

# **NEXEN ENERGY ULC**

## **Eastern Newfoundland Offshore Geophysical, Geochemical, Environmental and Geotechnical Program (2018 - 2027)**

### **Environmental Assessment Project Description**

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## LIST OF ACRONYMS AND ABBREVIATIONS

2D	Two-dimensional
3D	Three-dimensional
4D	Four-dimensional
<i>Accord Acts</i>	<i>Canada-Newfoundland and Labrador Atlantic Accord Implementation Act and the Canada-Newfoundland and Labrador Atlantic Accord Implementation Newfoundland and Labrador Act</i>
bar-m	bar-metres
C-NLOPB	Canada-Newfoundland and Labrador Offshore Petroleum Board (“the Board”)
CNOOC	China National Offshore Oil Corporation
CTD	Current, temperature and depth (measuring instrument)
DFO	Fisheries and Oceans Canada
EA	Environmental Assessment
EEZ	Exclusive Economic Zone
EL	Exploration Licence
FLO	Fisheries Liaison Officer
GPA	Geophysical Program Authorization
HSE&A	Health, Safety, Environment & Assurance
MARPOL	International Convention for the Prevention of Pollution from Ships
NAD	North American Datum
Nexen	Nexen Energy ULC
NL	Newfoundland and Labrador
psi	pounds per square inch
ROV	Remotely Operated Vehicle
SEA	Strategic Environmental Assessment
SPOC	Single Point of Contact
UK	United Kingdom
VEC	Valued Environmental Component
WGS	World Geodetic System

## 1.0 INTRODUCTION

### **Project Name: *Eastern Newfoundland Offshore Geophysical, Geochemical, Environmental and Geotechnical Program (2018 - 2027)***

Nexen Energy ULC (Nexen) is planning to undertake an offshore petroleum exploration program in the eastern portion of the Canada - Newfoundland and Labrador Offshore Area (the Project). The Project will include proposed geophysical, geochemical, environmental and geotechnical survey activities in this region between 2018 and 2027.

The proposed Project will require authorizations from the Canada-Newfoundland and Labrador Offshore Petroleum Board (C-NLOPB or the Board), pursuant to Section 138(1)(b) of the *Canada-Newfoundland Atlantic Accord Implementation Act* and Section 134(1)(b) of the *Canada-Newfoundland and Labrador Atlantic Accord Implementation Newfoundland and Labrador Act* (the *Accord Acts*).

This document provides an Environmental Assessment (EA) Project Description for this proposed exploration program, and is being submitted to the C-NLOPB in order to initiate the EA review process for the Project. It has been prepared and submitted in accordance with the Board's associated EA requirements and processes, and will allow the regulator to prepare and provide a Scoping Document that will help inform and guide the eventual planning, preparation and submission of the EA Report.

### **1.1 Identification of the Proponent**

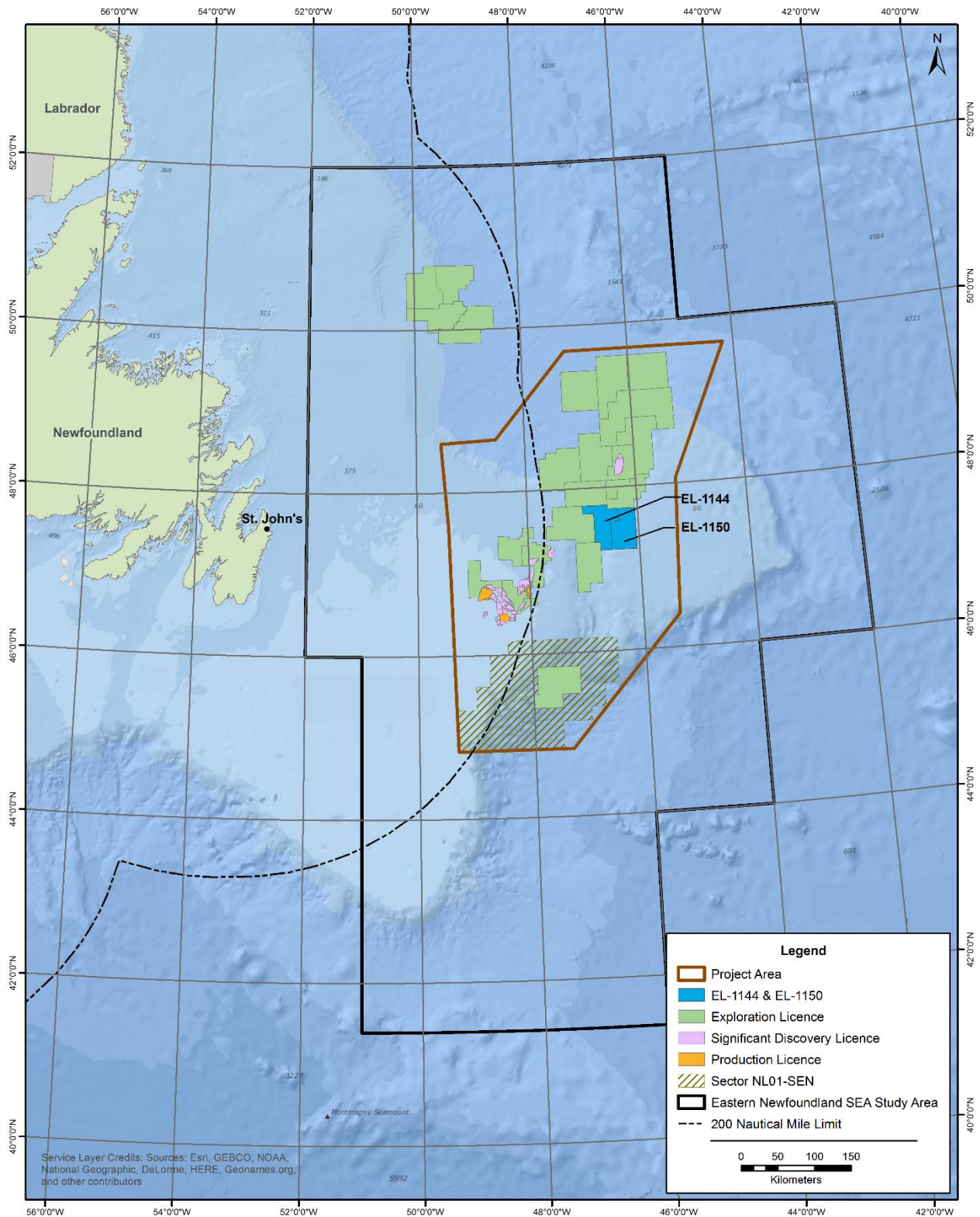
#### **1.1.1 Corporate Overview**

Nexen is an upstream oil and gas company that is responsible for managing its energy resources in Canada and providing management services and oversight to its affiliates including in the UK North Sea, offshore West Africa, and the United States ("manages"). A wholly-owned subsidiary of CNOOC Limited, Nexen manages three principal lines of businesses: 1) Conventional oil and gas, 2) Oil sands, and 3) Shale gas / oil. Although Nexen manages onshore production in several areas around the world, the largest component of the conventional business it manages occurs offshore, with approximately half of the production coming from offshore facilities in the UK North Sea, West Africa, and the Gulf of Mexico. The company is also a significant player in Canada's oil sands industry, and produces shale gas in northeastern British Columbia while also managing working interests in several shale projects in the United States. Further information on Nexen can be found at [www.nexencnoocld.com](http://www.nexencnoocld.com).

Nexen's current offshore interests in Eastern Canada include two existing Exploration Licences (ELs) off Eastern Newfoundland (EL 1144 and EL 1150) which were issued by the C-NLOPB effective January 15, 2016 and January 15, 2017, respectively. Nexen is currently sole interest holder in EL 1144 and EL 1150.

Nexen is currently developing its plans for an oil and gas exploration program offshore Eastern Newfoundland, which will involve several types of exploration survey activities over these existing and any forthcoming ELs and other areas of interest in the Project Area (Figure 1.1). These may include two-dimensional (2D), three-dimensional (3D) and possibly four dimensional (4D) seismic data acquisition, as well as associated geochemical, environmental and geotechnical survey activities.

**Figure 1.1 Nexen’s Eastern Newfoundland Offshore Geophysical, Geochemical, Environmental and Geotechnical Program, 2018-2027**



### 1.1.2 Health, Safety and Environment

Health, Safety and Environmental protection are core values at Nexen and the success of every activity undertaken by Nexen is measured on the ability to execute work safely each and every day. Nexen's business objectives are to operate safely and responsibly without causing harm to employees, contractors, joint venture partners or the communities in which we operate and to minimize the environmental impacts of Nexen's activities. Nexen is committed to promoting a culture of Safety First; striving for best-in-class health, safety and environmental performance.

The Nexen Health, Safety, Environment & Assurance (HSE&A) Policy commits to the following:

- Regulatory requirements, of the jurisdictions in which we operate, shall be met or exceeded to protect employees, contractors, the environment and communities' health, safety, security and well-being.
- An HSE&A focused culture shall be promoted, sustained and continuously improved across Nexen.
- Formal processes for identifying hazards, managing risks and ensuring compliance shall be developed, documented and implemented.
- Incidents and any departures from planned arrangements shall be promptly and effectively investigated, appropriate actions taken and findings shared to prevent recurrence.
- HSE&A policies, standards, processes and procedural aids shall be met or exceeded by all employees, contractors and their subcontractors undertaking work.

### 1.1.3 Proponent Information and Key Contacts

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## 1.2 Regulatory Context and Environmental Assessment Requirements

The C-NLOPB is responsible, on behalf of the Governments of Canada and Newfoundland and Labrador, for petroleum resource management in the Canada - NL Offshore Area. The *Accord Acts*, administered by the C-NLOPB, provide for joint management of this Offshore Area and govern all oil and gas activities in the region. In the implementation of its mandate, the role of the C-NLOPB is to facilitate the exploration for, and development of, the hydrocarbon resources in this area in a manner that conforms to the statutory provisions for: 1) worker safety; 2) environmental protection; 3) effective management of land tenure; 4) maximum hydrocarbon recovery and value; and 5) Canada-Newfoundland and Labrador benefits. The C-NLOPB's associated regulatory responsibilities include but are not limited to the administration and issuance of specific licences, authorizations and approvals pertaining to offshore oil and gas exploration and production activities in this region.

In planning to carry out offshore geophysical programs for petroleum resources in the Canada-NL Offshore Area, an Operator must apply for and obtain a Geophysical Program Authorization (GPA) from the C-NLOPB. In addition, proposed geological (including geochemical), environmental and geotechnical activities also require a Geological, Geotechnical and Environmental Program Authorization. The application and review processes and information requirements that pertain to these authorizations are outlined in the C-NLOPB's *Geophysical, Geological, Environmental and Geotechnical Program Guidelines* (June 2016), which also include various measures and requirements related to environmental planning, mitigation and reporting.

As part of its regulatory responsibilities and processes, the C-NLOPB also requires that project-specific EAs be conducted and submitted by Operators in relation to various types of oil and gas exploration activities in the Canada - NL Offshore Area, including those that are being proposed as part of this Project.

A number of other federal and provincial government departments and agencies also may have regulatory responsibilities, information and advice and/or other interests regarding the proposed Project and its environmental setting and potential effects, pursuant to their associated legislation and mandates. These include:

- Fisheries and Oceans Canada (DFO);
- Environment and Climate Change Canada;
- Transport Canada;
- Department of National Defence;
- NL Department of Environment and Climate Change;
- NL Department of Fisheries, Forestry and Agrifoods; and the
- NL Department of Natural Resources

Key legislation and regulations that are or may be relevant to the Project and its EA therefore include:

- The *Accord Acts* and associated Regulations and Guidelines, including the:
  - Geophysical, Geological, Environmental and Geotechnical Program Guidelines (June 2016),
  - Canada-Newfoundland and Labrador Exploration Benefits Plan Guidance (February 2006); and the
  - Offshore Physical Environmental Guidelines (September 2008).

- *Fisheries Act*;
- *Oceans Act*;
- *Navigation Protection Act*;
- *Canada Shipping Act*;
- *Migratory Birds Convention Act*, and the
- *Species at Risk Act* (Canada) and *Endangered Species Act* (NL).

In planning and conducting its oil and gas exploration activities, Nexen will comply with these and other relevant federal and provincial legislation, regulations and guidelines, as well as applicable international conventions and standards. Nexen also has in place its own comprehensive corporate HSE&A policies, plans and procedures for planning and conducting its oil and gas exploration and development projects and activities, and requires its contractors to adhere to these as applicable.

Nexen is also committed to creating and optimizing opportunities and benefits for Newfoundland and Labrador and Canadian workers and companies as part of its activities and operations in the Canada-NL Offshore Area, and to carrying out its business in full compliance with relevant *Canada-Newfoundland and Labrador Exploration Benefits Plan Guidance* and other applicable requirements.



## 2.0 PROJECT OVERVIEW

The following sections provide a description of the proposed Project, including its purpose and rationale, the proposed Project Area and survey timing, and its planned equipment and activities. This overview is based on, and reflects, the current stage of the planning and design of this multi-year offshore exploration program, and will therefore be subject to continued definition and refinement as these activities move forward.

### 2.1 Project Overview and Rationale

The petroleum industry is an important and valuable component of the Newfoundland and Labrador economy, and one that has been identified as having considerable potential for future growth. Oil and gas exploration has been a key aspect of the province's offshore petroleum industry to date, and on-going and future exploration is required in order to identify and further understand the existence of currently unknown and undeveloped hydrocarbon reserves in the region, and in doing so, to help facilitate the further development of this important economic sector. As a new entrant into Newfoundland and Labrador's oil and gas sector, Nexen is seeking to increase activities in the region through exploration, and if commercially viable hydrocarbon resources are successfully identified, through future development and production activities. In proposing, planning and undertaking this Project, Nexen's primary objectives are to acquire additional geological information to better understand the overall hydrocarbon potential of key parts of the Project Area, and to help define and assess prospects for potential future drilling activities.

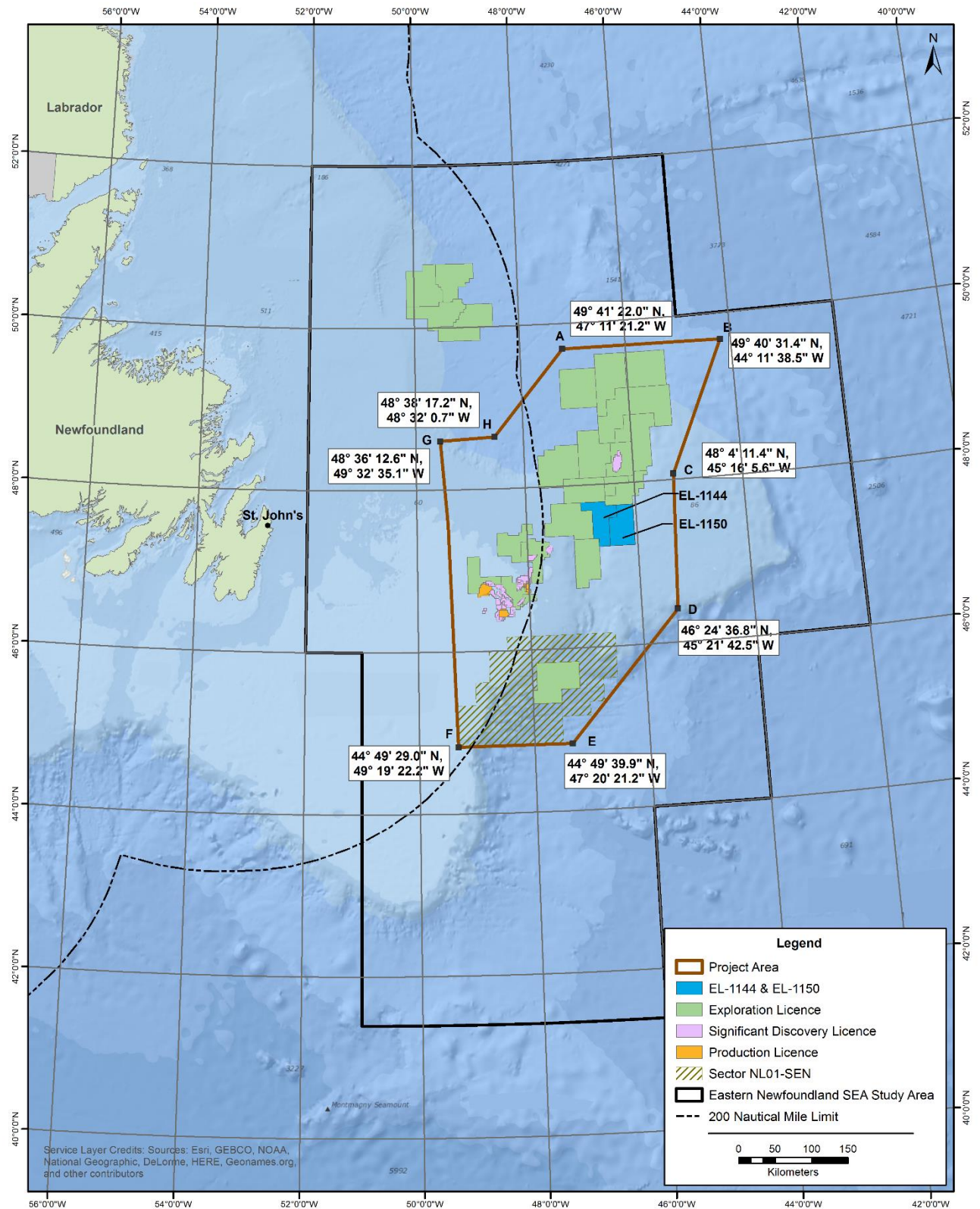
In the near term, the proposed petroleum exploration activities that comprise this Project and which are the subject of this EA will result in a number of direct and indirect economic benefits, including the creation of employment and business opportunities over the course of its planning and operational phases in 2017 and beyond. As noted earlier, the Project is being planned and will be carried out in full compliance with the C-NLOPB's *Canada-Newfoundland and Labrador Exploration Benefits Plan Guidance*. Should the exploration program be successful in identifying important and commercially viable oil and/or gas resources in the region, it could also lead to additional economic activity in Newfoundland and Labrador related to further exploration, and possibly, petroleum production activities. An important potential outcome of this Project could therefore be future economic development and growth in the province's offshore oil and gas sector and overall economy.

### 2.2 Project Location and Schedule

Offshore exploration survey programs such as those being proposed here are often planned and conducted to get an overall understanding of regional geology and hydrocarbon potential, and to help identify particular sites or zones that may warrant further investigation, such as through eventual exploration drilling activities.

The proposed Project Area is located off the eastern coast of the Island of Newfoundland, with its western edge being approximately 200 km east of St. John's (Figure 2.1). It covers a total area of approximately 147,200 km<sup>2</sup>, and encompasses the overall marine area within which all Project-related survey equipment use and data-acquisition activity will take place. Water depths in the Project Area range from approximately 100 m to 4,000 m. Coordinates for each of the identified corner points of the proposed Project Area are provided in Figure 2.1 and Table 2.1.

**Figure 2.1 Project Area Corner Points and Coordinates**



**Table 2.1 Project Area Corner Points and Coordinates**

Corner Point ID	Latitude	Longitude	Easting	Northing
A	49° 41' 22.0" N	47° 11' 21.2" W	774830	5511078
B	49° 40' 31.4" N	44° 11' 38.5" W	990852	5524816
C	48° 4' 11.4" N	45° 16' 5.6" W	926910	5339973
D	46° 24' 36.8" N	45° 21' 42.5" W	933306	5155094
E	44° 49' 39.9" N	47° 20' 21.2" W	789391	4970337
F	44° 49' 29.0" N	49° 19' 22.2" W	632589	4964847
G	48° 36' 12.6" N	49° 32' 35.1" W	607405	5384405
H	48° 38' 17.2" N	48° 32' 0.7" W	681701	5390165
* See Figure 2.1 Geodetic parameters (WGS): NAD 83				

As illustrated in Figure 2.1, portions of the Project Area are located within Canada's Exclusive Economic Zone (EEZ), whereas other parts are located beyond the 200 nautical mile limit. All Project survey activities and operations, including survey equipment deployment, use and recovery, testing, other data acquisition and seismic survey line turns, will be completed within the identified Project Area boundary.

The eventual "study area" for the EA will include and fully encompass the proposed Project Area, as well as a surrounding region that will be defined so as to encompass the likely environmental zone of influence of any and all Project related environmental interactions, emissions and resulting environmental effects. The EA study area will be identified as the EA process and associated analysis move forward, and will be defined and described in detail in the eventual EA Report.

Pending eventual EA approval and the receipt of all other required permits and authorizations from relevant regulatory authorities, it is currently anticipated that in-field Project work will commence in 2018. Project activity will generally occur within the April to November period for each and all years of the proposed exploration program, which will include survey activity in one or more years within the 2018 to 2027 timeframe. The actual timing of data acquisition in any given year will be determined at that time based on factors such as local weather, sea state and ice conditions, the nature, timing and intensity of commercial fisheries, and associated coordination with other marine activities in this area and elsewhere. It is possible that Nexen will concurrently conduct multiple surveys in any given year of the program.

## 2.3 Project Equipment and Activities

Project activities may include 2D, 3D and/or 4D seismic data acquisition, as well as associated geochemical, environmental and geotechnical surveys.

### 2.3.1 Seismic Surveys

The main elements of an offshore seismic program for petroleum exploration include a survey vessel, a sound source (typically compressed air), receivers (streamers) and associated supporting components and activities. In a marine seismic survey, one or more sound source array is towed behind a vessel while it travels along pre-determined survey lines. The sound source is fired at regular intervals and directs high energy (low frequency) sound pulses toward the seafloor which can penetrate below the

surface. The reflected acoustic energy is recorded by sensitive hydrophones in the streamer(s) which are towed behind the vessel. Computer-based data processing systems then convert the reflected acoustic signals into seismic data that can be used to map geological features and structures of interest within the survey area.

2D seismic programs tend to cover relatively large geographical areas, in order to identify sites or zones that may warrant further investigation, and they are therefore of short-term duration at any given location. These surveys typically use one sound source array and often employ a single streamer, with survey lines being widely spaced (usually several kilometers apart) and laid out in various directions. A number of 2D surveys may be designed and undertaken as part of the Project over its planned 10 year duration, and it is currently anticipated that this will involve approximately 2,200 to 5,000 km<sup>2</sup> of survey coverage within the Project Area per year over this period. Each 2D survey would involve the collection of approximately 1,000–3,000 line-kilometers of seismic data, and would range from approximately 10-30 days in duration. Seismic survey locations and associated survey line numbers, lengths and layouts have yet to be determined and will be defined as Project planning and implementation progress. More narrowly spaced (high resolution) 2D seismic survey work may also be undertaken at particular locations to evaluate potential wellsite drilling locations identified through the geophysical survey program (see Section 2.3.2).

It is also anticipated that a number of 3D seismic surveys may be completed over parts of the Project Area within this 10 year period. 3D seismic activities are typically more focussed and tend to cover smaller geographical areas than 2D surveys, and may use multiple sound source arrays and streamers which enables a greater resolution of potential oil and gas bearing geological structures. Although the specific number and size of 3D survey areas and associated line lengths and layouts have yet to be defined, it is currently expected that the surveys would range in area from 500-3,000 km<sup>2</sup> full-fold coverage. The duration of each 3D seismic survey would typically range from approximately 30-100 days.

It is also possible that 4D seismic survey activity will be carried out as part of the Project. Also known as “time lapse seismic”, 4D surveys incorporate multiple 3D seismic surveys over the same area at specified intervals. Final decisions around the potential inclusion and specific nature of any such 4D surveys have yet to be made by Nexen.

Although the particular seismic survey vessel(s) that would be used for the Project has yet to be selected and contracted, it would be a fully equipped, modern vessel suited to the operating environment and task, which would be approximately 75 – 90 m in length. The seismic source arrays, streamers and other equipment to be used during the surveys are contractor and vessel dependent.

A typical seismic source consists of air source arrays, ranging in volume from 3,000 in<sup>3</sup> to 6,000 in<sup>3</sup> which operate at towed depths between 5 m and 15 m. The towed array operates on compressed air at pressures of approximately 2,000-2,500 pounds per square inch (psi), and produces approximate peak-to-peak pressures of 100 to 150 bar-metres (bar-m). The array configurations are optimized to direct the signal downward towards and into the seafloor. If two source arrays are used for the 3D / 4D survey activity, they will not fire simultaneously but rather will have an alternate firing pattern (“flip-flop” mode). The source arrays’ discharge frequency is based on vessel speed and distance along the survey line. Firing of the complete source array will be stopped during the turns from line to line.

The planned 2D seismic surveys would use a single towed streamer, with a length ranging from 6,000 - 10,000 m which would be deployed at a depth of about 5 - 80 m. Where multiple streamers are planned to be used (such as for 3D survey activity), their specific numbers (up to an estimated 15), tow depths, and separation distances will be determined according to survey data collection objectives and other parameters and technical considerations. Streamers are planned to be solid or gel-filled to minimize any potential for environmental effects in the case of breaks or tears. Hydrophones in the streamers receive the sound waves reflected from structures underneath the ocean floor and transfer the data to an on-board recording and processing system. The seismic survey vessel would also passively collect and record gravity and magnetic data at the same time, and have an echosounder for depth soundings.

As survey vessel(s), source array and streamer characteristics and equipment configurations are contractor-specific, the particular vessels and equipment used may therefore vary somewhat from those described above, and from year to year. The overall characteristics of the seismic survey vessels and equipment used would, however, be generally in keeping with the parameters described above.

### **2.3.2 Geochemical, Environmental, Geotechnical and Wellsite Surveys**

Geochemical, environmental, geotechnical and wellsite survey activities may also be conducted as part of the Project, in order to collect additional information to help determine the hydrocarbon potential of, and/or environmental and seabed conditions within, relevant parts of the Project Area. The specific nature, location and timing of these activities in any year will be subject to regulatory approvals, information requirements and data collection objectives, as well as such factors as weather and ice conditions, the location of other marine activities in the region and other considerations.

Geochemical surveys are associated with exploration for hydrocarbon prospects. Data acquisition may be undertaken using a towed or Remotely Operated Vehicle (ROV) mounted seabed camera / video system, grab samplers, gravity or piston core, box corer and water sampler.

In addition, environmental surveys could include the collection of meteorological and oceanographic information within parts of the Project Area, as well as other environmental data collection activities focussed on specific physical or biological components at particular sites. Associated equipment may include water samplers, current, temperature and depth (CTD) measuring devices, wave rider buoys, seabed grab and core samples and fish sampling gear.

Geotechnical surveys may also be undertaken to better understand sea bottom conditions at particular locations within the Project Area. These can range from seabed sampling from a vessel of opportunity using core, grab and seabed sampling equipment, to in-situ sampling well below the seabed using a dedicated geotechnical drillship. Specific geotechnical activities may include, but not be limited to, cone penetration tests and vibrocorers.

As indicated previously, an objective of regional survey programs such as that being proposed here is often to help identify particular locations that may warrant further investigation through future exploration drilling activities. As the proposed survey activities that comprise this Project are initiated and completed and their results are analysed and interpreted, possible future wellsite locations may be identified and evaluated further through wellsite surveys. These site investigations may be carried out using 2D high-resolution reflection seismic, sub-bottom profilers, side-scan sonar, multi-beam echosounder and/or magnetometers. The wellsite surveys are conducted within a block / grid around the identified potential well site, with any final well location within this area being determined and

adjusted within the grid based on the interpreted data from the survey and other factors. Core, grab and seabed samples may also be acquired within these locations to further evaluate seabed sediment characteristics at these sites. For each of these activities, the survey vessel could be either a dedicated survey ship or could be a vessel of opportunity from which the appropriate equipment would be deployed. In 2018 (and in future years of the Project), Nexen may conduct one or more of these wellsite surveys, pending the identification of potential drillable prospects in the Project Area.

In conducting each of these types of marine activities, individual surveys would be an estimated 5-20 days in duration.

## 2.4 Project Logistics and Personnel

Any and all vessels that are used for this Project will fully meet the operational and environmental capabilities needed for the associated exploration activities, including in implementing relevant environmental mitigations, pollution prevention, safety and emergency response. All vessels will be in compliance with applicable legislation and regulations, and will be inspected by Transport Canada and approved for operation by the C-NLOPB before beginning any Project-related work. They will have appropriate oil spill / pollution prevention and emergency response plans in place, and each will be fully compliant with the International Convention for the Prevention of Pollution from Ships (MARPOL).

A typical seismic acquisition vessel can accommodate approximately 50-100 personnel, depending on project requirements. Personnel on a seismic vessel typically include the vessel owner / operator (ship's officers and marine crew), and technical and scientific personnel from the main seismic contractor. The seismic vessel will also have a Fisheries Liaison Officer (FLO) and Marine Mammal Observer(s) on board, as well as Nexen representative(s). All Project personnel will have each of the required certifications specified by relevant Canadian legislation and the C-NLOPB. Crew changes will be either by helicopter, ship-to-ship or ship-to-shore transfer. Standby or guard vessel(s) will be used to scout for hazards and for interacting and communicating with other marine users in the area, including fishers.

A typical vessel for the other geochemical, environmental, geotechnical and wellsite survey activities outlined above can typically accommodate 20-40 personnel, made up of technical personnel and the maritime crew and Nexen representatives. All Project personnel will again have all of the required certifications as specified by relevant Canadian legislation and the C-NLOPB.

Logistical and support activities for the surveys will largely depend on the contracted seismic acquisition company. The seismic vessel would use shore based facilities in or near St. John's, NL for initial authorization to enter and work in Canadian waters. Resupply of the vessels during the survey would be accomplished with a supply vessel from a Newfoundland port, most likely St. John's. Existing port infrastructure will be used for all support aspects, and fuel and supplies will be sourced from existing, local suppliers. Refuelling would take place offshore, utilizing the offshore supply vessel. Helicopter support may also be used intermittently and as required for the transportation of personnel or materials to and from the vessels. A shore based representative would be located in St. John's for the duration of the Project.

## 2.5 Environmental Planning, Management and Mitigation

Each of the potential environmental issues and interactions that may be associated with the proposed Project can be avoided or otherwise mitigated through the use of good planning and sound operational practices and procedures, supported by standard mitigations that are well established and outlined in relevant regulatory procedures and guidelines. These mitigations have been routinely and successfully applied to similar marine exploration programs off Eastern Newfoundland and elsewhere in recent years. These planning and management measures, in combination with Nexen's own environmental management systems and associated policies, plans and procedures, are designed to ensure that the Project will not result in adverse environmental effects.

The C-NLOPB's *Geophysical, Geological, Environmental and Geotechnical Program Guidelines* include various requirements and measures related to environmental planning, mitigation, monitoring and reporting that are intended to help avoid or reduce the potential effects of seismic noise in the marine environment, as well as interactions with other ocean users and other issues. These Guidelines include the *Statement of Canadian Practice with Respect to the Mitigation of Seismic Sound in the Marine Environment (2007)*, which set out a series of mitigation and monitoring requirements that pertain to these activities, including measures related to the:

- Planning of seismic surveys;
- Establishment and monitoring of a safety zone;
- Prescribed marine mammal observation and detection measures;
- Prescribed start-up procedures; and
- Prescribed shut-down requirements.

In planning and implementing the proposed Project, Nexen will continue to be guided and informed by these and other such requirements and approaches, as well as considering the various mitigation measures that have been identified through the Eastern Newfoundland Strategic Environmental Assessment (SEA) prepared by the C-NLOPB<sup>1</sup>. This includes processes and measures related to ensuring compliance with relevant environmental regulations and standards, as well as measures related to: equipment and material selection and use; waste management; discharge prevention and management (including potential liquid, solid or air / light emissions); accidental spill prevention and response; and associated communications and coordination procedures with regulatory authorities, stakeholders and key ocean users throughout the operational life of the Project. This will include the presence of a FLO on board the seismic ship, who will serve as the primary at-sea liaison between the commercial fishing industry and the seismic survey program, as well as a designated shore-based Single Point of Contact (SPOC) and other notifications and direct industry communications and consultations. As indicated, a standby or guard vessel will also be used to scout for hazards and for interacting and communicating with fishers and other marine users.

Mitigation measures that will be implemented to avoid or reduce any potential adverse effects that may result from the proposed Project will be identified and described in the EA Report.

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<sup>1</sup> Amec Environment and Infrastructure. Eastern Newfoundland Strategic Environmental Assessment (SEA). Prepared for the Canada-Newfoundland and Labrador Offshore Petroleum Board (August 2014)

## 4.0 ENVIRONMENTAL ASSESSMENT

As noted above, the C-NLOPB requires that project-specific EAs be conducted and submitted by Operators in relation to proposed exploration programs and other types of oil and gas projects and activities in the Canada- NL Offshore Area, including planned exploration programs such as that described herein.

The conduct of an EA is a regulatory review and planning process that is often applied to proposed development projects or other activities. Its purpose is to identify and evaluate the potential environmental effects of such activities, in order to help ensure that they can be considered and incorporated into planning and decision making. An EA involves predicting a project's potential effects and identifying and proposing measures to avoid or reduce adverse outcomes and enhance any benefits, and often includes public and stakeholder consultation at various stages of the process.

The EA Report for this Project will be planned and prepared in accordance with the requirements of the C-NLOPB's EA review process, and in full compliance with the EA Scoping Document that will be issued by the Board following its review of this Project Description, and with the input and advice of the Board's advisory agencies and organizations.

The EA will provide the required information about the Project, its existing environmental setting, potential environmental effects, proposed mitigations and any associated residual environmental effects and potential follow-up initiatives. The EA Report will form the basis for a review of the Project and its likely environmental implications by the C-NLOPB and other applicable government departments and agencies and non-governmental organizations, and will be a key input into eventual regulatory decisions around whether (and if so, how) the Project may proceed.

Consultation is a cornerstone of the EA process, and is a key aspect of Nexen's approach to planning and implementing its oil and gas exploration and development activities. As part of the planning and preparation of the EA Report, Nexen will engage with relevant organizations and individuals, and in doing so, will provide various mechanisms and opportunities for persons and groups to receive and review information, as well as to provide information and perspectives on the Project and its potential effects. This will include opportunities to identify questions, concerns and issues which require consideration in the EA, as well as in associated decisions and eventual Project planning and implementation.

Although it is likely that the structure and content of the EA Report will be defined and evolve as the EA process progresses, Nexen currently anticipates that it will include the following:

- 1) *Introduction*: A general overview of the proposed Project, as well as an identification of the Proponent, the regulatory framework and context for the Project and its EA, and the purpose of the EA Report and the overall organization of the document.
- 2) *Project Description*: This will describe the Project including its overall need and justification, location, alternatives, primary components and proposed activities, personnel requirements, schedule and other key characteristics.
- 3) *Existing Environment*: A description of the existing environmental setting for the Project, including the biophysical and socioeconomic environments that overlap and may interact with



the proposed Project. This overview will be based on existing and available information and data sets, and will draw heavily from the C-NLOPB's recently completed Eastern Newfoundland SEA (Amec 2014).

- 4) *Environmental Assessment Scope, Focus and Methodology*: This section will define the scope of the Project for EA purposes, as well as describing the nature, methods and outcomes of any regulatory, public and stakeholder consultation activities undertaken by Nexen in relation to the Project and its EA. This will be followed by an identification and description of the particular Valued Environmental Components (VECs) upon which the assessment is focused.

In keeping with most recent EAs for similar exploration projects in Newfoundland and Labrador and elsewhere, a preliminary list of potential VECs is provided below:

- Marine Fish and Fish Habitat;
- Marine / Migratory Birds;
- Marine Mammals and Sea Turtles;
- Species at Risk;
- Protected and Special Areas; and
- Commercial Fisheries and Other Marine Activities.

The final selection of VECs for the EA will, again, be based upon the results of the associated scoping exercise described above.

- 5) *Environmental Effects Assessment*: The detailed results of the environmental effects assessment for each of the selected VECs, organized as follows:

- EA Study Areas / Boundaries
- Potential Environmental Issues and Interactions
- Environmental Effects Assessment and Mitigation
- Residual Environmental Effects Summary and Evaluation
- Cumulative Environmental Effects
- Monitoring and Follow-up

- 6) *Environmental Assessment Summary and Conclusion*

## 5.0 SUMMARY AND CONCLUSION

Nexen is currently developing its plans for an oil and gas exploration program offshore Eastern Newfoundland, which may involve several types of survey activities over the existing and any forthcoming ELs, and other areas of interest in the Project Area. These may include 2D, 3D and possibly 4D seismic data acquisition, as well as associated geochemical, environmental, geotechnical and wellsite survey activities.

This document provides an EA Project Description for this proposed exploration program, and is being submitted to the C-NLOPB in order to initiate the EA review process for the Project. It has been prepared and submitted in accordance with the Board's associated EA requirements and processes, and will allow the regulator to prepare and provide a Scoping Document that will help inform and guide Nexen's eventual planning, preparation and submission of the required EA Report for the Project.