Elements of seismic operations as they may pass through your area...

There are five interrelated elements involved in a seismic survey, each depending on the completion of previous operations.

1. Obtaining permission to operate
2. Surveying the route
3. Laying out geophones
4. Generating energy waves and recording data
5. Cleaning up the site

The first representative of a seismic operation you may meet is the permit agent, who obtains the permission required to conduct a seismic operation in your area. If this is to be on private land, permission is obtained from the landowner. If it's to be along roads or on public lands, permission is obtained from a government agency and, where appropriate, adjacent landowners. The permit agent reports back general information to the seismic crew and provides them with agreements made in new areas. Sometimes, the permit agent travels hundreds of miles a day and may be days or weeks ahead of the actual seismic operation.

Next comes the survey crew, which marks the exact route the seismic line will take. The survey crew also measures surface elevations along the line and specifies the points where sound waves will be generated and listening devices placed.

Following the surveyors, another part of the instrument crew lays out sensitive listening devices along the seismic line. These "geophones" pick up the reflected sound waves after they have been weakened by passing through miles of underground rocks. The geophone converts these signals into electric impulses which are transmitted by cable to the recording truck. Inside the truck are delicate electronic instruments which amplify and record the electric impulses for later computer analysis. Geophones and recording instruments are so sensitive they can pick up footsteps scores of feet away.

There are several ways to generate seismic sound waves into the ground. In the present survey, truck-mounted vibration (vibroseis) will be used. Small explosive charges in shallow boreholes may also be sued in off-road areas.

While seismic crews move rapidly from area to area, they exercise care to clean up along the seismic line so the area is left as near to its original condition as possible. The permit agent or another representative of the crew will coordinate this effort to make sure that all the terms of the permit have been satisfied.

Source: International Association of Geophysical Contractors
Example of the Seismic Method

A vibrator truck (left) generates sound waves which penetrate the earth. These waves pass through the various rock layers and are eventually reflected back to the earth's surface. At the surface, the reflected waves are received by the geophones, converted to electrical impulses, and transmitted to a second truck. The second truck (right) "records" the electrical impulses on magnetic tape as seismograms. After the crews have completed their work, the collected subsurface data are processed and analyzed on computers to determine the area's potential for carbon dioxide storage.