



**HICKORY
CCS HUB**

Seismic Surveying in Warren County

Tenaska, an American energy company known for safe and environmentally responsible projects, is determining the viability of a carbon capture and sequestration (CCS) project – called Hickory CCS Hub – in Warren County, Indiana. Should the project move forward, the Hickory CCS Hub will sustain and advance local and regional industries while supporting local farmers and the local economy.

As part of the initial site feasibility assessment, Tenaska will need to conduct seismic surveying that will confirm the underground geology is ideal for this type of project.

Seismic surveys create localized vibration in a limited area to collect seismic data that will determine if the geology is suitable for carbon dioxide sequestration deep underground. While residents in close proximity (100 feet or less) may feel slight vibrations from vibroseis trucks, these surveys are safe to the public, property and roadways. Similar seismic surveys are performed to locate underground stores of oil and natural gas.

This handout provides information about seismic surveying. If you have questions, please contact:

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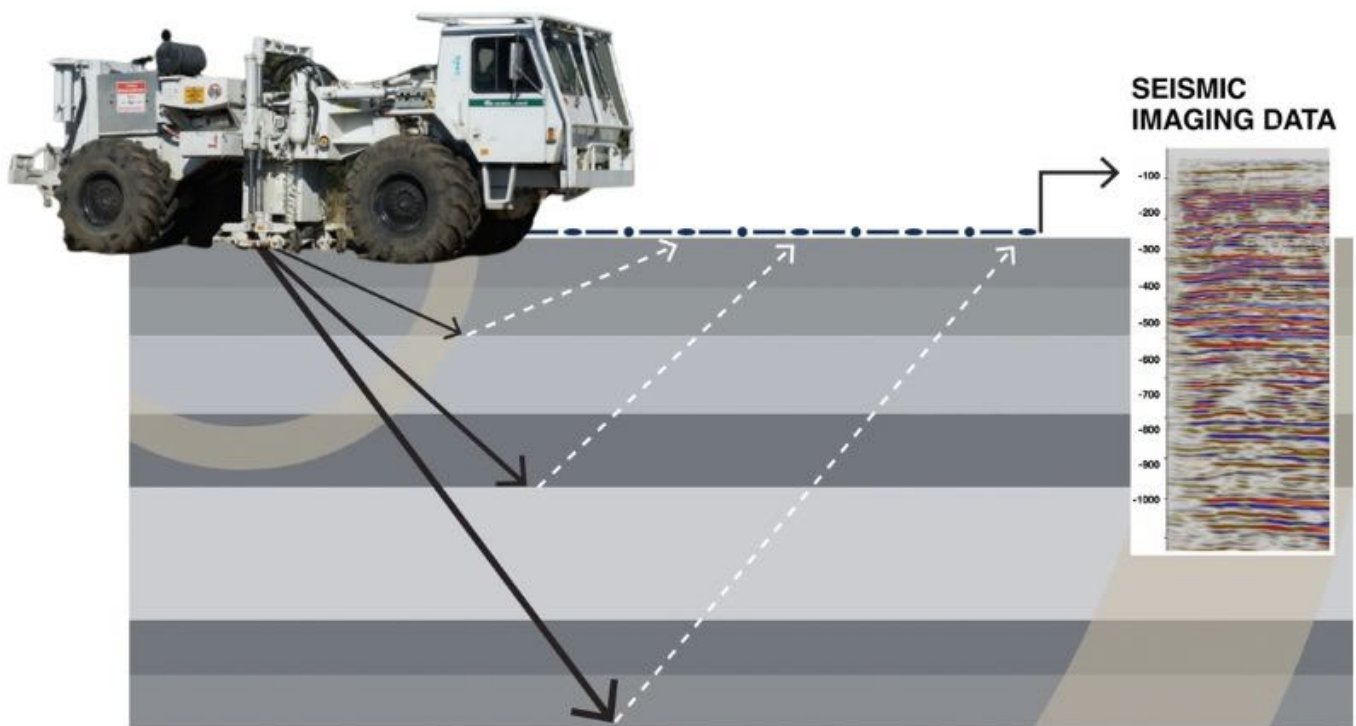
Seismic Surveying FAQs

What is a seismic survey?

Seismic surveys use low-frequency sound waves that travel through solid rock and sediment layers beneath the earth's surface to create maps of rock formations underground. This surveying is performed using sensors, called geophones, that are temporarily placed on the ground to listen to echoes from sound waves reflected from subsurface layers as shown below. Sound waves are also used in ultrasounds, though ultrasounds utilize high-frequency sound waves.

Seismic surveys determine geologic stability and map the safest locations for deep underground storage of carbon dioxide (CO₂). The process is already used across a variety of industries, including water resources (such as locating groundwater), geothermal energy, oil and gas exploration and mining.

To minimize our footprint, Tenaska uses a wide range of data and remote-sensing techniques before going into the field to conduct these surveys.



How is this work performed?

A “vibroiseis” truck will generate seismic waves, or pulses, underneath the earth’s surface. This truck is equipped with large metal plates, called pads, that send vibrations through the earth. The waves bounce off the multiple layers of rock formations underground and are recorded by geophone sensors to create accurate maps of the complex layers underground.

To collect this information, a crew drills a series of 1.5-inch-diameter holes approximately 3 inches deep and places the geophone sensors into them to detect and record imperceptible ground movement. The geophones are placed every 20 to 40 feet along a bar ditch.



Next, we create waves that travel underground. Once geophones are in place, the vibroseis truck lowers its pads and sends pulses into the ground. (For maximum safety, we also monitor the ground motion near any adjacent structures to ensure that we stay below established thresholds.)

What can residents expect?

When seismic surveys are performed, residents will see a vibroseis truck along select roadways. The truck will generate vibrations that may be felt up to 100 feet. It’s important to note that the vibrations are less than what would be felt from a passing freight train and pose no risk to infrastructure or drain tile.

Seismic crews will be equipped with high-visibility clothing, lighted vehicles, and a flagging/signing crew to ensure other road users are aware of operations.

Safety is our top priority. The work will not proceed if there is a risk of damage to roads or private property.

Once completed, there should be no sign at the surface that our crew has been here.

Who is involved in the permitting process?

Tenaska and its contractors will work closely with Warren County to obtain necessary permits to conduct the surveys.

How long will the work take?

Depending on the size of the area to be mapped and the complexity of the project, seismic surveying in Warren County will likely take about 30 days, with the seismic truck on the roads for about half of that time. Tenaska is working diligently to schedule the surveys in a way that does not interfere with the harvesting season.

Does the word ‘seismic’ mean it’s related to earthquakes?

While ‘seismic’ does refer to earthquakes, the term here simply describes the process of generating small vibrations which bounce off deep rock layers and are then recorded to give an image of the subsurface.

Carbon Capture & Sequestration FAQs

What makes a good location for a storage site?

Underground geology is an important component for siting CCS projects. Tests and surveys identify locations with porous rock overlaid by impermeable cap rock. To ensure safe, secure storage of CO₂, storage areas are then pinpointed using maps, published studies, rock samples and seismic imaging data.

Is CCS safe?

Yes, CO₂ is odorless, colorless and incombustible, which means it can be safely transferred through pipelines to injection wells into the geologically secure storage areas. Injection wells are rigorously permitted by the U.S. Environmental Protection Agency (EPA). EPA regulations also govern the siting, operation, testing and long-term maintenance of the wells. Everything is monitored 24/7, 365 days a year by pressure sensors that can detect a leak and immediately implement measures to address it.

Is CCS a new technology?

No. According to the Global CCS Institute, CCS projects have been operating since the mid-1990s with proven results. Today, there are 27 fully operational CCS facilities in the world, with another 135 in development. About half of these are in the United States.

ABOUT TENASKA

Tenaska is a leading energy company with Nebraska roots. Over the past 35 years, Tenaska has earned a reputation for developing safe and responsible energy projects and being a good business neighbor. We have developed, managed and/or operated approximately 22,000 megawatts of natural gas-fueled and renewable energy generating facilities. From a five-person operation in 1987 to more than 700 employees today, Tenaska is proud to serve our nation's energy needs. Learn more about our commitment to hard work and honest dealing at Tenaska.com.