibe locations and their relative positions are provided in Table 1.



Figure 2. Schlumberger Vibroseis Unit

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

The vibe operation will be conducted in accordance with the rules and restrictions for a non-explosive method. A variance has been obtained from Suhail Kanwar, the McKenzie County road engineer which allows for operations on County Roads, and also from Hess Bakken Investments II, LLC for the vibrator points which will be taken on well pad locations. A copy of email with approval is provided in this document, and also a copy of the variance from Hess Bakken Investments II, LLC. Images of the vibe locations are provided below in Figure 3 through Figure 7. These locations are approximate depending on conditions in the field and accessibility.



Table 1. Vibe Locations

Location	Latitude	Longitude	Datum	Description
1	47.75937	-103.44111	NAD 27, North Dakota North	Road
2	47.75578	-103.391264	NAD 27, North Dakota North	Road
3	47.732434	-103.383539	NAD 27, North Dakota North	Road
4	47.733586	-103.472479	NAD 27, North Dakota North	Pad - BW Stoveland/Hagen
5	47.704665	-103.449152	NAD 27, North Dakota North	Pad - McGregor



Figure 3. Hess Corporation BW-Hedstrom Vibe Location 1

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Figure 4. Hess Corporation BW-Hedstrom Vibe Location 2





Figure 5. Hess Corporation BW-Hedstrom Vibe Location 3

Schlumberger-  
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Schlumberger-  
Private

Figure 6. Hess Corporation BW-Hedstrom Vibe Location 4



Figure 7. Hess Corporation BW-Hedstrom Location 5



## Project Completion

At the completion of the project, the downhole geophones will be retrieved on wireline and the logging unit will leave the location. 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
- McKenzie County Road Engineer Notification of Variance
- Hess Bakken Invest II Notification of Variance
- Affidavit of landowner contact
- A plot map showing actual vibrator locations
- Geophysical Exploration Completion Report – Form GE 6B
- Letter of Landowner Notification

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

Sincerely,



Sandy Conners  
Hydraulic Fracture Monitoring and Borehole Seismic Geophysical Sales  
832-415-7595 cell  
[sconners@slb.com](mailto:sconners@slb.com)

## McKenzie County Road Engineer Notification of Variance



Wed 8/9/2017 5:02 PM

Smith, Nathaniel <nsmith@hess.com>

[Ext] RE: Using dirt county roads for vib points

To  Suhail Kanwar

Cc  tholweger@nd.gov;  Sandy Conners;  Ziegler, Abra

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Thank you for your help. I am sure that you will enjoy observing this operation as it is so different from the traffic that you normally see using your roads!

Schlumberger will be doing the orienting. The Schlumberger contact is Sandy Conners who is cced above. Sandy or one of her coworkers will get in touch with you before the orienting is done in order to give you time to meet the crew.

If you have questions about this do contact me or Sandy Conners.

Thanks,  
Nat

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**From:** Suhail Kanwar [<mailto:skanwar@co.mckenzie.nd.us>]  
**Sent:** Wednesday, August 09, 2017 4:42 PM  
**To:** Smith, Nathaniel  
**Cc:** [tholweger@nd.gov](mailto:tholweger@nd.gov)  
**Subject:** RE: Using dirt county roads for vib points

It appears okay to me. Please inform us when you do that so that we can witness one of these tests.

Thanks,

Suhail Kanwar, M.S., P.E. (ND, MN)  
Public Works Administrator/County Engineer  
Ph: (701) 444-7426  
Fax: (701) 444-4113  
McKenzie County, ND  
<https://www.facebook.com/mckenziecountynd>

## Hess Bakken Investments II Notification of Variance



Hess Bakken Investments II,

1501 McKinney Street  
Houston, TX 77010

September 28, 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 Buffalo Wallow Microseismic  
McKenzie County, North Dakota

Dear Mr. Holweger,

As part of the microseismic data collection to be done at Hess operated BW-Hedstrom 149-100 location in October 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 Schlumberger Limited 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.

## Affidavit of Landowner Contact

Todd L. Holweger  
Oil & Gas Division  
North Dakota Industrial Division  
600 East Boulevard Dept. 405  
Bismark, ND 58805-0840

October 4, 2017

Mr. Holweger,

Schlumberger has complied with the requirement that all landowners within a one half mile radius of the vibration points where geophysical activities are planned to be conducted commencing October 26, 2017 were provided written copies of NDCC 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 to allow commencement of operations.

Sincerely,



Sandy Conners  
Hydraulic Fracture Monitoring and Borehole Seismic Geophysical Sales  
832-415-7595 cell  
[sconners@slb.com](mailto:sconners@slb.com)

## Map Displaying Monitoring Location

The monitoring location is indicated by the yellow dotted box on the map, which is the location of the BW-Hedstrom 149-100-1201H-5 horizontal observation well.





## Geophysical Exploration Completion Report – 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 51455 (03-2011)

PERMIT NAME (Required): Hess BW-Hedstrom

PERMIT NUMBER: \_\_\_\_\_

### AFFIDAVIT OF COMPLETION (GEOPHYSICAL CONTRACTOR)


STATE OF Texas )

COUNTY OF Harris )

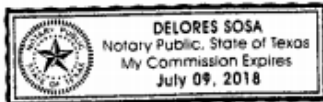
Before me, Delores Sosa, a Notary Public in and for the said  
County and State, this day personally appeared Sandra Conners

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

  
\_\_\_\_\_  
Geophysical Contractor Representative

Subscribed in my presence and sworn before me this 4 day of October, 2017



Notary Public 

My Commission Expires JULY 9, 2018

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Private

## Sample Letter of Landowner Notification

Flatland AG Holdings, LLLP.  
4391 115<sup>th</sup> Avenue NW  
Watford,, ND 58854  
Vibe Point #1

October 4, 2017

Dear Sir or Madam,

In accordance to the requirements of the North Dakota Industrial Division, all landowners must be given 7 days of notice of all geophysical activities that will occur within one half mile of any landowners. Additionally it is required that written copies of NDCC 28-08.1-04.1 (Exploration Permit) and NDCC Chapter 38-11.1 (Oil and Gas Production Damage Compensation) also be provided to the landowners

Schlumberger will be performing a series of geophysical exploration services for the upcoming monitoring project of the Hess BW-Hedstrom 149-100-1201H-5 well in McKenzie County, ND. The expected timeframe for this operation is October 26rd through November 10<sup>th</sup>, 2017.

The geophysical exploration will involve the use of a vibrator unit to perform a series of sweeps at up to five locations in the area. A map of five locations in which geophysical activity will take place is included in this packet. Three of the vibrator locations are on existing roads in the area and two are on Hess well pads. The McKenzie County Road engineer has provided Schlumberger a variance to allow access to the county roads as well as the Hess Bakken Investment II team.

This notification is to ensure that Schlumberger is in compliance with North Dakota Industrial Division requirements for geophysical activities.

## Vibrator Locations



Figure 1. Vibe Locations

## Vibrator Operation

The geophysical process will involve the use of a vibrator unit to perform a series of 10-14 second sweeps at up to five locations in the area. An image of a standard vibroseis unit is provided in Figure 2.



Figure 2. Schlumberger Vibroseis Unit

The vibrate operation will be conducted in accordance with the rules and restrictions for a non-explosive method. A variance has been obtained from McKenzie County Road Engineer and the Hess Bakken Investment II team in which the vibrator will operate in with respect to rule 43-02-12-05 regarding distance restrictions.

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

Sincerely,

A handwritten signature in black ink, appearing to be 'S Conners'.

Sandy Conners  
Hydraulic Fracture Monitoring and Borehole Seismic Geophysical Sales  
832-415-7595 cell  
[sconners@slb.com](mailto:sconners@slb.com)