

Project Description

**Noble Energy, Inc.
Mary's River 3D Seismic Project**

Prepared for Use by:

**Bureau of Land Management
Wells Field Office
3900 E. Idaho Street
Elko, Nevada 89801**

April 2012

Project Description

Mary's River 3D Seismic Project

1.0 INTRODUCTION

Noble Energy, Inc. (Noble) proposes to conduct a 3-D seismic program (Project) in the Tabor Flats area of Elko County, northwest of the city of Wells, Nevada. Noble owns mineral leases in the area, both federal and private. The surface ownership in this area consists of both lands administered by the Bureau of Land Management (BLM) and private lands. The Project is proposed to begin no earlier than August 15, 2012.

The purpose of the 3-D seismic program is to gain a better understanding of the subsurface geology to determine if there is oil and gas potential and to determine the best locations for exploratory drilling. The proposed Project will also provide information allowing identification of subsurface features that could impede drilling. Without the 3-D seismic program, the exploratory program would require significantly more exploratory wells. Thus, the seismic program reduces the exploratory drilling footprint that would otherwise be required and serves to narrow the areas within which Noble may propose to conduct exploratory drilling.

The proposed Project will be conducted in two phases. The first phase (seismic source line location surveying) will be conducted in support of permitting the proposed Project and will include surveying of seismic source and receiver locations and access routes as well as conducting biological and cultural surveys of the area. This phase is expected to be completed by early May 2012. The second phase will be the data collection and recording phase and will include the placement of source and receiver lines, data acquisition, and cleanup. This phase is anticipated to begin no earlier than August 15, 2012. The proposed Project includes the use of vibroseis units as the energy source. The potential need for the use of shot holes (with dynamite) is not anticipated but will not be determined until after the seismic source line location survey is complete.

2.0 PROPOSED PROJECT LOCATION

The proposed Project is located in Elko County Nevada approximately 4 miles northwest of Wells, Nevada and approximately 40 miles northeast of Elko, Nevada on the north side of Interstate-80. General access to the proposed Project from Elko and Wells is via Interstate-80 to Starr Valley Road (Elko County Road 230) or Exit 343 and proceeding north on local roads to the project area.

Legal Description for Federal Surface and/or Minerals (See Map 2):

T39N, R60E: N/2 & SW/4 Section 24, Section 25, E/2 SE/4 & W/2 W/2 Section 26
Sections 35 and 36

T39N, R61E: Section 20, N/2 N/2 Section 21, SW/4 NW/4 Section 22, Sections 28 & 30
(minerals only), Sections 31 & 32, and W/2, NW/4 NE/4 & SE/4 SE/4 Section 34,
Section 35 (minerals only)

T38N, R60E: Sections 1, 2, 11, 12, 13, 14, 23, 24, 25 & 26
T38N, R61E: W/2 NW/4 & NW/4 SW/4 Section 2
Sections 4, 6, 7, 8, 9
N/2 NW/4 & portion of SE/4 Section 10
S/2 Section 14, Section 15
S/2 SE/4, NE/4 SE/4 and NW/4 NW/4 Section 16
Section 18
W/2 Section 20
Section 22 less SE/4 SW/4
N/2 Section 23
Sections 26, 28 & 30
E/2 NE/4 and portion of S/2 north of RR Section 32
Section 34 and portion of N/2 north of RR Section 35

3.0 PROPOSED PROJECT PHASE I – SEISMIC SOURCE LINE LOCATION, BIOLOGICAL, AND CULTURAL SURVEYS

3.1 PROPOSED SEISMIC SOURCE LINE LOCATION SURVEY

To accurately define the extent and locations of the Project activities, a land survey crew will locate and place temporary pin flags at the initially proposed receiver and source points using a high-accuracy global positioning system (GPS). These one or two person crews will also identify the access routes to be used. The survey crew will be responsible for positioning receiver and source point stations such that they avoid all known and apparent cultural, natural, and existing land use features of importance. (These locations will be modified as additional natural and cultural resources are identified, as discussed in Sections 3.2 and 3.3 below). Vehicles bringing surveyors to and from the project area will remain on existing roads and trails. Crews will travel cross country on all-terrain vehicles (ATVs) and foot during the survey. The seismic survey is anticipated to take approximately 60 days to complete. Cutting of vegetation is not expected to be required. Existing routes and trails will be used to the maximum extent possible.

3.2 PROPOSED CULTURAL SURVEY

A Class III Cultural Resource Inventory will be conducted in accordance with applicable state and federal requirements on both lands administered by the BLM and on any private lands where permission can be obtained from the landowners. BLM-approved archaeological contractors will walk each source line and a portion of the receiver lines as required for access. The Inventory will include any proposed avoidance routes around identified sites and any access routes needed by the seismic crew.

GPS technology and field computers will be used to collect field data as efficiently as possible for the Cultural Resource Inventory. The shapefiles of the surveyed or proposed line locations will be loaded onto crew GPS units to follow the source and receiver lines. The GPS units will also be used to record site data. Laptop or tablet computers loaded with Nevada site forms will be utilized to record sites.

Site data will be transmitted back to the contractor offices on a nightly basis to allow for changes in the seismic source line locations and access routes (discussed in Section 3.1). In consultation with BLM, adjustments to the proposed source and receiver lines and access routes will be made so that sensitive cultural sites are avoided. Recording of eligible cultural sites, isolates, and historic not-eligible sites will adhere to BLM and State Historic Preservation Office (SHPO) standards.

3.3 PROPOSED BIOLOGICAL SURVEY

Sage-grouse lek surveys will be conducted in accordance with applicable requirements for the entire area proposed for the seismic program (as it applies to the disturbance to this species) plus a three-mile buffer around the program area. Two surveys for new or undocumented leks (aerial fixed-wing flights) will be conducted as well as three ground surveys of each lek for confirming activity status and recording lek attendance numbers. Lek attendance numbers will be used for monitoring trends and impacts, as per standard BLM and Nevada Department of Wildlife (NDOW) surveying protocols. Pygmy rabbit surveys will be conducted in accordance with applicable requirements for source and receiver lines along with access routes on BLM-administered lands. Vegetation types, wetlands, large game species, raptors, and general wildlife observations will also be recorded and presented to BLM. As noted in Section 3.1, the results of the biological survey will be utilized in consultation with BLM to move the initially proposed seismic source and receiver locations to minimize impacts.

4.0 PROPOSED PROJECT PHASE II – SEISMIC DATA COLLECTION AND RECORDING OPERATIONS

The proposed 3-D seismic program includes the generation of acoustic energy transmitted into the ground by the use of vibroseis units (see Photo 1). The recording equipment includes a series of geophones, which are magnets with a copper coil surrounding the magnet (see Photos 2 and 3). Each set of geophones will be connected to a recording box and battery at locations throughout the project area. When the coil is moved through the magnetic field by the acoustic energy, an electrical current is produced and recorded, providing geophysical data.

The source and receiver lines will use a 165-foot station interval and variable line intervals. The source and receiver lines are specialized electrical lines similar in size and weight to heavy duty extension cords and do not generally create disturbance of the surface or soil. Line trucks (pickup trucks) will be used to lay out the receiver lines in some areas while receivers in other areas may be deployed on foot or by ATV.

The use of trucks in some areas will allow for fewer passes along the line to reduce disturbance and access – generally once to lay out the equipment and once to pick it up. The deployment method for any individual area will be determined in consultation with BLM and private landowners after taking into account avoidance areas identified in biological and cultural surveys, and will be designed to minimize effects to such resources. Helicopters may be used to deploy some of the recording equipment to further reduce the impact to resources.

Once the equipment is dropped off, crew members will walk to the first receiver on the receiver line and manually connect the recording box, battery and geophones. The geophones will be laid out by hand around each station in a pre-determined pattern. They will be placed into the soil using foot pressure. Approximately 16 to 20 lines of receivers will be deployed at any one time.

The vibroseis trucks will make a single pass along each source line. When enough sources have been recorded such that a receiver line is no longer active, it will be picked up and moved from the trailing end of the active recording patch to the front edge of the patch in an assembly line fashion to allow recording to move smoothly across the project area. Each receiver line is expected to be on the ground for 1 to 2 weeks. Line maintenance will be required once the receiver lines are laid out. This will be conducted using ATVs and on foot.



Photo 1 - Vibroseis Truck



Photo 2 – Geophone along Receiver Line



Photo 3 – Receiver Line Layout

Depending on the results from the seismic source line location survey, if vibrator access is not possible in some locations (due to topography or ground conditions), shot-holes (with dynamite) will be required. The shot holes would be drilled using small rigs mounted on dune buggy-type vehicles. Shot holes will generally require 5 pounds of dynamite at depths of 40 to 150 feet. At this time it is not anticipated that shot holes will be required, but Noble is seeking BLM approval of the use of shot holes as part of the proposed Project in case access or other issues require such use.

5.0 PROPOSED PROJECT SCHEDULE, WORKFORCE AND TRAFFIC

Phase II of the proposed Project (seismic data collection and recording) is scheduled to begin no earlier than August 15, 2012, is anticipated to last approximately 2 months, and is anticipated to require 25 to 50 workers (depending on the contractor crew size). Seismic operations will be conducted 7 days per week. Workers will stay in Wells or Elko and travel to and from the site each day in carpool vans. Existing roads and trails will be used for access to the project area. Vehicles anticipated during seismic operations include 8 to 12 pickup trucks (e.g., line trucks, flatbed trucks, etc.), 1 fuel truck, 2 vans, 10 to 15 ATV/kubotas, and up to 9 vibroseis trucks. All vibroseis trucks are expected to be equipped with sand/flotation tires to minimize the surface impact along source lines (see Photo 1).

6.0 PROPOSED PROJECT DESIGN FEATURES (APPLICANT COMMITTED MEASURES TO PROTECT RESOURCES)

6.1 CULTURAL

If unknown cultural resources are found during operations (Phase 2), Noble will implement its Unanticipated Discovery Plan for Cultural Resources, which includes immediate stoppage of all work within thirty (30) meters of the discovery as directed by BLM and immediate notification of the BLM Authorized Officer.

Prior to commencement of operations, Noble will inform all employees and contractors of Archeological Resources Protection Act (ARPA), the Native American Graves Protection and Repatriation Act (NAGPRA), the Paleontological Resources Preservation Act (PRPA), and the National Historic Preservation Act (NHPA) requirements for compliance consideration.

6.2 WILDLIFE RESOURCES

Noble will inform employees and contractors that harassing or shooting of wildlife will not be permitted, dogs may not be brought to the project area, no firearms will be allowed on site, and there will be no littering.

6.3 SOILS

No truck traffic will be operated during wet periods or in areas of saturated ground when surface rutting could occur. This will also apply to soils which are deemed "sensitive" by the BLM.

6.4 VEGETATION

If operations cause unplanned surface rutting or have otherwise removed all surface vegetation, the areas will be reclaimed and reseeded as directed by the landowner. A reclamation plan will be created in consultation with the BLM.

6.5 NOXIOUS AND INVASIVE SPECIES

Noble will clean all equipment and vehicles prior to accessing public lands in the project area to prevent the spread of noxious weeds.

6.6 PUBLIC HEALTH AND SAFETY

Vehicle traffic will be limited to existing roads. Vehicles will travel at speeds within set speed limits for main roads. Noble will conduct a Job Site Assessment meeting prior to kick off with the entire project team and have daily safety meetings each morning. All contractors will be required to have a Health and Safety Plan written and implemented specific to this project's requirements. This Plan will include emergency response protocols.

6.7 WATER RESOURCES, WETLAND AND RIPARIAN AREAS

Fueling of vibroseis trucks will not occur within 300 feet of any riparian areas or standing or flowing surface water including streams, ponds, springs, seeps and stock reservoirs.

Noble will prepare, implement, and follow a Spill Prevention Plan in accordance with applicable regulations. Under this plan and in accordance with applicable requirements, Noble will clean up all diesel, hydraulic fuel, or other spills, including contaminated soils. All spill-related material will be hauled to an approved disposal site in accordance with applicable requirements.

Fuel trucks will not run down the source or receiver lines – fueling of the vibroseis trucks will occur at established roads.

6.8 EXISTING FACILITIES

A 300 foot buffer distance will be maintained from hazards (infrastructure, houses, barns, concrete pads, radio antennae). If utilized, Noble will maintain the required BLM buffer distances for use of dynamite shots.

Any facilities damaged in connection with this seismic operation will be immediately restored to original condition or replaced with a similar facility.

Fences will be avoided and gates will be used whenever possible. Gates will remain the position found after going through them. If a fence must be crossed, it will be let down or cut (as determined by the owner), crossed, and immediately put back up.

6.9 FIRE PROTECTION

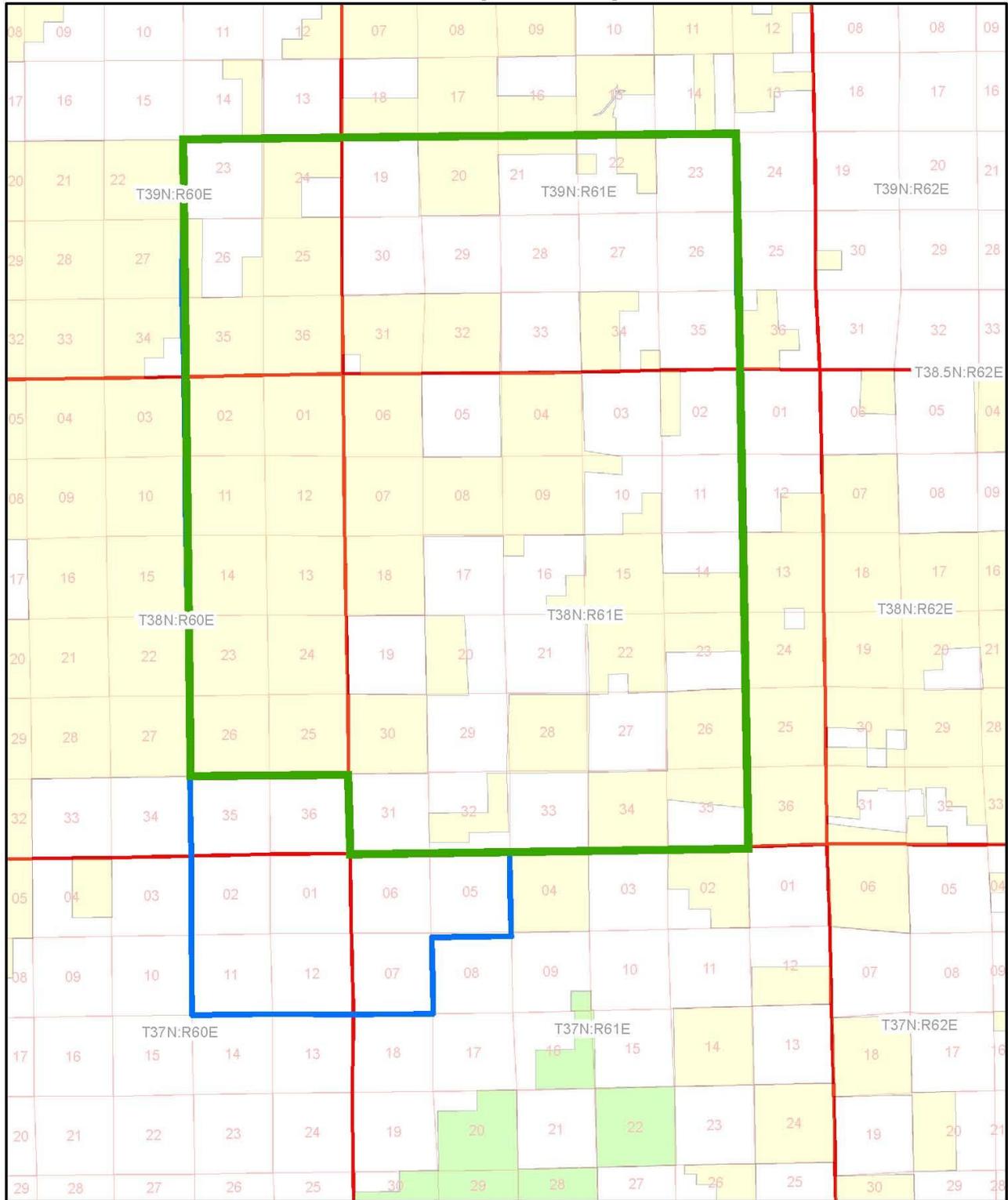
Due to the sensitive nature of the sagebrush habitat in this project area and the past history of fire impacts to grazing and sage grouse, Noble will prepare and implement a Fire Prevention Plan.

Portable generators used in the project area will have spark arresters.

Noble will coordinate with appropriate fire-fighting personnel in the BLM Wells Field Office and local authorities.

All vehicles will be equipped with fire extinguishers and shovels.

Lonewolf: Mary's River Project 2012



- New Boundary
- Original Project Boundary

Landstatus

- BLM
- Forest Service
- Private

N

0 1 Miles

HAYDEN-WING ASSOCIATES, LLC
 P.O. Box 8025 • 1201 N. Broadway • 2012
 MURKIN, WY 82432

Date: 4/19/2012