

GUIDELINES FOR SEISMIC TESTING ON DEC ADMINISTERED STATE LAND

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The current Trenton/Black River Gas Play and others in New York require seismic testing to locate reserves and to optimally site the drill location. The seismic reflection method is used for that purpose.

SEISMIC REFLECTION METHOD:

An energy source such as an explosive charge or vibroseis is used to send acoustic energy into the earth. The energy is reflected from subsurface layers and recorded at the surface with geophones (microphones). The collected data is processed by computer to create an image of the subsurface geology. The main methods are:

1. Shot-hole method - Holes are drilled which vary in depth and diameter. An explosive charge is placed in the holes and detonated to generate seismic waves that are recorded by “geophones” for later computer processing.
2. Surface shot method - A charge placed slightly below ground level is detonated to generate a seismic pulse into the ground. This method may be used when shot holes cannot be drilled or if the company believes the surface shot is the best method for acquiring data.
3. Vibroseis method - One to six or more trucks work closely together in a line. Truck-mounted metal pads vibrate the ground to produce acoustic waves. The reflected waves are recorded by a Seismograph for later computer processing (Reference: BLM Website)

There are numerous variations on these methods dependent on the geology, the requirements of the company’s exploration staff, economics and equipment availability. For example, the vibroseis method may involve the placement of geophones along public roads or in some instances they may be placed on a surveyed grid throughout the forest.

Temporary Revocable Permit (TRP) Guidelines for Seismic Testing on State Forests and Wildlife Management Areas (State Lands)

No seismic testing will be allowed on State Lands without the issuance of a TRP or compliance with the State Environmental Quality Review Act (SEQR). The Special Conditions developed for TRPs will be based on seismic testing method, amount and type of surface disturbance, impact on the environment, site specific sensitivities and public safety issues.

The Department will not issue TRPs for seismic testing on un-leased parcels or to anyone other than the valid lease holder for the property being tested. This will apply to all methods including vibroseis.

TRPs for seismic testing will only be issued to the holder of the Oil and Gas Lease (Lessee) for the State Land being tested. (Subcontractors may be used, however the TRP will only be issued to the lessee).

Requests for more than one seismic program deploying shot holes on State Land, within the

primary term (the first five years) of the lease, will only be approved if the Surface Manager (DEC Regional Forester on State Forests or DEC Regional Wildlife Biologist on Wildlife Management Areas) determines that the activity will not adversely impact the surface resources of the leased parcel. Requests will only be considered in the context of the cumulative impact of all testing to minimize damage to the natural resources contained in the Property. If more than one shot hole seismic test is approved, the lessee will be required to employ additional measures to limit the cumulative impact. These methods include, but are not limited to: the use of less invasive access methods such as helicopter assisted transportation and placement of equipment, limiting mechanized access to previously established access routes, additional site restoration efforts, blocking of all access routes to deter illegal off road vehicle use on the property and/or other means required by the Department to mitigate or reduce impacts.

All requirements related to SEQR must be fulfilled.

Prior to issuing a TRP for shot hole seismic testing (where shot holes will be placed on State Land), a SEQR assessment including the Long Environmental Assessment Form and, if appropriate, a Negative Declaration must be completed and submitted to Linda Kashdam-Schrom in both electronic and hard copy form. (In cases where a positive declaration is reached a full Environmental Impact Statement will be developed.) Additionally, the Regional Land Manager shall notice the TRP in the Environmental Notice Bulletin (ENB) for public comment for 15 days. Following the close of the 15 day period, the Regional Land Manager shall prepare a summary of public comments and if warranted, revise the TRP terms.

Most vibroseis type testing and shot hole testing where no charges are placed on State Land, with activity limited mostly to existing roads, will be considered as a Type 2 Action with no formal SEQR review needed, although the same efforts to minimize adverse impacts will be considered.

A separate TRP and performance bond will be required for each State Forest or Wildlife Management Area being tested.

TRP Special Conditions shall include:

1. Prior to conducting the seismic survey, the following information must be submitted to the Surface Manager with a copy to the Regional Minerals Manager.
 - A. Type of seismic method: shot hole, vibroseis or surface shot. If the shot hole method is used: include hole size, depth, charge, shots per mile and type of markers/monuments. Generally, surface shot methods will not be permitted.
 - B. A topographic map showing the actual route of the seismic lines and locations, with a key or legend indicating the Latitude / Longitude coordinates of each shot hole.
 - C. Plans for surface restoration and plugging shot holes including the removal of flagging, markers and shot wires.

2. No trees 3" DBH or larger shall be cut without written consent of the Surface Manager.
3. No holes will be drilled in any road, trail, picnic areas or other locations where the public tends to congregate, nor will they be drilled in any wetland, unique natural community or area of special concern. The Surface Manager shall have final approval on all shot hole locations.
4. To protect natural resources on the property and minimize impacts, the Department will restrict the size of drilling machinery used by the lessee. Only highly maneuverable, specialized drilling equipment designed with low ground pressure will be permitted. Use of equipment over 66 inches wide must be approved by the Surface Manager. Only highly maneuverable, specialized drilling equipment designed with low ground pressure will be permitted. In areas with steep terrain, sensitive habitats or wetlands, drilling with heli-portable or people portable units will be required. Helicopters may be used to stage equipment into the forest. Any deviation from these restrictions must be approved by the Surface Manager.
5. The Surface Manager will be notified at least 3 business days, and no more than 10 days, before seismic crews enter onto public lands. If weather or environmental conditions have changed, additional protection measures may be required, or seismic testing may be postponed until conditions improve.
6. The Lessee will have staff in the immediate vicinity of the shot location any time the blasting machine is present. Seismic company will also post warning signs, at locations designated by the surface manager, prior to detonation of the charges.
7. Surface reclamation will be required in all cases. All shot holes must be completely filled immediately following detonation. Reclamation may be accomplished by filling the hole with the cuttings and/or bentonite clay, tamping the hole and placing a mound over the hole for settling. Additional natural material from the area adjacent to the hole may only be used with prior approval of the Surface Manager. All markers, posting, flagging, shot wires and any other testing equipment or materials are to be removed from the site immediately following detonations and surface reclamation. Access points, trails and shot hole lines will be blocked (brushed in or with a rock or earthen barriers) at the completion of the job as directed by the Surface Manager.
8. Vibroseis method: Truck mounted equipment shall only be permitted on existing roads, or in other clearings as approved by the Surface Manager. Generally, no new clearings will be permitted expressly for seismic testing. New clearings may be permitted, if in the opinion of the Surface Manager it is in the best interests of the State of New York and will contribute to other land management goals.

9. Geophone Lines: Motor vehicles including ATV's will not be used off road to place geophone lines. Exceptions for the staging of equipment into the woods can be considered by the Surface Manager if this can be accomplished without an excessive impact to the area.
10. A performance bond in the amount of at least \$10,000 shall be provided to the Department for all TRPs issued for seismic testing. The performance bond clause used in our Notice of Sale for Timber Sales is to be inserted into the Special Conditions. A larger bond may be required in certain circumstances if deemed necessary by the Surface Manager.
11. A Pre-work Conference involving the Surface Manager, Lessee and their subcontractor will be scheduled to discuss the proposed operations, TRP Special Conditions, the impacts to the environment and public safety. The Regional Minerals Manager will be notified of the meeting and may attend or send a Minerals Resources staff member. Additional Special Conditions may be developed at the Conference to mitigate surface disturbance and danger/nuisance to the public. Any new Special Conditions will be provided to the Lessee in writing following the Conference.
12. Upon completion of seismic testing and restoration of the area, a completion report must be filed with the Surface Manager with a copy to the Regional Minerals Manager which shows the actual line locations, shot point locations, and any access routes. The permit holder will also supply an electronic file of the GPS "as drilled" locations of each shot hole in a format which is acceptable to the Land Manager.
13. A final inspection will be made by the Surface Manager before the bond is released.
14. The standard liability insurance provisions in the Department's TRP Policy will apply except that the limits of the policy must not be less than \$1,000,000 for each occurrence and at least \$2,000,000 in aggregate.
15. Shot-hole mulching operations must be set back 250' from existing roads and trails unless otherwise approved in writing by the surface manager. In order to limit surface impacts due to seismic operations, the use of mulching equipment for geophone line clearing on state land is discouraged and will only be allowed with written approval of the surface manager.

Additional terms may be added, on a case by case basis, as appropriate.