

Project Description

Eastern Newfoundland Offshore Seismic Program, 2015-2024

Prepared for

WesternGeco Canada

(Division of Schlumberger Canada Limited)

by



**21 January 2015
Project No. FA0035**

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WesternGeco Canada

200, 125-9th Avenue
SE Calgary, Alberta
T2G 0P6

by

LGL Limited, environmental research associates

P.O. Box 13248, Stn. A
St. John's, NL A1B 4A5
Tel: 709-754-1992
jchristian@lgl.com

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1.0 INTRODUCTION

WesternGeco Canada, a wholly-owned subsidiary of Schlumberger Canada Limited, is proposing to conduct two dimensional (2D), three dimensional (3D) and/or four dimensional (4D) seismic surveys in the eastern Newfoundland offshore (Figure 1). The Project Area identified in Figure 1 includes portions of the Northern Grand Banks and the Northeast Slope of Newfoundland, as well as the Flemish Pass, the Flemish Cap and Orphan Basin. WesternGeco Canada will be the Operator and may conduct 2D, 3D and/or 4D seismic surveys in one or more years within the 2015-2024 timeframe.

This document is the Project Description (PD), the first step in the Canada-Newfoundland and Labrador Offshore Petroleum Board's (C-NLOPB) environmental assessment (EA) process. This PD, combined with the technical and scoping advice received from the C-NLOPB, other federal agencies, and stakeholders consulted by WesternGeco Canada, will guide the preparation of an EA.

1.1 Relevant Legislation and Regulatory Approvals

An Authorization to Conduct a Geophysical Program will be required from the C-NLOPB. The C-NLOPB is mandated in this matter by the *Canada-Newfoundland and Labrador Atlantic Accord Implementation Newfoundland and Labrador Act* and the *Canada-Newfoundland Atlantic Accord Implementation Act*. The *Canadian Environmental Assessment Act, 2012* (CEAA 2012) came into force on 6 July 2012. The "Regulations Designating Physical Activities" lists physical activities which fall under the new Act. Marine seismic surveys are not included on the list and therefore do not require an EA under CEAA 2012.

Other legislation that is relevant to the environmental aspects of this project includes:

- *Species at Risk Act (SARA)*
- *Oceans Act*
- *Fisheries Act*
- *Navigable Waters Protection Act*
- *Canada Shipping Act*
- *Migratory Birds Convention Act*

One of the specific guidelines issued by the C-NLOPB, the *Geophysical, Geological, Environmental and Geotechnical Program Guidelines* (C-NLOPB 2012), is directly relevant to the proposed undertaking.

Authorizations for the kinds of activities described in this PD will be issued under the *Atlantic Accord Implementation Act* at the discretion of the C-NLOPB.

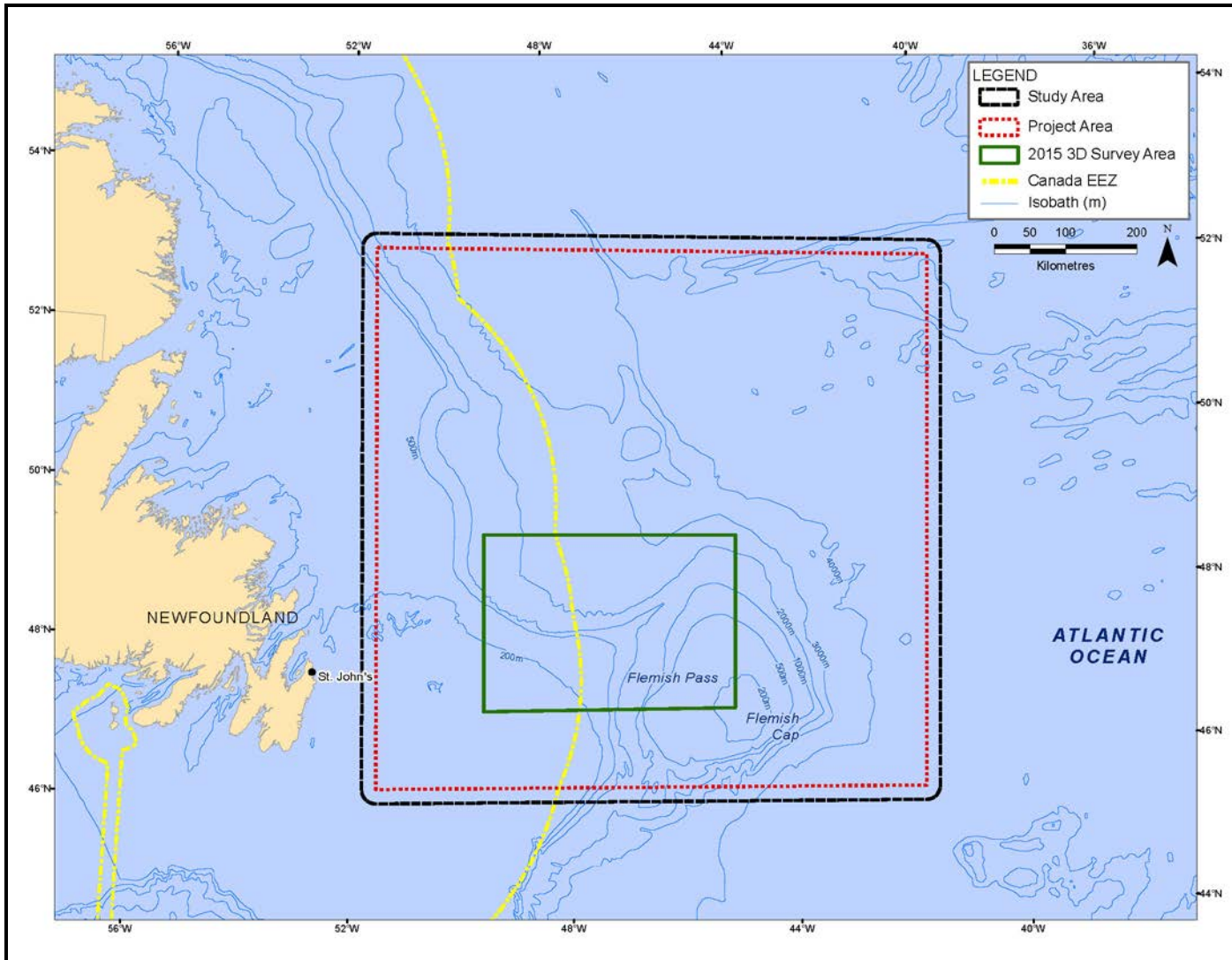


Figure 1. Locations of Project Area, Study Area and 2015 3D Survey Area for WesternGeco Canada’s Proposed Eastern Newfoundland Offshore Seismic Program, 2015-2024.

1.2 The Operator

The Operator, WesternGeco Canada, is a wholly-owned subsidiary of Schlumberger Canada Limited. WesternGeco Canada is focused on bringing together multi-geophysical measurements powered by a multi-domain expertise to produce a robust earth model in order to help our clients improve their assessment, exploration and exploitation of their reservoirs.

1.3 Canada-Newfoundland and Labrador Benefits

In full appreciation of the requirements of the *Canada-Newfoundland and Labrador Atlantic Accord Implementation Newfoundland Labrador Act* and the *Canada-Newfoundland Atlantic Accord Implementation Act*, WesternGeco Canada is committed to providing maximum benefits associated with East Coast operations to Canadians, and in particular, to Newfoundland and Labrador individuals and companies where they are commercially competitive in accordance with WesternGeco Canada's requirements.

WesternGeco Canada will manage the operations for these surveys from St. John's, Newfoundland and Labrador. WesternGeco Canada supports the principle that first consideration be given to personnel, support and other services that can be provided within Newfoundland and Labrador, and to goods manufactured in Newfoundland and Labrador, where such goods and services can be delivered at a high standard of Health, Safety and Environmental competency, be of high quality and are competitive in terms of fair market price. Contractors and subcontractors working for WesternGeco Canada in Newfoundland and Labrador must also apply these principles in their operations.

1.4 Contacts

Mr. Robert Hubbard
Multiclient Operations Manager
Schlumberger
10001 Richmond Avenue
Houston, TX 77042
USA

Phone: (713) 689-5805
Email: hubbard3@slb.com

Mr. Jacob Brown

New Ventures Manager
Schlumberger
10001 Richmond Ave
Houston, TX 77042
USA

Phone: (713) 689-6571
Email: jbrown9@slb.com

Mr. Steve Fealy

GeoSupport Manager
WesternGeco
10001 Richmond Ave
Houston, TX 77042
USA

Phone: (713) 689-2005
Email: fealys@exchange.slb.com

Ms. Lesa Tanner

Marine Shore Manager
WesternGeco
33 Thornhill Drive
Burnside Industrial Park
Dartmouth, NS
B3B 1R9
Canada

Phone: (902) 481-6427
Email: ltanner@calgary.westerngeco.slb.com

2.0 PROJECT DESCRIPTION

The official name of the Project is the Eastern Newfoundland Offshore Seismic Program, 2015-2024. WesternGeco Canada is proposing to conduct one or more 2D, 3D and/or 4D seismic surveys within its proposed Project Area (see Figure 1) between 2015 and 2024, starting as early as May 2015. The timing of the surveys is subject to WesternGeco Canada priorities and circumstances, weather conditions, contractor availability and regulatory approvals.

2.1 Spatial and Temporal Boundaries

The Study Area includes the Project Area plus a 20 km buffer around the Project Area to account for the propagation of seismic survey sound that could potentially affect marine biota (see Figure 1). The proposed Project Area includes space to account for ship turning and streamer deployment. The areas of the Study Area and Project Area are 643,553 km² and 581,299 km², respectively. More than half of the Study Area and Project Area is located outside of Canada's Exclusive Economic Zone (EEZ) (200 nm limit). Water depths within the Project Area range from <100 m to >4,000 m (see Figure 1).

The “corner” coordinates (decimal degrees, WGS84 projection) of the extents of the Project Area are as follow:

- Northwest: 53.008°N, 51.560°W;
- Northeast: 52.436°N, 40.206°W;
- Southeast: 45.828°N, 41.566°W; and
- Southwest: 46.160°N, 51.514°W

The 3D seismic survey area for 2015, with an area of 86,813 km², is also shown in Figure 1.

The temporal boundaries of the proposed Project Area are between 1 May and 30 November, from 2015-2024. The maximum duration of a seismic survey in any given year is 210 days. In 2015, the seismic survey is anticipated to require 150 to 210 days.

2.2 Project Overview

The proposed Project is a ship-borne geophysical program that includes approximately 10,000 km² of 3D seismic survey lines planned for 2015. Data acquisition plans for 2D, 3D and/or 4D surveys during 2016-2024 are not yet determined.

For the proposed 3D survey in 2015, the seismic survey vessel will either be the MV *Eagle* (see Section 2.2.6 for more details) or a similar vessel. The seismic survey vessel(s) used during subsequent 2D/3D/4D surveys are unknown at present but will be approved for operation in

Canadian waters and will be typical of the worldwide fleet. Details on airgun arrays and streamers are provided below.

The C-NLOPB's *Geophysical, Geological, Environmental and Geotechnical Program Guidelines* (C-NLOPB 2012) will be used as the basis for the marine mammal monitoring and mitigation program for the seismic surveys. Dedicated Marine Mammal Observers (MMOs) will monitor for marine mammals and sea turtles and implement mitigation measures as appropriate. The airgun array will be ramped up, and ramp ups will be delayed if a marine mammal or sea turtle is detected within the appropriate safety zone (minimum of 500 m as noted in Fisheries and Oceans Canada *Statement of Canadian Practice with respect to the Mitigation of Seismic Sound in the Marine Environment*). The airgun array will be shut down any time an Endangered or Threatened (as listed on Schedule 1 of SARA) marine mammal or sea turtle is detected within the safety zone. These measures are designed to minimize disturbance to marine life, particularly marine mammals and species considered at risk under the SARA. In addition, the MMOs will conduct a monitoring and release program for seabirds which may strand on board Project vessels. A Fisheries Liaison Officer (FLO) provided by the Fish, Food and Allied Workers (FFAW) will be on board the seismic vessel to ensure implementation of communication procedures intended to minimize conflict with the commercial fishery.

2.2.1 Objectives and Rationale

The primary objective of the Project is to determine the presence and likely locations of geological structures that might contain hydrocarbon deposits. Existing seismic data in the area do not provide sufficient quality or coverage to serve the needs of the energy companies in their exploration, development and production activities. Acquisition of more 2D, 3D and/or 4D seismic data is required to provide images of higher resolution and quality that will reduce the possibility of unnecessary drilling activity.

2.2.2 Project Phases

The Project will have two phases. The actual timing of these activities within the temporal scope will be dependent on economic feasibility, vessel availability and results of data interpretation of survey work from preceding phases.

1. Phase 1 will include a 3D survey in 2015 in the Project Area (see Figure 1); and
2. Phase 2 may include 2D, 3D and/or 4D seismic surveys in the Project Area, depending on the results of analyses of existing and acquired data.

2.2.3 Project Scheduling

The seismic surveys will be conducted between 1 May and 30 November of any given year from 2015 to 2024. The approximate duration of the proposed 2015 survey is 150 to 210 days.

2.2.4 Site Plans

In 2015, it is planned that approximately 10,000 km² of 3D seismic data will be acquired. Most 3D seismic survey lines will be orientated east-west, and sail line spacing will range from about 10 to 20 km. Survey line lengths are anticipated to range in length from approximately 50 to 300 km. Most of the Project Area for the Eastern Newfoundland Offshore Seismic Program occurs beyond Canada's Exclusive Economic Zone (EEZ).

2.2.5 Personnel

A typical seismic vessel can accommodate approximately 35-60 personnel. Personnel on a seismic vessel include ship's officers and marine crew as well as technical and scientific personnel. The seismic vessel will also have a FLO and MMOs on board. All project personnel will have all of the required certifications as specified by the relevant Canadian legislation and the C-NLOPB.

2.2.6 Seismic Vessel

In 2015, WesternGeco Canada will use either the MV *Eagle* or a similar vessel as the seismic vessel. The MV *Eagle* was built in Norway in 1999 and is registered in Panama. The vessel is 94.8 m long, 24 m wide and has a mean draft of 7.5 m. The vessel is equipped with 2 x Siemens 4200 Kw diesel electric motors and has a maximum cruising speed of 14 knots. It is also equipped with a helideck.

For seismic surveys in 2016-2024, vessel specifics will be provided once the vessel has been identified.

2.2.7 Seismic Energy Source Parameters

The proposed 2D/3D/4D survey sound source will consist of one or two airgun arrays, 5,085 in³ in total volume, which will operate at towed depths between 6 and 15 m. The airguns will be operated with compressed air at pressures of 2000 psi, and produce approximate peak-to-peak pressures of 120 bar-m.

Detailed specifications of the airgun array will be provided once the project design is completed and parameters are selected.

2.2.8 Seismic Streamers

In 2015, the 3D seismic survey vessel will tow multiple solid streamers that are 8,000-10,000 m in length at a depth 15-25 m. In subsequent 2D, 3D and/or 4D seismic surveys (2016-2024), streamer equipment specifications will be provided when program design is complete. The solid

streamers will be deployed at depths ranging from 15 to 25 m. As many as 16 streamers may be towed during a 3D or 4D seismic survey.

2.2.9 Logistics/Support

Vessels

Primary support and supply will be provided by a chartered vessel. During the 2015 3D seismic survey, it is anticipated that one local guard vessel will accompany the seismic vessel. The guard vessel will be used to scout ahead of the seismic vessel for fishing vessels and gear, as well as for hazards such as ice and floating debris.

Helicopters

The seismic vessel will be equipped with a helicopter deck. Helicopters are often used for crew changes and light re-supply. In 2015, crew changes will occur via port calls. It is not known at this time whether helicopters or vessel-to-vessel transfers will be used for crew changes during seismic program(s) in 2016-2024.

Shore Base, Support and Staging

WesternGeco Canada will have a shore representative based in St. John's for the duration of seismic programs. No new shore base facilities will be established as part of the Project.

2.2.10 Waste Management

Waste management will be consistent with industry best practices in offshore Newfoundland and Labrador.

2.2.11 Air Emissions

Air emissions will be those associated with standard operations for marine vessels, including the seismic vessel and any potential picket and/or supply vessel.

2.2.12 Accidental Events

In the unlikely event of the accidental release of hydrocarbons during the Project, the measures outlined in WesternGeco Canada's oil spill response plan will be implemented. The oil spill response plan will be filed with the C-NLOPB. In addition, WesternGeco Canada will have an emergency response plan in place.

2.3 Mitigation and Monitoring

Project mitigations will be detailed in the EA and will follow the guidelines outlined in the *Statement of Canadian Practice with Respect to the Mitigation of Seismic Sound in the Marine Environment*. Mitigation procedures will include ramp-ups, implementation of ramp-up delays and airgun array shutdowns for designated marine mammal and sea turtle species, use of dedicated MMOs and FLOs, and a fisheries compensation program. In addition, the MMOs will conduct a monitoring (systematic seabird counts based on protocols issued by the Canadian Wildlife Service) and release program for seabirds which may strand on board Project vessels.

3.0 ENVIRONMENTAL ASSESSMENT

The environmental assessment will closely follow previous assessments of seismic programs offshore Newfoundland and Labrador. The primary issues of concern are the effects of underwater sound from the airgun arrays on marine fauna and fisheries.

3.1 Physical and Biological Environment

The Eastern Newfoundland SEA (C-NLOPB 2014) provides descriptions of the physical and biological environments in the Study Area. A description of the physical and biological environments will be provided in the EA for this Project. Background information will be provided for anticipated Valued Environmental Components (VECs)—fish and fish habitat, fisheries, marine birds, marine mammals, sea turtles, species at risk and sensitive areas.

3.2 Effects of the Environment on the Project

A discussion of expected effects of the physical environment on the Project, based partially on information in the Eastern Newfoundland SEA (C-NLOPB 2014), will be provided in the EA for this Project.

3.3 Effects of the Project on VECs

The effects of Project activities on VECs, most notably the underwater sound from airgun arrays, will be assessed in detail. Information on the known effects of underwater sound on marine fauna, as well as of other Project activities, will be reviewed and used to predict residual effects on VECs. Mitigation and monitoring procedures will be included in the EA and will consider input received by stakeholders during consultations.

Accidental events (such as an unplanned hydrocarbon release) associated with Project activities will also be assessed in the EA. It will also include an analysis of cumulative environmental effects.

3.4 Consultations

During the course of the assessment, WesternGeco Canada will consult with stakeholders with an interest in the Project. Those consulted and the results of those consultations will be compiled in the EA.

In order to assist in scoping the effects assessment and mitigation plan, and to aid in addressing any issues of concern, WesternGeco Canada will undertake a consultation program with the interested parties, which may include, but are not limited to:

- Fisheries and Oceans Canada (DFO);
- Environment Canada (EC);
- ONE OCEAN;
- FFAW/UNIFOR;
- Study Area fishers;
- Nature Newfoundland and Labrador (formerly the Natural History Society);
- Various fish processors; and
- Other Newfoundland and Labrador fisheries industry stakeholders as identified.

4.0 REFERENCES

C-NLOPB (Canada-Newfoundland and Labrador Offshore Petroleum Board). 2012. Geophysical, Geological, Environmental and Geotechnical Program Guidelines, January 2012. 51 p.

C-NLOPB (Canada-Newfoundland and Labrador Offshore Petroleum Board). 2014. Eastern Newfoundland Strategic Environmental Assessment. Report by AMEC Environment & Infrastructure, St. John's, NL for the C-NLOPB, St. John's, NL. 527 p. + appendices.