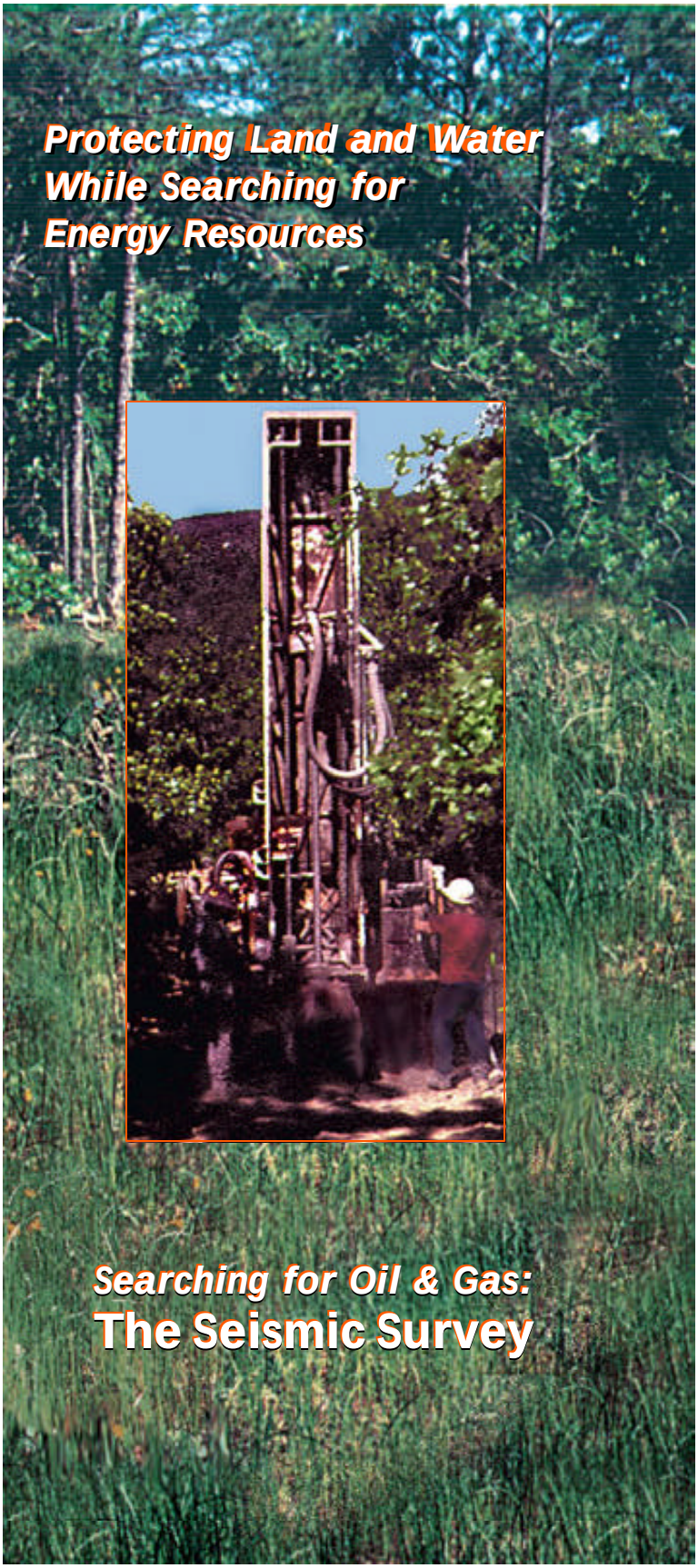

Protecting Land and Water
While Searching for
Energy Resources
Searching for Oil & Gas:
The Seismic Survey

The Seismic Survey

The seismic survey is one of the first steps in searching for oil and gas resources that directly affects the land and the landowners.

The survey usually requires people and machinery to be on private property and may result in disturbances of the land such as the clearing of trees. Landowners can benefit from a good understanding of what occurs during the survey and what can be done to reclaim disturbed areas once the survey is completed.

Landowner communication can affect how areas are reclaimed and help minimize the impact on land and water resources.

Access Permission

When an energy company selects an area for a seismic survey, landowners are contacted to obtain permission to allow crews on their land. This is a good opportunity for landowners to ask questions about what will occur on their land.

It is also a time for landowners to point out the location of water wells, buildings, existing roads and other features that need consideration when the survey lines are set. The survey crews can often make adjustments in their plans to accommodate special conditions.

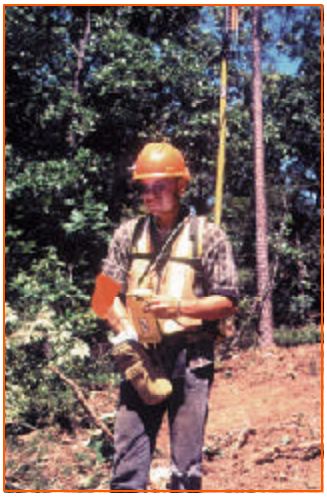
Good cooperation between landowners and the company representatives can help minimize impact to land and water.

How Surveys Are Made

In preparation for gathering the three-dimensional (3D) seismic data, the survey crew establishes grids. Source lines are established running one direction and receiver lines running a different direction.

The source lines mark the points where either explosives or vibroseis vehicles will be placed.

The receiver lines mark points where geophones (small devices in the ground that pick up reflected vibrations) will be placed to take readings when the explosives are set off or the vibroseis vehicles are used.



Survey crews use global positioning systems (GPS) to ensure accuracy of placement of source and receiver lines.

In timbered areas, a path may need to be cleared for the source lines. Paths for receiver lines are usually cleared by hand and need be only about four feet wide.

Vibroseis vehicles are often used rather than explosives in open, accessible areas.

Two Methods to Gather Information

The two main methods used to gather data are the use of explosives or vibroseis vehicles. Both methods send vibrations underground that are reflected back to the surface where readings are taken by geophones on the receiver lines and transferred to data recorders. This provides geologists with underground information to help determine if there is enough oil or gas in the area to justify drilling.

Reclamation

After the seismic work is completed, disturbed areas may need to be reclaimed. Some land-owners prefer areas cleared of timber for the survey to be left open for access, while others may want it returned to the original condition. This is something that can be discussed with the survey crew at the beginning.

Measures such as water bars (small terraces across the slope) may be needed to control erosion on disturbed areas.

Grass being seeded where timber was cleared.

Local Information

Many energy and geophysical service companies work closely with local agencies such as conservation districts and the USDA Natural Resources Conservation Service. These agencies can provide technical assistance with erosion control practices and make recommendations on the types of grasses appropriate for use in the disturbed areas.

This disturbed area in LeFlore County, Oklahoma, was reclaimed and seeded to a cool season grass. The grass will control erosion until native vegetation becomes reestablished.

This pamphlet is part of an educational project to inform landowners about the processes involved in the exploration for petroleum products and the protection of soil and water quality.

A video about the seismic process is also available through local conservation district offices.

This publication was produced by the Oklahoma Conservation Commission with technical assistance from BP, Latimer County Conservation District, LeFlore County Conservation District, Oklahoma Corporation Commission, USDA Natural Resources Conservation Service, and Veritas DGC Land, Inc.

For technical assistance with erosion control and water quality issues, contact your local conservation district.

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