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To: All Frontier oil and gas companies under the jurisdiction of the National Energy Board (Board or NEB) and All Interested Parties

**Statement of Canadian Practice with respect to the Mitigation of Seismic Sound in the Marine Environment**

Federal and provincial governments recently released a *Statement of Canadian Practice with respect to the Mitigation of Seismic Sound in the Marine Environment* (Statement) and an accompanying Background Paper. The Statement contains a set of mitigation measures which can assist in minimizing the potential adverse impacts of seismic activity that use air source arrays in non-ice covered marine waters. A copy of the Statement is attached for your information. The federal government has made the Statement and Background Paper available on the internet at [www.dfo-mpo.gc.ca/oceans-habitat](http://www.dfo-mpo.gc.ca/oceans-habitat). Use the window "Find Information On" and select "Reports and Publications". The documents are located under the heading "Documents, Frameworks and Strategies".

The NEB regulates seismic activities under the *Canada Oil and Gas Operations Act* (Act) and the associated *Canada Oil and Gas Geophysical Operations Regulations*. The Act and the regulations apply to the onshore and offshore areas including those in the Northwest Territories and Nunavut and the offshore areas of Yukon, British Columbia<sup>1</sup>, the Bay of Fundy, Hudson Bay, James Bay and the Gulf of St. Lawrence. Companies that propose to conduct marine seismic activities in these areas must apply to the NEB for an authorization pursuant to section 5(1)(b) of the Act.

Companies planning to carry out seismic activities under NEB jurisdiction should become familiar with the Statement. The mitigative measures contained in the Statement were developed based on available scientific knowledge and can be considered to be the current best practice for minimizing potential adverse impacts of seismic activity that use air source arrays. Applications for authorizations to conduct seismic operations and related environmental assessment documents should identify the mitigative measures that would be applied and a rationale for any that represent modifications or variations to those that are set out in the Statement.

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<sup>1</sup> There are federal and provincial moratoria on oil and gas activities in the territorial seas offshore of British Columbia since 1972 and 1989 respectively.

For additional information, please contact the Chief Conservation Office at (403) 299-2792 or by email at [bharat.dixit@neb-one.gc.ca](mailto:bharat.dixit@neb-one.gc.ca).

Yours truly,

A handwritten signature in black ink, appearing to read 'bdixit' with a stylized flourish at the end.

Bharat Dixit  
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Attachment

# Statement of Canadian Practice with respect to the Mitigation of Seismic Sound in the Marine Environment

## Context

The Statement of Canadian Practice with respect to the Mitigation of Seismic Sound in the Marine Environment specifies the mitigation requirements that must be met during the planning and conduct of marine seismic surveys, in order to minimize impacts on life in the oceans. These requirements are set out as minimum standards, which will apply in all non-ice covered marine waters in Canada. The *Statement* complements existing environmental assessment processes, including those set out in settled land claims. The current regulatory system will continue to address protection of the health and safety of offshore workers and ensure that seismic activities are respectful of interactions with other ocean users.

## Definitions

Cetacean: means a whale, dolphin or porpoise.

Critical habitat: means the habitat that is necessary for the survival or recovery of a listed wildlife species and that is identified as the species' critical habitat in the recovery strategy or in an action plan for the species.

Marine Mammal Observer: means an individual trained to identify different species of marine mammals and turtles that may reasonably be expected to be present in the area where the seismic survey will take place.

Marine mammals: means all cetaceans and pinnipeds.

Passive Acoustic Monitoring: means a technology that may be used to detect the subsea presence of vocalizing cetaceans.

Pinniped: means a seal, sea lion or walrus.

Ramp-up: means the gradual increase in emitted sound levels from a seismic air source array by systematically turning on the full complement of an array's air sources over a period of time.

Seismic air source: means an air source that is used to generate acoustic waves in a seismic survey.

Seismic air source array(s): means one or a series of devices designed to release compressed air into the water column in order to create an acoustical energy pulse to penetrate the seafloor.

Seismic survey: means a geophysical operation that uses a seismic air source to generate acoustic waves that propagate through the earth, are reflected from or refracted along subsurface layers of the earth, and are subsequently recorded.

“Statement:” means the Statement of Canadian Practice for the Mitigation of Seismic Sound in the Marine Environment.

Whale: means a cetacean that is not a dolphin or porpoise.

## Application

1. Unless otherwise provided, the mitigation measures set out in this Statement apply to all seismic surveys planned to be conducted in Canadian marine waters and which propose to use an air source array(s).
2. The mitigation measures set out in this Statement do not apply to seismic surveys conducted:
  - a. on ice-covered marine waters; or
  - b. in lakes or the non-estuarine portions of rivers.

## Planning Seismic Surveys

### Mitigation Measures

3. Each seismic survey must be planned to
  - a. use the minimum amount of energy necessary to achieve operational objectives;
  - b. minimize the proportion of the energy that propagates horizontally; and
  - c. minimize the amount of energy at frequencies above those necessary for the purpose of the survey.
4. All seismic surveys must be planned to avoid:
  - a. a significant adverse effect for an individual marine mammal or sea turtle of a species listed as endangered or threatened on Schedule 1 of the *Species at Risk Act*; and
  - b. a significant adverse population-level effect for any other marine species.
5. Each seismic survey must be planned to avoid:
  - a. displacing an individual marine mammal or sea turtle of a species listed as endangered or threatened on Schedule 1 of the *Species at Risk Act* from breeding, feeding or nursing;
  - b. diverting an individual migrating marine mammal or sea turtle of a species listed as endangered or threatened on Schedule 1 of the *Species at Risk Act* from a known migration route or corridor;
  - c. dispersing aggregations of spawning fish from a known spawning area;
  - d. displacing a group of breeding, feeding or nursing marine mammals, if it is known there are no alternate areas available to those marine mammals for those activities, or that if by using those alternate areas, those marine mammals would incur significant adverse effects; and
  - e. diverting aggregations of fish or groups of marine mammals from known migration routes or corridors if it is known there are no alternate migration routes or corridors, or that if by using those alternate migration routes or corridors, the group of marine mammals or aggregations of fish would incur significant adverse effects.

## Safety Zone and Start-up

### Mitigation Measures

6. Each seismic survey must:
  - a. establish a safety zone which is a circle with a radius of at least 500 metres as measured from the centre of the air source array(s); and
  - b. for all times the safety zone is visible,
    - i. a qualified Marine Mammal Observer must continuously observe the safety zone for a minimum period of 30 minutes prior to the start up of the air source array(s), and
    - ii. maintain a regular watch of the safety zone at all other times if the proposed seismic survey is of a power that it would meet a threshold requirement for an assessment under the *Canadian Environmental Assessment Act*, regardless of whether the Act applies.
7. If the full extent of the safety zone is visible, before starting or restarting an air source array(s) after they have been shut-down for more than 30 minutes, the following conditions and processes apply:
  - a. none of the following have been observed by the Marine Mammal Observer within the safety zone for at least 30 minutes:
    - i. a cetacean or sea turtle,
    - ii. a marine mammal listed as endangered or threatened on Schedule 1 of the *Species at Risk Act*, or
    - iii. based on the considerations set out in sub-section 4(b), any other marine mammal that has been identified in an environmental assessment process as a species for which there could be significant adverse effects; and
  - b. a gradual ramp-up of the air source array(s) over a minimum of a 20 minute period beginning with the activation of a single source element of the air source array(s), preferably the smallest source element in terms of energy output and a gradual activation of additional source elements of the air source array(s) until the operating level is obtained.

## Shut-down of Air Source Array(s)

### Mitigation Measures

8. The air source array(s) must be shut down immediately if any of the following is observed by the Marine Mammal Observer in the safety zone:
  - a. a marine mammal or sea turtle listed as endangered or threatened on Schedule 1 of the *Species at Risk Act*; or
  - b. based on the considerations set out in sub-section 4(b), any other marine mammal or sea turtle that has been identified in an environmental assessment process as a species for which there could be significant adverse effects.

## **Line Changes and Maintenance Shut-downs**

### Mitigation Measures

9. When seismic surveying (data collection) ceases during line changes, for maintenance or for other operational reasons, the air source array(s) must be:
  - a. shut down completely; or
  - b. reduced to a single source element.
  
10. If the air source array(s) is reduced to a single source element as per subsection 9(b), then:
  - a. visual monitoring of the safety zone as set out in section 6 and shut-down requirements as set out in section 8 must be maintained; but
  - b. ramp-up procedures as set out in section 7 will not be required when seismic surveying resumes.

## **Operations in Low Visibility**

### Mitigation Measures

11. Under the conditions set out in this section, cetacean detection technology, such as Passive Acoustic Monitoring, must be used prior to ramp-up for the same time period as for visual monitoring set out in section 6. Those conditions are as follows:
  - a. the full extent of the safety zone is not visible; and
  - b. the seismic survey is in an area that
    - i. has been identified as critical habitat for a vocalizing cetacean listed as endangered or threatened on Schedule 1 of the Species at Risk Act, or
    - ii. in keeping with the considerations set out in sub-section 4(b), has been identified through an environmental assessment process as an area where a vocalising cetacean is expected to be encountered if that vocalizing cetacean has been identified through the environmental assessment process as a species for which there could be significant adverse effects.
  
12. If Passive Acoustic Monitoring or similar cetacean detection technology is used in accordance with the provision of section 11, unless the species can be identified by vocal signature or other recognition criteria:
  - a. all non-identified cetacean vocalizations must be assumed to be those of whales named in sections 8(a) or (b); and
  - b. unless it can be determined that the cetacean(s) is outside the safety zone, the ramp-up must not commence until non-identified cetacean vocalizations have not been detected for a period of at least 30 minutes.

## **Additional Mitigative Measures and Modifications**

### Mitigation Measures

13. Persons wishing to conduct seismic surveys in Canadian marine waters may be required to put in place additional or modified environmental mitigation measures, including modifications to the area of the safety zone and/or other measures as identified in the environmental assessment of the project to address:
  - a. the potential for chronic or cumulative adverse environmental effects of
    - i. multiple air source arrays (e.g., two vessels on one project; multiple projects), or
    - ii. seismic surveys being carried out in combination with other activities adverse to marine environmental quality in the area affected by the proposed program or programs;
  - b. variations in sound propagation levels within the water column, including factors such as seabed, geomorphologic, and oceanographic characteristics that affect sound propagation;
  - c. sound levels from air source array(s) that are significantly lower or higher than average; and
  - d. species identified in an environmental assessment process for which there is concern, including those described in sub-section 4b).
  
14. Variations to some or all of the measures set out in this Statement may be allowed provided the alternate mitigation or precautionary measures will achieve an equivalent or greater level of environmental protection to address the matters outlined in sections 6 through 13 inclusive. Where alternative methods or technologies are proposed, they should be evaluated as part of the environmental assessment of the project.
  
15. Where a single source element is used and the ramping up from an individual air source element to multiple elements is not applicable, the sound should still be introduced gradually whenever technically feasible.