

**Seismic Activity on Exploration Licences 2415, 2416 and 2409
Scoping Document for the Environmental Assessment**

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Seismic Exploration Activities on Exploration Licences 2415, 2416 and 2409 Scoping Document for the Environmental Assessment

1.0 Purpose

This document provides a description of the scope of the project, the factors to be considered, and the scope of the factors related to the Environmental Assessment (EA) for the proposed seismic exploration project by Canadian Superior Energy Inc. in Exploration Licences (ELs) 2415, 2416 and 2409.

This document has been developed by the Canada - Nova Scotia Offshore Petroleum Board (CNSOPB), as the Responsible Authority (RA) for this project, pursuant to Sections 15 and 16 of the Canadian Environmental Assessment Act (CEA Act).

2.0 Regulatory Considerations

The project will require authorizations pursuant to Section 142 (1)(b) of the Canada - Nova Scotia Offshore Petroleum Resources Accord Implementation Act (S.C. 1988, c. 28). Issuance of this authorization is described in the Law List Regulations of the CEA Act and therefore constitutes a power as described in sub-section 5(1)(d) of the CEA Act. The CNSOPB, as the sole RA, must ensure that an environmental assessment of the project is carried out. Pursuant to Section 17(1) of the CEA Act, the CNSOPB will delegate the preparation of the environmental assessment to the proponent.

Based on the information contained in the project description submitted to the CNSOPB in January 2006, Fisheries and Oceans Canada (DFO) and Environment Canada (EC) have determined that they are in possession of specialist knowledge and information to support the EA process.

Environment Canada administers several statutes including the *Canadian Environmental Protection Act* (CEPA), *Species at Risk Act* (SARA), *Department of Environment Act*, *Fisheries Act* (Section 36), and *Migratory Birds Convention Act*. Fisheries and Ocean Canada administers a number of statutes including the *Fisheries Act* and *Oceans Act*. The *Gully Marine Protected Area Regulations* under the *Oceans Act* were enacted in May 2004. DFO also has responsibilities for aquatic species (including marine mammals, fish and turtles) under SARA.

3.0 Scope of the Project

The proposed seismic exploration activity will occur in the marine waters under the jurisdiction of the CNSOPB, on the Scotian Shelf, in EL 2415 (Marauder Block), EL 2416 (Marconi Block), and EL 2409 (Mariner Block). The Marauder Block is located approximately 310km from Halifax and 12km from Sable Island. The Marconi Block is approximately 330km from Halifax and 16km from Sable

Island. The Mariner Block is approximately 275km from Halifax and between 2km and 10km from Sable Island.

Canadian Superior, the proponent, is proposing a multi-year, multi-survey seismic program. It is anticipated that seismic exploration will occur within the ELs and on the lands between the Mariner and Marauder Blocks.

The proponent has stated that surveys could occur at any time in any given year. Individual surveys could occur as early as 2006 and as late as 2013. Therefore, a commitment to periodic review of the EA to ensure validity of the findings is required.

4.0 Factors to be Considered

The EA shall include a consideration of the following factors as described in subsection 16(1) of the CEA Act:

- the environmental effects of the project, including the environmental effects of malfunctions or accidents that may occur in connection with the project and any cumulative environmental effects that are likely to result from the project in combination with other projects or activities that have been or will be carried out;
- the significance of the effects referred to in paragraph (a);
- comments from the public that are received in accordance with the CEA Act and the regulations;
- measures that are technically and economically feasible and that would mitigate any significant adverse environmental effects of the project; and

The project will be posted on the Canadian Environmental Assessment Registry and the CNSOPB public registry. The proponent's EA will be posted on the CNSOPB public registry and will be open for comment for 30 days. Comments will also be requested from the CNSOPB's Fisheries Advisory Committee. All public comments received will be distributed to Canadian Superior and posted on the CNSOPB public registry.

5.0 Scope of the Factors to be Considered

Based on previous EAs of similar projects, the CNSOPB has focused the scope of the factors to be considered to those that have the potential to have significant adverse environmental effects. This scope includes consideration of the regulations, standards and required mitigation to be followed during project activities.

Section 6 outlines the issues of concern and the potential environmental risks that are to be assessed in the EA, and includes discussion of the rationale for the inclusion of each of the components and activities listed.

Appendix A describes those factors that are considered unlikely to have the potential to cause significant adverse environmental effects. Rationale for the exclusion of these factors, and specific mitigation that must be implemented to allow for their exclusion in the EA are included in Appendix A. These excluded factors are considered outside of the scope and do not require assessment in the EA. If mitigation other than that indicated in Appendix A is to be used, further assessment may be required.

6.0 Issues of Concern and Potential Environmental Risks

6.1 Fish Spawning

Vessel noise may affect fish behavior by causing fish to avoid areas of vessel travel and/or by causing a 'startle response'. This may result in diversion from spawning areas. The proponent shall therefore identify all known spawning areas and expected spawning times in the project area. Where practical, it will be a requirement that known spawning areas shall be avoided by the seismic vessel. The proponent shall determine the potential for significant adverse environmental effects on fish spawning as a result of the project where avoidance is not practical.

The assessment shall include a discussion of mitigative measures to be used to minimize the potential for significant adverse environmental effects on fish spawning, including those listed in the *Statement of Canadian Practice on the Mitigation of Seismic Noise in the Marine Environment*. No further assessment of fish, beyond assessment for the potential for significant adverse environmental effects on fish spawning, is required.

6.2 Species at Risk

The proponent shall assess the potential for significant adverse environmental effects on all species at risk that may occur in the project area. The assessment shall be in accordance with the EA requirements identified in the CEA Act and the Species at Risk Act. The proponent shall identify and evaluate all environmental effects, including cumulative effects, of the project on species listed on Schedule 1 of the SARA, and their critical habitat. The proponent shall also assess the means by which potential adverse effects on species at risk and their critical habitat will be mitigated through design and/or operational procedures, including those listed in the *Statement of Canadian Practice on the Mitigation of Seismic Noise in the Marine Environment*. The mitigation measures identified shall be consistent with SARA recovery strategies and/or action plans. The proponent shall indicate whether the

project will be in compliance with the SARA prohibitions (SARA Sections 32, 33 and 58) and shall identify whether any SARA Section 73 permits will be requested.

New species may be added to Schedule 1 of SARA throughout the life of the project. Therefore, assessment of species at risk shall include a similar analysis for species listed by COSEWIC as either endangered, threatened or of special concern. A commitment to periodic review of the EA will be required to determine if the species at risk assessment is still valid. The proponent should note that additional mitigation may be required should new species be added to Schedule 1.

6.3 Snow Crab

There has been public expression of concern about the potential for seismic activity to have an effect on snow crab populations. Also, current recruitment levels for snow crab are below average on the Scotian Shelf, and any further threats to the population should be minimized. Research into the effects of seismic on snow crab remains ongoing. The proponent will therefore assess the potential effects on snow crab in the EA, using the most current scientific knowledge available.

A commitment to periodic review of the EA findings to ensure consistency with advances in scientific knowledge of the effects of seismic on snow crab will be required. Should future research lead to the conclusion that seismic surveying can cause significant adverse environmental effects on snow crab, the proponent will be required to apply additional mitigation to avoid these effects.

6.4 Special Areas – The Gully and Sable Island

The Gully Marine Protected Area (MPA) is near the proposed project area. Seismic noise generated by the project may reach whales and other biological receivers in the Gully. Marine mammals, such as the endangered Northern Bottlenose Whale, frequent the waters of the Gully. Marine mammals may show avoidance behavior as a result of seismic noise. This may result in diversion from migration routes and/or feeding areas. Seismic noise may mask marine mammal vocalization, potentially affecting communication among individuals. There is also the potential for collisions between marine mammals and seismic vessels and/or support vessels.

Section 4 of the Gully Marine Protected Area Regulations prohibits activities in the vicinity of the MPA that are likely to result in disturbance to any living marine organism within the MPA. The proponent shall provide analysis of potential impacts to the Gully ecosystem and demonstrate compliance with the MPA Regulations. The proponent will also identify whether any activity

plans will be submitted for approval under Section 6 of the Regulations (such as turning in the MPA).

Assessment of the potential for significant adverse environmental effects on the Gully, including cumulative effects as a result of multiple surveys, shall be included in the EA. Assessment of potential effects on the Gully shall include:

- acoustic modeling covering the entire year (including factors such as seabed, geomorphic and oceanographic characteristics that influence propagation) with an assessment of potential impacts based in predicted sound levels;
- average and worst case sound exposure levels for a variety of depths within the MPA and Zone 1
- investigations of the potential for multipath propagation, reverberation in the canyon, and sound channelling or ducting;
- information and analysis of the signal excess (i.e. signal to noise comparisons with ambient or background sound levels);
- detailed operational mitigation techniques, e.g., ramp-up and shut-down procedures, and a code of conduct.

The proponent shall be required to provide evidence that there will be no other concurrent seismic programs close to the Gully. Seismic operators will be required to adhere to marine mammal observer protocols stated in the most recent version of the *Statement of Canadian Practice on the Mitigation of Seismic Noise in the Marine Environment* for night and poor weather detection.

If received sound levels predicted by acoustic modeling exceed those measured in the Gully during the 2003 seismic season, the proponent will design and conduct an Environmental Effects Monitoring (EEM) program and/or a compliance monitoring program. The program will use field validation to verify the model predications and monitor for significant marine mammal responses. Regardless of whether levels are high enough to require a program, the proponent shall consult with DFO to determine if there is potential for collaborative research and monitoring in conjunction with the seismic program.

An assessment of the potential for vessel traffic in the Gully shall also be included in the EA. Spills from malfunctions and/or accidental events may have the potential to reach the Gully and shall be assessed. A cumulative effects assessment of the potential effects of multiple surveys shall also be included in the EA. The proponent shall discuss the means by which design and/or operational procedures, including follow-up measures, will be implemented to mitigate significant adverse effects on the Gully.

Sable Island is also within the vicinity of the proposed project area. It is a federally protected area and a designated Migratory Bird Sanctuary. Bird species at risk, such as the Roseate Tern and the Ipswich Sparrow, breed on Sable Island. Spills from malfunctions and/or accidental events may have the potential to reach Sable Island. Therefore, assessment of the potential for significant adverse environmental effects on Sable Island, including cumulative effects as a result of multiple surveys, shall be included in the EA.

The assessment shall address the fate and effects of accidental spills on Sable Island and its resident species. The assessment shall include the means by which design and/or operational procedures, including follow-up measures, will be implemented to mitigate significant adverse effects on the Sable Island.

6.5 Malfunctions and Accidental Events

Accidental spills have the potential to affect the health and/or survival of plankton, fish eggs and larvae, juvenile and adult fish, marine mammals, marine birds, marine turtles, and marine invertebrates in the immediate vicinity of a seismic vessel. Historically, hydrocarbon releases have occurred from breaks in streamers. Therefore, the potential for accidental spills and the effects of accidental spills shall be assessed.

The proponent shall provide information on the sources and volumes of petroleum products expected to be onboard. The proponent will also be required to assess the measures to be used to minimize the potential for accidental releases of these materials into the environment. A commitment to submit a spill response plan that considers the EA findings is required as well.

6.6 Other Ocean Users

Commercial fisheries for halibut, snow crab and stone crab, as well as some ground fish, shrimp, scallop, and shark fisheries occur in the project area. Interaction with marine shipping, military vessels, and scientific research vessels may also occur. The proponent shall therefore assess and discuss mitigative measures to minimize potential interference with other ocean users. Consultation with other oceans users and DFO to determine the extent of potential interaction is required, the results of which shall be summarized and assessed in the EA.

6.7 Cumulative Effects

Section 16 (1) of the CEA Act requires that every screening or comprehensive study of a project and every mediation or assessment by a review panel include a consideration of any cumulative environmental effects that are likely to result from the project in combination with other projects or activities that have been or will be carried out.

A number of seismic projects have occurred on the Sable Island Bank in the past. The proponent will be required to estimate the shot-point density over the life of their project, and assess the potential effects of the additional seismic surveying, taking into account the past seismic activity in the project area. The assessment shall include the means by which design and/or operational procedures, including follow-up measures, will be implemented to mitigate significant adverse effects from cumulative effects.

7.0 Follow-up Monitoring

Based on the discussion of the above issues of concern and potential environmental risks, the proponent will include discussion of the need for, and requirements of, a follow-up program.

Fisheries and Oceans Canada conduct research in the Gully from time to time, and this project may provide DFO or others with an opportunity to conduct research. An EEM program and/or compliance monitoring may be required, as outlined in Section 6.4.

8.0 Spatial and Temporal Boundaries

The proponent will clearly define, and provide the rationale for, the spatial and temporal boundaries that are used in its environmental assessment. Boundaries should be flexible and adaptive to enable adjustment or alteration based on field data.

The temporal scope should describe the timing of project activities to the best of the proponent's knowledge at the time of drafting of the EA. Updates on timing of project activities will be submitted to the CNSOPB as soon as they are determined. Validation of the EA findings will be required after a period of time (to be determined).

9.0 Significance of Adverse Environmental Effects

The proponent will clearly describe the criteria by which it proposes to define the term "significance" of any adverse effects (i.e., following the employment of mitigative measures) that are predicted by the environmental assessment. This definition should be consistent with the November 1994 Canadian Environmental Assessment Agency reference guide *Determining Whether a Project is Likely to Cause Significant Adverse Environmental Effects*.

10.0 Assessment Summary Section

The assessment will include a detailed summary of all mitigation, commitments and follow-up measures discussed in the EA. Adherence to mitigation measures,

commitments and/or follow-up measures will be considered by the CNSOPB as possible conditions of authorization.

Appendix A: Components and Activities Outside of the Scope

I) Air quality

The major emission sources from the proposed project are the seismic vessel and any support vessels. It is expected that project emissions will not cause an exceedance of applicable air quality standards or guidelines. There are limited emissions sources, and few receptors in the project area.

Assessment of potential effects on air quality can be excluded from the EA provided that :

- the proponent adheres to MARPOL Annex VI, Regulations for the Prevention of Air Pollution from Ships; and
- the proponent adheres to the Air Emissions provisions of the Offshore Waste Treatment Guidelines, including submissions of greenhouse gas emissions.

II) Water Quality

Malfunctions and accidental events may have an effect on water quality. An assessment of the effects of hydrocarbon spills on living organisms and special areas, rather than water quality, is the appropriate focus for this assessment. Assessment of the effects of malfunctions and/or accidental events is required as is stated in Section 6.5.

Assessment of the potential effects on water quality can be excluded from the EA provided that:

- the proponent adheres to the Nova Scotia Offshore Area Petroleum Geophysical Regulations;
- the proponent adheres to the Offshore Waste Treatment Guidelines; and
- the proponent is in compliance with the Fisheries Act (Section 36).

III) Fish

There is no scientific evidence to date to suggest that seismic has adverse population level effects on fish, therefore significant adverse environmental effects are not expected to result from this project. As stated in Section 6.1, assessment of the effects on seismic on fish *spawning* shall be included in the EA.

No further assessment of the potential effects on fish will be required, provided that:

- the proponent adheres to all mitigation measures outlined in the *Statement of Canadian Practice on the Mitigation of Seismic Noise in the Marine Environment*.

IV) Marine Benthos

The proponent will be required to adequately assess the effects of seismic on snow crab, as stated in Section 6.3. No further assessment of marine benthos is required at this time. However, little research has been done on the effects of seismic on other invertebrates. Therefore the proponent will be required to review scientific knowledge related to the potential effects of seismic noise on marine benthos, and may be required to validate the environmental assessment and/or implement additional mitigation to avoid significant adverse environmental effects on marine benthos as a result of the project.

V) Marine Mammals and Sea Turtles

As stated in Sections 6.2 and 6.4, the potential for effects on marine mammal and turtle species at risk, as well as those species that may occur in the Gully, will be assessed. Provided that appropriate mitigation is applied, it is not expected that seismic surveying will have an adverse population level effect on marine mammals or sea turtles.

No further assessment beyond that stated in Sections 6.2 and 6.4 will be required provided that:

- the proponent adheres to mitigation measures outlined in the *Statement of Canadian Practice on the Mitigation of Seismic Noise in the Marine Environment* for marine mammals and sea turtles.

As stated in section 6.2, the proponent should note that additional mitigation may be required should new species be added to Schedule 1 of SARA.

VI) Marine Birds

It is recognized that the attraction of any bird species to lights on vessels or discharge of food waste may cause collision, landing, and may disrupt migration. Contact with vessel surfaces may also result in oiling of birds. An assessment of the potential adverse environmental effects on bird species at risk will be required, as outlined in Section 6.2. Population level effects are not anticipated from seismic projects, however.

No further assessment of effects on marine birds shall be required, provided that:

- the proponent adheres to the protocol described in Williams and Chardine's brochure entitled "The Leach's Storm Petrel: General Information and Handling Instructions" should birds land on vessels involved with the project. A permit is required from the Canadian Wildlife Service of Environment Canada to implement this protocol.

VII) Effects of the Environment on the Project

Physical environmental conditions acting on the project that could have consequences for the environment (factors which could affect the project design or operation) include meteorology, oceanography and ice regime. The proponent is required to monitor physical environmental conditions and develop a plan to avoid potential adverse effects on the environment as a result of environmental influences on the project. An Emergency Response Plan is required. A certificate from Transport Canada to assure vessels are suited for possible effects from the environment is required as well.