

# Breckenridge Geophysical 3D Seismic Project

## Seismic Testing:

Seismic Acquisition Services LLC, along with Breckenridge Geophysical, LLC will be conducting a 3-D seismic survey in Weld and Boulder Counties, specifically in and around the Town of Erie, CO. Recording operations will take 1-2 weeks and began in early May 2019; please see additional information enclosed regarding when we anticipate being in your area and our preferred operating hours.

Below are answers to frequently asked questions about this project including what a 3-D seismic survey is, why we are doing this work, and what you can expect while we are working in your area. Although you may not notice this activity, we wanted to take the time to make sure you and your neighbors are informed about this project before we begin working. We also want to make sure that you have our contact numbers to ask questions or get more information. We appreciate your patience while we perform our work in your community.

## What is a 3-D Seismic Survey?

A 3-D seismic survey uses state-of-the-art technology to produce a detailed image of the geological layers deep beneath the earth's surface. Think of it as a sonogram, or cat scan, for the earth.

## How is a Seismic Survey conducted?

The first step in conducting a seismic survey is to work with all stakeholders to secure the appropriate permits for access and to agree upon conditions of approval, resulting in agreements with many of the surface property owners within the project area. The next step in conducting a seismic survey is to survey the locations for all of the source points and receiver stations that will be required during the recording operations using high precision GPS surveying techniques. The surveying will occur over a several week period before the recording operations begin and will result in a series of orange and pink pin flags around the project area. Flags will only be placed on properties where we have previously obtained permission from the land owners to work.

To generate a 3D subsurface picture, Vibroseis vehicles direct low energy vibrations into the ground. These acoustic waves, also known as seismic waves, travel deep into the earth, bounce off the various geologic layers and reflect back to the surface where they are recorded. Passive listening devices called geophones, will be temporarily placed on the surface of the ground to receive the sound signature of each of the formations and record this data. The data collected is then turned in to a 3D map which geologists and geophysicists use to plan and steer horizontal wells in the Niobrara formation.

## What can residents expect during the survey?

During the project you may see vehicles both in town and in the surrounding fields that say 'Breckenridge'. You may also see workers wearing orange reflective vests placing recording equipment on private property where we have previously obtained permission from the landowners to work. This recording equipment will remain in the fields for several weeks during the survey process. Large trucks, about the size of a garbage truck, called a Vibroseis source vehicle will be used to provide the Vibroseis signal that we will record. The Vibroseis source vehicles will work both on public streets and private land and fields only where permission has been granted by the landowners. This 3-D seismic survey is designed to minimize the impact on residents by using cable-free recording equipment and by keeping the Vibroseis source vehicles as far away as possible from homes and buildings. Additionally, cable-free technology reduces the amount of time our crews spend working on this project in your community.

Throughout the project, SAS permit agents are committed to working closely with residents and will respond quickly to any inquiries you may have.

## How much vibration can residents expect?

The vibrations are very low energy and can only be felt by a person usually within about 100 ft of the Vibroseis source, and sometimes up to 300 feet. Each source location is vibrated for less than one minute, so most homeowners may not even notice. When operating near homes the sources operate only during the day (typically between 9AM and 3PM on weekdays) and at further reduced energy levels. This means that inside your homes you may feel vibrations or perhaps see items vibrate. This is not unusual, and again, will only last a minute or so. These vibrations will be live-monitored to ensure they stay within federal guidelines to ensure the safety of all in the immediate area, and prevent any damage to structures within the survey area. As the Vibroseis units are large industrial vehicles with large engines, you will likely hear them working during daylight hours. Note that you may be receiving this notice because you could possibly hear them on a neighboring street—please see attached map for reference.

## Will this testing damage my home or property?

No, there should be no damage to any property. The project has been designed to be a safe distance from all buildings and will be closely monitored in real time. The crew is following federal guidelines (see *US Bureau of Mines Report of Investigations #8507*) for safe operations and will stop well in advance of vibrations reaching a potentially damaging threshold. If any damage does result from our work, we will repair those damages.



*Seismic trucks used in a 3-D seismic survey*

## How will this work benefit the community?

The data gathered in this survey will allow our clients to more efficiently and safely develop the resources within the project area. This means that fewer wells will be needed to develop the resources and that those wells take less time to drill. Seismic data also makes it possible to drill longer wells with greater setbacks from existing houses and other buildings. This efficiency will directly benefit land owners within the community who have leased their minerals and will add to the income and tax base within the towns and county. Our clients take pride in partnering with the communities in they work. For several months, we have been working closely with local governments, HOAs, and individuals to ensure this project is completed safely, efficiently, and with minimal impact to residents along the route.

We greatly appreciate the opportunity to work in your community. For additional information please contact:

**[Permit Hotline \(Seismic Acquisition Services\):](#)**

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