CANADA-NEWFOUNDLAND and LABRADOR OFFSHORE PETROLEUM BOARD

GEOPHYSICAL, GEOLOGICAL,

ENVIRONMENTAL AND GEOTECHNICAL

PROGRAM GUIDELINES

JANUARY 2012

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Table of Contents

Page No.

List of Tables

Page No.

List of Figures

Page No.

PREFACE

The *Canada-Newfoundland Atlantic Accord Implementation Act* and the *Canada-Newfoundland and Labrador Atlantic Accord Implementation Newfoundland and Labrador Act* require that before issuing an authorization for work or activity in the offshore area, the Board shall:

i) consider the safety of the work or activity;

ii) ensure that the applicant provides for financial responsibility; and

iii) approve a Canada-Newfoundland and Labrador Benefits Plan, unless the Board determines that such a requirement need not be complied with.

Before issuing an authorization, the Board must also assess the proposed work or activity to determine its potential environmental effects.

For authorizations relating to geophysical, geological, environmental or geotechnical programs, these objectives are achieved by a review of information submitted in support of the application for authorization. This document provides guidance on the information required from operators applying for such authorizations and replaces the Guidelines previously published in May 2008.

Approved:

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Chairman and CEO,
Canada-Newfoundland and Labrador Offshore Petroleum Board

1.0 INTRODUCTION

The Canada-Newfoundland and Labrador Offshore Petroleum Board (the Board) is the authority responsible for the administration of the regulations pertaining to all exploration for, and production of, hydrocarbons in the Newfoundland and Labrador offshore area. These Guidelines have been prepared to help operators who wish to conduct a geophysical, geological, geotechnical or environmental program within this area. They replace those issued by the Board in May 2008. The Guidelines are based on the *Canada-Newfoundland Atlantic Accord Implementation Act*, the *Newfoundland and Labrador Atlantic Accord Implementation Newfoundland and Labrador Act* (the Acts), the *Newfoundland Offshore Area Oil and Gas Operations Regulations*, the *Newfoundland Offshore Area Petroleum Geophysical Operations Regulations, Petroleum Occupational Safety and Health – Newfoundland Regulations* (Draft dated November 1989) (hereinafter referred to as the *Draft NL Petroleum OSH Regulations)*, the *Newfoundland and Labrador Occupational Health and Safety Act* and the *Canadian Environmental Assessment Act.* These guidelines also incorporate the May 2008 *Statement of Canadian Practice with Respect to the Mitigation of Seismic Sound in the Marine Environment.*

Geophysical Programs are described as those involving the indirect measurement of physical properties of rocks. This includes but is not limited to 2-D, 3-D and 4-D seismic surveys, seabed surveys, controlled source electromagnetic (CSEM), airborne gravity and magnetic surveys. In the case of well-related seismic surveys (vertical seismic profiles (VSPs)), any survey where the seismic source is activated from a vessel (walk-away or walk-above) rather than suspended directly from the drilling unit (zero-offset), is also considered a geophysical program.

Geological Programs are described as those involving the collection and analysis of lithological, paleontological or geochemical materials.

Geotechnical Programs are described as those involving the measurement of physical properties of seabed and subsoil.

Environmental Programs are described as those involving the study of physical, chemical and biological elements of the lands, oceans or coastal zones.

Prospective operators who propose to employ a foreign vessel and/or personnel to conduct their programs should be aware that additional Federal legislation applies and the relevant Federal Government departments should be consulted if such use is contemplated. Information as to the appropriate contacts in these departments is given in Appendix 4 of this document.

These guidelines also include information regarding the procedures for obtaining permission to sample or borrow well material curated by the Board at its Core Storage and Research Centre in St. John's, and the reporting requirements for any work on such material. Effective March 2000, the Board implemented fees for technical program authorizations, listed in Table 1.

Table 1.0: Authorization application fees.

Program Type	Cost of Authorization
Geophysical/Geological with field work	$30,000
Wellsite, Environmental, Geotechnical or Aeromagnetic	$20,000
Vertical Seismic Profile	$15,000
Geophysical/Geological/Geotechnical without field work	$2,500

For most programs, information must be submitted to the Board at three stages; at the time of application for authorization (program assessment), during field operations (weekly reporting), and after completion of the program (final reports and data submission).

Within these guidelines, geophysical, geological, geotechnical or environmental programs will be referred to as technical programs, and the personnel responsible for collecting the data relating to these programs as the technical crew.

Additional information may be obtained from the Board at:

Canada-Newfoundland and Labrador Offshore Petroleum Board,
Suite 500, TD Place,
140 Water Street,
St. John's, NL, A1C 6H6
Tel: (709) 778-1400,
Fax : (709) 778-1473,
E-mail: information @cnlopb.nl.ca

Forms are available on our website at www.cnlopb.nl.ca

2.0 OPERATING LICENCE

No exploratory activity involving field work will be authorized by the Board unless the applicant holds a valid operating licence. Any individual or corporation may apply to the Board for an operating licence. The following documentation is required to be submitted with each application.

1) Completed *Operating Licence* application form.
2) $25 fee payable to the Receiver General.
3) If the licensee is a corporation, written evidence that the corporation is in good standing, or if the licensee is an individual, a valid birth certificate verifying that the individual is at least 18 years of age.

Operating licenses are issued for a maximum period of one year and are valid from their commencement date to the March 31st the following year. An Operating licence is not transferable.

3.0 AUTHORIZATIONS

3.1 Programs with Field Work

Any technical program involving field work in the Newfoundland and Labrador offshore area must be authorized by the Board prior to its commencement. The environmental project description must be submitted at least **6 months** in advance of the proposed commencement date. The Environmental Assessment for a proposed technical program must be submitted at least **90 days** in advance of the proposed commencement date. The remaining information requested in Sections 3.1.1 to 3.1.5 is required at least **30 days** prior to program commencement (for the use of chemical explosives as the proposed seismic energy source, information must be submitted **90 days** before).

Table 2.0: Submission dates for documentation in support of the application.

Document	**Required Submission Date**
Environmental Project Description	6 months prior to program start*
Environmental Assessment	90 days prior to program start
Application and remaining documentation	30 Days prior to program start. 90 days before if the use of chemical explosives as the proposed seismic energy source.

*Seabed geohazard surveys, VSPs and technical programs like aeromagnetic or CSEM may require less than six months notice for environmental project description.

Upon receipt of an application for authorization, the Board will notify and/or will consult those Federal and Provincial government departments that may have interests in, or concerns about, the proposed field work. Comments received from these agencies are taken into account by the Board in establishing conditions for the program authorization granted to the operator. During the review of an application for authorization, the Board will address the following concerns:

1) program description;
2) safety of operations
3) Canada-Newfoundland and Labrador benefits;

4) environmental protection; and
5) financial responsibility.

The information pertaining to these matters that must be submitted with the Application for Authorization is outlined in Sections 3.1.1 to 3.1.5 below.

Once all concerns have been satisfactorily addressed by the operator, the work or activity may be authorized by the Board. **Programs in distinct areas require separate authorizations**, and a unique program number will be assigned by the Board for each program. This should be quoted on all subsequent correspondence. Any subsequent amendment or addition to the program must be forwarded to the Board for approval. Significant additions or amendments may require an additional authorization to be issued with fees as indicated in Table 1. The Board may also place additional program specific conditions on an authorization.

An authorization may only be extended if the field work is in progress at the time of the expiry date of the authorization.

3.1.1 Program Description

A full description of the proposed field work should be submitted including the following information:

1) **three completed**, signed applications of *Geophysical/Geological/Environmental/Geotechnical Program Authorization* forms;
2) a detailed description of the aims and objectives of the proposed program and any relevant supporting documentation: for example, for geophysical programs, relevant documentation would include descriptions of source, and detector equipment, including geometry and configuration, peak pressure and rise time of source and acquisition parameters;
3) one copy of a location map detailing the proposed program and its relationship to the land interests in the area (paper and PDF);
4) one copy of a page size map showing the relationship between the proposed program and neighbouring coastlines, provincial or territorial boundaries, and other pertinent geographic features (paper and PDF);
5) for a geophysical program, a digital file with beginning and end points for each proposed 2-D line, or an outline of the area to be surveyed for a 3-D program. Data should reference NAD 83.

3.1.2 Safety of Operations

For all programs involving field work, the Acts (section 139.1) require operators to submit a duly executed “Declaration of Fitness”. This document attests that the operator has ensured that, in addition to meeting all the specific requirements of applicable legislation:

1) the equipment, installation and/or vessel(s) (including support vessel) are fit for the purposes for which they are to be used;
2) the procedures are appropriate;
3) the personnel are qualified and competent; and
4) this situation will continue for the duration of the program.

Prior to authorizing the program, the Board requires that the operator demonstrate that it has taken, and will continue to take, all reasonable measures to ensure the continued validity of this "Declaration". In this regard and pursuant to the Acts (sub-section 138(1)) operators are required to submit a Safety Plan for the proposed activity, which consolidates the following information:

1) the operator's policies and procedures as they relate to the management of health and safety for the type of activity defined in the application for both operator and contractor personnel;
2) the operator's hazard identification and associated risk assessment for the program;
3) the operator's contingency plans;
4) the operator's policies and procedures as they relate to contractor selection and integration;
5) summary of safety related clauses in contracts;
6) description of and reference to applicable contractor policies and procedures for the program;
7) summary and results of the operator's verification activities (pre-contractual or pre-operational inspections, surveys or audits) onboard installations and support vessel which verify the state of equipment, implementation of procedures and personnel competency for the proposed program;
8) confirmation of compliance to all sections of the *Draft NL Petroleum OSH Regulations* and the *NL Petroleum Geophysical Regulations*. If a section of the regulations cannot be complied with, a summary of planned deviations and associated regulatory query forms are to be provided;
9) summary of the operator's arrangements for monitoring compliance during program execution;
10) summary of plans for communicating program specifics to all contractors;
11) the name, address, work history and safety record of the principal contractor(s).

The details requested in (a), (b), (c) listed below, should also be included and/or referenced in this plan rather than resubmitted as separate details.

The following lists are provided to give operators guidance on the type of information to be described, submitted and/or referenced as appropriate. The lists are not intended to limit the operator's overview of a project. Operators have the responsibility to assess and

ensure appropriate management of all hazards and compliance to regulations. Submission of the requisite information is required prior to a C-NLOPB safety audit onboard the vessel, if required.

If the Board requires a safety audit prior to commencement of the program, the operator must make the appropriate arrangements. If items do not comply with the legislation or stated policies during the safety audit, these will have to be corrected prior to issuing the authorization. This safety audit shall be arranged after the Board has received all information referred to in Section 3.1.2. A pre-approval safety audit may take up to 12 hours on board the vessel to complete**.**

(a) Marine Programs

For programs that propose to use marine vessel(s), the following information and/or documentation is required to be submitted or described/referenced in the program specific Safety Plan, as appropriate:

1) the principal contractor's and/or vessel operator's/owner's safety policy and procedures manuals as they relate to both normal operations and emergencies (if not already described/referenced in the program specific plan or operator's contingency plans);
2) vessel specifications to demonstrate that the vessel(s) (including support vessel) are suitable for its intended purpose;
3) operating history of each vessel and support craft;
4) the operator's evaluation of major contractors' accident experience on previous work;
5) ISM Certificate for each vessel including support vessels (e.g. seismic chase & guard vessels);
6) Transport Canada Safety Inspection Certificates, issued either directly by Transport Canada or by the Transport Canada delegated authority, for each vessel and support vessel to be utilized in the program (note: for Canadian flag vessels operating beyond 120 nautical miles, a Home Trade 1 certificate is required, beyond 200 nautical miles a foreign going certificate is required, as well as, associated Cargo Ship Safety Construction and Equipment Certificates);
7) arrangements for the testing of potable water prior to the commencement of the program to ensure that it meets Sections 9.19 to 9.24 of the *Draft NL Petroleum OSH Regulations*;
8) sufficient information to show that all pressure systems used by the technical crew have been designed, constructed, certified, installed and inspected in accordance with Part V of the *NL Petroleum OSH Regulations*;
9) information to confirm the following with respect to the training and competency of personnel:

a) members of the technical crew required to operate and maintain components of the seismic energy source, if used, are adequately trained and demonstrated to be competent;

b) members of the crews have received training and instruction regarding any hazardous substances or conditions to which they may be exposed;

c) the number of First aid Attendants and Medics meet the requirements listed in Sections 16.3 to 16.8 of the *Draft NL Petroleum OSH Regulations*;

d) all members of the technical crew have completed an approved survival course (Marine Emergency Duties A1 (MED A1), Basic Survival Training (BST), or equivalent), (Marine crew is covered by the vessels flagged state Occupational Health and Safety Legislation);

e) if helicopter transport is to be used, completion of BST or Helicopter Underwater Escape Training (HUET) and the Helicopter Underwater Escape Breathing Apparatus (HUEBA) module is required.

The operator should submit a training matrix to demonstrate that all personnel meet the requirements.

10) documentation verifying that fixed (cranes, winches, a-frames, etc.) and loose lifting gear (wire ropes, slings, chains, fittings, etc.) to be used in the program have been certified by a qualified third party inspector within the past 12 months and confirmation that Transport Canada or a delegated authority have reviewed and approved any changes affecting certification;

11) where temporary equipment or structures have been installed, documentation to show that the sea fastening has been properly designed, installed and certified by a qualified third party and confirmation that Transport Canada or delegated authority have reviewed and approved any changes affecting certification;

12) if explosives are to be used, details of their storage, handling and use (Sections 10.24 and 10.25 of the *Draft NL Petroleum OSH Regulations*);

13) licences for all radioactive sources and sufficient information to show that such sources will be stored, handled and used in accordance with the requirements of the *Atomic Energy Control Act* (Section 10.26 of the *Draft NL Petroleum OSH Regulations*);

14) permit to work procedures (e.g. confined space entry, hot work, isolation/lock out of equipment) for:

a) marine crew; and

b) technical crew

If a common procedure is not being utilized, provisions to ensure coordination between both crews.

15) details of the program to ensure that hazardous substances are properly stored, handled, labeled, warning signs posted, and that Material Safety Data Sheets are

available onboard the vessel (Part X of the *Draft NL Petroleum OSH Regulations*);

16) confirmation that a First Aid Kit to meet the requirements of Section 16.11 of the *Draft NL Petroleum OSH Regulations*, will be maintained onboard during the program;

17) confirmation that appropriate fall restraint arrangements are being utilized. These must meet the requirement of CSA Z259 as referenced in Section 12.10 of the *Draft NL Petroleum OSH Regulations*;

18) if the vessel complement will be more than 40 persons, information to show that the vessel has a first aid room that meets the requirements of Section 16.14 of the *Draft NL Petroleum OSH Regulations*;

19) details of arrangements for the vessel to maintain regular communications with a shore base during operations, including procedures to be followed in the event of an overdue contact with the vessel;

20) details of arrangements to ensure a physician, who has specialized knowledge in the treatment of the safety and health problems that may be encountered in an oil and gas industry, is available to the vessel at all times for medical consultation;

21) confirmation that an adequate number of approved abandonment suits, appropriately sized to fit all personnel, both marine and technical, will be maintained onboard during the program;

22) information to show that procedures and equipment are in place to:

    a) prevent person overboard situations; and

    b) deal with person overboard situations should they occur;

23) if helicopters are to be used for crew changes during the program, the following information must be provided:

    a) verification that the vessel's helicopter deck meets the requirements of TP4414 and CAP 437 and is suitable for the type of helicopter to be used;

    b) verification that the equipment and procedures onboard the vessel have been reviewed by the helicopter contractor, and that there is an appropriate level of coordination between the vessel crew and the helicopter contractor;

    c) Certificate of Airworthiness for the helicopter;

    d) details of pre-flight briefings;

    e) confirmation of availability of approved helicopter suits;

    f) description of flight following procedures;

    g) procedures to be followed in the case of a missing or overdue helicopter;

    h) provisions related to redundancy for long over-water flights;

    i) the aircrafts ability to land on water in various sea states;

j) the aircraft's ability to communicate with the shore base, the installation, other support craft and lifeboats;
k) the rapid and effective deployment of life rafts and other emergency equipment in the event of an emergency landing on water or a capsize;
l) the configuration and design of aircraft interiors, e.g., doors, windows, upper torso passenger restraints, etc., to protect passengers and allow the most efficient emergency egress of passengers considering both landings on water and helicopter capsize;
m) offshore operational requirements, e.g., weather effects on helicopter load limits, flying at night, the transport of passengers and freight at the same time and any other factor that could affect operational requirements;
n) the amount of reserve helicopter fuel kept on board installations and the rationale used to arrive at this amount;
o) the provision of suitable equipment to assist in underwater escape, e.g., goggles, appropriate breathing escape devices, approved helicopter transportation suits, etc., and how this may impact helicopter design and maintenance;
p) maintenance systems and the incorporation of automated usage and monitoring systems or other methods to ensure the continued suitability of the aircraft;
q) procedures pertaining to helicopter deck operations as developed in consultation with the helicopter contractor and vessel owner to ensure compatibility;
r) helicopter flight crews experience both with the aircraft and with offshore operations; and
s) flight time allocated for first-response practice and drills

Note: *In the NL offshore area, operators using helicopters for transport are expected to maintain a dedicated SAR helicopter on a 24-hour per day basis in support of helicopter operations. This helicopter should be capable of being airborne within 20 minutes. Equipment should include auto-hover, forward looking infrared radar (FLIR), a search-light, rescue-winch and survival equipment suitable for deployment from the helicopter. The functional specification of the helicopter should be submitted to the C-NLOPB. Helicopter SAR technicians should be trained in the operation of the winch and deployment of the survival equipment. SAR helicopter crews must receive adequate training, practice and drills to achieve and maintain proficiency.*

24) if a marine vessel is to be used for crew changes during the program, the following information must be provided:

a) complete details of the transfer procedure including specific weather limits;

b) confirmation that the operator has reviewed and accepted the transfer procedure; and
c) transfer vessel's certification as a passenger vessel and an explanation of its suitability for the proposed transfer method;

Note: *Transfers at sea should be avoided if at all possible. If deemed necessary, they may only be carried out in ideal weather conditions. Transfers at sea require the use of appropriate protective equipment that provides flotation, thermal protection and sufficient manual dexterity. A suitable person overboard boat must be available and ready for immediate use with a suitably trained crew, in addition to the boat being used for transfer. All transfer methods must be considered (e.g. davit to davit, gangway, etc) and the lowest risk option chosen. The onus is on the operator to demonstrate the need for and safety of transfers at sea.*

25) information to show that an occupational health and safety committee or representative has been established for the technical crew in accordance with the Newfoundland and Labrador Occupational Health and Safety Act, and the "Other Requirements Respecting Health and Safety";

Note: *Where separate committees/representatives exist, provisions for co-operation between the two crews must be included.*

26) information showing that the technical crew's right to refuse dangerous work is known to vessel and technical management , (Marine crew is covered by the vessels flagged state Occupational Health and Safety Legislation);
27) confirmation that procedures in place to handle dangerous work refusals are in compliance with the *Newfoundland and Labrador Occupational Health and Safety Act* and "*Other Requirements Respecting Health and Safety*";
28) details of how the operator has ensured that language differences will not affect the safety of operations;
29) confirmation that all contractors have been provided with the following documentation:
    a) the *Draft NL Petroleum OSHY Regulations*;
    b) the "*Draft NL Petroleum Geophysical Operations Regulations* if a geophysical or geological program is being conducted;
    c) the *Newfoundland and Labrador Occupational Health and Safety Act;*
    d) C-NLOPB *"Other Requirements Respecting Health and Safety";* and
    e) C-NLOPB *"Incident Reporting and Investigation Guidelines"*.

Note: *Operators are expected to ensure that their personnel and their contractor's personnel are familiar with the applicable legislation and guidance*.

(b) Airborne Programs

If the proposed field work is to be conducted using an aircraft, the following information/documentation will be required:

1) the name, address, work history and safety record of the aircraft operator/owner;
2) a general description of the aircraft to include the following:
   a) registration, designation, call sign;
   b) dimensions;
   c) fuel capacity;
   d) range;
   e) safety equipment;
   f) communications and navigation equipment;
   g) operating history; and
   h) safety record;
3) a copy of a valid Certificate of Airworthiness for the aircraft;
4) a description of:
   a) the flight following procedures; and
   b) the procedures to be followed in the event of a missing or overdue aircraft. If the aircraft is not registered in Canada, additional information may be requested.

(c) Programs using a Mobile Offshore Drilling Unit (MODU)

If the proposed program is to be conducted using a MODU, additional information/documentation may be required.

3.1.3 Canada-Newfoundland and Labrador Benefits

The Board's *Canada-Newfoundland and Labrador Exploration Benefits Plan Guidelines* are applicable to technical programs. The Guidelines can be found at www.cnlopb.nl.ca under Publications/Guidelines/*Canada-Newfoundland and Labrador Exploration Benefits Plan Guidelines*, February 2006, Appendix 2. Operators should review these Guidelines in detail prior to submission of a *Canada-Newfoundland and Labrador Exploration Benefits Plan*. The following summarizes the Board's Requirements.

1) A *Canada-Newfoundland and Labrador Exploration Benefits Plan* must be submitted by the operator for approval by the Board. *The Canada-Newfoundland and Labrador Exploration Benefits Plan* should include, at a minimum, the following information:

a) pursuant to the Acts, (Section 45(3) (a)), any corporation or other body carrying out any work or activity in the offshore area must have an appropriate presence in the Province. In the case of a seismic survey, this will apply to the company applying for the authorization to conduct the program.

b) confirmation of an operator's commitments to the statutory requirements of Section 45 of the legislation;

c) a description of the proposed program, including location, duration, vessels, etc;

d) a description of the operator's policies and initiatives to provide full and fair opportunity to Canadian companies and residents in procurement and employment activities, with first consideration to Newfoundland and Labrador companies and residents;

e) a summary of the estimated expenditures to conduct the programs, including a listing of all contracts greater than $100,000, and the name and address of the successful vendor(s);

f) a description of the successful geophysical contractor, and, if applicable, information supporting the choice of a foreign contractor and/or vessel;

g) a listing of all marine and technical crew members who will be employed during the program. The listing should include the nationality of each crew member and their residency at the time of hire (Canadian residents must be identified as Newfoundland and Labrador residents or Other Canadian residents), along with a rationale to explain the use of any foreign workers;

2) An annual Benefits Report, summarizing the Canada-Newfoundland and Labrador benefits related to the program is required, as discussed in Section 5.2 of the Board's *Canada-Newfoundland and Labrador Exploration Benefits Plan Guidelines*.

3.1.4 Environmental Protection

3.1.4.1 Environmental Assessment

As part of its environmental protection responsibilities, the Board must ensure that an environmental assessment of proposed technical programs in the Newfoundland and Labrador Offshore Area is conducted. In addition, the Board is required to ensure that a "screening" level of assessment pursuant to the *Canadian Environmental Assessment Act* (CEAA) is conducted for a seismic survey (e.g. 2-D or 3-D seismic, a seabed survey or a VSP program), in which the air pressure measured one metre from the energy source will be greater than 275.79 kPa (2.7579 bar-metres or 228.8 dB).

At least **six months** prior to the planned commencement of a technical program, the operator should submit to the C-NLOPB Environmental Affairs Department a project

description that describes the activities to be undertaken, the schedule of those activities and the location.

Seabed geohazard surveys, VSPs and technical programs like aeromagnetic or remote hydrocarbon detection may require less than six months notice. The operator is still advised, however, to submit a project description to Environmental Affairs as early in the planning process as possible.

Based on the information provided in the project description, Environmental Affairs will confirm the environmental assessment requirements (e.g. CEAA Screening or C-NLOPB review under Accord legislation only) and will provide the operator with a Scoping Document that describes the scope of the assessment to be conducted, including the scope of the factors to be included in the assessment.

Following its receipt of the Scoping Document, the operator will be responsible for submission of an environmental assessment report that:

1) describes its assessment of the potential environmental effects associated with the proposed program, in a manner that satisfies the requirements of the Scoping Document;
2) reports on consultations with interested parties who may be affected by program activities. Such parties included, but are not limited to, the Department of Fisheries and Oceans (DFO), One Ocean, the Fish, Food and Allied Workers Union (FFAWU), and relevant fish processors/harvesting companies. The report should identify specific areas of concern that were raised in these consultations and the proposed means by which valid concerns will be addressed;
3) is suitable for public release.

The environmental assessment should be submitted to the Board at least 90 days prior to the planned commencement of activities.

Further guidance on the preparation and conduct of environmental assessments under the CEAA can be found at the web page http://www.ceaa-acee.gc.ca.

3.1.4.2 Environmental Protection Measures and Reporting

In May 2008 the C-NLOPB adopted the *Statement of Canadian Practice with Respect to the Mitigation of Seismic Sound in the Marine Environment* (the Statement), which, in its entirety, is contained in Appendix 2 of these Guidelines. Operators should implement the mitigations listed in the statement when planning and undertaking marine seismic surveys, in addition to any other project-specific measures that may be identified during the environmental assessment process.

Appendix 2 also describes recommended practices for interaction with other ocean users, particularly fisheries interests, and recommended reporting formats for marine mammal and seabird observations. A report on the results of any monitoring undertaken during

seismic surveys should be submitted to C-NLOPB within one year of completion of the field work in a format that is suitable for public release.

3.1.5 Financial Responsibility

An operator applying for any authorization from the Board is required to submit proof of financial responsibility for approval by the Board. For technical programs, the form, amount and scope of coverage is dealt with in paragraph 5.7 of the *Guidelines Respecting Financial Responsibility Requirements for Work or Activity in the Newfoundland and Labrador or Nova Scotia Offshore* Areas, available from the Board office or on our website at http://www.cnlopb.nl.ca/leg_guidelines.shtml. The operator should submit the required information and documentation with the *Proof of Financial Responsibility* form and indemnity agreement, samples of which are included in Appendix 1 and are available on our website. For further information, please contact the Board's Legal and Land Department at (709) 778-1408.

3.2 Programs without Field Work

If an operator plans to claim allowable expenditures against security deposit or rental commitments for an exploration licence for a program which does not involve field work, the program must be approved by the Board prior to its initiation. Examples of programs which may be eligible for such credits include the purchase and/or reprocessing of seismic data, and biostratigraphic or palynological studies. Documentation describing the purpose and objectives of the program and addressing the Canada-Newfoundland and Labrador Benefits concerns, as described in Sections 3.1.1. and 3.1.3 respectively, should be included with a completed copy of the *Geophysical/Geological Program Approval for Programs without Field Work*) application form.

3.2.1 Data Submission for Programs without Field Work

Reporting requirements mirror that of programs with field work. An operator is required to submit processing and interpretation reports for any reprocessing as well as submission of the SEGY data (Table 8). All geological programs without field work must also have appropriate interpretation reports as described in Section 6.

4.0 ALLOWABLE EXPENDITURES

Allowable expenditure claims must be for work conducted in relation to the licenced land and completed within the time period of the licence term. Work completed before an operator has been awarded a licence, or after the licence has been returned to the Crown is **NOT** applicable for allowable expenditure.

Applicants for allowable expenditure should consult the terms and conditions of the licence for which the allowable is to be claimed. The applicant may only submit R&D/E&T expenses for either allowable expenditure or against their R&D/E&T credit, **NOT** both. Allowable expenditures for work programs will only be processed when all data associated with the program(s) have been submitted to the C-NLOPB as per data submission guidelines.

Allowable expenditure forms must be accompanied with a breakdown of financial expenditures (Excel format) and proof of expenditure in the form of invoices and supporting documentation. The C-NLOPB may request additional information as required to process the allowable expenditure application (Table 3). **Claims associated with licences awarded post 2009 must be accompanied by a cost statement prepared and certified by an external auditor satisfactory to the Board, pursuant to the terms and conditions of the EL.**

Table 3.0: Required documentation for allowable expenditure.

Allowable Expenditure Form	• Submitted original, signed by Operator.
Proof of Expenditure	• Invoices and/or corresponding proof of payment as defined by the terms and conditions of the licence.
Summary of Expenditures	• Spreadsheet in Excel format.
Digital Information	• Examples: survey map, corner points of survey*, survey navigation*.

* A 4km buffer around licences may be added to 2-D and 3-D seismic submitted as an allowable expenditure.

5.0 REPORTING REQUIREMENTS DURING FIELD WORK

5.1 Weekly Reports

The operator is responsible for ensuring that reporting on the commencement and completion of the survey is forwarded to the Board. Weekly progress reports must be submitted, the weekly reporting period is considered to be 0600 (UTC) Monday to 0600 (UTC) Monday and reports should include the following information.:

1) program number;
2) description of program activity for the week, e.g. number of kilometers of seismic recorded, names of lines recorded;
3) details of any significant downtime and causes;
4) any significant dates, for example mobilization, suspension;
5) description of all communications and/or interaction with fishers and their relevant organizations; and
6) any additional information as specified in the authorization.

The required reports may be forwarded by e-mail or by other mutually agreed method.

The principal contractor for the survey may submit the required reports on behalf of the operator; however the Board must be informed of the person responsible for the reporting prior to commencement of the survey.

5.2 Reporting of Incidents and Incident Statistics

Any accident or hazardous occurrence as specified by Section 27 of the *NL Geophysical Operations Regulations* or Section 15.4 of the *Draft NL Petroleum OSH Regulations*~~,~~ must be reported to the Board. Guidance on the reporting and investigation of incidents is provided in the *C-NLOPB / CNSOPB Guideline for the Reporting and Investigation of Incidents.*

Quarterly statistics reports must also be provided to the Board. Guidance and forms for the reporting of statistics have been provided in the *C-NLOPB / CNSOPB Guideline for the Reporting and Investigation of Incidents.*

5.3 Reporting of Occupational Health and Safety Committee Meeting Minutes

Meeting minutes from occupational health and safety committee meetings must be submitted to the Board as soon as practicable following each meeting.

6.0 FINAL REPORTS

For all geophysical, geological or environmental programs, the final report must be submitted to the Board within one year of completion of the field work. Geotechnical reports must be submitted within 90 days of rig release or completion of field work. For programs in which no field work is involved, the final report must be submitted to the Board within one year of the estimated completion date shown on the approval form.

The report should be in a form acceptable to the Board, and contain the information described below that is relevant to the program conducted. Interpretation reports must be submitted as print copies. In addition, a CD containing a searchable PDF formatted copy of the report, with sufficiently high resolution for the enclosures that original quality will be maintained if reprinted, should be submitted. Operations and processing reports should, preferably, be submitted in searchable PDF format only. The numbers required of each type of report are shown in the table below.

Table 4.0: Required copies of reports.

	Interpretation, Operations & Processing	
	Print	**Digital**
All Offshore Areas	2	1

Any correction to, or omission from, the report that is made or discovered after its submission must be reported to the Board.

6.1 All technical Programs: Common Reporting Requirements

a) Title page containing:

- program number, as assigned by the Board;
- operator's report name;
- type of survey;
- survey locality;
- year of field work;
- name of program operator (or legal representative or agent) and participants;
- names of principal contractors;
- specific interests involved;
- name of author or person responsible for the report; and
- report date.

b) table of contents and list of enclosures;

c) introduction;

d) locality map, preferably page size, showing the location of the survey with respect to the licences involved and latitude/longitude co-ordinates;

e) statistical summary, including:

- mobilization/demobilization dates;
- significant dates such as commencement, suspension, recommencement and termination;
- number of technical and marine personnel and their nationality;
- production data, time lost and daily production;
- summary of conditions pertaining to weather, ice conditions or sea state; and
- summary of factors which caused significant down time

f) description of the data acquisition equipment and field procedures, including, where appropriate:

- all vessels or aircraft, including ownership and flag of registry; and
- all components of the navigation system, with estimates of accuracy and repeatability.

6.2 Geophysical and Geological Programs: Specific Reporting Requirements

Any final report submitted to fulfill the reporting requirements of a geophysical or geological program authorization, should be signed by a professional geoscientist and include the following information, in addition to that detailed in Section 6.1. **This is defined as a minimum, but is not meant to limit what the operator may submit to enhance the overall completeness of the final report.** Maps and enclosures should not depend on colour to impart information such as contour values.

6.2.1 Operations Report

a) Additional information on the data acquisition equipment and field procedures to include:

- the energy source parameters, including pressure/time plots;
- the detector equipment, including detector array geometry;
- streamer tracking system;
- the recording system;
- the on-board processing facility;
- recording parameters, such as shotpoint interval, station interval, sampling rate, recording filter(s) settings, gain control, polarity, fold, aircraft elevation; and
- fathometer used.

6.2.2 Processing Report

a) description of the geophysical data processing and display, including:

- for seismic reflection data, each type of processing for which sections were generated, including the processing procedures applied to the data;
- final processed bin (grid) coordinates;
- for electromagnetic data:
  - all corrections applied to field and metadata;
  - all processing procedures applied to the final data;
  - discussion of methods and processing for all 2-D and 3-D modeling and inversion.
- for gravity data:
  - all corrections applied;
  - method of correcting discrepancies at line intersections;
  - method of spatial filtering, residual mapping and second derivative mapping;
  - method of gravity modeling, and

- loop closure maps for elevation control; and

- for magnetic data;
  - all corrections applied to the total field data;
  - correction for diurnal;
  - correction with regional field;
  - method of spatial filtering, residual mapping and second derivative mapping;
  - method of correcting discrepancies at line intersections; and
  - method of magnetic modeling.

6.2.3 Interpretation Report

a) Written discussion of the maps and sections, including the correlation between the geophysical and geological events, correlations between gravity, magnetic, CSEM (resistivity) and seismic data, details of corrections or adjustments applied to the data during interpretation, examples of correlated seismic sections which illustrate the interpretative technique for structural and stratigraphic interpretation, and any velocity information used for time-to-depth conversion.

b) Geological program reports should include a written discussion of the results of the project and tie the project into the regional geological framework. Illustrations should include:

- measured sections;
- correlation or structural cross-sections;
- core or sample descriptions;
- geotechnical and other analyses;
- micro-paleontology and palynology; and
- interpretative maps such as paleogeographic, facies and isopach.

6.2.4 Maps and Enclosures

a) Seismic shotpoint maps, gravity station maps, magnetic survey maps, EM source/receivers maps, track plots and flight lines with numbered fiducial points, which are on a working scale and show these geophysical data in relation to the operator's previous data in the area. One paper print of each map should accompany each copy of the report.

- **All map scales should be selected by the operator to appropriately present the data at a workable level of detail.**

b) Bathymetry maps.

c) Interpretative maps appropriate to the type of survey, which indicate the interpretation of data from the survey and integration with previous surveys recorded by the operator in the same area, for example:

- for seismic reflection surveys, all maps displaying time structure, depth structure, isopach, isochron, velocity, seismic amplitude and character change;
- for gravity surveys, all maps displaying Bouguer gravity, residual gravity field, derivative maps (if maps were not made, individual gravity profiles with sufficient annotation for interpretation);
- for magnetic surveys, all maps displaying total magnetic intensity, corrected total field, residual magnetic field and derivative maps (if maps were not made, individual profiles with sufficient annotation for interpretation); and
- for electromagnetic surveys, MVO and PVO curves, 2-D receiver line resistivity cross sections, and 3-D model resistivity cross sections and maps.

d) Any other information, used or produced during the interpretation, such as synthetic seismograms or seismic modeling or attribute analyses.

6.2.5 Data

a) 2-D seismic (Table 5.0)

- Digital images (TIFF format) of each seismic section (fully annotated – including side legend with processing and acquisition parameters, horizontal annotation with CDP and SP numbering) are required. Images must be of the final processing output, pre-stack time migration (PSTM) and pre-stack depth migration (PSDM) if generated. Where no migrated sections were prepared, copies of the last processing of non-migrated sections should be submitted. For 2-D data the lines should be displayed at approximately 1:100000 or 50 traces per inch horizontal scale, and either 2½" per second or 5 cm per second vertical scale.
- One copy of the digital seismic traces is required. Submission must be final processing, either migrated (PSTM and PSDM), or non-migrated as described previously. The data should be in SEG-Y format with header information in SEG Standard as shown in Appendix 3.
- A digital copy of the raw navigation.
- A digital copy of the shotpoint location (final processed) data is required. All location data should reference the NAD83 datum and identify the appropriate UTM zone.
- A digital copy of the velocity data is required. All appropriate location data should be included with the time and velocity data.
- Data should be submitted on USB drive.
- Copies of other versions of the processed seismic data may be requested.

b) 3-D seismic (Table 6.0)

- Digital images (TIFF format) of inlines and cross-lines (fully annotated – including side legend with processing and acquisition parameters, horizontal annotation with CDP and SP numbering) are required. Images must be of the final processing output, pre-stack time migration and pre-stack depth migration (if generated). Where no migrated sections were prepared, copies of the last processing of non-migrated sections should be submitted. For 3-D data, all lines should be displayed at approximately 1:100000 or 50 traces per inch for horizontal scale, and either 2½" per second or 5 cm per second vertical scale. The spacing for inlines should be 1000 m, for cross-lines 1500 m and time slices at 200 ms.
- For 3-D, grid information, line and trace location information must be provided such that the data grid can be produced in C-NLOPB software.
- One copy of the digital seismic traces is required. Submission must be final processing, either migrated (PSTM and PSDM), or non-migrated as described previously. The data should be in SEG-Y format with header information in SEG Standard as shown in Appendix 3.
- A digital copy of the raw navigation.
- A digital copy of the shotpoint location (final processed) data is required. All location data should reference the NAD83 datum and identify the appropriate UTM zone.
- A digital copy of the velocity data is required. All appropriate location data should be included with the time and velocity data.
- Data should be submitted on USB drive.
- Copies of other versions of the processed seismic data may be requested.

c) Wellsite surveys (Table 7.0) – 2-D High Resolution seismic and 3-D reprocessed seismic.

- Digital images (TIFF format) of each seismic section (fully annotated – including side legend with processing and acquisition parameters, horizontal annotation with CDP and SP numbering) are required. Images must be of the final processing output (relative amplitude and automatic gain control (AGC) scaled stack sections). Where no migrated sections were prepared, copies of the last processing of non-migrated sections should be submitted. For 3-D reprocessed high resolution seismic, inline and cross-line tiff images at 500m spacing through the cube are required.
- One copy of each, relative amplitude and AGC scaled digital seismic traces is required. Submission must be final processing, either migrated or non-migrated as described previously. The data should be in SEG-Y format with header information in SEG Standard as shown in Appendix 3.

- A digital copy of the raw navigation.
- A digital copy of the shotpoint location (final processed) data is required. All location data should reference the NAD83 datum and identify the appropriate UTM zone.
- Data should be submitted on USB drive.
- Copies of other versions of the processed seismic data may be requested.

d) Controlled Source Electromagnetic Surveys (Table 9.0)

- Raw field data recorded at each receiver, with navigation and metadata for transmitter and receiver locations.
- Final processed data (2-D and 3-D models if generated), SEGY or equivalent format.
- Amplitude/magnitude vs. offset (AVO/MVO) curves from all receivers (all harmonics).
- Phase vs. offset (PVO) curves from all receivers (all harmonics).
- Resistivity cross sections (TIFF format) – on all receiver lines, 2-D vertical and horizontal slices through the 3-D resistivity model at 500 m intervals (x, y and z (depth)), if generated.

e) Gravity Surveys (Table 10.0)

- Two copies of digital records of any gravity data in ASCII format containing latitude/longitude, water depth, observed absolute value of gravity, calculated Bouguer anomaly and Free-air anomaly, for all data points.

f) Magnetic Surveys (Table 10.0)

- Two copies of digital records of any magnetic data in ASCII format containing latitude/longitude, total field value corrected for diurnal variation and residual magnetic field for all readings.

g) Other Surveys (Table 10.0)

- Any surveys not included are required to submit equivalent data, interpretation, operations and processing information.

Operators are advised that data submitted to the Board may be provided to the Geological Survey of Canada, Government of Canada or Government of Newfoundland and Labrador. The data remains subject to the confidentiality provisions described in Section 9.

Table 5.0: 2-D Seismic Data Submission Requirements (*Interpretation report is not required for non-exclusive 2-D seismic surveys.)

Data Required	Report	Format	Date for Submission	Submission Media	Remarks
Raw Navigation	1 digital	UKOOA	12 months after completion of program	CD/DVD/USB	P2/94 or equivalent information
Shotpoint location data (Final Navigation data)	1 digital	UKOOA	12 months after completion of program	CD/DVD/USB	P1/90 or equivalent information – see comments above.
Digital seismic traces - final migrated PSTM and PSDM if generated (last processing where not available).	1 digital (each)	SEGY (SEG Standard)	12 months after completion of program	USB	See Appendix for SEG Standard
Digital images of seismic sections - fully annotated, final processed data (PSTM and PSDM if generated).	1 digital (each)	TIFF (300 DPI minimum)	12 months after completion of program	CD/DVD/USB	1:100000 or 50 traces per inch horizontal scale, 2.5 inches per second or 5 cm per second vertical scale.
Velocity data	1 digital	ASCII	12 months after completion of program	CD/DVD/USB	Including line number, shotpoint, time, RMS pairs for both stacked and migrated velocities.
Interpretation Report* Operations Report Processing Report	2 copies paper 1 copy digital (each)	Paper and searchable PDF	12 months after completion of program	Paper and CD/DVD/USB	See above for required content. Report to reference time and depth surfaces where applicable.

Table 6.0: 3-D Seismic Data Submission Requirements

Data Required	Report	Format	Date for Submission	Submission Media	Remarks
Raw Navigation	1 digital	UKOOA	12 months after completion of program	CD/DVD/USB	P2/94 or equivalent information
Shotpoint location data (Final Navigation data)	1 digital	UKOOA	12 months after completion of program	CD/DVD/USB	P1/90 or equivalent information – see comments above.
Polygonal position data (full fold outline)	1 digital	UKOOA	12 months after completion of program	CD/DVD/USB	Survey inflection points describing the corner points in inline/cross-line, lat/long and UTM coordinates.
Digital seismic traces - final migrated PSTM and PSDM if generated (last processing where not available).	1 digital	SEGY (SEG Standard)	12 months after completion of program	USB	See Appendix for SEG Standard
Digital images of seismic sections - fully annotated, final processed data (PSTM and PSDM if generated).	1 digital (each)	TIFF (300 DPI minimum)	12 months after completion of program	CD/DVD/USB	1:100000 or 50 traces per inch horizontal scale, 2.5 inches per second or 5 cm per second vertical scale.
Velocity data	1 digital	ASCII	12 months after completion of program	CD/DVD/USB	Including line number, shotpoint, time, RMS pairs for both stacked and migrated velocities.
Interpretation Report* Operations Report Processing Report	2 copies paper 1 copy digital (each)	Paper and searchable PDF	12 months after completion of program	Paper and CD/DVD/USB	See above for required content. Report to reference time and depth surfaces where applicable.

*Interpretation report is not required for non-exclusive 3-D seismic surveys.

Table 7.0: Wellsite Seismic Data Submission Requirements

Data Required	Report	Format	Date for Submission	Submission Media	Remarks
Raw Navigation	1 digital	UKOOA	12 months after completion of program	CD/DVD/USB	P2/94 or equivalent information
Shotpoint location data (Final Navigation data)	1 digital	UKOOA	12 months after completion of program	CD/DVD/USB	P1/90 or equivalent information – see comments above.
Digital seismic traces - final stack or migrated sections, relative amplitude and AGC scaled versions.	1 digital (each)	SEGY (SEG Standard)	12 months after completion of program	CD/DVD/USB	See Appendix for SEG Standard
Digital images of seismic sections - fully annotated, final processed data.	1 digital (each)	TIFF (300 DPI minimum)	12 months after completion of program	CD/DVD/USB	For 3-D reprocessed – Inlines and cross-lines at 500 m intervals
Interpretation Report Operations Report Processing Report	2 copies paper 1 copy digital (each)	Paper and searchable PDF	12 months after completion of program	Paper and CD/DVD/USB	See above for required content
3-D reprocessed high resolution seismic – if generated	1 digital	SEGY (SEG Standard)	12 months after completion of program	CD/DVD/USB	See Appendix for SEG Standard – Acceptable for deepwater only (>500 metres water depth).

Table 8.0: Reprocessed Seismic Data Submission Requirements (Programs without field work)

Data Required	Report	Format	Date for Submission	Submission Media	Remarks
Shotpoint location data (Final Navigation data)	1 digital	ASCII	12 months after completion of program	CD/DVD/USB	P1/90 or equivalent information
Digital seismic traces - final migrated PSTM and PSDM if generated (last processing where not available).	1 digital (each)	SEGY (SEG Standard)	12 months after completion of program	USB	See Appendix for SEG Standard
Digital images of seismic sections - fully annotated, final processed data (PSTM and PSDM if generated).	1 digital	TIFF (300 DPI minimum)	12 months after completion of program	CD/DVD/USB	1:100000 or 50 traces per inch horizontal scale, 2.5 inches per second or 5 cm per second vertical scale.
Velocity data	1 digital	ASCII	12 months after completion of program	CD/DVD/USB	Including line number, shotpoint, time, RMS pairs for both stacked and migrated velocities
Interpretation Report Processing Report	2 copies paper 1 copy digital (each)	Paper and searchable PDF	12 months after completion of program	Paper and CD/DVD/USB	See above for required content.

Table 9.0: Controlled Source Electromagnetics Data Submission Requirements *

Data Required	Report	Format	Date for Submission	Submission Media	Remarks
Raw field data	1 digital	ASCII or equivalent format	12 months after completion of program	CD/DVD/USB	Including navigation (UKOOA) for Transmitter and Receiver with all associated metadata.
Final processed data, 2-D and 3-D model data	1 digital	SEGY or equivalent format	12 months after completion of program	CD/DVD/USB	
Magnitude and Phase vs. Offset data (MVO and PVO) (all harmonics)	1 digital (each)	PDF or TIFF or equivalent format	12 months after completion of program	CD/DVD/USB	
Fully annotated image of final processed data	1 digital	TIFF (300 DPI minimum)	12 months after completion of program	CD/DVD/USB	2-D receiver lines and inline/cross-line/depth slices through the 3-D volume.
Interpretation Report Operations Report Processing Report	2 copies paper 1 copy digital (each)	Paper and searchable PDF	12 months after completion of program	Paper and CD/DVD/USB	See above for required content.

* Other electromagnetic surveys must submit equivalent data to CSEM requirements where applicable.

Table 10.0: Gravity/Magnetics/Other Data Submission Requirements

Data Required	Report	Format	Date for Submission	Submission Media	Remarks
Track plot location data (Final Navigation data)	1 digital	UKOOA	12 months after completion of program	CD/DVD/USB	P1/90 or equivalent information
Raw Field Data	1 digital	ASCII/ SEGY/ equivalent	12 months after completion of program	CD/DVD/USB	Navigation and all raw field data with associated meta data
Processed Data	1 digital	ASCII/ SEGY/ equivalent	12 months after completion of program	CD/DVD/USB	Including final navigation and calculated field data Gravity specific – see above Magnetic specific – see above
Digital images of interpretation maps	1 digital	TIFF (300 DPI minimum)	12 months after completion of program	CD/DVD/USB	Include all maps from the interpretation report in separate geo-referenced TIFF images
Interpretation Report Operations Report Processing Report	2 copies paper 1 copy digital (each)	Paper and searchable PDF	12 months after completion of program	Paper and CD/DVD/USB	See above for required content.

6.3 Non-Exclusive Geophysical or Geological Programs: Specific Reporting Requirements

Operators of non-exclusive geophysical or geological surveys, where the data has been acquired with the intention of selling it to the public, are obliged to submit a report covering sections 6.1 and sections 6.2 (excluding 6.2.3 and 6.2.4). If the data is withdrawn from public availability, or the Board becomes aware that the data is not being made fully publicly available, the operator must submit sections 6.2.3 and 6.2.4, as appropriate, within twelve months of the date of withdrawal of the data. Purchasers of non-exclusive data who wish to have the cost of the purchase offset against work expenditure commitments for an Exploration Licence, must submit an interpretation report covering sections 6.2.3 and 6.2.4 above, in addition to having completed and had approved a *Geophysical/Geological Program Approval (without field work*) form as detailed in Section 3.2.

6.4 Environmental Programs: Specific Reporting Requirements

Final reports for environmental field programs should include the following, in addition to the items described in Section 6.1:

a) a general overview of the data or samples which were acquired during the program, and of any analyses which were performed upon them;

b) a description of quality control and quality assurance procedures which were in place during the field program and, where appropriate, which were in place at facilities where sample handling and analysis were performed;

c) the data or information which was collected during the program. The scope of this reporting will be determined on a case-by-case basis, and may take the form of a data appendix to the report, or a digital data storage medium accompanying the report;

d) the results of any analyses which were performed upon the data collected during the program.

6.5 Geotechnical Programs: Specific Reporting Requirements

Final reports for geotechnical programs should be signed by a professional engineer or geoscientist and should include the following information in addition to that mentioned in Section 6.1:

a) location maps at a working scale;

b) a description of the boring and geotechnical equipment that was used during the program;

c) a description of sample handling procedures, storage, onboard measurements and results;

d) a description of the laboratory procedures, measurements and results;

e) correlations between borehole data and available geophysical data;

f) interpretative maps showing distribution and thickness of relevant geological/geotechnical units;

g) Any other information, such as bathymetry, used or produced during the interpretation of the data.

7.0 SEABED SURVEYS

7.1 General

Seabed surveys, using geophysical and geotechnical methods are conducted to determine the nature of the sea floor and underlying sediments. As such, they may be required to assist with the positioning of wells, pipelines or production facilities.

Prior to positioning a jack-up or gravity-based structure, a geotechnical survey may be required as outlined below.

a) Jack-Up Drilling Units

Prior to preloading the jack-up at a wellsite, an independent geotechnical engineering consultant shall evaluate the geotechnical and foundation characteristics of the seabed. In most cases, at least one geotechnical borehole (drilled no further than 100 m from the proposed wellsite) will be required to be drilled to a depth of the anticipated spud-can penetration plus 1½ times the maximum spud-can diameter. In some cases, the consultant may have sufficient information to assess the foundation characteristics without the benefit of a borehole. The depth, sampling interval and number of boreholes in the program shall be at the discretion of the consultant in consultation with the operator.

b) Platforms, Caissons and Artificial Islands

Where a platform, artificial island or caisson-type structure is to be used to support a drilling rig or production facility, the geotechnical and foundation characteristics of the seabed at the proposed site and/or of the fill material, must be evaluated before any excavation, fill placement or installation of the structure occurs.

7.2 Objectives

The objectives and typical methodology for seabed surveys are shown in Table 11.

Table 11.0: Objectives and Typical Methodology for Seabed Surveys

Objectives	Typical Methodology
Identification of shallow geological hazards; for example, slump scars, channels, faulting, gas, gas hydrates, shallow trap closure.	High resolution seismic using sparker, small airgun array, or sleeve exploder; supplemented with 3-D seismic, if available. Reprocessed 3-D high resolution may replace a conventional 2-D high resolution dataset in deepwater.
Detailed bathymetry.	Echo sounder.
Identification of surficial geology, boulder till, channel fill, slumping, faulting, gas-charged sediments.	Sub-bottom profiler.
Nature and characteristics of sea floor sediments.	Side scan sonar, grab samples **and/or** gravity/piston and cores of the sea floor and near surface sediments, sea floor photographs.
Identification of iceberg scours, morphology of depositional units, shipwrecks, sea floor obstructions, bedforms indicative of sea floor sediment dynamics.	Sidescan sonar, sea bottom photographs. Sub-bottom profiler.
Engineering data on seabed deformation, bearing capacity and stability (if required).	Borehole core samples, in situ and laboratory tests.
Location and identification of sea floor installations, wrecks and cables.	Side scan sonar (magnetometer survey as required).

7.3 Well Locations

An operator who proposes to drill a well in the Newfoundland and Labrador offshore area must ensure that such an operation is conducted safely. The submission of an application for Approval to Drill a Well (ADW) must be preceded or accompanied by documentation to show that the operator has investigated the immediate area of the proposed location to identify any possible hazards to drilling on the seafloor, and during the drilling of the well prior to setting surface casing. A seabed survey should be conducted to achieve these objectives. Existing 3-D seismic data should also be used to assist in the interpretation for all areas where available.

It is mandatory that a seabed survey, including high-resolution seismic data be conducted for all well locations. In addition, **all proposed well locations must be positioned on a high-resolution seismic line**. In deepwater (>500m) it is acceptable to use reprocessed 3-D seismic in lieu of 2-D high-resolution seismic data for identification of shallow drilling hazards (see section 7.6).

If the 2-D high-resolution seismic line spacing is greater than 250 m, the well can only be drilled if there is conventional 3-D seismic available to supplement interpretation over the surrounding area. In this case, the operator must additionally submit the following with the ADW - three inlines and three cross-lines, no more than 250 m apart, with two passing through the proposed well location.

a) Existing Survey

- A pre-existing seabed survey may be used if the area covered by the earlier survey is adequate, except in areas where movement of hydrocarbons due to drilling activity is suspect.
- Existing data must be modern and available in SEGY format for assessment and analysis.
- If the surficial data is more than two years old, an inspection of the seabed in the vicinity of the well and anchor pattern should be carried out prior to spud.

7.4 Survey Design

The wellsite survey must have sufficient density and areal extent to identify hazards and tie regional geology. It is recommended the survey be large and dense enough to allow for changes in well location due to identification of surfical or subsurface hazards and changes to well planning. Survey design will be specific to the intended drilling rig. Figure 1 and 2 represent C-NLOPB guidance for MODU and Jack-up drilling units. Operators specialists should design a program to best suit their given conditions and equipment.

7.4.1 MODU Specific Requirements

The wellsite survey should cover a radius of the anchor limit plus 1 km, allowing for potential changes in location and identification of any regional features such as slump deposits. A maximum primary line spacing of 250 m with tie lines at 500 m is recommended.

7.4.2 Jack-Up Specific Requirements

The wellsite survey should have a line spacing of 50 m, recorded within a radius of 200 m of the proposed location. With additional lines spaced at 100 m out to 500 m for both inlines and cross-lines. In addition, two orthogonal lines should be acquired through the proposed location to a distance of two km from the well location to allow for interpretation of the local/regional geological setting.

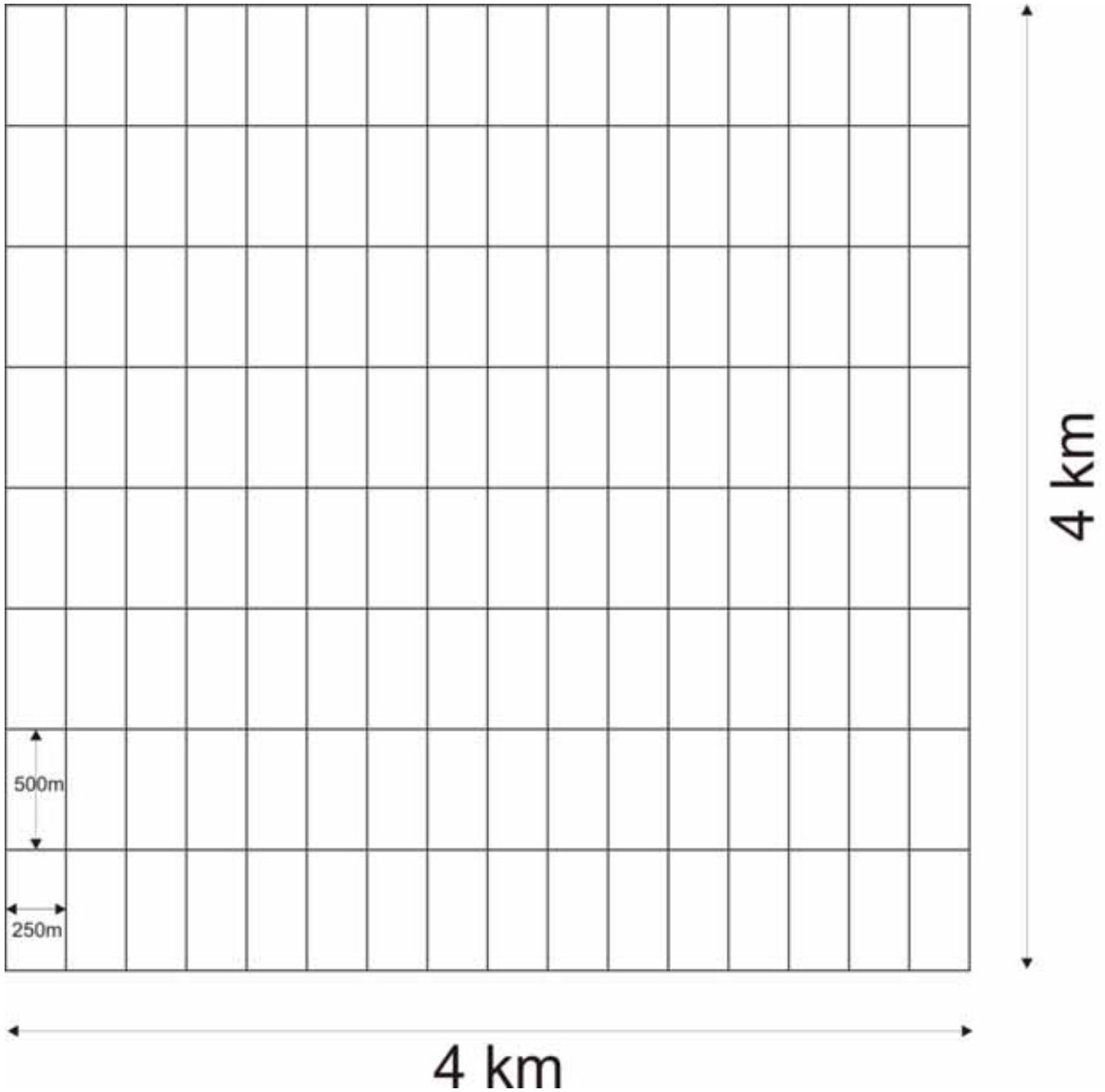

Figure 1.0: MODU wellsite survey pattern.

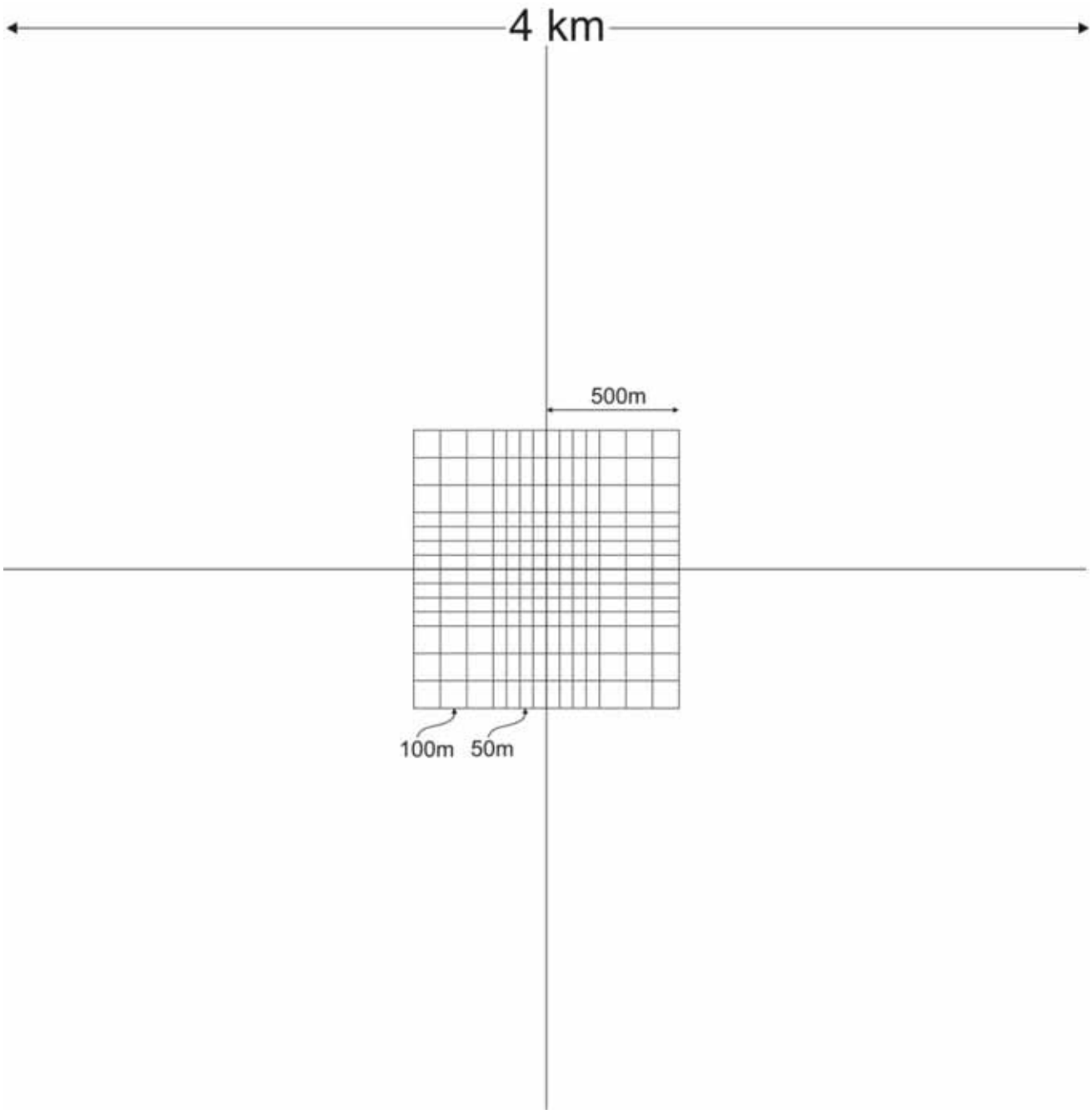

Figure 2.0: Jack-up drilling unit wellsite survey pattern.

7.5 Authorizations and Reporting During Field Work

The Board's requirements for seabed surveys prior to and during field work activity are as described in Sections 3 and 5 above.

7.6 Reprocessed 3-D Seismic Data

The use of conventional 3-D seismic data reprocessed to 3-D high-resolution seismic data is acceptable for replacement of 2-D high-resolution wellsite seismic data in deepwater. Currently deep water is defined as greater than 500 metres water depth (>500 m). The reprocessing of 3-D seismic data for geohazard use is expected to maximize the sampling rate and frequency content of the original 3-D seismic data. Operators desiring to use reprocessed 3-D seismic for geohazard identification should contact the Board.

7.7 Final Reports

Final reports for seabed surveys must be submitted within one year of completion of field work, or prior to an Application to Drill a Well on the surveyed location. Sections 6.1 should be addressed in the final report. The following data, specifically relating to seabed surveys, should also be included:

a) Basic technical data:

- i) digital TIFF copies of the relative amplitude and automatic gain control stack sections;
- ii) digital shotpoint location data or the survey;
- iii) prints of representative bottom photographs or a copy of the video;
- iv)* any material remaining after analysis of sea bottom samples or geotechnical test hole material.
- v)* prints of borehole photographs;
- vi)* bathymetric profiles in the form of annotated single paper copies;
- vii)* sub-bottom profiler records in single paper copies;
- viii)* sidescan data in the form of single paper copies of corrected or uncorrected records;

***Note**: *Items (iv) to (v) need to be submitted only if the operator plans to destroy the data. If, at any future date, the operator plans to destroy these data, prior approval must be obtained from the Board.*

b) description of the (re)processing applied to the high resolution or 3-D seismic data;

c) results of interpretation:

- i) structure maps and isopach maps of the most significant events picked from the seismic data;
- ii) detailed bathymetric map;
- iii) surficial geology map;

iv) results of sidescan sonar surveys, including side scan mosaics, and a description and discussion of the distribution and morphology of sedimentary units, pock marks, sea floor photographs, sea floor features such as sediment distribution, and, where appropriate, a discussion of ice scours, with an analysis of scour density, cross-sectional shape, depth of sediment disturbance and dimensions;

v) descriptions of sea bottom photographs and their locations;

vi) location and description of samples and cores;

vii) results of any geotechnical investigations or other studies carried out during the survey;

viii) identification of man-made obstacles;

ix) compilation map showing type, depth and extent of features considered to be drilling hazards.

The Board may inform other operators in the area if any significant hazards to drilling are detected during a wellsite investigation.

8.0 SAMPLING AND BORROWING OF WELL MATERIAL

Cuttings, cores and fluid samples for wells drilled in the Newfoundland and Labrador offshore area are curated at the Board's Core Storage and Research Centre. Once a well is released, as described in Section 9, these materials are available for public examination. Permission to sample such materials may be obtained by application to the Board. A copy of the *Core Storage and Research Centre Sampling/Borrowing Well Materials Memorandum* form is available on our website. A geological program number will be assigned to such requests, and one copy of any reports or other materials produced as a result of these studies, must be submitted to the Board within one year of the estimated completion date shown on the application form.

9.0 RELEASE OF DATA

Under the Acts, reports and data resulting from most technical programs in the Newfoundland and Labrador offshore area, cease to be privileged five years following completion of the program. However, the Board has extended the confidentiality period for non-exclusive programs to ten years following program completion. The completion date for geophysical, geological and geotechnical programs involving field work is established as six months following the termination date of the field work. A detailed breakdown of specific data confidentiality periods is available in Table 12.

Reports detailing the results of monitoring of marine mammals, sea turtles and sea birds, undertaken as part of a technical program, will be released one year following completion of the survey.

Reports and data generated as a result of requests to sample well materials from the Core Storage facility are released five years following completion of the work for exclusive programs, and ten years for non-exclusive studies.

Well material obtained directly from the drilling of the well will be released as per the Draft Data Acquisition and Reporting Guidelines (December, 2009), available on our website (www.cnlopb.nl.ca).

Technical and environmental programs which are well specific are released with the factual well material **or** five years and six months following completion of field work, whichever date is earlier. Technical environmental programs which are not well specific are released five years and six months following completion of field work. A full listing of the geophysical and geological reports and data released by the Board may be found in the publication *Released Geophysical and Geological Reports – Newfoundland and Labrador Offshore Area (2006)* or *Released Geophysical Reports December 2010*, copies of which may be obtained from the Board office or from our website.

Table 12.0: Data Release Periods

Data Classification	Data Type	Release Format	Confidentiality Period
Exclusive	Reports (Interpretation, Processing, Operations)	Paper	5 years
Exclusive	Seismic*	Paper	5 years
Exclusive	CSEM, Gravity, Magnetics	Paper	5 years
Exclusive	Reprocessed Seismic** (program without field work)	Paper	5 years
Exclusive	Other***	Paper	5 years
Non-Exclusive	Reports (Processing, Operations)	Paper	10 years
Non-Exclusive	Seismic*	Paper	10 years
Non-Exclusive	CSEM, Gravity, Magnetics	Paper	10 years
Non-Exclusive	Other***	Paper	10 years

* Seismic includes 2-D/3-D/4-D/VSP/wellsite geophysical programs.
** Reprocessed Seismic includes any reprocessed data authorized as Geophysical Program Without Fieldwork.
*** Other – given rapid changes in technology, this category includes any form of geophysical program not covered explicitly.

APPENDIX 1

List of Application Forms

Below is a list of Board forms available on the website:

Operating Licence application

Geophysical Program Authorization Application (2D Seismic, 3D Seismic, Wellsite Seismic)

Geological/Geotechnical/Environmental Program Authorization Application

Geophysical/Geological Application for Programs Without Field Work

Vertical Seismic Profile Program Authorization

Electromagnetic Program Authorization

Core Storage and Research Centre Sampling/Borrowing Well Materials Memorandum

Proof of Financial Responsibility for Work Authorization

Indemnity Agreement

Declaration of Fitness

Quarterly Statistics Report

Incident Notification

Incident Investigation Report

Allowable Expenditure Form

Schedule "A" Form

Originals of these forms may be obtained from:

Canada-Newfoundland and Labrador Offshore Petroleum Board
Suite 500, TD Place
140 Water Street
St. John's, Newfoundland
A1C 6H6
Tel: (709) 778-1400
Fax: (709) 778-1473
E-mail: information@cnlopb.nl.ca
Website: www.cnlopb.nl.ca

APPENDIX 2

Environmental Planning, Mitigation and Reporting

This Appendix contains recommended environmental planning, mitigation and reporting measures for marine seismic surveys in the NL offshore area. Section I contains verbatim the *Statement of Canadian Practice with Respect to the Mitigation of Sound in the Marine Environment* that describes measures for the planning and conduct of marine seismic surveys that are intended to prevent or minimize potential effects upon the natural environment. Section II contains recommended practices for interaction with other ocean users, particularly fisheries interests, during the conduct of surveys. Finally, Section III contains recommended reporting formats for marine mammal and seabird observations during surveys.

I. 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) 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 m as measured from the center 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 vocalizing cetacean is expected to be encountered if that vocalizing cetacean has been identified through the environment 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 section 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 Mitigation 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 4(b).

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.

II. INTERACTION WITH OTHER OCEAN USERS

1) VSP Programs and Well Site Surveys

a) The operator should implement operational arrangements to ensure that the operator and/or its survey contractor and the local fishing interests are informed of each other's planned activities. Communication throughout survey operations with fishing interests in the area should be maintained.

b) The operator should publish a Canadian Coast Guard “Notice to Mariners” and a “Notice to Fishers” via the CBC Radio program Fisheries Broadcast.

c) Operators should implement a gear and/or vessel damage compensation program, to promptly settle claims for loss and/or damage that may be caused by survey operations. The scope of the compensation program should include replacement costs for lost or damaged gear and any additional financial loss that is demonstrated to be associated with the incident. The operator should report on the details of any compensation awarded under such a program.

d) Procedures must be in place on the survey vessel(s) to ensure that any incidents of contact with fishing gear are clearly detected and documented (e.g. time, location of contact, loss of contact, and description of any identifying markings observed on affected gear). As per Section 5.2 of these Guidelines, any incident should be

reported immediately as per the *C-NLOPB / CNSOPB Guideline for the Reporting and Investigation of Incidents.*

2) 2-D and 3-D Seismic Programs

In addition to the measures indicated in Section 1 above, the following mitigation measures should also be implemented:

a) Surveys should be scheduled, to the extent possible, to reduce potential for impact or interference with Department of Fisheries and Oceans (DFO) science surveys. Spatial and temporal logistics should be determined with DFO to reduce overlap of seismic operations with research survey areas, and to allow an adequate temporal buffer between seismic survey operations and DFO research activities.

b) Seismic activities should be scheduled to avoid heavily fished areas, to the extent possible. The operator should implement operational arrangements to ensure that the operator and/or its survey contractor and local fishing interests are informed of each other's planned activities.

Communication throughout survey operations with fishing interests in the area should be maintained. The use of a 'Fisheries Liaison Officer' (FLO) onboard the seismic vessel is considered best practice in this respect.

c) Where more than one survey operation is active in a region, the operator(s) should arrange for a 'Single Point of Contact' for marine users that may be used to facilitate communication.

III. SEABIRD AND MARINE MAMMAL MONITORING AND REPORTING

Operators are expected to implement a seabird and marine mammal observation program throughout survey activities. Such a program should involve a designated observer trained in marine mammal and seabird observations.

For marine mammal monitoring, the monitoring protocol outlined in ESRF Report #156 *Recommended Seabird and Marine Mammal Observation Protocols for Atlantic Canada* (2004) should be implemented. The report is available on the internet at the following link:

http://www.esrfunds.org/documents/ESRF156.pdf

Monitoring reporting forms are available in Appendix B of the ESRF Report #156.

For seabird monitoring, the Canadian Wildlife service (CWS) has developed a pelagic seabird monitoring protocol that should be used when undertaking seabird observations. Two versions of the protocol have been developed: one for individuals with seabird survey experience, and another for inexperienced observers. Copies of the protocol and reporting forms, and a guide sheet to the pelagic seabirds of Atlantic Canada, are available from the Mount Pearl, NL CWS office.

A report on the monitoring program and its results should be submitted to C-NLOPB no later than one year after completion of the survey.

APPENDIX 3

The SEG-Y format in which seismic trace data should be submitted is described herein.

Pure SEG-Y Format Description

Trace Header Item	Byte Location	Format		Trace Header Item	Byte Location	Format
trace number within line	1	integer		correlated, 1=no, 2=yes	125	short
trace number within reel	5	integer		sweep frequency at start	127	short
original trace number	9	integer		sweep frequency at end	129	short
trace number in field record	13	integer		sweep length in ms	131	short
shot point	17	integer		sweep type, 1=linear	133	short
cdp number	21	integer		sweet trace taper length at	135	short
cdp ensemble number	25	integer		sweet trace taper length at	137	short
id code	29	short		taper type	139	short
number of vertically stacked	31	short		alias filter frequency	141	short
number of horizontally stacked	33	short		alias filter slope	143	short
data use, 1=production, 2=test	35	short		notch frequency	145	short
shot to receiver distance	37	integer		notch slope	147	short
receiver elevation	41	integer		low cut frequency	149	short
source elevation	45	integer		high cut frequency	151	short
source depth	49	integer		low cut slope	153	short
receiver datum elevation	53	integer		high cut slope	155	short
source datum elevation	57	integer		year recorded	157	short
water depth at source	61	integer		day of year	159	short
water depth at group	65	integer		hour of day	161	short
scalar for elevations	69	short		minute of hour	163	short
scalar for coordinates	71	short		second of minute	165	short
source coordinate x	73	integer		time basis code, 1=local	167	short
source coordinate y	77	integer		trace weighting factor	169	short
group coordinate x	81	integer		geophone group number of	171	short
group coordinate y	85	integer		geophone group number of	173	short
coordinate units, 1=length	89	short		geophone group number of	175	short
weathering velocity	91	short		gap size	177	short
sub-weathering velocity	93	short		overtravel associated with	179	short
uphole time at source	95	short		optional 1	181	integer
uphole time at rx	97	short		optional 2	185	integer
source static correction	99	short		optional 3	189	integer
group static correction	101	short		optional 4	193	integer
total static correction	103	short		optional 5	197	integer
lag time A	105	short		optional 6	201	integer
lag time B	107	short		optional 7	205	integer
delay recording time	109	short		optional 8	209	integer
start mute	111	short		optional 9	213	integer
end mute	113	short		optional 10	217	integer
number of samples in this trace	115	short		optional 11	221	integer
sampling interval	117	short		optional 12	225	integer
gain type of field instruments	119	short		optional 13	229	integer
gain constant for instruments	121	short		optional 14	231	integer
initial or early gain (db)	123	short		optional 15	237	integer

APPENDIX 4

Contacts for the use of foreign vessels and/or persons

Requirements Under Federal Legislation

Contact names and numbers of federal departments that may have concerns about the use of foreign vessels and/or personnel during the collection of technical data are included below. The information contained herein is for guidance only and the Board cautions that additional departments may need to be contacted depending on the circumstances of the application.

Use of Foreign Vessels

Canada Border Services Agency
Carrier Control
191 Laurier Avenue West, 8th Floor
Sir Richard Scott Building
Ottawa, Ontario
Canada K1A 0L5
Attention: Manager, Carrier and Cargo Program, Border and Compliance Program Directorate
Tel: (613) 954-7204 Fax: (613) 957-9717

Transport Canada
Marine Safety
P.O. Box 1300
St. John's, NL
Canada A1C 6H8
Attention: Regional Director General
Tel: (709) 772-2397 Fax: (709) 772-2193

Foreign Personnel Wishing to Work in Canada

Information regarding foreign personnel who wish to work temporarily in Canada may be obtained from either:

Citizenship and Immigration Canada
31 Pippy Place
St. John's, NL
Canada A1B 3X2
Attention: Regional Manager
Tel: (709) 772-6560 Fax: (709 772-2929

or, outside Canada, any Canadian consulate.

Where immigration deems that Employment Authorizations are required, please contact Service Canada at the following address:

Service Canada
223 Churchill Avenue
P.O. Box 8548
St. John's, NL
Canada A1B 3P3
Tel: (709) 772-6391/2385/5338 Fax: (709) 772-6442