CANADA-NEWFOUNDLAND and LABRADOR OFFSHORE PETROLEUM BOARD DETERMINATION REPORT

PART A: GENERAL INFORMATION

Screening Date	**October 15, 2014**
EA Title	Environmental Assessment of GX Technology Canada Ltd.'s GrandSPAN 2D Seismic, Gravity and Magnetic Survey, 2014-2018
Proponent	GX Technology Canada Ltd. (GXT) 1905, 500 4th Ave SW Calgary, Alberta T2P 2V6
Contact	Mr. Robert Pitt GrandSPAN Environmental Manager GX Technology Canada Ltd. 20 Duntara Crescent St. John's, NL A1E 5Z1
C-NLOPB File No.	48006-020-002
Location	Offshore Southern and Eastern Newfoundland
Referral Date	**December 5, 2013**
EA Start Date	**December 20, 2013**
Law List Triggers	Paragraph 138(1) (b) *Canada-Newfoundland Atlantic Accord Implementation Act* and *Paragraph* 134(1) (b) *Canada-Newfoundland and Labrador Atlantic Accord Implementation Newfoundland and Labrador Act*

Part B: PROJECT INFORMATION

On December 3, 2013, GX Technology Canada Ltd. (GXT) submitted a project description entitled, *GXT GrandSPAN 2014-2018 2D Seismic, Gravity and Magnetic Survey* (GX Technology, December 2013) to the Canada-Newfoundland and Labrador Offshore Petroleum Board (C-NLOPB), describing its plans to conduct a 2-Dimensional (2D) (single streamer) marine geophysical survey to collect seismic, gravity and magnetic data in the eastern and southern offshore regions of Newfoundland from 2014 to 2018. GXT submitted the *Environmental Assessment of GX Technology Canada Ltd.'s GrandSPAN 2D Seismic, Gravity and Magnetic Survey 2014-2018* (AMEC, 2014a) on March 17, 2014. On May 28 and July 4, 2014, the C-NLOPB requested additional information from GXT. GXT responded to the review comments

on June 12 and July 7, 2014 and provided the administrative consolidation of review comments *GX Technology Canada Ltd.'s GrandSPAN 2D Seismic, Gravity and Magnetic Survey 2014-2018 Revised Environmental Assessment Addendum: Response to 28 May 2014 and 4 July 2014 Consolidated Review Comments* (AMEC 2014b).

1 Description of Project

GXT is proposing to conduct a geophysical program that includes 2-Dimensional (2D) (single streamer) seismic, gravity and magnetic surveys in open (ice-free) waters. The planned program is a regional Basin Span survey designed to examine very deep geological formations over very broad (basin scale) areas and regions. Surveys are proposed between 1 May and 31 December in any given year between, 2014 and 2018. The proposed Project is a ship-borne geophysical program that could include as much as 14,000 line km in any program year.

2 Description of Environment

A complete description of the biological and physical environment can be found in the Environmental Assessment (EA) report (March 2014) and the subsequent EA Addendum (July 2014). The following sections provide references to the appropriate sections of the EA Report and the EA Addendum.

2.1 Physical Environment

A description of meteorological and oceanographic characteristics in the Study Area, including: geology; bathymetry; climatology; physical oceanography; and ice conditions are provided in Section 4.1 of the EA Report (AMEC, 2014a). Additional information was provided in theEA Addendum (AMEC 2014b).

2.2 Biological Environment

A detailed description of the biological environment may be found in Section 4.2 of the EA Report (AMEC, 2014a) and the EA Addendum (AMEC 2014b). Specifically, information on: marine fish and fish habitat; marine/migratory birds; marine mammals and sea turtles; marine fisheries including commercial, industry and government research vessel surveys, sealing, aquaculture, Aboriginal fisheries; sensitive and protected areas; species at risk; and other marine activities.

There are 16 Species at Risk, as defined under Schedule 1 of the *Species at Risk A*ct (SARA) that may occur within the Study Area. The following table identifies species likely to be present and their SARA listing and the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) status.

SPECIES	SARA Status	COSEWIC Status
North Atlantic Right Whale (*Eubalaena glacialis*)	Schedule 1 – Endangered (May 2013)	Endangered (May 2013)
Blue Whale (*Balenoptera musculus*)	Schedule 1 – Endangered (May 2012)	Endangered (May 2012)
Northern Bottlenose Whale (*Hyperoodon ampullatus*) Scotian Shelf population	Schedule 1 – Endangered (May 2011)	Endangered (May 2011)
Leatherback Sea Turtle (*Dermochelys coriacea*)	Schedule 1 – Endangered (May 2012)	Endangered (May 2012)
White Shark (*Carcharodon carcharias*) Atlantic population	Schedule 1 – Endangered (April 2006)	Endangered (April 2006)

Red Knot *rufa* subspecies (*Calidris canutus rufa*)	Schedule 1 – Endangered (April 2007)	Endangered (April 2007)
Beluga Whale (*Delphinapterus leucas*) St. Lawrence population	Schedule 1 –Threatened (May 2004)	Threatened (May 2004)
Northern Wolffish (*Anarhichas denticulatis*)	Schedule 1 – Threatened (November 2012)	Threatened (November 2012)
Spotted Wolffish (*Anarhichas minor*)	Schedule 1 – Threatened (November 2012)	Threatened (November 2012)
Chimney Swift (*Chaetura pelagica*)	Schedule 1 – Threatened (April 2007)	Threatened (April 2007)
Harlequin Duck (*Histrionicus histrionicus*)	Schedule 1 – Special Concern (November 2013)	Special Concern (November 2013)
Peregrine falcon *anatum/tundrius* (*Falco peregrinus anatum/tundrius*)	Schedule 1 – Special Concern (April 2007)	Special Concern (April 2007)
Rusty Blackbird (*Euphagus carolinus*)	Schedule 1 – Special Concern (April 2006)	Special Concern (April 2006)
Atlantic Wolffish (*Anarhichas lupus*)	Schedule 1 – Special Concern (November 2012)	Special Concern (November 2012)
Fin Whale (*Balaenoptera physalus*) Atlantic population	Schedule 1 – Special Concern (May 2005)	Special Concern (May 2005)
Sowerby's Beaked Whale (M*esoplodon bidens*)	Schedule 1 – Special Concern (November 2006)	Special Concern (November 2006)

Final recovery strategies have been prepared for seven species currently designated as either *endangered* or *threatened* under Schedule 1 and potentially occurring in the Project Area: (1) the North Atlantic right whale (Brown 2009); (2) the leatherback sea turtle (DFO 2013); (3) the spotted wolffish (Kulka et al. 2007); (4) the northern wolffish (Kulka et al. 2007); (5) the blue whale (Beauchamp et al. 2009); (6) the Scotian Shelf population of the northern bottlenose whale (DFO 2010); and (7) the St. Lawrence Estuary population of beluga whale (DFO 2012). In addition, a management plan has been prepared for the Atlantic wolffish (Kulka et al. 2007), currently with *special concern* status on Schedule 1 of *SARA*.

Part C: ENVIRONMENTAL ASSESSMENT PROCESS

3. Review Process

On December 3, 2013, GXT submitted a project description entitled*, GXT GrandSPAN 2014-2018 Marine 2D Seismic, Gravity and Magnetic Survey* (GXT 2013) to the C-NLOPB, describing its plans to conduct a 2D seismic survey in the Southern and Eastern Newfoundland offshore area. The Project requires an authorization pursuant to Section 138(1) (b) of the *Canada-Newfoundland Atlantic Accord Implementation Act* and Section 134(1) (a) of the *Canada-Newfoundland and Labrador Atlantic Accord Implementation Newfoundland and Labrador Act (the Accord Acts).* The C-NLOPB requested comments on the project description and identification of expertise on December 20, 2013 from: DFO; Environment Canada (EC); Department of National Defence (DND); Transport Canada (TC); Natural Resources Canada (NRCan); Health Canada; Canada-Nova Scotia Offshore Petroleum Board (CNSOPB); and the Newfoundland and Labrador Departments of Environment and Conservation (NLDEOC),

Fisheries and Aquaculture (NL DFA) and Natural Resources (NL DNR). The C-NLOPB requested comments on the project description from One Ocean (OO) and the Fish, Food and Allied Workers Union (FFAW).

On January 28, 2014, the C-NLOPB notified GXT that an environmental assessment was required and the Scoping Document was provided.

GXT submitted the *Environmental Assessment of GX Technology Canada Ltd.'s GrandSPAN 2D Seismic, Gravity and Magnetic Survey, 2014-2018* (AMEC, 2014a) on March 18, 2014. The C-NLOPB forwarded the EA Report on March 18, 2014 to DFO, EC, DND, CNSOPB, NL DEOC, NL DFA and NL DNR. The FFAW and OO were also provided a copy of the EA Report for review.

Comments on the EA Report were received from DND, EC, CNSOPB, DFO and the FFAW. In order to address deficiencies in the EA Report, GXT was required to provide a response to the EA Report review comments. On June 12, 2014, GXT responded to the review comments, via the *GX Technology Canada Ltd.'s GrandSPAN 2D Seismic, Gravity and Magnetic Survey, 2014-2018 Environmental Assessment Addendum: Responses to Review Comments* (AMEC 2014b) and this was forwarded to reviewers for their consideration. Additional comments were provided from reviewers and these were forwarded to GXT on July 4, 2014. All comments were addressed satisfactorily by July 14, 2014.

3.1 Scope of Project

The Project Area encompasses the area within which all survey equipment deployment and data acquisition will take place. It is located over portions of the continental shelf, slope and rise adjacent to the Island of Newfoundland between approximately 50°20'N and 40°58'N, and from approximately 59°00'W to 41°45'W, at its maximum extent. The area within France's maritime boundary associated with St. Pierre et Miquelon is not included in the Project Area. Water depths in the area range from approximately 40 m to more than 4,000 m. The Study Area includes the Project Area plus a 20 km buffer area around the Project Area to account for the propagation of seismic survey sound that could potentially affect marine biota.

The proposed Project is a ship-based geophysical program where a maximum of 14,000 km of 2D seismic survey data would be acquired in any given year. Additional seismic surveys may be conducted within the Project Area during 2015–2018. The proposed 2-D program will use a conventional seismic ship which will tow a sound source (airgun array) and a single streamer (buoyant cable) containing receiving (listening) hydrophones. The seismic vessel will also passively collect and record gravity and magnetic data at the same time, and will have an echosounder for depth soundings. The seismic vessel will be accompanied by a support vessel. Any vessel operated as part of the Project will be in compliance with all applicable legislation and regulations, and will be inspected by Transport Canada and approved for operation by the C-NLOPB in accordance with applicable regulatory requirements.

The seismic energy source will be an airgun array comprising individual airguns of various sizes, typically from approximately 30 in^3 to 400 in^3 in volume. The maximum total size that may be used, and which is considered in this EA, is 6,420 in^3. The nominal firing pressure of the array will be 2,000 pounds per square inch (psi) and the array will be towed at a depth of 8–18 m. The survey speed will be around 4.5 knots (8.3 km/h).

The seismic ship will tow a single seismic streamer up to 15 km long, deployed near the ocean surface at a depth of approximately 8 to 18 m. The cable for the planned 2014 survey activities will be a solid

streamer that contains a non-liquid fill to reduce self-noise properties and provide consistent buoyancy. The streamer will be made up of solid streamer sections up to 150 m in length.

Gravity and magnetic data will be collected (passively) using a marine gravitymeter. The seismic vessel will also be equipped with an echosounder that will operate at a frequency of 38 kHz or 200 kHz and will be used to collect water depth information. Sound velocity profiles will also be acquired in the water column at various locations within the survey area. Sound velocity profiles will be obtained by the support vessel and will measure pressure, temperature, and salinity.

Seismic surveys will occur within the 1 May to 31 December period between 2014 to 2018. The timing of the acquisition of specific lines within the Project Area in any year will depend on several factors, including commercial fish harvesting, local weather, sea state, and ice conditions.

3.2 Boundaries

The boundaries of the Project are defined in the EA Report as follows and are acceptable to the C-NLOPB.

Boundary	**Description**
Temporal	Between 1 May and 31 December, 2014 to 2018.
Project Area	Offshore Southern and Eastern Newfoundland, with the "corner" coordinates: • 50° 20' 00.0"N, 54° 35' 00.0"W; • 50º 20' 00.0"N, 41º 45'00.0"W; • 45º 30' 00.0"N, 41º 45' 00.0"W; • 40º 58' 21.7"N, 49º 00' 00.0"W; • 40º 58' 21.7"N, 55º 34' 23.3"W; and • 46º 54' 48.9"N, 59°00' 34.9"W. The Project Area includes the vessel' turning radii. The Project Area does not include the area within France's maritime boundary associated with St. Pierre et Miquelon.
Study/Affected Area	The Study Area includes the Project Area plus a 20 km buffer area for potential effects around the Project Area.
Regional Area	The area extending beyond the "Affected Area" boundary within Southern and Eastern Newfoundland.

There may also be an area of influence from the sound array. However, depending on the marine species present, this area of influence will vary in size. Hearing thresholds have been determined for a number of species (seals and odontocetes), but the threshold is not known for others (baleen whales). The sound that is actually received by the marine species depends on the energy released from the source and its propagation (and loss) through the water column. Therefore, the hearing ability of the species and background noise will affect the amount of noise from an airgun array detected.

3.3 Scope of Assessment

For the purpose of meeting the requirements of the *Accord Act*, the factors that were considered to be within the scope of the environmental assessment are those set out in the *GX Technology Southern Grand Banks 2D Seismic, Gravity and Magnetic Program, 2014 to 2018 Scoping Document* (C-NLOPB 2014).

4. Consultation

4.1 Consultation carried out by GXT

In-person meetings were held by GXT representatives (Project Manager and Environmental Manager) gave presentations with details about ION/GXT, the Project, and why and how it is going to be carried out. The presentation by GXT showed the Project and Study Areas and maps of potential 2014 survey lines and fish harvesting locations (key species) in relation to the Project Area. Information was recorded about commercial fish harvesting, as well as any issues, concerns and advice about mitigations (particularly avoiding concurrent fisheries) and communications. Attendees were also provided with copies of the presentation and the Project Description filed with the C-NLOPB.

GXT also communicated by telephone and/or email. Information packages (e.g., Project Description, sample maps) were sent and comments / advice were invited. Email communications included the Project Description filed with the C-NLOPB and links to the C-NLOPB Registry and/or Project summaries and maps.

Consultations and contacts (in-person meetings, telephone discussion, email (as indicated) were conducted with representatives of the following groups / agencies (in alphabetical order, by organization).

- Association of Seafood Producers (ASP) – telephone / email
- Atlantic Shark Association – telephone
- Canada / Canadian Wildlife Service – telephone / email
- Canada-Nova Scotia Offshore Petroleum Board (C-NSOPB) – in person / telephone / email
- Canadian Association of Prawn Producers (CAPP) – email
- Clearwater Seafoods - telephone / email
- Davis Strait Fisheries - email
- Department of Fisheries and Aquaculture, Newfoundland and Labrador - email
- Department of Fisheries and Oceans Canada (DFO) - in person / telephone and/or email
- Department of National Defence – email
- Eastern Shore Fishermen's Protective Association – telephone/email
- Fish, Food and Allied Workers Union (FFAW)– in person / telephone / email
- Government of France – in-person /telephone / email
  - Office of the Prefect of St Pierre et Miquelon
  - Le Service des Affaires Maritimes - Marine Department (officials)
- Groundfish Enterprise Allocation Council (GEAC) - email
- Harbour Grace Shrimp Company - email
- Icewater Fisheries - email
- Marine Atlantic – email
- Mersey Seafoods Ltd. – email
- MV Osprey Ltd. - email
- Nataaqnaq Fisheries Inc. - email
- Nature Newfoundland and Labrador – in person / email
- Netukulimk Fisheries Limited, Miawpukek First Nation - email
- Newfound Resources Ltd. (NRL) - telephone / email
- Nova Scotia Swordfishermen's Association - telephone / email
- Ocean Choice International (OCI) - in person / telephone / email

- One Ocean - in person / email
- Sambro Fisheries - telephone
- Seafreez Foods Inc. (Barry Group Inc.) – email
- Shelburne County Quota Group – telephone / email

The following agencies / groups that were consulted provided the following feedback. In several cases, information and advice was also provided in comments to the C-NLOPB for its final Scoping Document, which was also considered by GXT and informed the preparation of the EA. Information about the project was also presented and/or e-mailed to each of the groups. Most of the comments and information received by GXT and its consultants during the consultations for this EA related to operational information - about harvesting locations and times, and/or science surveys locations and times.

Canada-Nova Scotia Offshore Petroleum Board

- Extent of overlap with Nova Scotia based fisheries / fishing areas

Environment Canada / Canadian Wildlife Service

- Environmental baseline (survey) information for marine / migratory birds
- Protocols for seabird observations during the survey
- Advice /protocols for seabird handling, oiled seabirds, strandings

Department of Fisheries and Aquaculture, Newfoundland and Labrador

- Information about aquaculture sites in coastal areas adjacent to the Project and Study Areas

Department of Fisheries and Oceans Canada

- Information about timing and locations of DFO-operated science surveys
- Fisheries catch and effort datasets
- RV survey datasets
- Information about species fisheries / fisheries management / stock status
- Environmental baseline information related to fish and fish habitat in the Study Area
- Marine mammal sightings data
- Small-craft harbours

Department of National Defence

- Details of the location of unexploded ordnance in and near the Study Area
- Request for continuing information about project activities

Government of France for St. Pierre et Miquelon

- GXT provided information (in French and English) about the proposed project. They were informed by GXT that there would be no acquisition within any part of the French EEZ and that any transits through the zone with seismic equipment in tow would follow any requirements of the St. Pierre et Miquelon authorities.
- Information was also presented during meetings with Le Service des Affaires Maritimes, which is responsible for fisheries and other marine matters. No issues were reported to GXT.
- They were informed by GXT that if acquisition is proposed within any part of the French EEZ in the future, it would be pursued directly with the Government of France as a separate Project.

Marine Atlantic

- Information about Marine Atlantic ferry routes and activities in and near the Study Area

Nature Newfoundland and Labrador

- Wildlife in the Study Area
- Oceanographic data

One Ocean

- Fisheries and fisheries issues within the Study Area
- One Ocean Protocol for Seismic Survey Programs

The most consistent issue raised during the consultations was the commercial fisheries – specifically a perspective that the survey should not interfere with or otherwise affect harvesting success or science surveys. The FFAW emphasised during meetings with GXT the matter of avoiding all survey stations used during the post-season trap survey for snow crab until all stations near seismic survey lines are complete (typically finished within the September - November period).

GXT has committed to follow-up discussions each year with key groups. They are to occur before the survey is permitted, during project activities, and after the survey is complete.

The C-NLOPB is satisfied that the consultations carried out by GXT, and reported on in the EA Report, included all elements of the Project, and that GXT has addressed substantive concerns about the proposed Project.

4.2 Review of the March 2014 EA Report

The C-NLOPB forwarded the EA Report on March 18, 2014 to DFO, EC, DND, CNSOPB, NLDEC, NLDFA, NLDNR, FFAW, and OO.

DND provided comments on the EA Report on 24 April, 2014 which stated that comments provided by DND during the scoping phase were not appropriately addressed and that they would likely be in the area in a non-interference manner, thus requesting it be informed of dates and locations of seismic activities. DND provided a response to the EA Addendum on 23 June 2104 that they had no further comments.

EC provided comments on the EA Report on 24 April 2014. The key issues were: the potential use of helicopters; proper data numbers and concentrations of seabirds; a recommendation to always perform a ramp-up/soft start; and lighting on the vessel. They reiterated that their comments on the draft scoping document (January 15, 2014) were still valid. EC provided a response on the EA Addendum on 17 June 2014 with a reminder to the proponent to submit bird observation data. EC provided a reply on July 14, 2014 that they were satisfied.

The CNSOPB provided comments on 13 May 2014. They requested a map that indicated the NS-NL boundary line overlaid with the Study Area and reviewed this in relation to crab fishing areas off Cape Breton. The CNSOPB provided a response on the EA Addendum on 24 June 2014 that they were satisfied.

DFO provided comments on the EA Report on 21 May 2014. Their comments focused on: COSEWIC assessments; special and sensitive areas; clarification of species at risk information presented; adherence to the Standard of Canadian Practice; and marine and commercial fisheries. DFO provided a response on the EA Addendum on 25 June 2014 that they were satisfied.

The FFAW provided comments on the EA Report on 27 May 2014. The key issues were: clarification of results of fisheries surveys; the dynamic nature of the fisheries; timing of commercial fisheries; avoidance as a mitigation; and avoidance of active fisheries and the DFO Post Season Trap Survey for Snow Crab. The FFAW provided comments on the EA Addendum on 03 July, 2014. Comments included: the vastness of the commercial fishery; the role of the FLO; avoidance of active fisheries; and temporal and spatial avoidance of the post-season trap survey for snow crab. On July 10, 2014 the FFAW responded that they had no further comments.

The consolidated review comments were provided to GXT on May 28, 2014. GXT responded on June 12, 2014 in the form of an EA Addendum. GXT's June 12, 2014 response was forwarded to reviewers on June 13, 2014 for consideration. Additional comments were forwarded to GXT on Jul7 4, 2014. For administrative purposes, all review comments and responses were consolidated by GXT and included in a revised EA Addendum on July 20, 2014.

The C-NLOPB believes that all substantive comments within the scope of the EA have been satisfactorily addressed.

5. Environmental Effects Analysis

5.1 Methodology

The C-NLOPB reviewed the environmental effects analysis presented by GXT in its EA Report. A Valued Ecosystem Component (VEC) based assessment, based on the interaction of project activities with VECs, was used in assessing environmental effects, including cumulative effects and effects due to accidental events. The environmental assessment methodology and approach used by the Proponent is acceptable to the C-NLOPB.

Potential adverse environmental effects, including cumulative effects, were assessed with respect to:

- magnitude of impact;
- geographic extent;
- duration, likelihood, and frequency;
- reversibility;
- ecological, socio-cultural and economic context; and
- significance of residual effects following implementation of mitigation measures.

The potential effect significance of residual effects, including cumulative effects, for each VEC was rated in this environmental screening report as follows:

0 = No Detectable Adverse Effect
1 = Detectable Effect, Not Significant
2 = Detectable Effect, Significant
3 = Detectable Effect, Unknown

These ratings, along with the likelihood of the effect, were considered in determining overall significance of residual effects.

In the EA Report, GXT presented information regarding the potential effects of the seismic survey program activities on fish and fish habitat, commercial fisheries, seabirds, marine mammals and sea turtles, species at risk, and sensitive areas. A summary of the effects assessment follows.

5.2 Valued Ecosystem Components/ Potential Environmental Effects

5.2.1 Fish and Fish Habitat 1

The seismic survey program will not result in any direct physical disturbance of the bottom substrate. During seismic surveys, survey equipment is not expected to come in contact with the seafloor and deep-water corals and sponges. Therefore the negligible residual effects on fish habitat (i.e., water and sediment quality, phytoplankton, zooplankton, and benthos) are predicted to be **not significant**.

The potential effects of the proposed project on fish and marine invertebrates may be found in Section 5.3 of the EA Report and the EA Addendum. Mitigations consistent with those outlined in the *Geophysical, Geological, Environmental and Geotechnical Program Guidelines* (C-NLOPB 2012), will be implemented. Spatial and temporal avoidance of critical life history times (e.g., spawning aggregations) should mitigate the behavioural effects of exposure to airgun sound. The effects assessment concluded that physical effects on fish due to project activities will be: negligible to low in magnitude; over an area of less than 1 to 11- 100 km^2; and for a duration of less than 1 month to 1 - 12 months. The likelihood of effects (behavioural and physical) is low and therefore **not significant**.

Any potential physical or behavioural impact to invertebrate species is considered to be: negligible to low in magnitude; over an area of less than 1 to 11 - 100 km^2; and for a duration of less than 1 month to 1 to 12 months. The likelihood of effects (behavioural and physical) is low and therefore **not significant**.

5.2.2 Commercial and Traditional Fisheries and DFO Research Surveys 1

A discussion of the potential effects of the proposed project on fisheries may be found in Section 5.4 of the EA Report and the EA Addendum.

Given the application of mitigation measures, including the avoidance of fishery activity, it is predicted that the effects of seismic activity, including vessel movement, will be: negligible to low in magnitude; over an area of less than 1 to 11 to 100 km^2; and for a duration of less than 1 month to 1 to 12 months. The likelihood of effects (behavioural and physical) is low and therefore **not significant**.

To avoid potential conflict with DFO Research surveys, GXT will maintain communications with DFO personnel to keep up-to-date on the timing of planned research surveys. In addition, a temporal and spatial buffer zone will be implemented, in consultation with DFO, to reduce any potential interference with fish behavioural patterns. The impact of both noise and the seismic streamer on DFO research surveys will be negligible and **not significant.** To avoid potential conflict with the execution of the Industry-DFO Collaborative Post-Season Trap Survey for Snow Crab, GXT has committed to maintain regular communication with DFO and the FFAW in the area of survey operations. GXT will avoid all known science operating/set locations by at least 30 km (i.e. a 30 km radius) for at least 7 days before surveying the locations. While the fisheries research is active, GXT will also maintain a 30 km closest point of approach (CPA) from the active gear. With the implementation of mitigative measures, the impact of both noise and the seismic streamer on DFO research surveys and Industry-DFO Snow Crab trap surveys will be negligible and **not significant**.

5.2.3 Marine Birds 1

The potential effects of the proposed project on marine/migratory birds may be found in Section 5.5 of the EA Report and the EA Addendum.

Seabirds are expected to flush or dive in response to sounds or to avoid the area. It is predicted that there will be **no significant effects** on seabirds from the sound. The magnitude of the effect (if it occurs) will be: negligible to low; over an area less than 1 to 100 km^2; and for a duration of 1 to 12 months.

Efforts will be made by GXT to minimize deck light (if safe and practical) and to conduct routine checks for stranded birds. With the implementation of mitigative measures, the effect of vessel lighting on marine birds is predicted to be: of low magnitude; within an area 1to 10 km^2, and over duration of less than 1 to 12 months. Therefore, the effect of vessel lighting on marine birds is deemed **not significant**.

5.2.4 Marine Mammals and Sea Turtles 1

The discussion on the potential effects of the proposed project on marine mammals and sea turtles may be found in Section 5.6 of the EA Report and the EA Addendum.

The effects on marine mammals are predicted to be: negligible to low in magnitude; within an area less than 1 km to 100 km^2, and for a duration of 1to12 months. With the application of mitigation measures, the likelihood of effects occurring is low, and effects will be **not significant**.

The effects on sea turtles are predicted to be: negligible to low in magnitude; within an area less than 1 km to 100 km^2; and over duration of 1 to 12 months. With the application of mitigation measures, the overall likelihood of effects occurring is low, and effects will be **not significant.**

5.2.5 Species at Risk 1

The discussion of potential effects of the proposed project on species at risk may be found in Section 5.7 of the EA Report and the EA Addendum.

Each of the fish species at risk are highly mobile, and with the implementation of project mitigations, any individuals within the project's zone of influence are likely to move out of the area, thus, will **not be adversely affected**. The project will not affect identified critical habitat for either of these species, and given that it will not result in physical disturbance of the seafloor or coastline, it will not affect the residences of other key habitats of any individual or populations. The effects assessment concluded that physical effects on fish due to project activities will be: negligible to low in magnitude; over an area of less than 1 to 11 to 100 km^2; and for a duration of less than 1 month to 1 to 12 months. The likelihood of effects (behavioural and physical) is low and therefore **not significant**.

The main potential environmental interactions between the project and the bird species at risk are the same as those for the Marine/Migratory Bird VEC. Planned mitigation measures will help to avoid or reduce adverse interactions and interactions with project activities are therefore unlikely. It is predicted that there will be **no significant effects** on marine/migratory birds. The magnitude of the effect (if it occurs) will be: negligible to low; over an area less than 1 to 100 km^2; and for a duration of 1 to 12 months.

All of the marine mammal and sea turtle species at risk are highly mobile, and with the implementation of project mitigations individuals within the project's zone of influence are likely to move out of the

area. Key mitigations and monitoring outlined in the EA Report that are designed to minimize potential effects of airgun array noise on SARA-listed marine mammals and sea turtles will be implemented. Specifically, GXT has committed to adhere to mitigations detailed in Appendix 2 of the *Geophysical, Geological, Environmental and Geotechnical Program Guidelines* (C-NLOPB 2012) including those in the *Statement of Canadian Practice with Respect to the Mitigation of Seismic Sound in the Marine Environment.* . The effects on marine mammals are predicted to be: negligible to low in magnitude; within an area less than 1 km to 100 km^2, and for a duration of 1to12 months. With the application of mitigation measures, the likelihood of effects occurring is low, and effects will be **not significant**. The effects on sea turtles are predicted to be: negligible to low in magnitude; within an area less than 1 km to 100 km^2; and over duration of 1 to 12 months. With the application of mitigation measures, the overall likelihood of effects occurring is low, and effects will be **not significant.**

5.2.6 Sensitive Areas 0

The discussion on the potential effects of the proposed project on sensitive areas may be found in Section 5.8 of the EA Report. Based on the previous conclusions on the effects of the project on the other VECs, the project is predicted to have **no significant effect** on sensitive habitat.

5.2.7 Water Quality/Discharges 0

Information on discharges may be found in Section 2.7 of the EA Report and in the respective VEC sections of Section 5 of the EA Report. The effect of the program operations on marine water quality should be undetectable and **not significant**.

5.3 Cumulative Environmental Effects 1

A discussion of potential cumulative environmental effects may be found in Section 3.4.6 of the EA Report and in the respective VEC discussions in Section 5. With the implementation of mitigative measures and the limited temporal scope and overlap with other projects and activities, the cumulative environmental effect of the program, in conjunction with other projects and activities, is predicted to be **not significant**.

5.4 Accidents and Malfunctions

GXT will use a solid core streamer that will eliminate the risk of leakage associated with cables filled with floatation fluid. In the unlikely event of the accidental release of hydrocarbons or other materials during the project, GXT and its survey contractor will implement the measures outlined in its Oil Spill Response Plan which will be filed with the C-NLOPB. In addition, GXT has an Emergency Response Plan in place which bridges the emergency plans of all project entities and vessels to the local facilities and the Halifax Search and Rescue Region. The GXT representative onboard will represent GXT in all offshore Quality, Health, Safety and Environment (QHSE) activities at sea. The GXT Project Manager will represent the Proponent onshore from an office in St. John's, NL.

Effects due to accidental spills associated with the proposed operation are considered, overall, to be detectable if they occur, but **neither significant nor likely**.

5.5 Follow-up Program Required Yes☐ No☒

The C-NLOPB does not require follow-up monitoring to be undertaken for this Project.

6. Other Considerations

The C-NLOPB is satisfied with the environmental information provided by GXT regarding the potential adverse environmental effects which may result from the proposed project, and are satisfied with the operator's proposed monitoring and mitigative measures.

The C-NLOPB is of the view that the environmental effects from the project, in combination with other projects or activities that have been or will be carried out, are **not likely** to cause significant adverse cumulative environmental effects.

7. Recommended Conditions and /or Mitigations

The C-NLOPB recommends that the following conditions be included in the authorization if the geophysical program is approved:

- *The Operator shall implement or cause to be implemented, all the policies, practices, recommendations and procedures for the protection of the environment included in or referred to in the Application and in the "Environmental Assessment of GX Technology Canada Ltd.'s GrandSPAN 2D Seismic, Gravity and Magnetic Survey, 2014-2018"* (AMEC March 2014) and "*GX Technology Canada Ltd.'s GrandSPAN 2D Seismic, Gravity and Magnetic Survey, 2014-2018 Revised Environmental Assessment Addendum: Responses to 28 May 2014 and 4 July 2014 Consolidated Review Comments"* (AMEC 20 July 2014).

- *No later than January 31, 2015, the Operator shall submit a report to the C-NLOPB describing the progress and potential environmental effects of its 2014 program. It shall include, but not be limited to, copies of the Fisheries Liaison Officer (FLO) reports, the marine mammal observer (MMO) and seabird observer reports that were produced during the program, and the seabird and marine mammal observation data that were collected during the program .*

Part D: DETERMINATION DECISION

8 C-NLOPB Decision

The C-NLOPB is of the opinion that, taking into account the implementation of the proposed mitigation measures set out in the conditions above and those committed to by GX Technology Canada ltd., the Project ***is not likely to cause significant adverse environmental effects****.*

Responsible Officer *Original signed by Elizabeth Young* D*ate: October 15, 2014*

Elizabeth Young
Environmental Assessment Officer
*Canada-Newfoundland and Labrador Offshore Pet*roleum Board

References:

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