Newfoundland Orphan Basin Exploration Drilling Program

Environmental Impact Statement

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Executive Summary

BP Canada Energy Group ULC proposes to conduct exploration drilling activities within the areas of its existing offshore exploration licences (ELs) in the Orphan Basin, between approximately 343 and 496 kilometres northeast of St. John's, Newfoundland and Labrador, in the Northwest Atlantic Ocean. The Newfoundland Orphan Basin Exploration Drilling Program (the Project) may involve drilling up to 20 exploration wells, with an initial well proposed to be drilled in 2020, pending regulatory approval.

BP was awarded exploration rights to ELs 1145, 1146, 1148, with its co-venturers Hess Canada Oil and Gas ULC and Noble Energy Canada ULC, and EL 1149 with co-venturer Noble Energy Canada ULC by the Canada-Newfoundland and Labrador Offshore Petroleum Board (C-NLOPB) in 2016. The full term of these ELs extends from January 15, 2017, to January 15, 2026. BP will serve as the operator for the exploration drilling program.

Offshore exploration drilling, under certain circumstances, is a designated activity under the *Canadian Environmental Assessment Act, 2012* (CEAA 2012). On March 5, 2018, the Canadian Environmental Assessment Agency (the Agency) determined that a federal environmental assessment (EA) is required for the Project pursuant to CEAA 2012. This Environmental Impact Statement (EIS) has been prepared to satisfy Project-specific Guidelines for the Preparation of an Environmental Impact Statement Pursuant to CEAA 2012, which were developed by the Agency with input from other government departments and agencies, and the public.

The EIS is focused on the identification and assessment of potential adverse environmental effects of the Project on valued components (VCs). VCs are environmental attributes associated with the Project that are of interest or concern to Indigenous peoples, regulatory agencies, BP, resource managers, scientists, key stakeholders, and/or the general public. The following six VCs were selected to facilitate a focused and effective EA process that complies with government requirements and supports public review:

- Marine Fish and Fish Habitat
- Marine and Migratory Birds
- Marine Mammals and Sea Turtles
- Special Areas
- Indigenous Peoples and Community Values
- Commercial Fisheries and Other Ocean Users

The assessment methods used in the preparation of this EIS included an evaluation of the potential environmental effects for each VC that may arise during routine Project activities, as well as from accidental events. Also considered are cumulative effects arising in combination with effects from other past, present, or likely future projects and activities. Specific studies were conducted in support of the EA process including: drill waste dispersion modelling (Appendix B); an underwater sound assessment (Appendix C); and oil spill fate and trajectory modelling (Appendix D).

Routine Project activities with potential environmental interactions include: the presence and operation of the mobile offshore drilling unit (MODU) (including light and underwater sound emissions, air emissions, and establishment of a safety zone); vertical seismic profiling (underwater sound emissions); discharges (including discharge of drill muds and cuttings and other discharges); well abandonment and decommissioning; and supply and servicing operations (sound and air emissions from helicopter transportation and supply / support vessel operations).

Mitigation is proposed to reduce or eliminate adverse environmental effects. Most potential adverse Project effects will be addressed by engineering design, standard mitigation measures and best management practices. With the implementation of proposed mitigation measures, adverse residual (i.e., after planned mitigation is applied) environmental effects of routine Project activities and components are predicted to be not significant for all VCs.

Environmental effects associated with potential accidental events are assessed with the focus on credible worst-case accidental event scenarios that could result in serious environmental effects. Accidental events considered in the EIS include spills that could occur during MODU or platform supply vessel (PSV) operations, and a subsea well blowout incident. Interactions with VCs are identified for these scenarios, and potential environmental effects are assessed, including consideration of design mitigation and contingency planning.

In the unlikely event of a Project-related accidental event resulting in the large-scale release of oil (e.g., a well blowout incident), effects to marine and migratory birds, Indigenous people and community values, and commercial fisheries and other ocean users have potential to be significant if the spill trajectory overlaps spatially and temporally with sensitive receptors. However, with the implementation of proposed well control, spill response, contingency, and emergency response plans (refer to Section 15.3), significant residual adverse environmental effects are unlikely to occur.

In summary, the Project is not likely to result in significant adverse residual environmental effects, including cumulative environmental effects, provided that the proposed mitigation measures are implemented.

BP recognizes the challenge of managing and meeting growing worldwide demand for energy while addressing climate change and other environmental and social issues. The proposed Project will contribute to energy diversification and is expected to generate industrial, employment, and social benefits. The Project is also expected to contribute to technological and scientific knowledge sharing in Canada and Newfoundland and Labrador, advancing the understanding of deep-water drilling operations offshore Newfoundland and Labrador.

A concordance table (Table E.1) is provided to demonstrate compliance with the EIS Guidelines (Appendix A) and indicate where requirements have been addressed in this EIS document.

Table E.1 Concordance with Guidelines for the Preparation of an Environmental Impact Statement pursuant to the *Canadian Environmental Assessment Act, 2012* for the Newfoundland Orphan Basin Exploration Drilling Project, BP Canada Energy Group ULC

EIS Guidelines	EIS Reference
1. INTRODUCTION	
The EIS must include a full description of the changes the project will cause to the environment that may result in adverse effects on areas of federal jurisdiction (i.e., section 5 of CEAA 2012) including changes that are directly linked or necessarily incidental to any federal decisions that would permit the project to be carried out.	Sections 4.2.2 and 17.1.1; Chapters 8-14
The EIS must also include a list of key mitigation measures that the proponent proposes to undertake in order to avoid or minimize any adverse environmental effects of the project. It is the responsibility of the proponent to provide sufficient data and analysis on potential changes to the environment to ensure a thorough evaluation of the environmental effects of the project by the Agency.	Section 2.10.3; Chapters 8-14; Table 18.2
2. GUIDING PRINCIPLES	
2.1. Environmental assessment as a planning and decision making tool	Sections 1.5 and 4.2.1
2.2. Public participation	
The proponent is required to provide current information about the project to the public and especially to the communities likely to be most affected by the project	Chapter 3; Sections 4.1.2 and 4.2.1
2.3. Engagement with Indigenous groups	
The proponent is expected to engage with potentially affected groups, beginning as early as possible in the project planning process.	Chapter 3; Sections 4.1.2 and 4.2.1
The proponent shall provide potentially affected groups with opportunities to learn about the project and its potential effects and to make their concerns known about the project's potential effects and discuss measures to mitigate those effects.	Chapter 3; Sections 4.1.2 and 4.2.1
The proponent is strongly encouraged to work with potentially affected groups to establish an engagement approach.	Chapter 3; Sections 4.1.2 and 4.2.1
The proponent will make reasonable efforts to integrate Aboriginal traditional knowledge into the assessment of environmental effects.	Chapter 3; Sections 4.1.2, 4.2.1, and 7.4; Chapters 8-14
2.4. Application of the precautionary approach	
The proponent will demonstrate that all aspects of the project have been examined and planned in a careful and precautionary manner in order to avoid significant adverse environmental effects	Section 4.2.1

EIS Guidelines	EIS Reference
3. SCOPE OF THE ENVIRONMENTAL ASSESSMENT	
3.1. Designated project	
On January 8, 2018, BP Canada Energy Group ULC, the proponent of the Newfoundland Orphan Basin Exploration Drilling Project provided a project description to the Agency. Based on this project description, the Agency has determined that an EA is required under CEAA 2012 and will include the following project components and activities:	EIS submission
The mobilization, operation and demobilization of Mobile Offshore Drilling Unit(s) designed for year-round operations for the drilling, testing and abandonment of up to twenty wells within exploration licences operated by BP Canada Energy Group ULC (1145, 1146, 1148 and 1149), including consideration of any proposed safety exclusion zones. Drilling may occur in various water depths under consideration, with various types of drilling units, and with multiples drilling units operating simultaneously, if applicable.	Sections 1.2, 2.3, and 2.4
Vertical seismic profiling surveys and in-water works (e.g. wellsite surveys) to support the specific exploration wells under consideration, but excluding surveys potentially required to support conduct of the EA (e.g. environmental baseline surveys) and surveys related to the broader delineation of resources.	Sections 1.2, 2.3, and 2.4
Well evaluation and testing.	Sections 1.2, 2.3, and 2.4
The loading, refuelling and operation of marine support vessels (i.e. for re-supply and transfer of materials, fuel, and equipment; on-site safety during drilling activities; and transport between the supply base and Mobile Offshore Drilling Unit(s)) and helicopter support (i.e. for crew transport and delivery of light supplies and equipment) including transportation to the Mobile Offshore Drilling Unit(s).	Sections 1.2, 2.3, and 2.4
Note: If the proponent acquires and becomes the operator of new Exploration Licences in the Eastern Newfoundland Offshore Area issued by the Canada-Newfoundland and Labrador Offshore Petroleum Board and submits corresponding information to the Agency prior to the submission of the EIS, the Agency will consider whether activities on these additional licences may be incorporated into the scope of this EA.	Sections 1.2, 2.3, and 2.4
3.2. Factors to be considered	
Environmental effects of the project, including the environmental effects of malfunctions or accidents that may occur in connection with the project and any cumulative environmental effects that are likely to result from the project in combination with other physical activities that have been or will be carried out.	Section 4.1.2; Chapters 8-14
The significance of the effects referred to above.	Sections 4.1.2 and 18.3; Chapters 8-14
Comments from the public.	Chapter 3; Section 4.1.2; Chapters 8-14
Mitigation measures that are technically and economically feasible and that would mitigate any significant adverse environmental effects of the project.	Sections 4.1.2 and 18.2; Chapters 8-14
The requirements of the follow-up program in respect of the project.	Sections 4.1.2 and 18.2; Chapters 8-14

EIS Guidelines	EIS Reference
The purpose of the project.	Sections 1.1, 1.4, 2.1, and 4.1.2
Alternative means of carrying out the project that are technically and economically feasible and the environmental effects of any such alternative means.	Sections 2.9 and 4.1.2
Any change to the project that may be caused by the environment	Section 4.1.2; Chapter 16
The results of any relevant regional study pursuant to CEAA 2012.	Sections 1.6 and 4.1.2; Chapters 8-14
Changes to the environment	
Under CEAA 2012, an examination of environmental effects that result from changes to the environment as a result of the project being carried out or as a result of the federal government exercising any power duty or function that would allow the project to be carried out must be considered in the EIS.	Section 4.2.2; Chapters 8-14 and 17
In scoping the potential changes to the environment that may occur, the proponent should consider any potential changes in the physical environment such as changes to air quality, water quality and quantity, and physical disturbance of land that could reasonably be expected to occur.	Section 4.2.2; Chapters 8-14 and 17
Valued components to be examined	
The proponent must conduct and focus its analysis on VCs as they relate to section 5 of CEAA 2012, including the ones identified in Section 6.3 (Part 2) of these guidelines that may be affected by changes in the environment, as well as species at risk and their critical habitat as per the requirement outlined in section 79 of the Species at Risk Act.	Section 4.2.2; Chapters 8-14
The list of VCs presented in the EIS will be completed according to the evolution and design of the project and reflect the knowledge acquired through public consultation and engagement with Indigenous groups.	Chapter 3; Section 4.2.2; Chapters 8-14
The EIS will describe what methods were used to predict and assess the adverse environmental effects of the project on these valued components.	Section 4.2; Chapters 8-14
The VCs will be described in sufficient detail to allow the reviewer to understand their importance and to assess the potential for environmental effects arising from the project activities.	Section 4.2; Chapters 8-14
The EIS will provide a rationale for selecting specific VCs and for excluding any VCs or information specified in these guidelines. Challenges may arise regarding particular exclusions, so it is important to document the information and the criteria used to justify the exclusion of a particular VC or piece of information. Justification may be based on, for example, primary data collection, computer modelling, literature references, public participation or engagement with Indigenous groups, or expert input or professional judgement.	Section 4.2.2; Chapters 8-14

EIS Guidelines	EIS Reference
The EIS will identify those VCs, processes, and interactions that either were identified to be of concern during any workshops or meetings held by the proponent or that the proponent considers likely to be affected by the project. In doing so, the EIS will indicate to whom these concerns are important (i.e. the public or Indigenous groups) and the reasons why, including environmental, cultural, historical, social, economic, recreational, and aesthetic considerations, and traditional knowledge. If comments are received on a component that has not been included as a VC, these comments will be summarized and the rationale for excluding the component will address the comments.	Chapter 3; Section 4.2.2; Chapters 8-14
Spatial and temporal boundaries	
The spatial and temporal boundaries used in the EA may vary depending on the VC and will be considered separately for each VC, including for VCs related to the current use of lands and resources for traditional purposes by Aboriginal peoples, or other environmental effects referred to under paragraph 5(1)(c) of CEAA 2012. The proponent is encouraged to consult with the Agency, federal and provincial government departments and agencies, local government, and Indigenous groups, and take into account public comments when defining the spatial and temporal boundaries used in the EIS.	Sections 1.2, 2.2, and 4.2.3.4; Chapters 8-14
The EIS will describe the spatial boundaries, including local and regional study areas, of each VC to be used in assessing the potential adverse environmental effects of the project and provide a rationale for each boundary. Spatial boundaries will be defined taking into account the appropriate scale and spatial extent of potential environmental effects, community knowledge and Aboriginal traditional knowledge, current or traditional land and resource use by Indigenous groups, ecological, technical, social, and cultural considerations.	Sections 1.2, 2.2, and 4.2.3.4; Chapters 8-14
The temporal boundaries of the EA will span all phases of the project determined to be within the scope of this EA as specified under section 3.1 above. If effects are predicted after project decommissioning, this should be taken into consideration in defining boundaries. Community knowledge and Aboriginal traditional knowledge should factor into decisions around defining temporal boundaries.	Sections 1.2, 2.2, and 4.2.3.4; Chapters 8-14
If the temporal boundaries do not span all phases of the project, the EIS will identify the boundaries used and provide a rationale.	Sections 1.2, 2.2, and 4.2.3.4; Chapters 8-14
PREPARATION AND PRESENTATION OF THE ENVIRONMENTAL IMPACT STATEMENT	
4.1. Guidance	
The proponent is encouraged to consult relevant Agency policy and guidance on topics to be addressed in the EIS, and to liaise with the Agency during the planning and development of the EIS. The proponent is also encouraged to consult relevant guidance from other federal departments.	Sections 1.5 and 1.6
Submission of regulatory and technical information necessary for federal authorities to make their regulatory decisions during the conduct of the EA is at the discretion of the proponent. Although that information is not necessary for the EA decision, the proponent is encouraged to submit it concurrent with the EIS. While the EIS must outline applicable federal authorizations required for the project to proceed, the proponent must provide information relevant to the regulatory role of the federal government. It should be noted that the issuance of these other applicable federal legislative, regulatory, and constitutional requirements is within the purview of the relevant federal authorities, and are subject to separate processes post EA decision.	Sections 1.5 and 1.6

EIS Guidelines	EIS Reference
4.2. Use of information	
Government expert advice	
The Agency will advise the proponent of the availability of pertinent information or knowledge or expert and specialist knowledge received from other federal authorities or other levels of government so that it can be incorporated into the EIS.	Noted
4.2.2. Community knowledge and Aboriginal traditional knowledge	
The proponent will incorporate into the EIS the community knowledge and Aboriginal traditional knowledge to which it has access or that is acquired through public participation and engagement with Indigenous groups, in keeping with appropriate ethical standards and obligations of confidentiality.	Sections 1.6.2, 4.1.2, 4.2.1, and 7.4; Chapters 3 and 8-14
The proponent will integrate Aboriginal traditional knowledge into all aspects of its assessment including both methodology (e.g. establishing spatial and temporal boundaries, defining significance criteria) and analysis (e.g. baseline characterization, effects prediction, development of mitigation measures).	Sections 1.6.2, 4.1.2, and 4.2.1; Chapters 3 and 8-14
Agreement should be obtained from Indigenous groups regarding the use, management, and protection of their existing traditional knowledge information during and after the EA.	Sections 1.6.2, 4.1.2, 4.2.1, and 7.4; Chapters 3 and 8-14
4.2.3. Existing information	
In preparing the EIS, the proponent can use existing information relevant to the project, if applicable. When relying on existing information to meet requirements of the EIS Guidelines, the proponent will either include the information directly in the EIS or clearly direct the reader to where it may obtain the information (i.e. through cross-referencing).	Section 4.2.4; Chapters 5-7
When relying on existing information to support the effects assessment, the proponent will provide a rationale to support the use of the information in relation to the specific project (separate factual lines of evidence from inference, and state any limitations on the inferences or conclusions that can be drawn from the existing information. In such circumstances, the proponent will clearly describe potential or known data or knowledge gaps, and describe how such gaps have been addressed in the assessment of the project.	Section 4.2.4; Chapters 5-14
Confidential information	
In implementing CEAA 2012, the Agency is committed to promoting public participation in the EA of projects and providing access to the information on which EAs are based. All documents prepared or submitted by the proponent or any other stakeholder in relation to the EA are included in the Canadian Environmental Assessment Registry and made available to the public on request. For this reason, the EIS will not contain information that: is sensitive or confidential (i.e. financial, commercial, scientific, technical, personal, cultural or other nature), that is treated consistently as confidential, and the person affected has not consented to the disclosure; or may cause substantial harm to a person or specific harm to the environment through its disclosure.	Confidential information is not included in the EIS.

EIS Guidelines	EIS Reference
4.3. Study strategy and methodology	
It is possible these guidelines may include matters which, in the judgement of the proponent, are not relevant or significant to the project. If such matters are omitted from the EIS, the proponent will clearly indicate it in the EIS, and provide a justification so the Agency, federal authorities, Indigenous groups, the public and any other interested party have an opportunity to comment on this decision. Where the Agency disagrees with the proponent's decision, it will require the proponent to provide the specified information.	Section 4.2.2
The assessment will include the following general steps:	
Identifying the activities and components of the project.	Sections 2.3 and 2.4
Predicting potential changes to the environment.	Section 4.2; Chapters 8-14
Predicting and evaluating the likely effects on identified VCs.	Section 4.2; Chapters 8-14
Identifying technically and economically feasible mitigation measures for any significant adverse environmental effects.	Section 4.2; Chapters 8-14
Determining any residual environmental effects.	Section 4.2; Chapters 8-14
Considering cumulative effects of the project in combination with other physical activities that have been or will be carried out.	Section 4.2; Chapter 14
Determining the potential significance of any residual environmental effect following the implementation of mitigation measures.	Sections 4.2 and 18.3; Chapters 8-14
For each VC, the EIS will describe the methodology used to assess project-related effects.	Section 4.2; Chapters 8-14
The EIS could include an analysis of the pathway of the effects of environmental changes on each VC.	Section 4.2; Chapters 8-14
The EIS will document where and how scientific, engineering, community knowledge and Aboriginal traditional knowledge were used to reach conclusions.	Section 4.2; Chapters 8-14
Assumptions will be clearly identified and justified.	Section 4.2; Chapters 8-14
All data, models and studies will be documented such that the analyses are transparent and reproducible.	Sections 4.2 and 15.4; Chapters 8-14; Appendices B, C, and D
All data collection methods will be specified. The uncertainty, reliability, sensitivity, and conservativeness of models used to reach conclusions must be indicated.	Sections 4.2 and 15.4; Chapters 8-14; Appendices B, C, and D

EIS Guidelines	EIS Reference
The EIS will identify all significant gaps in knowledge and understanding related to key conclusions, and the steps to be taken by the proponent to address these gaps. Where the conclusions drawn from scientific, engineering and technical knowledge are inconsistent with the conclusions drawn from Aboriginal traditional knowledge, the EIS will present each perspective on the issue and a statement of the proponent's conclusions.	Section 4.2; Chapters 8-14 and 17
The EIS will include a description of the environment (both biophysical and human), including the components of the existing environment and environmental processes, their interrelations as well as the variability in these components, processes, and interactions over time scales appropriate to the likely effects of the project. The description will be sufficiently detailed to characterize the environment before any disturbance to the environment due to the project and to identify, assess and determine the significance of the potential adverse environmental effects of the project. These data should include results from studies done prior to any physical disruption of the environment due to project related activities. The information describing the existing environment may be provided in a stand-alone chapter of the EIS or may be integrated into clearly defined sections within the effects assessment of each VC. This analysis will include environmental conditions resulting from historical and present activities in the local and regional study areas.	Section 4.2; Chapters 5-7
If the baseline data have been extrapolated or otherwise manipulated to depict environmental conditions in the study areas, modelling methods and equations will be described and will include calculations of margins of error and other relevant statistical information, such as confidence intervals and possible sources of error. The proponent will provide the references used in creating their approach to baseline data gathering, including identifying where appropriate, the relevant federal or provincial standards. The proponent is encouraged to discuss the timeframe and considerations for its proposed baseline data with the Agency prior to submitting its EIS.	Section 4.2; Chapters 5-7
In describing and assessing effects to the physical and biological environment, the proponent will take an ecosystem approach that considers both scientific and community knowledge and Aboriginal traditional knowledge and perspectives regarding ecosystem health and integrity. The proponent will consider the resilience of relevant species populations, communities, and their habitats. The assessment of environmental effects on Aboriginal peoples, pursuant to paragraph 5(1)(c) of CEAA 2012, will undergo the same rigour and type of assessment as any other VC (including setting of spatial and temporal boundaries, identification and analysis of effects, identification of mitigation measures, determination of residual effects, identification and a clear explanation of the methodology used for assessing the significance of residual effects and assessment of cumulative effects).	Section 4.2; Chapters 8-14
The proponent will consider the use of both primary and secondary sources of information regarding baseline information, changes to the environment and the corresponding effect on health, socio- economics, physical and cultural heritage and the current use of lands and resources for traditional purposes.	Sections 4.2 and 7.4; Chapters 8-14
The proponent will provide Indigenous groups the opportunity to review and provide comments on the information used for describing and assessing effects on Aboriginal peoples (further information on engaging with Indigenous groups is provided in Part 2, Section 5 of this document). Where there are discrepancies in the views of the proponent and Indigenous groups on the information to be used in the EIS, the EIS will document these discrepancies and the rationale for the proponent’s selection of information.	Chapter 3; Sections 4.2 and 7.4; Chapters 8-14
The assessment of the effects of each of the project components and physical activities, in all phases, will be based on a comparison of the biophysical and human environments between the predicted future conditions with the project and the predicted future conditions without the project. In undertaking the environmental effects assessment, the proponent will use best available information and methods. All conclusions will be substantiated. Predictions will be based on clearly stated assumptions. The proponent will describe how each assumption has been tested. With respect to quantitative models and predictions, the EIS will document the assumptions that underlie the model, the quality of the data and the degree of certainty of the predictions obtained.	Section 4.2; Chapters 8-14 and 17

EIS Guidelines	EIS Reference
4.4. Presentation and organization of the environmental impact statement	
To facilitate the identification of the documents submitted and their placement in the Canadian Environmental Assessment Registry, the title page of the EIS and its related documents will contain the following information: project name and location; title of the document, including the term “environmental impact statement”; subtitle of the document; name of the proponent; and date of submission of the EIS.	Title page
The EIS will be written in clear, precise language. A glossary defining technical words, acronyms and abbreviations will be included. The EIS will include charts, diagrams, tables, maps, and photographs, where appropriate, to clarify the text. Perspective drawings that clearly convey the various components of the project will also be provided. Wherever possible, maps will be presented in common scales and datum to allow for comparison and overlay of mapped features.	Entire EIS
Detailed studies (including all relevant and supporting data and methodologies) will be provided in separate appendices and will be referenced by appendix, section, and page in the text of the main document.	Throughout EIS and Appendices
The EIS will explain how information is organized in the document. This will include a table of contents with a list of all tables, figures, and photographs referenced in the text.	Table of Contents
A complete list of supporting literature and references will also be provided.	Throughout EIS and Appendices
A table of concordance, which cross references the information presented in the EIS with the information requirements identified in the EIS Guidelines, will be provided.	Table of Concordance
4.5. Summary of the environmental impact statement	
The proponent will prepare a summary of the EIS in both of Canada’s official languages (French and English) to be provided to the Agency at the same time as the EIS that will include the following: a concise description of all key components of the project and related activities; a summary of the engagement with Indigenous groups, and the participation of the public and government agencies, including a summary of the issues raised and the proponent’s responses; an overview of expected changes to the environment; an overview of the key environmental effects of the project, as described under section 5 of CEAA 2012, and proposed technically and economically feasible mitigation measures; an overview of how factors under paragraph 19(1) of CEAA 2012 were considered; the proponent’s conclusions on the residual environmental effects of the project, and the significance of those effects, after taking into account the mitigation measures.	EIS Summary
The summary is to be provided as a separate document and should be structured as follows:	EIS Summary
Introduction and EA context	
Project overview	
Alternative means of carrying out the project	
Public participation	EIS Summary
Engagement with Indigenous Groups	

EIS Guidelines	EIS Reference
Summary of environmental effects assessment for each valued component, including: description of the baseline; anticipated changes to the environment; anticipated effects; mitigation measures; and significance of residual effects.	
Follow-up and monitoring programs proposed	
The summary will have sufficient details for the reader to understand the project, any potential environmental effects, proposed mitigation measures, and the significance of the residual effects. The summary will include key maps illustrating the project location and key project components.	
Part 2 – Content of the Environmental Impact Statement	
1. INTRODUCTION AND OVERVIEW	
1.1 The proponent	Section 1.3
In the EIS, the proponent will:	
Provide contact information (e.g. name, address, phone, fax, email); identify itself and the name of the legal entity(ies) that would develop, manage, and operate the project; describe corporate and management structures; specify the mechanism used to ensure that corporate policies will be implemented and respected for the project; and identify key personnel, contractors, and/or sub-contractors responsible for preparing the EIS.	Section 1.3
1.2 Project overview The EIS will describe the project, key project components and associated activities, scheduling details, the timing of each phase of the project and other key features. If the project is part of a larger sequence of projects, the EIS will outline the larger context.	Sections 1.1 and 1.2; Chapter 2
1.3 Project location	
The EIS will contain a description of the geographical setting in which the project will take place. This description will focus on those aspects of the project and its setting that are important in order to understand the potential environmental effects of the project. The following information will be included:	
The Universal Transverse Mercator (UTM) projection coordinates of the main project site.	Section 2.2
Current land and resource use in the area.	Section 2.2; Chapter 7
Distance of the project facilities and components to any federal lands.	Sections 1.5.3, 2.2, and 7.4
The environmental significance and value of the geographical setting in which the project will take place and the surrounding area.	Sections 1.5.3 and 2.2; Chapter 6
Environmentally sensitive areas, such as national, provincial, and regional parks, ecological reserves, ecologically and biologically significant areas, fishery closure areas, vulnerable marine ecosystems, and habitats of federally or provincially listed species at risk and other sensitive areas.	Sections 1.5.3, 2.2, and 6.4
Description of local and Indigenous communities.	Section 7.4

EIS Guidelines	EIS Reference
Traditional territories and/or consultation areas, treaty lands, and Indian Reserve lands.	Section 7.4
1.4. Regulatory framework and the role of government	
The EIS will identify:	
Any federal power, duty or function that may be exercised that would permit the carrying out (in whole or in part) of the project or associated activities.	Sections 1.5 and 17.2.2
Legislation and other regulatory approvals that are applicable to the project at the federal, provincial, regional, and municipal levels.	Section 1.5
Government policies, resource management plans, planning or study initiatives pertinent to the project and/or EA and their implications.	Section 1.5
Any treaty, self-government, or other agreements between federal or provincial governments and Indigenous groups that are pertinent to the project and/or EA.	Sections 3.2 and 7.4
Any relevant land use plans, or land zoning.	N/A
Regional, provincial, and/or national objectives, standards or guidelines that have been used by the proponent to assist in the evaluation of any predicted environmental effects.	Section 1.6; Chapters 8-14; Appendix D
2. PROJECT JUSTIFICATION AND ALTERNATIVES CONSIDERED	
2.1. Purpose of the project	
The EIS will describe the purpose of the project by providing the rationale for the project, explaining the background, the problems, or opportunities that the project is intended to satisfy and the stated objectives from the perspective of the proponent. If the objectives of the project are related to broader private or public sector policies, plans or programs, this information will also be included.	Section 2.1
The EIS will also describe the predicted environmental, economic, and social benefits of the project. This information will be considered in assessing the justifiability of any significant adverse residual environmental effects as defined in section 5 of CEAA 2012, if such effects are identified.	Section 1.4
2.2. Alternative means of carrying out the project	
The EIS will identify and consider the environmental effects of alternative means of carrying out the project that are technically and economically feasible.	Section 2.9
The proponent will complete the following procedural steps for addressing alternative means: The proponent will complete the assessment of alternative means in accordance with the Agency's Operational Policy Statement entitled "Addressing "Purpose of" and "Alternative Means" under the Canadian Environmental Assessment Act, 2012". Identify the alternative means to carry out the project. Identify the effects of each technically and economically feasible alternative means. Select the approach for the analysis of alternative means (i.e. identify a preferred means or bring forward alternative means). Assess the environmental effects of the alternative means.	Section 2.9

EIS Guidelines	EIS Reference
In its alternative means analysis, the proponent will address, at a minimum, the following project components:	
Choice of drilling fluid (i.e. water-based drilling mud or synthetic-based drilling mud); choice of drilling unit (i.e. drillship or semi-submersible); management of drilling wastes (i.e. disposal on seabed or into water column, recover and ship to shore, re-inject); water management and location of the final effluent discharge points; and alternative ways to light the platform at night (or flare at night when testing the well), to reduce attraction and associated mortality of birds, such as by installing flare shields.	Section 2.9.2.1
The EIS should include a discussion on how wastes and potential associated toxic substances would be minimized. The proponent should also discuss any alternatives that would enable it to achieve these objectives and adopt best practices in waste management and treatment.	Sections 2.8 and 2.9.2.3
With the objective of minimizing potential environmental impacts of discharges to the marine environment, the proponent should identify the quantity and type of chemicals (or constituents) that may be used in support of the proposed project that are: included on the Canadian Environmental Protection Act's List of Toxic Substances; not included on the OSPAR[1] Pose Little or No Risk to the Environment (PLONOR) list of chemicals and have a PARCOM[2] Offshore Chemical Notification Scheme Hazard Rating of A, B or purple, orange, blue, or white; or not included on the PLONOR list of chemicals and have not been assigned a PARCOM Offshore Chemical Notification Scheme Hazard Rating.	Sections 2.8 and 2.9.3
Alternatives to the use of the above-listed chemicals (e.g. through alternative means of operating or use of less-toxic alternatives) should be discussed in the EIS.	Sections 2.9.2.1 and 2.9.3
The Agency recognizes that projects may be in the early planning stages when the EIS is being prepared. Where the proponent has not made final decisions concerning the placement of project infrastructure, the technologies to be used, or that several options may exist for various project components, the proponent shall conduct an environmental effects analysis at the same level of detail for each of the various options available (alternative means) within the EIS.	Sections 2.9.1, 2.9.2.1, and 2.9.2.2
3. PROJECT DESCRIPTION	
3.1. Project components	
The EIS will describe the project, by presenting the project components, associated and ancillary works, and other characteristics that will assist in understanding the environmental effects. This will include:	
Maps, at an appropriate scale, of the project location; project components; boundaries and UTM coordinates of the proposed exploration licences (1145, 1146, 1148, and 1149); the major existing infrastructure; adjacent land and resource uses; and any important environmental features.	Chapter 2
If the project is part of a larger sequence of projects, the proponent will outline the larger context and present the relevant references, if available.	The Project is a stand-alone project, and not part of any other project.

EIS Guidelines	EIS Reference
In its EIS, the proponent will describe:	
• the Mobile Offshore Drilling Units and/or drillships and their operations (drilling, testing, abandonment) in locations and water depths under consideration;	Sections 2.3.1 and 2.4.1
• navigation activities (number and frequency of trips), size and types of vessels, anticipated vessel routes and anchorages, predicted percentage of increase in vessel traffic of similar size vessels resulting from the project, icebreaking activities (time of year, frequency, duration, expected start and end dates), and ballast water management.	Sections 2.3.3 and 2.4.5; Chapter 16
• helicopters, including routes, number, and frequency of trips;	Sections 2.3.3 and 2.4.5.2
• vertical seismic profiling or any other in-water works (e.g. wellsite surveys) to support the specific exploration wells under consideration, but excluding surveys potentially required to support the conduct of the EA (e.g. environmental baseline surveys) and surveys related to the broader delineation of resources;	Section 2.4.2
• well evaluation and testing;	Section 2.4.3
• reagent requirements and uses (e.g. volumes, storage, types);	Section 2.8.3
• petroleum products (e.g. source, volume, storage);	Section 2.8.3
• the nature, composition, and fate (e.g. areal extent) of drilling wastes (e.g. muds, cuttings) at various water depths and at various stages of drilling, including during riserless drilling and drilling with the marine riser in place, using dispersion modeling;	Section 2.8.2; Appendix B
• the management or disposal of wastes (e.g. type and constituents of waste, quantity, treatment, and method of disposal) including: - drilling muds, drill solids; - deck drainage; - cooling water; - bilge and ballast water; - fire control system test water; - operational discharges from subsea systems and the installation of subsea systems; - sewage and food wastes; - well treatment or testing fluids; and - other operational discharges.	Section 2.8
• contributions to atmospheric emissions, including emissions profile (i.e. type, rate and source) for activities including routine or upset flaring (including the contribution from any produced fluids that may be added to any flares), routine drilling, testing, shipping etc.;	Section 2.8.1
• sources and extent of light, heat, and noise;	Sections 2.8.5 and 2.8.6
• transfers of bulk materials (e.g. mud) and fuel;	Section 2.4.5

EIS Guidelines	EIS Reference
• number of employees and transportation of employees;	Sections 2.4.5 and 2.6
• drinking and industrial water requirements (source, quantity required, need for water treatment);	Sections 2.3.1 and 2.8.3
• energy supply (source, quantity);	Sections 2.3.1 and 2.8.1
• waste disposal (types of waste, methods of disposal, quantity); and	Section 2.8
3.2. Project activities	
The EIS will include descriptions of the drilling, testing and decommissioning, suspension or abandonment of exploration wells associated with the proposed project.	Sections 2.4.1, 2.4.3, and 2.4.4
This will include descriptions of the activities to be carried out during each phase, the location of each activity, expected outputs and an indication of the activity's magnitude and scale. Water depths for potential drill sites will be specified.	Section 2.2, 2.4.1, 2.4.3, and 2.4.4
Although a complete list of project activities should be provided, the emphasis will be on activities with the greatest potential to have environmental effects. Sufficient information will be included to predict environmental effects and address concerns identified by the public and Indigenous groups. Highlight activities that involve periods of increased environmental disturbance or the release of materials into the environment.	Sections 2.4.1, 2.4.2, 2.4.3, 2.4.4, and 2.4.5
The EIS will include a summary of the changes that have been made to the project since originally proposed, including the benefits of these changes to the environment, Indigenous groups, and the public.	Sections 2.2 and 2.9
The EIS will include a schedule including time of year, frequency, and duration for all project activities. The information will include a description of:	Section 2.7
Drilling and testing activities	
• operation of the Mobile Offshore Drilling Unit and/or drillships, including: - drilling at various water depths and in locations under consideration - well flow testing - waste management - water management	Sections 2.4.1, 2.4.3, 2.8, and 2.9.2.4
• vertical seismic profile surveys; equipment requirements (type, quantity); and	Section 2.4.2
• well evaluation and testing;	Section 2.4.3
• equipment requirements (type, quantity); and	Section 2.3
• storage and management of hazardous materials, fuels, and residues.	Section 2.8.4

EIS Guidelines	EIS Reference
Supply and servicing	
• vessel support, including loading, refuelling and operation of marine support vessels (i.e. for transfer, re-supply, and on-site safety during drilling activities); and	Section 2.4.5
• helicopter support (i.e. crew transport and delivery of supplies and equipment).	Section 2.4.5
Decommissioning, suspension, or abandonment of wells	
• the preliminary outline of a well decommissioning, suspension and abandonment plan for wells at varying water depths	Section 2.4.4
4. PUBLIC PARTICIPATION AND CONCERNS	
The EIS will describe the ongoing and proposed public participation activities that the proponent will undertake or that it has already conducted on the project. It will provide a description of efforts made to distribute project information and provide a description of information and materials that were distributed during the consultation process.	Chapter 3
The EIS will indicate the methods used, where the consultation was held, the persons and organizations consulted, the concerns voiced and the extent to which this information was incorporated in the design of the project as well as in the EIS.	Chapter 3
The EIS will provide a summary of key issues raised related to the project and its potential effects to the environment as well as describe any outstanding issues and ways to address them.	Chapter 3 – summaries by group
5. ENGAGEMENT WITH INDIGENOUS GROUPS AND CONCERNS RAISED	
For the purposes of developing the EIS, the proponent will engage with Indigenous groups that may be affected by the project, to obtain their views on:	
• effects of changes to the environment on Aboriginal peoples (health and socio-economic conditions; physical and cultural heritage, including any structure, site or thing that is of historical, archaeological, paleontological, or architectural significance; and current use of lands and resources for traditional purposes) pursuant to paragraph 5(1)(c) of CEAA 2012; and	Section 3.2
• potential adverse impacts of the project on potential or established section 35 rights, including title and related interests, in respect of the Crown's duty to consult, and where appropriate, accommodate Aboriginal peoples.	Section 3.2
With respect to potential adverse impacts of the project on potential or established section 35 rights, including title and related interests, the EIS will document for the groups identified in Section 5.1 below (or in subsequent correspondence from the Agency):	
• potential or established section 35 rights, including title and related interests, when this information is directly provided by a group to the proponent, the Agency or is available through public records, including: - geographical extent, nature, frequency and timing of the practice or exercise of the right; and, - maps and data sets (e.g. fish catch numbers);	Sections 3.2 and 7.4

EIS Guidelines	EIS Reference
• potential adverse impacts of each of the project components and physical activities, in all phases, on potential or established section 35 rights, including title and related interests. This assessment is to be based on a comparison of the exercise of the identified rights, title, and related interests between the predicted future conditions with the project and the predicted future conditions without the project. Include the perspectives of potentially impacted groups where these were provided to the proponent by the groups;	Chapter 12; Section 17.2.1
• measures identified to accommodate potential adverse impacts of the project on the potential or established section 35 rights, including title and related interests. These measures will be written as specific commitments that clearly describe how the proponent intends to implement them, and may go beyond mitigation measures that are developed to address potential adverse environmental effects;	Chapter 12
• potential adverse impacts on potential or established section 35 rights, including title and related interests that have not been fully mitigated or accommodated as part of the EA and associated engagement with Indigenous groups. The proponent will also take into account the potential adverse impacts that may result from the residual and cumulative environmental effects. Include the perspectives of potentially affected groups where these were provided to the proponent by the groups.	Chapter 12; Section 14.6
The information sources, methodology and findings of the assessment of paragraph 5(1)(c) effects under CEAA 2012 may be used to inform the assessment of potential adverse impacts of the project on potential or established section 35 rights, including title and related interests. However, there may be distinctions between the adverse impacts on potential or established section 35 rights, including title and related interests and paragraph 5(1)(c) effects under CEAA 2012. The proponent will carefully consider the potential distinction between these two aspects and, where there are differences, will include the relevant information in its assessment.	Chapter 12; Section 17.2.1
In terms of gathering views from potentially affected groups with respect to both environmental effects of the project and the potential adverse impacts of the project on potential or established section 35 rights, including title and related interests, the EIS will document:	
• VCs suggested by groups for inclusion in the EIS, whether they were included, and the rationale for any exclusions;	Chapter 3; Section 4.2.2
• specific suggestions raised by each group for mitigating the effects of changes to the environment on Aboriginal peoples or accommodating potential adverse impacts of the project on potential or established section 35 rights, including title and related interests;	Chapter 3
• views expressed by each group on the effectiveness of the mitigation or accommodation measures;	Chapter 3
• from the proponent's perspective, any potential cultural, social, and/or economic impacts or benefits to each group identified that may arise as a result of the project. Include the perspectives of potentially affected groups where these were provided to the proponent by the groups;	Chapters 3 and 12; Sections 14.6 and 17.2.1
• any other comments, specific issues and concerns raised by potentially affected groups and how they were responded to or addressed;	Chapter 3; Sections 8.1.2, 9.1.2, 10.1.2, 11.1.2, 12.1.2, and 13.1.2

EIS Guidelines	EIS Reference
• changes made to the project design and implementation directly as a result of discussions with potentially affected groups;	Chapter 3; Sections 8.1.2, 9.1.2, 10.1.2, 11.1.2, 12.1.2, and 13.1.2
• where and how Aboriginal traditional knowledge was incorporated into the environmental effects assessment (including methodology, baseline conditions and effects analysis for all VCs) and the consideration of potential adverse impacts on potential or established section 35 rights, including title and related interests, and related mitigation measures; and	Chapter 3; Section 7.4; Chapters 8-14
• any additional issues and concerns raised by potentially affected groups in relation to the environmental effects assessment and the potential adverse impacts of the project on potential or established section 35 rights, including title and related interests.	Chapters 3 and 12
The Agency recommends the proponent create a tracking table of key issues raised by each group, including the concerns raised related to the project, proposed mitigation measures, and where appropriate, a reference to the proponent's analysis in the EIS.	Chapter 3
5.1. Indigenous groups and engagement activities	
With respect to engagement activities, the EIS will document:	
• the engagement activities undertaken with each group prior to the submission of the EIS, including the date and means of engagement (e.g. meeting, mail, telephone);	Chapter 3
• any future planned engagement activities; and	Section 3.2.9
• how engagement activities by the proponent allowed groups to understand the project and evaluate its effects on their communities, activities, potential or established section 35 rights, including title and related interests.	Chapters 3 and 12
In preparing the EIS, the proponent will ensure that groups have access to timely and relevant information on the project and how the project may adversely impact them. The proponent will structure its engagement activities to provide adequate time for groups to review and comment on the relevant information. Engagement activities are to be appropriate to the groups' needs, arranged through discussions with the groups and in keeping with established consultation protocols, where available. The EIS will describe all efforts, successful or not, taken to solicit the information required from groups to support the preparation of the EIS.	Section 3.2
The proponent will ensure that views of groups are recorded and that groups are provided with opportunities to validate the interpretation of their views. The proponent will keep detailed tracking records of its engagement activities, recording all interactions with groups, the issues raised by each group and how the proponent addressed the concerns raised. The proponent will share these records with the Agency.	Section 3.2
For the groups listed below, the proponent will ensure they are notified about key steps in the EIS development process and of opportunities to provide comments on key EA documents and/or information to be provided regarding their community. The proponent will ensure these groups are reflected in the baseline information and assessment of potential environmental effects as described under paragraph 5(1)(c) of CEAA 2012 and/or impacts to potential or established section 35 rights, including title and related interest in the EIS. These groups include:	Section 3.2

EIS Guidelines	EIS Reference
Newfoundland and Labrador • the Labrador Inuit (Nunatsiavut Government) • the Labrador Innu (Innu Nation) • the NunatuKavut Community Council Nova Scotia • 11 Mi'kmaq First Nation groups represented by Kwilmu'kw Maw-klusuaqn Negotiation Office (KMKNO): - Acadia First Nation - Annapolis Valley First Nation - Bear River First Nation - Eskasoni First Nation - Glooscap First Nation - Membertou First Nation - Paqtnkek Mi'kmaw Nation - Pictou Landing First Nation - Potlotek First Nation - Wagmatcook First Nation - Waycobah First Nation • Millbrook First Nation • Sipekne'katik First Nation New Brunswick • eight Mi'gmaq First Nations groups represented by Mi'gmawe'l Tplu'taqnn Inc. (MTI) - Fort Folly First Nation - Eel Ground First Nation - Pabineau First Nation - Esgenoôpetitj First Nation - Buctouche First Nation - Indian Island First Nation - Eel River Bar First Nation - Metepnagiag Mi'kmaq First Nation • Elsipogtog First Nation • five Maliseet First Nation groups represented by Wolastoqey Nation in New Brunswick (WNNB) - Kingsclear First Nation - Madawaska Maliseet First Nation - Oromocto First Nation - Saint Mary's First Nation	

EIS Guidelines	EIS Reference
- Tobique First Nation • Woodstock First Nation • Peskotomuhkati Nation at Skutik (Passamaquoddy) Prince Edward Island • Abegweit First Nation • Lennox Island First Nation Quebec • three Mi'gmaq First Nation groups represented by Mi'gmawei Mawiomi Secretariat (MMS) - Micmas of Gesgapegiag - La Nation Micmac de Gespeg - Listuguj Mi'gmaq Government • Les Innus de Ekuanitshit • Première Nation des Innus de Nutashkuan	
In addition, for the purposes of good governance, the proponent should also provide information to and discuss potential environmental effects from the Project, as described under section 5(1)(c) of CEAA 2012, with the Qalipu Mi'kmaq First Nation Band and the Miawpukek First Nation.	Section 3.2.1
6. EFFECTS ASSESSMENT	
6.1. Project setting and baseline conditions	
Based on the scope of the project described in Section 3 (Part 1), the EIS will present baseline information in sufficient detail to enable the identification of how the project could affect the VCs and an analysis of those effects. Should other VCs be identified during the conduct of the EA, the baseline condition for these components will also be described in the EIS. As a minimum, the EIS will include a description of the following environmental components.	Chapters 5-7
6.1.1. Atmospheric environment	
The EIS will describe the atmospheric environment and climate at the project site and within areas that could be affected by routine project operations or accidents and malfunctions, such as:	
• ambient air quality in the project areas and in the airshed likely to be affected by the project, including consideration of the following contaminants: total suspended particulates (TSP), fine particulates smaller than 2.5 microns ($PM_{2.5}$), respirable particulates of less than 10 microns (PM_{10}), carbon monoxide (CO), sulphur oxides (SO_X), nitrogen oxides (NO_X), volatile organic compounds (VOCs), hydrogen sulfide (H_2S) and any other potentially toxic air pollutants	Section 5.3.3
• identify and quantify existing greenhouse gas emissions by individual pollutant measured as kilotonnes of CO_2 equivalent per year in the project study areas;	Section 5.3.3
• direct and indirect sources of air emissions;	Section 5.3.3

EIS Guidelines	EIS Reference
• ambient noise and light levels;	Section 5.3.10
• current provincial/territorial/federal limits for greenhouse gas emission targets; and	Section 5.3.3
• historical records of relevant meteorological information (e.g. total precipitation (rain and snow); mean, maximum and minimum temperatures; typical wind speed and direction; freezing spray; lighting; and visibility).	Section 5.3
Particular attention should also be given to the analysis of extreme meteorological events that have the potential to result in adverse effects on the project (e.g. high wind events).	Section 5.3.5
Relevant marine climate data sources should be consulted, including but not limited to data from Environment and Climate Change Canada moored weather buoys and any offshore platforms operating in the Eastern Newfoundland Strategic Environmental Assessment (SEA) area. Data from the International Comprehensive Atmosphere Ocean Dataset (ICOADS), the United States of America National Oceanographic and Atmospheric Administration (NOAA) database of tropical cyclone activity in the North Atlantic, NOAA's Climate Forecast System Reanalysis (CFSR), and the Canadian Lightning Detection Network.	Sections 5.3.1, 5.3.5, 5.3.9, and 5.6.2
6.1.2 Marine environment	
The EIS will describe the marine environment within areas that could be affected by routine project operations or by accidents and malfunctions, including:	
• marine water quality (e.g. water temperature, turbidity, salinity, and pH);	Sections 5.3.6, 5.4.4, and 5.6.2
• marine geology and geomorphology (i.e. bottom sediments, including quality, thickness, grain size, and mobility);	Sections 5.1.2 and 5.4.1
• physical oceanography including surface and subsurface current patterns, current velocities, waves, storm surges, long shore drift processes, tidal patterns, and tide gauges levels for the site, in proximity to the site, and along the marine transportation routes with consideration of predicted climate change effects	Section 5.4
• available bathymetric information (e.g. maximum and mean water depths) for the site and along marine transportation routes if applicable	Section 5.4.1
• ice climate in the regional study area, including ice formation and thickness, breakup, and movement;	Section 5.5
• ice conditions along the marine transportation routes with consideration of predicted climate change and its possible effect on the timing of ice formation in the future;	Section 5.5
• fast-ice characteristics, including its surface area and seasonal stability along the marine transportation routes;	Section 5.5
• marine plants, including all benthic and detached algae, marine flowering plants, brown algae, red algae, green algae, and phytoplankton;	Section 6.1.4
• acoustic environment (ambient noise levels from natural sources, shipping, seismic surveys, and other sources), including information on geographic extent and temporal variations and how the acoustic environment may be affected by the project.	Section 5.3.10

EIS Guidelines	EIS Reference
When describing the baseline marine environment, relevant data sources such as DFO Research Vessel Surveys/Science Reports and other primary and secondary scientific literature should be consulted. In addition to data sources discussed under Atmospheric Environment and Climate (some of which contain marine data), the proponent should consult MSC50 Wind and Wave Hindcast Data, and long term gridded hourly wind and wave measurements for the North Atlantic.	Chapter 5
6.1.3 Fish and fish habitat	
The EIS will describe fish and fish habitat within areas that could be affected by routine project operations or by accidents and malfunctions, including:	
• a characterization of fish populations on the basis of species and life stage, including information on the surveys carried out (e.g. location of sampling stations, catch methods, date of catches, species, catch per-unit effort) and the source of data available (e.g. government and historical databases, commercial fishing data);	Sections 6.1.3, 6.1.4, 6.1.5, 6.1.6, and 6.1.7
• a description of primary and secondary productivity in affected water bodies with a characterization of seasonal variability;	Sections 6.1.4 and 6.1.10
• a list of federally and provincially listed marine species at risk that are known to be present; and	Sections 6.1.8 and 6.1.9
• benthic flora and fauna and their associated habitat, including sensitive features such as corals and sponges (Note: a benthic habitat survey (ROV / camera), including transects of seafloor in the area of the well locations, may be required).	Section 6.1.6
Emphasis will be placed on the waters likely to be affected by the project and their physical characteristics, water, and sediment quality. Hence, for all areas in which effects are anticipated, the EIS will describe the biophysical water and sediment characteristics, including: • a description of the physical and biological characteristics of the fish and fish habitat likely to be directly or indirectly affected by the project;	Section 6.1
• maps, at a suitable scale, indicating the surface area of potential or confirmed fish habitats and a description of these habitats as determined by water depths, type of substrate (sediments), aquatic vegetation, and potential use (i.e. spawning, rearing, nursery, feeding, overwintering, migration routes, etc.). Where appropriate, this information should be linked to water depths (bathymetry) to identify the extent of a water body's littoral / photic zone;	Section 6.1
• quality, thickness, grain size and mobility of bottom sediments; and	Section 6.1.6
• a discussion of sea bottom stability at the project site.	Sections 5.1.2 and 5.4.1
Any sampling survey methods used by the proponent will be described in order to allow experts to ensure the quality of the information provided. If previous studies on the habitat in the study area were conducted, they are to be submitted with the EIS.	No field work was undertaken for the EIS (refer to Section 6.1)

EIS Guidelines	EIS Reference
6.1.4 Migratory birds and their habitat	
The EIS will describe migratory and non-migratory marine birds and their habitat at the project site and within areas that could be affected by routine project operations or accidents and malfunctions.	Section 6.2
Migratory birds are protected under the Migratory Birds Convention Act (MBCA) and associated regulations. Preliminary data from existing sources will be gathered, including information such as:	
• birds and their habitats that are found or are likely to be found in the study area. This description may be based on existing sources, but supporting evidence is required to demonstrate that the data used are representative of the avifauna and habitats found in the study area. The existing data must be supplemented by surveys, if required;	Sections 6.2.2, 6.2.3, and 6.2.4
• abundance, distribution, and life stages of migratory and non-migratory birds likely to be affected in the project area based on existing information, or surveys, as appropriate, to provide current field data;	Sections 6.2.2, 6.2.3, and 6.2.4
• year-round migratory bird use of the area (e.g. winter, spring migration, breeding season, fall migration), based on preliminary data from existing sources and surveys to provide current field data if appropriate; and	Sections 6.2.2, 6.2.3, and 6.2.4
• areas of concentration of migratory birds, such as for breeding, feeding or resting.	Sections 6.2.2, 6.2.3, 6.2.4, and 6.2.5
Other relevant datasets should be consulted, such as those available from the Canadian Wildlife Service (e.g. Eastern Canadian Seabirds at Sea (ECSAS), Programme intégré de recherches sur les oiseaux pélagiques (PIROP)), the Atlantic Canada Conservation Data Centre (ACCDC), recovery strategies, management plans, Newfoundland and Labrador Department of Environment and Climate Change Wildlife Division, previous petroleum operations in the area and university or other research programs, if available.	Section 6.2.1
6.1.5. Species at Risk	
The EIS will describe federal species at risk and their habitat at the project site and within areas that could be affected by routine project operations or accidents and malfunctions, such as:	
• a list of all potential or known federally listed species at risk that may be affected by the project, using existing data and literature as well as surveys to provide current field data;	Sections 6.1.8, 6.2.4, and 6.3.7
• a list of all federal species designated by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) for listing on Schedule 1 of the Species at Risk Act. This will include those species in the risk categories of extirpated, endangered, threatened and of special concern;	Sections 6.1.8, 6.2.4, and 6.3.7
• any published studies that describe the regional importance, abundance, and distribution of species at risk including management plans, recovery strategies or plans. The existing data must be supplemented by surveys, if required; and	Sections 6.1.8, 6.2.4, and 6.3.7
• residences, seasonal movements, movement corridors, habitat requirements, key habitat areas, identified and proposed critical habitat and/or recovery habitat (where applicable) and general life history of species at risk that may occur in the project area, or be affected by the project.	Sections 6.1.8, 6.2.4, and 6.3.7

EIS Guidelines	EIS Reference
• The following information sources on species at risk and species of conservation concern should be among those consulted: - Species at Risk Act Registry (www.sararegistry.gc.ca); - COSEWIC; - Relevant government agencies; - Local naturalist and interest groups; and - Indigenous groups and First Nations.	Sections 6.1.8, 6.2.4, and 6.3.7
6.1.6. Marine mammals	
The EIS will describe marine mammals and their habitat at the project site and within areas that could be affected by routine project operations or accidents and malfunctions, such as:	
• marine mammal species that may be present, the times of year they are present, the ranges of the species and their migration patterns, and	Sections 6.3.2, 6.3.3, 6.3.4, and 6.3.5
• important areas in the vicinity of the drilling sites or supply routes (e.g. for mating, breeding, feeding and nursing of young) or that could be impacted by the project (e.g. acoustics, spills, etc.).	Sections 6.3.2, 6.3.3, 6.3.4, 6.3.5, and 6.3.8
6.1.7. Marine turtles	
The EIS will describe marine turtles and their habitat at the project site and within areas that could be affected by routine project operations or accidents and malfunctions, such as:	
• marine turtle species that may be present, the times of year they are present, the ranges of the species and their migration patterns; and	Section 6.3.6
• important areas in the vicinity of the drilling sites or supply routes (e.g. for mating, breeding, and feeding) or that could be impacted by the project (e.g. routine discharges, spills, etc.).	Sections 6.3.6 and 6.3.8
6.1.8. Indigenous peoples	
Baseline information will describe and characterize the elements in paragraph 5(1)(c) of CEAA 2012 based on the spatial and temporal scope selected for the EA according to the factors outlined in Part 1, Section 3.2.3 of this document. Baseline information will also characterize the regional context of each of the elements of paragraph 5(1)(c) of CEAA 2012 to support the assessment of project related effects and cumulative effects. Baseline information will be sufficient to provide a comprehensive understanding of the current state of each VC.	Section 7.4

EIS Guidelines	EIS Reference
Baseline information for current use of lands and resources for traditional purposes will focus on the traditional activity (e.g. fishing) and include a characterization of all attributes of the activity that can be affected by environmental change. This includes not only identifying species of importance, but also assessing the quality and quantity of preferred traditional resources and locations, timing (e.g. seasonality, access restrictions, distance from community), ambient/sensory environment (e.g. noise, air quality, visual landscape, presence of others) and cultural environment (e.g. historical/generational connections, preferred areas). As applicable, specific aspects that will be considered include, but are not limited to:	
• current use of lands and resources for traditional purposes, including:	
• location of traditional territory (including maps where available);	Section 7.4
- commercial and traditional fishing activity within the project's potential zone of influence, including licences and maps;	Sections 7.4.2, 7.4.3, 7.4.4, 7.4.5, 7.4.6, and 7.4.7
- fish, wildlife, birds, plants, or other natural resources of importance for traditional use;	Sections 7.4.2, 7.4.3, 7.4.4, 7.4.5, 7.4.6, and 7.4.7
- places where fish, wildlife, birds, plants, or other natural resources are harvested, including places that are preferred;	Sections 7.4.2, 7.4.3, 7.4.4, 7.4.5, 7.4.6, and 7.4.7
- access and travel routes for conducting traditional practices;	Sections 7.4.2, 7.4.3, 7.4.4, 7.4.5, 7.4.6, and 7.4.7
- frequency, duration, or timing of traditional practices; and	Sections 7.4.2, 7.4.3, 7.4.4, 7.4.5, 7.4.6, and 7.4.7
- cultural values associated with the area affected by the project and the traditional uses identified.	Sections 7.4.2, 7.4.3, 7.4.4, 7.4.5, 7.4.6, and 7.4.7
• any Project components and a description of any activities (e.g. exclusion zones) that may affect commercial fisheries or other uses;	Sections 7.4.2, 7.4.3, 7.4.4, 7.4.5, 7.4.6, and 7.4.7
• location of reserves and communities; and	Sections 7.4.2, 7.4.3, 7.4.4, 7.4.5, 7.4.6, and 7.4.7

EIS Guidelines	EIS Reference
• human health, primarily with respect to potential contamination of food sources;	Sections 7.4.2, 7.4.3, 7.4.4, 7.4.5, 7.4.6, and 7.4.7
• physical and cultural heritage (including any site, structure, or thing of archaeological, paleontological, historical, or architectural significance).	Sections 7.4.2, 7.4.3, 7.4.4, 7.4.5, 7.4.6, and 7.4.7
Any other baseline information that supports the analysis of predicted effects on Indigenous peoples will be included as necessary. The EIS will also indicate how input from groups, including Aboriginal traditional knowledge, was used in establishing the baseline conditions related to health and socio- economics, physical and cultural heritage and current use of lands and resources for traditional purposes.	Sections 7.4.2, 7.4.3, 7.4.4, 7.4.5, 7.4.6, and 7.4.7
6.1.9. Other changes to the environment arising as a result of a federal decision or due to changes on federal lands, in another province or outside Canada	
Should there be the potential for a change to the environment arising as a result of a federal decision(s), or on federal lands, lands in another province or lands outside Canada, the EIS will include baseline information on the environmental component likely to be affected (if this information is not already covered in other subsections of these guidelines).	Chapter 17
6.1.9.1. Special areas	
The EIS will describe special areas (e.g. species at risk critical habitat that has been designated and that has been proposed or that may be under consideration, Important Bird Areas, Migratory Bird Sanctuaries, ecological reserves, etc.) at the project site and within areas that could be affected by routine project operations or accidents and malfunctions, such as: • Marine Refuge Areas (e.g. Northeast Newfoundland Slope Closure) • Ecologically and Biologically Significant Areas (e.g. The Southeast Shoal and Tail of the Banks, The Northeast Shelf and Slope, Lily Canyon-Carson Canyon, and The Virgin Rocks) • Fishery Closure Areas (e.g. Northwest Atlantic Fisheries Organization Coral Closures, Orphan Knoll Seamount) • Preliminary Representative Marine Areas (South Grand Bank Area)	Sections 6.4.1, 6.4.2, 6.4.3, and 6.4.4
The EIS will describe the distances between the edge of the project area (i.e. drill sites and marine transportation routes) and special areas. It shall state the rationale for designating specific areas as “special” (i.e. the defining environmental features of the special area).	Sections 6.4.1 and 6.4.2
6.1.9.2. Human environment	
With respect to potential effects on the human environment, non-Indigenous people and the related VCs, baseline information will describe and characterize the following that could be affected by routine project operations or accidents and malfunctions. At a minimum, this should include:	
• any federal lands, lands located outside the province or Canada that may be affected by the project operations or by accidents and malfunctions;	Section 7.2.1

EIS Guidelines	EIS Reference
• the current and historical use of waters that may be affected by routine project operations or by accidents and malfunctions, including:	Chapter 7
- current commercial and recreational fishing activity, including licence holders and species fished;	Sections 7.2.3, 7.2.7, 7.2.8, 7.2.9, and 7.2.10
- other ocean uses (e.g. shipping, research, oil, and gas, military, ocean infrastructure [e.g. subsea cable]);	Sections 7.1 and 7.3
• the location of and proximity of any permanent, seasonal, or temporary residences or camps that could be affected by routine project operations or accidents and malfunctions;	Section 7.1
• health and socio-economic conditions that could be affected by routine project operations or accidents and malfunctions, including the functioning and health of the socio-economic environment, encompassing a broad range of matters that affect communities in the study area in a way that recognizes interrelationships, system functions and vulnerabilities;	Sections 7.4 and 17.2.1
• physical and cultural heritage, including structures, sites, or things of historical, archaeological, paleontological, or architectural significance that could be affected by routine project operations or accidents and malfunctions;	Sections 7.4 and 17.2.1
• the rural and urban settings that could be affected by routine project activities or accidents and malfunctions; and	Section 7.1
• any project components and activities (e.g. exclusion zones) that may affect commercial or recreational fisheries or other uses.	Section 2.4.1; Chapters 12 and 13
The EIS should also discuss the potential to encounter unexploded ordnance (UXOs), based on consultation with the Department of National Defence.	Section 7.3.4
6.2. Predicted changes to the physical environment	
The EA will include a consideration of the predicted changes to the environment as a result of the project being carried out or as a result of any powers, duties or functions that are to be exercised by the federal government in relation to the project. These predicted changes to the environment are to be considered in relation to each phase of the project (e.g. drilling, testing, decommissioning, suspension, abandonment) and are to be described in terms of the magnitude, geographic extent, timing, duration, frequency, ecological and social context, and whether the environmental changes are reversible or irreversible.	Chapters 8-14 and 17
The EIS will include stand-alone sections that summarize those changes that may be caused by the project on the components of the environment listed in paragraph 5(1)(a) of CEAA 2012, namely fish and fish habitat, aquatic species, and migratory birds.	Chapters 8-14 and 17
The EIS will include a stand-alone section that summarizes any change the project may cause to the environment that may occur on federal lands or lands outside the province in which the project is to be located (including outside of Canada).	Section 17.1
In situations where the project requires one or more federal decisions identified in section 5(2), the EIS will also include a stand-alone section that describes any change that may be caused by the project on the environment that is directly linked or necessarily incidental to these decisions (e.g. changes to commercial fishing).	Section 17.2.2

EIS Guidelines	EIS Reference
6.3. Predicted effects on valued components	
Based on the predicted changes to the environment identified in Section 6.2 above, the proponent is to assess the environmental effects of the project on the following VCs. All interconnections between VCs and between changes to multiple VCs will be described:	
6.3.1. Fish and fish habitat	
• the identification of any potential adverse effects to fish and fish habitat as defined in subsection 2(1) of the Fisheries Act, including the calculations of any potential habitat loss (temporary or permanent) in terms of surface areas (e.g. spawning grounds, fry-rearing areas, feeding), and in relation to watershed availability and significance. The assessment will include a consideration of:	
- effects on water quality including changes to chemical composition, temperature, oceanographic conditions, etc.;	Sections 8.1.3, 8.3.1, and 8.3.3
- the geomorphological changes and their effects on hydrodynamic conditions and fish habitats (e.g. modification of benthic habitat including corals and sensitive habitat, area affected by drilling waste, disturbance to water column);	Sections 8.1.3, 8.3.1, and 8.3.3
- the modifications of hydrological and hydrometric conditions on fish habitat and on the fish species' life cycle activities (e.g. reproduction, juvenile, rearing, and feeding, movements);	Sections 8.1.3, 8.3.1, and 8.3.3
- any potential imbalances in the food web in relation to baseline conditions;	Sections 8.1.3, 8.3.1, and 8.3.3
- underwater noise and vibration emissions from project activities (i.e. drilling, vertical seismic profiling, offshore supply vessel operation, well abandonment) and how it may affect fish health and behaviour;	Sections 8.1.3, 8.3.1, and 8.3.3
- effects on the primary and secondary productivity of water bodies and how project-related effects may affect fish food sources;	Sections 8.1.3, 8.3.1, and 8.3.3
• the effects of changes to the aquatic environment on fish and their habitat, including:	
- the anticipated changes in the composition and characteristics of the populations of various fish species, including shellfish and forage fish including mortality of fish, eggs, and larvae; environment and species (e.g. corals, plants);	Sections 8.1.3, 8.3.1, and 8.3.3
- any modifications in migration or local movements during and after project activities (e.g. vertical seismic profiling, drilling);	Sections 8.1.3, 8.3.1, and 8.3.3
- any modifications and use of habitats by federally or provincially listed fish species;	Section 8.3.4
- a discussion of the effects of drilling waste disposal on marine benthos and other components of the aquatic environment, recognizing that the disposal of these wastes is expected to be a primary cause of effect on benthos;	Section 8.3.3
- a discussion of the length of time it would take for the benthic environment to return to baseline conditions in water depths within which the Project would occur;	Section 8.3.3 and 8.3.5
- a discussion of how project timing correlates to key fisheries windows and any potential effects resulting from overlapping periods; and	Section 13.3.3

EIS Guidelines	EIS Reference
- a discussion of how data examining the deposition of drilling-related wastes (e.g. fluid, mud residues, cuttings) and acoustic monitoring data would be collected during and after drilling operations and how this would be used to verify effects predictions.	Sections 8.3.2 and 8.5
6.3.2. Marine plants	
• effects on marine plants, including all benthic and detached algae, marine flowering plants, brown algae, red algae, green algae, and phytoplankton.	Section 8.3.3
6.3.3. Marine mammals	
• effects on marine mammals, including but not limited to:	
- mortality and other effects from vessel collisions or disturbance; and	Sections 10.1.3, 10.3.1, and 10.3.3
- direct and indirect effects caused by increased disturbance (e.g. noise, light, vibrations) including mortality, physical injury and behavioural changes (e.g. habitat avoidance, disruption to feeding behaviour, deviation in migration routes, communication masking, discomfort and behavioural disturbance).	Sections 10.1.3, 10.3.1, 10.3.3, and 11.3.3
- exposure to spilled contaminants (e.g. fuel, oils) and operational discharges (e.g. deck drainage, gray water, black water); and	Sections 10.1.3, 10.3.1, and 10.3.3
- change in marine habitat quality from drill muds and cuttings and sedimentation.	Sections 10.1.3, 10.3.1, and 10.3.3
6.3.4. Marine turtles	
• effects on marine turtles, including but not limited to:	
- mortality and other effects from vessel collisions or disturbance; and	Sections 10.1.3, 10.3.1, and 10.3.3
- direct and indirect effects caused by increased disturbance (e.g. noise, light, vibrations) including mortality, physical injury and behavioural changes (e.g. habitat avoidance, disruption to feeding behaviour, deviation in migration routes, communication masking, discomfort and behavioural disturbance).	Sections 10.1.3, 10.3.1, 10.3.3, and 11.3.3
- exposure to spilled contaminants (e.g. fuel, oils) and operational discharges (e.g. deck drainage, gray water, black water); and	Sections 10.1.3, 10.3.1, and 10.3.3
- change in marine habitat quality from drill muds and cuttings and sedimentation.	Sections 10.1.3, 10.3.1, and 10.3.3

EIS Guidelines	EIS Reference
6.3.5. Migratory birds	
• direct and indirect adverse effects on migratory birds, including population level effects that could be caused by all project activities, including but not limited to:	
- noise disturbance from seismic equipment including both direct effects (physiological), or indirect effects (foraging behaviour of prey species);	Sections 9.1.3, 9.3.1, 9.3.5, and 11.3.3
- physical displacement as a result of vessel presence (e.g. disruption of foraging activities);	Sections 9.1.3, 9.3.1, and 9.3.5
- night-time illumination levels from lights and flares during different weather conditions and seasons and during different project activities (e.g. drilling, well testing) and associated nocturnal disturbance (e.g. increased opportunities for predators, attraction to the drilling unit and vessels and subsequent collision or exposure to vessel-based threats, incineration in flares, disruption of normal activities);	Sections 9.1.3, 9.3.1, 9.3.5, and 11.3.3
- exposure to spilled contaminants (e.g. fuel, oils) and operational discharges (e.g. deck drainage, gray water, black water);	Sections 9.1.3, 9.3.1, and 9.3.5
- attraction of, and increase in, predator species as a result of waste disposal practices (i.e. sanitary and food waste) and the presence of incapacitated/dead prey near the Mobile Offshore Drilling Unit or support vessels;	Sections 9.1.3, 9.3.1, and 9.3.5
- physical harm or mortality from flaring on the drilling unit or other vessel based threats;	Sections 9.1.3, 9.3.1, and 9.3.5
- collision risk with the drilling unit and other project infrastructure;	Sections 9.1.3, 9.3.1, and 9.3.5
- the effects of oil spills in the nearshore or that reach land on landbird species;	Sections 9.1.3, 9.3.1, and 9.3.5
- change in marine habitat quality from drill muds and cuttings and sedimentation; and	Sections 9.1.3, 9.3.1, and 9.3.5
- indirect effects caused by increased disturbance (e.g. noise, light, presence of workers), relative abundance movements and changes in migratory bird habitat.	Sections 9.1.3, 9.3.1, 9.3.5, and 11.3.3
6.3.6. Species at risk	
• the potential effects of the project on federally listed species at risk and those species listed by the Committee on the Status of Endangered Wildlife in Canada classified as extirpated, endangered, threatened or of special concern (flora and fauna) and their critical habitat, including:	
- alteration of habitat (including critical habitat) features;	Sections 8.3.4, 9.3.4, and 10.3.4

EIS Guidelines	EIS Reference
- direct and indirect effects from noise, vibrations, and increased exposure to contaminants of concern;	Sections 8.3.4, 9.3.4, and 10.3.4
- a discussion of migration patterns of federal species at risk and related effects (e.g. displacement, increased risk of collision); and	Sections 8.3.4, 9.3.4, and 10.3.4
- direct and indirect effects on the survival or recovery of federally listed species (list species).	Sections 8.3.4, 9.3.4, and 10.3.4
6.3.7. Indigenous peoples	
With respect to Indigenous peoples, a description and analysis of how changes to the environment caused by the project will affect the following activities exercised by each Indigenous group, as applicable to the proposed project:	
• current use of lands and resources for traditional purposes. This assessment will characterize the effects on the use or activity (e.g. fishing) as a result of the underlying changes to the environment (i.e. how will the activity change if the project proceeds). The underlying changes to the environment will also be described, including, but not limited to:	Sections 12.1.3, 12.3.1, 12.3.3, 12.3.4, and 12.3.5
- any changes to resources (fish, birds, or other natural resources) used for traditional purposes (e.g. fishing, use of sacred sites);	Sections 12.1.3, 12.3.1, 12.3.3, 12.3.4, and 12.3.5
- effects on food, social, ceremonial, and commercial fishing;	Sections 12.1.3, 12.3.1, 12.3.3, 12.3.4, and 12.3.5
- a discussion of how drilling activities correlates to key fisheries windows, and any potential impacts resulting from overlapping periods;	Sections 12.1.3, 12.3.1, 12.3.3, 12.3.4, and 12.3.5
- changes related to species important to Indigenous people's current use of resources, including changes to key habitat;	Sections 12.1.3, 12.3.1; 12.3.3, 12.3.4, and 12.3.5
- any changes or alterations to access into the areas used for traditional purposes and commercial fishing, including implementation of exclusion zones;	Sections 12.1.3, 12.3.1, 12.3.3, 12.3.4, and 12.3.5
- any changes to the environment that affect cultural value or importance associated with traditional uses or areas affected by the project (e.g. values or attributes of the area that make it important as a place for inter-generational teaching of language or traditional practices, communal gatherings, integrity of preferred traditional practice areas);	Sections 12.1.3, 12.3.1, 12.3.3, 12.3.4, and 12.3.5
- how timing of project activities (e.g. drilling, flaring) have the potential to interact with the timing of traditional practices, and any potential effects resulting from overlapping periods;	Sections 12.1.3, 12.3.1, 12.3.3, 12.3.4, and 12.3.5

EIS Guidelines	EIS Reference
- consideration of the regional context for traditional use and the value of the project area in that regional context, including alienation of lands from traditional use;	Sections 12.1.3, 12.3.1, 12.3.3, 12.3.4, 12.3.4, and 17.2.1
- any changes to environmental quality (e.g. air, water), the sensory environment (e.g. noise, light, visual landscape), or perceived disturbance of the environment (e.g. fear of contamination of water or country foods) that could detract from use of the area or lead to avoidance of the area;	Sections 12.1.3, 12.3.1, 12.3.3, 12.3.4, and 12.3.5
- an assessment of the potential to return affected areas to pre-project conditions to support traditional practices;	Section 12.3.5
• human health, focusing on effects on health outcomes or risks in consideration of, but not limited to, potential changes in water quality (recreational and cultural uses), availability of country foods (e.g. marine species), and noise exposure. When risks to human health due to changes in one or more of these components are predicted, a complete Human Health Risk Assessment (HHRA) examining all exposure pathways for pollutants of concern may be necessary to adequately characterize potential risks to human health. Where adverse health effects are predicted, any incidental effects such as effects on current use of lands and resources for traditional purposes will also be assessed. The proponent must provide a justification if it determines that an assessment of the potential for contamination of country foods is not required or if some contaminants are excluded from the assessment;	Section 12.3.4 and 17.2.1
• socio-economic conditions, including, but not limited to:	
- the use of navigable waters	Sections 13.1.3, 13.3.1, 13.3.3, 13.3.5, and 17.2.1
- commercial fishing (e.g. catch rates, exclusion zones, gear damage or loss, well abandonment, marketability of seafood products) and food security	Sections 13.1.3, 13.3.1; 13.3.3, 13.3.5, and 17.2.1
- commercial outfitters	Sections 13.1.3, 13.3.1; 13.3.3, 13.3.5, and 17.2.1
- recreational use	Sections 13.1.3, 13.3.1; 13.3.3, 13.3.5, 17.2.1
• physical and cultural heritage, and structures, sites, or things of historical, archaeological, paleontological, or architectural significance to groups, including, but not limited to:	Section 17.2.1
- the loss or destruction of physical and cultural heritage	Sections 12.1.3, 12.3.1, 12.3.3, 12.3.4, 12.3.4, and 17.2.1

EIS Guidelines	EIS Reference
- changes to access to physical and cultural heritage	Sections 12.1.3, 12.3.1; 12.3.3, 12.3.4, 12.3.4, 17.2.1
- changes to the cultural value or importance associated with physical and cultural heritage	Sections 12.1.3, 12.3.1, 12.3.3, 12.3.4, 12.3.4, and 17.2.1
• other effects of changes to the environment on groups should be reflected as necessary.	Sections 13.1.3, 13.3.1, 13.3.3, and 13.3.4
6.3.8. Other valued components that may be affected as a result of a federal decision or due to effects on federal lands, another province or outside Canada	
If there is the potential for a change to the environment arising as a result of a federal decision(s), for example an authorization under section 138(1) of the Canada-Newfoundland and Labrador Atlantic Accord Implementation Act or section 35 of the Fisheries Act, the EIS should include a description of the specific project components for which a federal authorization/decision is required, and an assessment of any other VCs (not already covered in other subsections of these guidelines) that may be affected by the changes to the environment caused by these specific project components. If there is the potential for the project to result in environmental changes on federal lands (or waters), another province, or another country, then VCs of importance not already identified should be included. For example, if the project will result in the generation of greenhouse gas emissions, the EIS should include a description of the project's greenhouse gas emissions in a regional, provincial, national, or international context if applicable.	Chapter 17
Suggested VCs are noted below for this project.	
6.3.8.1. Air quality and greenhouse gas emissions	
• comparison of anticipated air quality concentration against the Canadian Ambient Air Quality Standards (CAAQS) for fine particulate matter or other relevant federal and/or provincial criteria for other contaminants of potential concern;	Section 5.3
• description of all methods and practices (e.g. control equipment) that will be implemented to minimize and control atmospheric emissions throughout the project life cycle. If the best available technologies are not included in the project design, the proponent will need to provide a rationale for the technologies selected;	Section 2.8.1
• an estimate of the direct greenhouse gas emissions associated with all phases of the project (i.e. including drilling, well testing and marine and helicopter transportation) as well as any mitigation measures proposed to minimize greenhouse gas emissions. This information is to be presented by individual pollutant and should also be summarized in CO2 equivalent per year. The proponent is responsible for the following:	
- provide an estimate of the contribution of the project emissions at the local, provincial, and federal scale, and indicate the category into which the project falls in terms of the relative magnitude of its contribution to greenhouse gas emissions (project with low, medium, or high emission rates);	Section 2.8.1
- justify all estimated emissions and emission factors used;	Section 2.8.1

EIS Guidelines	EIS Reference
- provide the estimation or derivation method, and disclose and describe all assumptions and emission intensity factors used;	Section 2.8.1
- compare and assess the level of estimated emissions to the regional, provincial, and federal emission targets;	Section 2.8.1
- provide information related to the project's electrical demand and sources of electrical power for equipment, i.e. the project's main source and any other additional sources (generators, etc.), as appropriate;	Section 2.8.1
• changes in ambient noise levels; and	Sections 2.8.5, 5.3.10, 8.3.3, 9.3.3, and 10.3.3
• changes in night-time light levels.	Sections 2.8.6, 5.3.10, 8.3.3, 9.3.3, and 10.3.3
6.3.8.2. Commercial fisheries	
• effects of changes to the environment on commercial fishing activities (e.g. effects on fished species affecting fisheries success, displacement from fishing areas (e.g. exclusion zones), gear loss or damage);	Sections 13.1.3, 13.3.1, 13.3.3, and 13.3.5
• a discussion of how drilling activities correlates to key commercial fisheries windows, and any potential impacts resulting from overlapping periods;	Sections 13.1.3, 13.3.1, 13.3.3, and 13.3.5
• effects from subsea infrastructure that could be left in place (e.g. wellheads) following abandonment; and	Sections 13.1.3, 13.3.1, 13.3.3, and 13.3.5
• changes to habitat of commercial fish species (e.g. noise, water, and sediment quality).	Sections 13.1.3, 13.3.1, 13.3.3, and 13.3.5
6.3.8.3. Special areas	
• effects on special areas, including, but not limited to:	
- use of dispersants, and	Sections 11.1.3, 11.3.1, 11.3.3, and 11.3.4
- change to habitat quality (e.g. noise, light, water, sediment quality).	Sections 11.1.3, 11.3.1, 11.3.3, and 11.3.4
- change to the environmental features that define the special area (e.g. physical features, species assemblages, species abundance).	Sections 11.1.3, 11.3.1, 11.3.3, and 11.3.4

EIS Guidelines	EIS Reference
6.3.8.4. Human environment	
• effects of changes to the environment on health and socio-economic conditions, physical and cultural heritage and any structure, site or thing that is of historical, archaeological, paleontological, or architectural value, including, but not limited to the following, as applicable:	
- recreational activities;	Sections 13.1.3, 13.3.1, 13.3.3, and 13.3.5
- other ocean uses;	Sections 13.1.3, 13.3.1, 13.3.3, and 13.3.4
- socio-economic conditions;	Section 12.3.4
- human health;	Section 12.3.4
- physical and cultural heritage (e.g. shipwrecks);	Section 12.3.4 and 14.7.4
- rural and urban settings that could be affected by routine activities and/or accidents and malfunctions.	Sections 7.1 and 15.4.7
6.4 Mitigation measures	
Every EA conducted under CEAA 2012 will consider measures that are technically and economically feasible and that would mitigate any significant adverse environmental effects of the project. Under CEAA 2012, mitigation measures include measures to eliminate, reduce or control the adverse environmental effects of a designated project, as well as restitution for damage to the environment through replacement, restoration, compensation, or other means. Measures will be specific, achievable, measurable, and verifiable, and described in a manner that avoids ambiguity in intent, interpretation, and implementation. Mitigation measures may be considered for inclusion as conditions in the EA decision statement and/or in other compliance and enforcement mechanisms provided by other authorities' permitting or licensing processes.	Sections 2.10, 8.3.2, 9.3.2, 10.3.2, 11.3.2, 12.3.2, 13.3.2, and 18.2
The EIS will describe the standard mitigation practices, policies and commitments that constitute technically and economically feasible mitigation measures and that will be applied as part of standard practice regardless of location. The EIS will then describe the project's environmental protection plan and its environmental management system, through which the proponent will deliver this plan. The plan will provide an overall perspective on how potentially adverse effects would be minimized and managed over time. The EIS will further discuss the mechanisms the proponent would use to require its contractors and sub-contractors to comply with these commitments and policies and with auditing and enforcement programs.	Sections 2.10, 8.3.2, 9.3.2, 10.3.2, 11.3.2, 12.3.2, 13.3.2, and 18.2
The EIS will then describe mitigation measures that are specific to each environmental effect identified. Mitigation measures will be written as specific commitments that clearly describe how the proponent intends to implement them and the environmental outcome the mitigation measure is designed to address. The EIS will describe mitigation measures in relation to species and/or critical habitat listed under the Species at Risk Act. These measures will be consistent with any applicable recovery strategy and action plans. The EIS will also identify and describe mitigation measures to avoid or lessen adverse effects on listed COSEWIC species.	Sections 8.3.2, 9.3.2, 10.3.2, 11.3.2, 12.3.2, and 13.3.2

EIS Guidelines	EIS Reference
The EIS will specify the actions, works, minimal disturbance footprint techniques, best available technology, corrective measures, or additions planned during the project's various phases to eliminate or reduce the significance of adverse effects. The EIS will also present an assessment of the effectiveness of the proposed technically and economically feasible mitigation measures. The reasons for determining if the mitigation measure reduces the significance of an adverse effect will be made explicit. The proponent is also encouraged to identify mitigation measures for effects that are adverse although not significant.	Sections 8.3.2, 9.3.2, 10.3.2, 11.3.2, 12.3.2, and 13.3.2
The EIS will indicate what other technically and economically feasible mitigation measures were considered, and explain why they were rejected. Trade-offs between cost savings and effectiveness of the various forms of mitigation measures will be justified. The EIS will identify who is responsible for the implementation of these measures and the system of accountability.	Sections 2.9, 8.3.2, 9.3.2, 10.3.2, 11.3.2, 12.3.2, and 13.3.2
Where mitigation measures are proposed to be implemented for which there is little experience or for which there is some question as to their effectiveness, the potential risks and effects to the environment should those measures not be effective will be clearly and concisely described. In addition, the EIS will identify the extent to which technological innovations will help mitigate environmental effects. Where possible, it will provide detailed information on the nature of these measures, their implementation, management, and the requirements of the follow-up program.	Sections 8.3.2, 9.3.2, 10.3.2, 11.3.2, 12.3.2, 13.3.2, and 18.2
Adaptive management is not considered as a mitigation measure, but if the follow-up program (refer to Section 8 below) indicates that corrective action is required, the proposed approach for managing the action should be identified.	Sections 8.3.2, 9.3.2, 10.3.2, 11.3.2, 12.3.2, 13.3.2, and 18.2
6.5. Significance of residual effects	
After having established the technically and economically feasible mitigation measures, the EIS will present any residual environmental effects of the project on the VCs identified in Section 6.3 above. The residual effects, even if very small or deemed insignificant, will be described.	Sections 8.4, 9.4, 10.4, 11.4, 12.4, and 13.4
The EIS will then provide a detailed analysis of the significance of the residual environmental effects that are considered adverse following the implementation of mitigation measures, using guidance described in Section 4 of the Agency's Operational Policy Statement, Determining Whether a Project is Likely to Cause Significant Adverse Environmental Effects under the Canadian Environmental Assessment Act, 2012.	Sections 8.4, 9.4, 10.4, 11.4, 12.4, and 13.4
The EIS will identify the criteria used to assign significance ratings to any predicted adverse effects. It will contain clear and sufficient information to enable the Agency, technical and regulatory agencies, Indigenous groups, and the public to review the proponent's analysis of the significance of effects. The EIS will document the terms used to describe the level of significance.	Sections 8.1.5, 9.1.5, 10.1.5, 11.1.5, 12.1.5, 13.1.5, 8.4, 9.4, 10.4, 11.4, 12.4, and 13.4

EIS Guidelines	EIS Reference
The following criteria should be used in determining the significance of residual effects: • magnitude • geographic extent • timing • duration • frequency • reversibility • ecological and social context • existence of environmental standards, guidelines, or objectives for assessing the effect	Sections 8.1.5, 9.1.5, 10.1.5, 11.1.5, 12.1.5, 13.1.5, 8.4, 9.4, 10.4, 11.4, 12.4, and 13.3.5
In assessing significance against these criteria, the proponent will, where possible, use relevant existing regulatory documents, environmental standards, guidelines, or objectives such as prescribed maximum levels of emissions or discharges of specific hazardous agents into the environment. The EIS will contain a section which explains the assumptions, definitions and limits to the criteria mentioned above in order to maintain consistency between the effects on each VC.	Sections 8.1.1, 9.1.1, 10.1.1, 11.1.1, 12.1.1, 13.1.1, 8.4, 9.4, 10.4, 11.4, 12.4, and 13.4
Where significant adverse effects are identified, the EIS will set out the probability (likelihood) that they will occur, and describe the degree of scientific uncertainty related to the data and methods used within the framework of this environmental analysis.	Sections 8.4, 9.4, 10.4, 11.4, 12.4, 13.4, and 18.3
6.6. Other effects to consider	
6.6.1. Effects of potential accidents or malfunctions	
The failure of certain works caused by equipment malfunctions, human error, or exceptional natural events (e.g. earthquake, hurricane, submarine landslide) could cause major environmental effects. The proponent will therefore conduct an analysis of the risks of accidents and malfunctions, determine their effects, and present preliminary emergency response measures.	Chapter 15
Taking into account the lifespan of different project components, the proponent will identify the probability of potential accidents and malfunctions related to the project, including an explanation of how those events were identified, potential consequences (including the environmental effects as defined in section 5 of CEAA 2012), the plausible worst case scenarios and the effects of these scenarios.	Chapter 15
This assessment will include an identification of the magnitude of an accident and/or malfunction, including the quantity, mechanism, rate, form and characteristics of the contaminants and other materials likely to be released into the environment during the accident and malfunction events and would potentially result in an adverse environmental effect as defined in section 5 of CEAA 2012.	Chapter 15
The EIS will describe the safeguards that have been established to protect against such occurrences and the contingency and emergency response procedures that would be put in place if such events do occur.	Sections 15.1 and 15.3
The effects of accidental spills and blowouts will therefore require assessment in the EIS, including fate and xxxviiehavior modelling, and hydrologic trajectory modelling for worst-case large-scale spill scenarios that may occur, including any assumptions, limitations, and formulated hypotheses, accompanied by supporting documentation of methodologies and the cumulative results of the modelling.	Sections 15.4 and 15.5; Appendix D

EIS Guidelines	EIS Reference
Results should be reported in a manner that illustrates the effects of varying weather and oceanographic conditions that may occur throughout the year, and should include a projection for spills originating at the site and followed until the slick volume is reduced to a negligible amount or until a shoreline is reached. Spill scenarios should also consider potential worst–cases, including when species at risk and high concentrations of marine birds or fish are present or for areas important for reproduction. A discussion on water depth and its effect on blow-out rate and spill trajectory modelling assumptions must be provided. Where well locations have not yet been identified, points of origin selected for spill trajectory models should be conservative (e.g. selecting a potential location within the proposed drilling area that is closest to a sensitive feature or that could result in greatest effects).	Sections 15.4 and 15.5; Appendix D
Based on the results of the spill modelling and analysis in the EIS, an emergency response plan (e.g. oil spill contingency plan) for spills (small and large) and blowouts will be required. At a minimum, an outline of the emergency response plan along with key commitments is required in the EIS. Depending on the outcomes of the effects analysis, specific detail on key components of the plan will be required in the EIS. The proponent should commit to finalizing the plan in consultation with regulators prior to the application of permits. The EIS shall include a discussion on the use, availability (including nearest location), timing (testing and mobilizing) and feasibility of a capping stack to stop a blowout and resultant spills. If dispersants are to be used, the proponent shall consider associated environmental effects in the EIS (e.g. effects on marine life) and provide a plan for their use. The environmental effects of other measures outlined in the emergency response plan should also be considered (e.g. effects from burns). The EIS shall include the means by which design and/or operational procedures, including follow-up measures, will be implemented to mitigate significant adverse effects from malfunctions and/or accidental events.	Sections 15.3 and 15.5
The potential to encounter shallow gas pockets, and associated implications, should also be discussed.	Sections 2.2 and 15.2
The EIS should also consider effects of accidents in the near-shore environment (e.g. spills and ship groundings, as applicable) and of spills reaching shore; including effects on species at risk and their critical habitat, colonial nesters and concentrations of birds, and their habitat. The proponent will also demonstrate what long-term actions it would be prepared to undertake to remediate spill-affected lands and waters.	Sections 15.2 and 15.5
The EIS should include a summarization of the nature, extent and magnitude of spills, and accidental releases related to existing production installations and past exploration drilling programs in the Newfoundland and Labrador offshore. Comparisons with similar settings (e.g. in the Ormen Lange field in Norway and elsewhere) would also be meaningful for deep water drilling where there is very low probability but very high consequences associated with landsliding.	Sections 15.2 and 16.10
6.6.2. Effects of the environment on the project	
The EIS will take into account how local conditions and natural hazards, such as severe and/or extreme weather conditions and external events (e.g. icebergs, seismic events, and submarine landslide potential), could adversely affect the project and how this in turn could result in effects to the environment (e.g. extreme environmental conditions result in malfunctions and accidental events) with consideration of predicted climate change effects. These events will be considered in different probability patterns (e.g. 5- year event vs. 100-year event).	Section 16.1
The EIS will provide details of planning, design and construction strategies intended to minimize the potential environmental effects of the environment on the project.	Section 16.2

EIS Guidelines	EIS Reference
6.6.3. Cumulative effects assessment	
The proponent will identify and assess the project's cumulative effects using the approach described in the Agency's Operational Policy Statement entitled Addressing Cumulative Environmental Effects under the Canadian Environmental Assessment Act, 2012 and the guide entitled Technical Guidance for Assessing Cumulative Environmental Effects under the Canadian Environmental Assessment Act, 2012.	Chapter 14
In its EIS, the proponent will: – Identify and provide a rationale for the VCs that will constitute the focus of the cumulative effects assessment, focussing the cumulative effects assessment on the VCs most likely to be affected by the project and other project and activities. To this end, the proponent must consider, without limiting itself thereto, the following components likely to be affected by the project:	Chapter 14
- fish and fish habitat, - migratory birds, - marine mammals and marine turtles, - species at risk, - marine plants, - special areas, - commercial fisheries, - Indigenous peoples, - air quality and greenhouse gases, and - human environment.	
• Identify and justify the spatial and temporal boundaries for the cumulative effect assessment for each VC selected. The boundaries for the cumulative effects assessments will generally be different for each VC considered. These cumulative effects boundaries will also generally be larger than the boundaries for the corresponding project effects.	Section 14.1.2
• Identify the sources of potential cumulative effects. Specify other projects or activities that have been or that are likely to be carried out that could cause effects on each selected VC within the boundaries defined, and whose effects would act in combination with the residual effects of the project. This assessment may consider the results of any relevant study conducted by a committee established under section 73 or 74 of CEAA 2012.	Section 14.1.3
• Assess the cumulative effects on each VC selected by comparing the future scenario with the project and without the project. Effects of past activities (activities that have been carried out) will be used to contextualize the current state of the VC. In assessing the cumulative effects on current use of lands and resources for traditional purposes, the assessment will focus on the cumulative effects on the relevant activity (e.g. fishing).	Sections 14.1.4, 14.2, 14.3, 14.4, 14.5, 14.6, and 14.7
• Describe the mitigation measures that are technically and economically feasible. The proponent shall assess the effectiveness of the measures applied to mitigate the cumulative effects. In cases where measures exist that are beyond the scope of the proponent's responsibility that could be effectively applied to mitigate these effects, the proponent will identify these effects and the parties that have the authority to act. In such cases, the EIS will summarize the discussions that took place with the other parties in order to implement the necessary measures over the long term.	Section 14.8

EIS Guidelines	EIS Reference
• Determine the significance of the cumulative effects; and	Sections 14.2.6, 14.3.6, 14.4.6, 14.5.5, 14.6.5, and 14.7.5
• Develop a follow-up program to verify the accuracy of the assessment or to dispel any uncertainty concerning the effectiveness of mitigation measures for certain cumulative effects.	Section 14.8
The proponent is encouraged to consult with key stakeholders and Indigenous groups prior to finalizing the choice of VCs and the appropriate boundaries to assess cumulative effects.	Chapter 3
7. SUMMARY OF ENVIRONMENTAL EFFECTS ASSESSMENT	
The EIS will contain a table summarizing the following key information:	
• potential environmental effects on valued components;	Chapter 17; Section 18.1
• proposed mitigation measures to address the effects identified above; and	Section 18.2
• potential residual effects and the significance of the residual environmental effects.	Section 18.3
The summary table will be used in the EA Report prepared by the Agency. An example of a format for the key summary table is provided in Appendix 1 of this [EIS Guidelines] document.	Sections 18.1 and 18.3
In a second table, the EIS will summarize all key mitigation measures and commitments made by the proponent which will more specifically mitigate any significant adverse effects of the project on VCs (i.e. those measures that are essential to ensure that the project will not result in significant adverse environmental effects).	Section 18.2
8. FOLLOW-UP AND MONITORING PROGRAMS	
A follow-up program is designed to verify the accuracy of the effects assessment and to determine the effectiveness of the measures implemented to mitigate the adverse effects of the project. Considerations for developing a follow-up program include: • whether the project will impact environmentally sensitive areas/VCs or protected areas or areas under consideration for protection; • the nature of Indigenous and public concerns raised about the project; • the accuracy of predictions; • whether there is a question about the effectiveness of mitigation measures or the proponent proposes to use new or unproven techniques and technology; • the nature of cumulative environmental effects; • the nature, scale, and complexity of the program; and • whether there was limited scientific knowledge about the effects in the EA.	Sections 8.5, 9.5, 10.5, 11.5, 12.5, 13.4, 14.8, and 18.2

EIS Guidelines	EIS Reference
8.1. Follow-up program	
The EIS shall present a preliminary follow-up program and shall include: • objectives of the follow-up program and the VCs targeted by the program; • list of elements requiring follow-up; • number of follow-up studies planned as well as their main characteristics (list of parameters to be measured, planned implementation timetable, etc.); • intervention mechanism used in the event that an unexpected deterioration of the environment is observed; • mechanism to disseminate follow-up results among the concerned populations; • accessibility and sharing of data for the general population; • opportunity for the proponent to include the participation of Indigenous groups and stakeholders on the affected territory, during the development and implementation of the program; and • involvement of local and regional organizations in the design, implementation and evaluation of the follow-up results as well as any updates, including a communication mechanism between these organizations and the proponent.	Chapters 8-14; Section 18.2
The discussion / description of follow-up and monitoring programs relative to the currently proposed drilling program should include a short summary of the design and results/outcomes of monitoring programs that have been undertaken for previously assessed and/or completed offshore exploration drilling programs in similar environments and how these will be factored into the verification of impact predictions and design of the follow up and monitoring for the current exploration drilling program.	Sections 8.3.3 and 18.2
8.2. Monitoring	
The proponent will prepare an environmental monitoring program for all phases of the project.	Chapters 8-14; Section 18.2; details will be provided in the Environmental Protection Plan (EPP)
Specifically, the environmental impact statement shall present an outline of the preliminary environmental monitoring program, including the: • identification of the interventions that pose risks to one or more of the environmental and/or valued components and the measures and means planned to protect the environment;	Chapters 8-14; Section 18.2; details will be provided in the EPP
• identification of regulatory instruments that include a monitoring program requirement for the valued components;	Chapters 8-14; Section 18.2; details will be provided in the EPP
• description of the characteristics of the monitoring program where foreseeable (e.g. location of interventions, planned protocols, list of measured parameters, analytical methods employed, schedule, human and financial resources required);	Chapters 8-14; Section 18.2; details will be provided in the EPP

EIS Guidelines	EIS Reference
• description of the proponent's intervention mechanisms in the event of the observation of non-compliance with the legal and environmental requirements or with the obligations imposed on contractors by the environmental provisions of their contracts;	Chapters 3 and 8-14; Section 18.2; details will be provided in the EPP
• guidelines for preparing monitoring reports (number, content, frequency, format) that will be sent to the authorities concerned; and	Chapters 8-14; Section 18.2; details will be provided in the EPP
• plans to engage Indigenous groups in monitoring, where appropriate.	Chapters 8-14; Section 18.2; details will be provided in the EPP

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Abbreviations

Accord Acts	*Canada-Newfoundland and Labrador Atlantic Accord Implementation Act* and the *Canada-Newfoundland and Labrador Atlantic Accord Implementation Newfoundland and Labrador Act*
ACSS	Atlantic Canada Shorebird Survey
ADW	Approval to Drill a Well
Agency	Canadian Environmental Assessment Agency
AMO	Atlantic Multidecadel Oscillation
AP	Alkylphenols
API	American Petroleum Institute
asl	above sea level
BAOAC	Bonn Agreement Oil Appearance Code
bbl	barrel
BIO	Bedford Institute of Oceanography
BOP	blowout preventer
BP	BP Canada Energy Group ULC
CAC	criteria air contaminant
CAPP	Canadian Association of Petroleum Producers
CEA	cumulative effects assessment
CEAR	Canadian Environmental Assessment Registry
CEAA 2012	*Canadian Environmental Assessment Act, 2012*
CEPA	*Canadian Environmental Protection Act, 1999*
CFSR	Climate Forecast System Reanalysis
CGFZ	Charlie-Gibbs Fracture Zone
C-NLOPB	Canada-Newfoundland and Labrador Offshore Petroleum Board
CMA	Crab Management Area
CNSOPB	Canada-Nova Scotia Offshore Petroleum Board
CO	carbon monoxide
CO_2	carbon dioxide
CO_2 eq	carbon dioxide equivalent
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CRA	commercial, recreational, and Aboriginal
CWS	Canadian Wildlife Service
dB	decibel

DFO	Fisheries and Oceans Canada
DP	dynamic positioning
DTOC	Discontinuous true oil colour
EA	environmental assessment
EBSA	Ecologically and Biologically Significant Area
ECCC	Environment and Climate Change Canada
ECSAS	Eastern Canadian Seabirds at Sea program
EEZ	Economic Exclusion Zone
EIS	Environmental Impact Statement
EL	exploration licence
EPP	Environmental Protection Plan
ERP	Emergency Response Plan
ESRF	Environmental Studies Research Fund
FAO	Food and Agriculture Association
FPSO	floating production, storage and offloading [facility]
FSC	food, social and ceremonial
GBR	geohazard baseline review
GHG	greenhouse gas
ha	hectare(s)
IAIA	International Association for Impact Assessment
IBA	Important Bird Area
ICOADS	International Comprehensive Ocean-Atmosphere Data Set
ICS	Incident Command System
IIP	International Ice Patrol
IMA	Integrated Management Area
IMO	International Maritime Organization
IMP	Incident Management Plan
in^3	cubic inch
IOGP	International Association of Oil and Gas Producers
IPCC	Intergovernmental Panel on Climate Change
IPIECA	International Petroleum Industry Environmental Conservation Association
IUCN	International Union for the Conservation of Nature
IWC	International Whaling Commission
km	kilometer(s)
LAA	Local Assessment Area
MARPOL	*International Convention for the Prevention of Pollution from Ships*
MBCA	*Migratory Birds Convention Act, 1994*

MBS	Migratory Bird Sanctuary
MGS	mud gas separator
MMO	marine mammal observer
MODU	mobile offshore drilling unit
MPA	Marine Protected Area
MTD	mass transport deposits
NAFO	Northwest Atlantic Fisheries Organization
NAO	North Atlantic Oscillation
NEB	National Energy Board
NL	Newfoundland and Labrador
NL ESA	Newfoundland and Labrador *Endangered Species Act*
nm	nautical mile
NMFS	National Marine Fisheries Service
NO_2	nitrogen dioxide
NO_X	nitrogen oxides
NOAA	National Oceanic and Atmospheric Administration
NOEC	no observed effect concentration
NPA	*Navigation Protection Act*
NPRI	National Pollutant Release Inventory
NRA	NAFO's Regulatory Area
NRCan	Natural Resources Canada
NS	Nova Scotia
OA	Operations Authorization
OCNS	Offshore Chemical Notification Scheme
OCSG	Offshore Chemical Selection Guidelines for Drilling and Production Activities on Frontier Lands
OEM	original equipment manufacturer
OLF	Norwegian Oil Industry Association
OMS	Operating Management System
OPS	Operational Policy Statement
OSCAR	Oil Spill Contingency and Response
OSRL	Oil Spill Response Limited
OWTG	Offshore Waste Treatment Guidelines
PA	Project Area
PAH	Polycyclic Aromatic Hydrocarbon
PB / GB	Placentia Bay / Grand Banks
PCA	Parks Canada Agency

PCB	Polychlorinated Biphenyl
PLONOR	pose little or no risk
PIROP	Programme intégré de recherches sur les oiseaux pélagiques
PM	particulate matter
$PM_{2.5}$	particulate matter less than 2.5 microns
PM_{10}	particulate matter less than 10 microns
The Project	Newfoundland Orphan Basin Exploration Drilling Program
psi	pounds per square inch
PSV	platform supply vessel
PTS	permanent threshold shift
RAA	Regional Assessment Area
rms	root-mean-square
ROV	remotely operated vehicle
SAR	species at risk
SARA	*Species at Risk Act*
SBM	synthetic-based [drilling] mud
SCAT	Shoreline Clean-up Assessment Technique
SEA	Strategic Environmental Assessment
SEL	sound exposure level
SFA	Shrimp Fishing Area
SO_2	sulphur dioxide
SO_X	sulphur oxides
SOCC	species of conservation concern
SOCP	Statement of Canadian Practice with respect to the Mitigation of Seismic Sound in the Marine Environment
SPL	sound pressure level
SRP	Spill Response Plan
SSDI	subsea dispersant injection
SWIS	Subsea Well Intervention Services
TAC	total allowable catch
TD	total depth
Technical Guidance Document	Technical Guidance for Assessing Cumulative Environmental Effects under the *Canadian Environmental Assessment Act, 2012*
THC	total hydrocarbons
TL	transmission loss
TPAH	total polycyclic aromatic hydrocarbons
TTS	temporary threshold shift

TPM	total particulate matter
UK	United Kingdom
UNESCO	United Nations Educational, Scientific and Cultural Organization
US EPA	US Environmental Protection Agency
UXO	unexploded ordinance
VC	Valued Component
VME	Vulnerable Marine Ecosystem
VOC	volatile organic compound
VSP	vertical seismic profiling
WBM	water-based [drilling] mud
WG-EAFM	Working Group on Ecosystem Approaches to Fisheries Management

1.0 INTRODUCTION

BP Canada Energy Group ULC (BP Canada Energy Group ULC and/or any of its affiliates are hereafter generally referred to as "BP") proposes to conduct exploration drilling activities within the areas of its existing offshore exploration licences (ELs) in the Orphan Basin, between approximately 343 and 496 kilometres (km) northeast of St. John's, Newfoundland and Labrador, in the Northwest Atlantic Ocean. The Newfoundland Orphan Basin Exploration Drilling Program (the Project) may involve drilling up to 20 exploration wells with an initial well proposed to be drilled in 2020 pending regulatory approval.

BP was awarded exploration rights to ELs 1145, 1146, 1148, with its co-venturers Noble Energy Canada ULC and Hess Canada Oil and Gas ULC, and EL 1149 with co-venturer Noble Energy Canada ULC (Table 1.1; Figure 1.1) by the Canada-Newfoundland and Labrador Offshore Petroleum Board (C-NLOPB) in 2016. The term of these ELs extends from January 15, 2017 to January 15, 2026, with the first term ending January 15, 2023. BP will serve as the operator for the exploration drilling program.

Table 1.1 Licence Size and Interest

EL	Size	Interest
1145	233,654 ha	BP Canada Energy Group ULC (50%) Hess Canada Oil and Gas ULC (25%) Noble Energy Canada ULC (25%)
1146	192,807 ha	BP Canada Energy Group ULC (50%) Hess Canada Oil and Gas ULC (25%) Noble Energy Canada ULC (25%)
1148	252,482 ha	BP Canada Energy Group ULC (50%) Hess Canada Oil and Gas ULC (25%) Noble Energy Canada ULC (25%)
1149	264,249 ha	BP Canada Energy Group ULC (60%) Noble Energy Canada ULC (40%)

Offshore exploration drilling, under certain circumstances, is a designated activity under the *Canadian Environmental Assessment Act, 2012* (CEAA 2012). On March 5, 2018, the Canadian Environmental Assessment Agency (the Agency) determined that a federal environmental assessment (EA) process is required for the Newfoundland Orphan Basin Exploration Drilling Program pursuant to CEAA 2012 and published project-specific guidelines for the preparation of an Environmental Impact Statement (EIS) (Agency 2018).

This EIS document has been prepared to satisfy project-specific EIS Guidelines (Agency 2018) and is also intended to fulfill EA requirements of the C-NLOPB pursuant to the *Canada-Newfoundland and Labrador Atlantic Accord Implementation Act* and the *Canada-Newfoundland and Labrador Atlantic Accord Implementation Newfoundland and Labrador Act* (collectively referred to as the "Accord Acts").

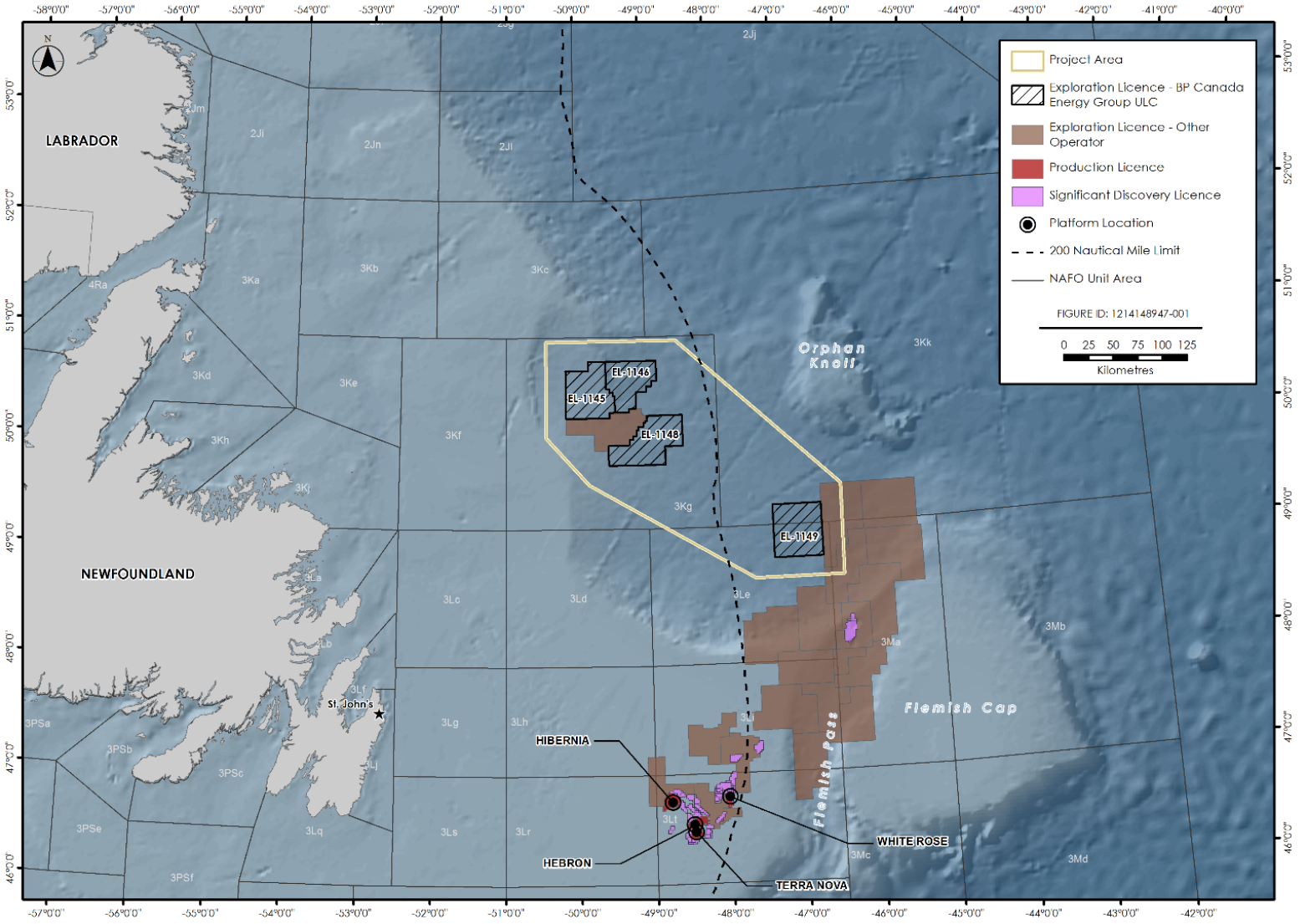

Figure 1.1 Project Location

1.1 Project Overview

BP proposes to drill up to 20 exploration wells on ELs 1145, 1146, 1148, and 1149 during the term of the ELs. The ELs are located in the Grand Banks Region, with ELs 1145, 1146, and 1148 located in the West Orphan Basin within Canada's 200 nautical mile (nm) Exclusive Economic Zone (EEZ), and EL 1149 located in the East Orphan Basin, beyond the EEZ. Water depths in these ELs range from approximately 1,000 to 3,000 m. Specific wellsite locations are not yet known but drilling operations will be conducted within the defined boundaries of ELs 1145, 1146, 1148, and/or 1149.

Wells will be drilled using either a semi-submersible rig or a drillship, referred to generically as a mobile offshore drilling unit (MODU). It is possible that the same MODU may not be used for drilling all wells in the drilling program. At this time, it is anticipated that exploration drilling will be carried out in multiple phases so that initial well results can be analyzed to inform the execution strategy for subsequent wells.

Logistics support will be provided through a fleet of platform supply vessels (PSVs) and helicopters. Existing shore-based facilities in Eastern Newfoundland will be used for supply, support and logistical functions. Onshore activities at existing shore-based facilities (e.g., supply base) are not included in the scope of this EIS.

1.2 Scope of the Environmental Impact Statement

The Newfoundland Orphan Basin Exploration Drilling Program (the Project) that is assessed within the scope of the Environmental Impact Statement (EIS), in accordance with the EIS Guidelines (Appendix A) includes:

- MODU mobilization and drilling
  - mobilization, operation and demobilization of the MODU
  - establishment of a safety zone
  - light and sound emissions associated with MODU presence and operation
  - waste and water management, including discharge of drill muds and cuttings, and other discharges and emissions
- Vertical seismic profiling (VSP) operations
- Well evaluation and testing
- Well decommissioning, suspension and abandonment
- Supply and servicing
  - loading, refueling and operation of PSVs (for re-supply and transfer of materials, fuel and equipment; on-site safety during drilling activities; and transit between the supply base and the MODU)
  - helicopter support (for crew transport and delivery of supplies and equipment)

Some other components or activities which are not included within the scope of the EIS Guidelines may be described where necessary in relevant chapters for broader context. The exact well locations have not yet been finalized; however, these will be confirmed as part of the regulatory approval process for each well in the program as described in detail in Section 1.5.1.

The EIS is defined by spatial boundaries to adequately consider potential adverse environmental effects from the Project. The Project Area encompasses the immediate area in which Project activities and components may occur, including direct physical disturbance to the marine benthic environment (ELs 1145, 1146, 1148, and 1149) plus a 20-km buffer (Figure 1.1). Based on discussion with the Canadian Environmental Assessment Agency (the Agency), one Project Area was identified that encompassed both the West Orphan Basin (ELs 1145, 1146, and 1148) and East Orphan Basin (EL 1149). This will accommodate transit of PSVs between the west and east areas. A Local Assessment Area (LAA) and Regional Assessment Area (RAA) have also been defined to assess potential environmental effects which may occur beyond the Project Area. Section 4 of this EIS provides additional information on spatial boundaries used to evaluate potential environmental effects from the Project.

The planned temporal scope of the Project covers the term of the ELs (2017 to 2026) during which time planned Project activities (including well drilling, testing, abandonment, and associated activities) may occur. The EIS assumes that planned Project activities may occur year-round within this timeframe, although BP's preference is to conduct drilling between May and October.

A more detailed description of the Project, including its overall need, purpose and justification, location, key components and activities, schedule, potential emissions and their management, Project alternatives, and overall environmental planning and management systems, is provided in Chapter 2.

1.3 Proponent Information

BP is a global energy company, operating in over 70 countries around the world, with well-established operations in Europe, North and South America, Australasia, Asia, and Africa. BP has decades of experience managing the extraction of oil and natural gas in all types of environments around the world, both onshore and offshore. In Canada, BP focuses on developing energy from Canada's oil sands and is also pursuing offshore opportunities in Newfoundland and Labrador and Nova Scotia.

This proposed exploratory program in the Orphan Basin is consistent with BP's strategic priorities. BP also holds interests in various licences in the Flemish Pass and Jeanne d'Arc Basins.

BP has established an office in Halifax, Nova Scotia, to oversee its planned deep-water exploration drilling program offshore Nova Scotia. BP intends to establish a physical presence in St. John's, Newfoundland in 2019 ahead of the proposed Newfoundland and Labrador drilling program. Preliminary planning is being conducted by BP staff based primarily in Halifax, with technical resources drawn from BP's Canadian headquarters in Calgary, Alberta, and BP's global operations in the United Kingdom and Houston, Texas.

The overall Project will be managed by BP through a multidisciplinary Project Team based on a functional model to provide technical and management expertise to the Project. The Team will include members of BP's Global Wells Organization who are responsible for delivering a consistent and standardized approach to the safe delivery of wells-related activity across the company. The Project Team will also include professionals responsible for health, safety, environment and emergency response management. More information on Project personnel is provided in Section 2.6.

1.3.1 Proponent Contact Information

All communications regarding the environmental assessment for the Project should be directed to the following contacts:

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Halifax, NS B3J 3M8

1.3.2 How BP Operates

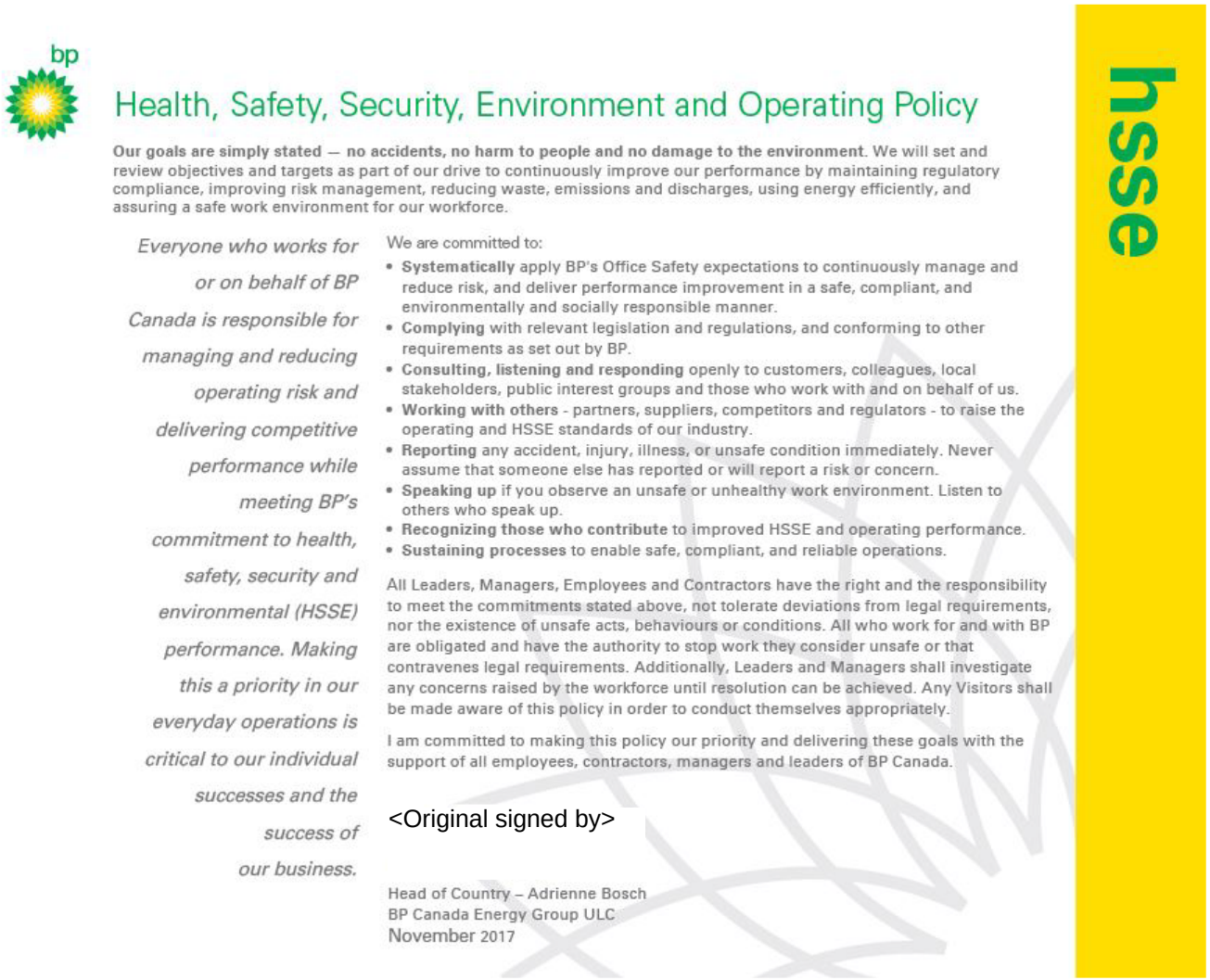
BP is dedicated to maintaining values of Safety, Respect, Excellence, Courage and One Team, upholding these values internally and externally in the areas it operates. Figure 1.2 summarizes BP's values.

BP's health, safety, security, and environment (HSSE) goals are: no accidents, no harm to people, and no damage to the environment (Figure 1.3). Safety is at the heart of everything BP does as a company, driven by leadership and applied across all operations through BP's Operating Management System (OMS) framework. Everyone who works for BP is responsible for their safety and the safety of colleagues, partners, suppliers, and local communities.

The BP Code of Conduct sets out the standards of behaviour and working in line with BP's values, defines how to work at a group, team and individual level within the company. With clear and concise content setting out the principles and expectations on topics such as equal opportunities, human rights and conflicts of interest, it helps BP's workforce to operate in line with BP's values and maintain the company's commitment to high ethical standards throughout its activities and operations. The BP Code of Conduct applies to all BP employees, officers and members of the Board, and BP expects and encourages all contractors and their employees to act in a way that is consistent with the BP Code of Conduct.

The OMS is a framework that brings together BP's global operating principles. It includes requirements for HSSE management, social responsibility and operational reliability, as well as requirements for other operational aspects, for example, maintenance requirements, contractor relations and organizational learning. More information about BP's OMS is provided in Section 2.10.1.

Figure 1.2 BP Values



bp

Health, Safety, Security, Environment and Operating Policy

Our goals are simply stated — no accidents, no harm to people and no damage to the environment. We will set and review objectives and targets as part of our drive to continuously improve our performance by maintaining regulatory compliance, improving risk management, reducing waste, emissions and discharges, using energy efficiently, and assuring a safe work environment for our workforce.

Everyone who works for or on behalf of BP Canada is responsible for managing and reducing operating risk and delivering competitive performance while meeting BP's commitment to health, safety, security and environmental (HSSE) performance. Making this a priority in our everyday operations is critical to our individual successes and the success of our business.

We are committed to:

- **Systematically** apply BP's Office Safety expectations to continuously manage and reduce risk, and deliver performance improvement in a safe, compliant, and environmentally and socially responsible manner.
- **Complying** with relevant legislation and regulations, and conforming to other requirements as set out by BP.
- **Consulting, listening and responding** openly to customers, colleagues, local stakeholders, public interest groups and those who work with and on behalf of us.
- **Working with others** - partners, suppliers, competitors and regulators - to raise the operating and HSSE standards of our industry.
- **Reporting** any accident, injury, illness, or unsafe condition immediately. Never assume that someone else has reported or will report a risk or concern.
- **Speaking up** if you observe an unsafe or unhealthy work environment. Listen to others who speak up.
- **Recognizing those who contribute** to improved HSSE and operating performance.
- **Sustaining processes** to enable safe, compliant, and reliable operations.

All Leaders, Managers, Employees and Contractors have the right and the responsibility to meet the commitments stated above, not tolerate deviations from legal requirements, nor the existence of unsafe acts, behaviours or conditions. All who work for and with BP are obligated and have the authority to stop work they consider unsafe or that contravenes legal requirements. Additionally, Leaders and Managers shall investigate any concerns raised by the workforce until resolution can be achieved. Any Visitors shall be made aware of this policy in order to conduct themselves appropriately.

I am committed to making this policy our priority and delivering these goals with the support of all employees, contractors, managers and leaders of BP Canada.

<Original signed by>

Head of Country – Adrienne Bosch
BP Canada Energy Group ULC
November 2017

hsse

Figure 1.3 BP's HSSE Policy

1.3.3 EIS Team

This EIS was prepared leveraging BP's global expertise in exploration drilling with Stantec Consulting Ltd.'s (Stantec) extensive experience conducting environmental assessments in Newfoundland and Labrador, Canada and internationally.

BP's in-house scientists and engineers contributed special expertise with respect to well design and operations, drilling wastes and discharges (including drill waste and oil spill modelling), underwater sound and marine life, regulatory compliance, spill contingency and response, and communications.

Stantec provided overall project management for the EIS and was responsible for general writing and providing expertise with respect to marine fish and fish habitat, Indigenous peoples and community values, and commercial fisheries and other ocean users. In addition, the following consultants provided key expertise in support of EIS preparation:

- Jay Hartling Consulting Limited (Indigenous expertise)
- LGL Limited (marine mammal and sea turtle and marine and migratory birds support)
- Oceans Ltd (physical environment support)
- JASCO Applied Sciences (underwater sound support)

1.4 Benefits of the Project

The Project is predicted to result in several economic, social, and technological benefits realized on local (e.g., Newfoundland and Labrador), regional (e.g., Atlantic Canadian provinces), and national scales. The following describes some of the predicted benefits the Project may generate.

1.4.1 Energy Diversification and Sustainability

Although there is greater attention around the world on using energy more sustainably, energy demand is forecasted to continue to grow with global energy consumption predicted to increase at least one-third by 2040 (BP 2018a). BP recognizes the energy transition underway poses a significant challenge – how to meet the world's increasing demand for energy while, at the same time, reducing carbon emissions. New technologies and consumer preferences for low carbon energy are leading to changes in the fuel mix, resulting in a gradual decarbonization. Nevertheless, oil and natural gas are expected to continue to play a significant part in meeting the growing demand for affordable energy and hydrocarbon feedstocks for several decades (BP 2017). BP strives to reduce greenhouse gas emissions in its operations while supplying the affordable energy the world needs.

Exploration is a critical activity to enable continued oil and gas discoveries to maintain production to meet global demand for oil and gas and maintain diversification of Canada's energy reserves. The ELs in the West and East Orphan Basins present potentially significant geological formations and hydrocarbon reserves and allow BP to continue to diversify its portfolio of projects.

1.4.2 Economic Benefits

The *Memorandum of Agreement between the Government of Canada and the Government of Newfoundland and Labrador on Offshore Oil and Gas Resource Management and Revenue Sharing* (The Atlantic Accord) promotes the development of petroleum resources in the offshore area of Newfoundland and Labrador "for the benefit of Canada as a whole and Newfoundland and Labrador in particular" and recognizes Newfoundland and Labrador as "the principal beneficiary of the oil and gas resources off its shores". Since production began in 1997, over $19 billion in offshore royalties have been paid to the Government of Newfoundland and Labrador from three development projects – Hibernia, Terra Nova, and White Rose (Canadian Association of Petroleum Producers [CAPP] 2016; Government of Newfoundland and Labrador 2018a). A fourth development project, Hebron, began producing oil in 2017. Royalty and tax payments help pay for hospitals, roads, schools and social programs in the province (CAPP 2016).

The province's offshore oil and gas resource represents a significant opportunity for jobs and growth in the industry within Newfoundland and Labrador. The oil and gas industry (including support activities) is the largest contributor to gross domestic product (GDP) in Newfoundland and Labrador, accounting for approximately 16.7% of the province's nominal GDP in 2015 (Government of Newfoundland and Labrador 2017). Although the vast majority of economic benefits comes from development projects, exploration drilling activities, such as those proposed for the Project, are required to identify potential for commercial development. Increased exploration drilling is considered an immediate priority by the Province in order to sustain oil and gas industry growth and development (Government of Newfoundland and Labrador 2018a). With an objective of doubling oil and gas production in Newfoundland and Labrador, the Province has set a number of long-term targets including the drilling of over 100 new exploration wells by 2030 (Government of Newfoundland and Labrador 2018b).

1.4.3 Industrial Benefits

BP is committed to investing in the areas where BP operates. The Project will contribute to the Newfoundland and Labrador economy through the procurement of equipment and services, referred to as industrial benefits. In 2016, BP committed to a total exploration expenditure of $425,805,000 as part of its successful bid for the ELs in the Eastern Newfoundland Region. The qualified work expenditures are associated with exploration activity in the ELs over the initial six-year period of the nine-year EL. This exploration expenditure will contribute, in part, industrial benefits to the Newfoundland and Labrador economy. BP is committed to incorporating processes and procedures for Newfoundland and Labrador and Canadian businesses, manufacturers, consultants, contractors and service companies to receive a full and fair opportunity to provide goods and services to the program on a competitive basis.

1.4.4 Employment Benefits

It is likely that there will be some employment opportunities associated with the Project, not only through direct hire with BP but also through consultants, contractor and service companies to be procured for the Project. These opportunities will be communicated to local and regional audiences, using methods such as local media. Where BP employment opportunities are identified, all hiring will be carried out according to

BP's Code of Conduct and include a transparent hiring process. First consideration will be given to residents of Newfoundland and Labrador and Canada, as a whole, where they have the appropriate competencies.

BP has offices in Calgary, AB and Halifax, NS, and plans to open a local office in St. John's, NL, in advance of drilling operations commencing. The office will be staffed with management and administrative support staff. During planning and operations, technical staff directly working on the Project will also work in the St. John's office. BP recognizes the importance of having a local presence and location known to stakeholders, Indigenous groups, and local businesses.

1.4.5 Community Investment

BP's community investment strategy is to invest in people and programs that pursue sustainable and long-lasting progress. BP seeks to work closely with partner organizations so that BP can play an active, dedicated role in the communities we operate within.

The BP community investment program's main focus areas are:

- education
- environment
- economic development

As planning progresses for the Project, BP will seek local community investment opportunities that align with these areas of focus in the province of Newfoundland and Labrador.

1.4.6 Benefits Plan

In accordance with section 45 of the Accord Act, BP, as operator, will submit a Benefits Plan for approval to the C-NLOPB. BP is required to have an approved Benefits Plan prior to the approval or authorization of any work or activity in the Newfoundland and Labrador offshore area (refer to Section 1.5.1). This plan will document BP's commitment to providing industrial benefits and employment opportunities on a full and fair basis for residents of Canada, and in particular, Newfoundland and Labrador that arise from Project activities. It will also address how BP will develop and implement an education, training, research and development expenditure program in Newfoundland and Labrador. The Benefits Plan will also describe the consultative, monitoring and reporting procedures that BP intends to establish to help achieve these commitments.

1.4.7 Knowledge Benefits

In addition to the economic and associated community and social benefits described above, the Project is likely to contribute to technological and scientific knowledge sharing and advancement in Newfoundland and Labrador and Canada.

This Project will involve deep-water drilling activities, with water depths in BP's ELs extending to nearly 3,000 m. BP has deep-water drilling interests in a number of locations around the globe and can offer a wealth of experience in deep-water operations and technology. The Scotian Basin Exploration Project,

which commenced drilling operations on an initial well in 2,771 m water depth offshore Nova Scotia in April 2018, will also add experience and learnings which can be incorporated into the planning of the Newfoundland Orphan Basin Exploration Drilling Program.

During Project operations, BP will submit reports to the C-NLOPB on environmental and operational performance which will also contribute to the understanding of environmental conditions and deep-water drilling operations offshore Newfoundland and Labrador.

1.5 Regulatory Framework and the Role of Government

The Project will require approvals and authorizations under applicable regulatory processes as discussed in the following subsections.

1.5.1 Offshore Regulatory Framework

Petroleum activities in the Newfoundland and Labrador offshore area are regulated by the C-NLOPB, a joint federal-provincial agency reporting to the federal and provincial Ministers of Natural Resources. In 1986, the Government of Canada and the Province of Newfoundland and Labrador signed the Canada-Newfoundland and Labrador Offshore Petroleum Resource Accord to promote social and economic benefits associated with petroleum exploitation. The federal and provincial governments established mirror legislation to implement the Accord. The *Canada-Newfoundland and Labrador Atlantic Accord Implementation Act* and the *Canada-Newfoundland and Labrador Atlantic Accord Implementation Newfoundland and Labrador Act* are collectively referred to as the Accord Acts.

Under the Accord Acts, the C-NLOPB issues licences for offshore exploration (and development) and is responsible for the management and conservation of offshore petroleum resources, and protection of the environment, as well as the health and safety of offshore workers, while enhancing employment and industrial benefits for Newfoundland and Labrador residents and Canadians.

Offshore petroleum activities and the C-NLOPB's decision-making processes are governed by a variety of legislation, regulations, guidelines, and memoranda of understanding. Exploration drilling programs require an Operations Authorization (OA) under the Accord Acts. Prior to issuing an OA, the C-NLOPB requires the following to be submitted:

- An Environmental Assessment Report
- A Canada-Newfoundland and Labrador Benefits Plan
- A Safety Plan
- An Environmental Protection Plan (including a waste management plan)
- Emergency Response and Spill Contingency Plans
- Appropriate financial security
- Appropriate certificates of fitness for the equipment proposed for use in the activities

For each well in the drilling program, a separate Approval to Drill a Well (ADW) is required. This authorization process involves specific details about the drilling program and well design.

There are several regulations under the Accord Acts that govern specific exploration or development activities. There are also various guidelines, some of which have been jointly developed with the C-NLOPB, Canada-Nova Scotia Offshore Petroleum Board (CNSOPB) and National Energy Board (NEB), which are intended to address environmental, health, safety, and economic aspects of offshore petroleum exploration and development activities. Of particular relevance to the environmental assessment (EA) of this Project are the *Drilling and Production Guidelines* (C-NLOPB and CNSOPB 2017a), the Offshore Waste Treatment Guidelines (OWTG) (NEB et al. 2010) and the *Offshore Chemical Selection Guidelines for Drilling and Production Activities on Frontier Lands* (OCSG) (NEB et al. 2009). Key relevant regulations and guidelines that fall under the jurisdiction of the C-NLOPB are summarized in Table 1.2. This list is intended to be indicative of requirements relevant to this EIS and program planning, but is not intended to represent an exhaustive list of all legal and regulatory requirements.

1.5.2 Environmental Assessment Requirements

Offshore exploration drilling, under certain circumstances, is a designated physical activity subject to the requirements of the *Canadian Environmental Assessment Act, 2012* (CEAA 2012). Section 10 of the *Regulations Designating Physical Activities* pursuant to CEAA 2012 applies to the drilling, testing, and abandonment of offshore exploratory wells in the first drilling program in an area set out in one or more ELs issued in accordance with the Accord Acts.

The Project will constitute the first drilling, testing, and abandonment of offshore exploratory wells within the ELs issued to BP by the C-NLOPB. Following submission of the Project Description document (BP 2018b), the Agency determined the requirement for an EA process under CEAA 2012 and provided EIS Guidelines (Appendix A) to BP to provide direction in the preparation of an EIS document. The EIS is also intended to satisfy the C-NLOPB requirements for an EA Report as part of the OA review process under the Accord Acts.

In February 2018, the Government of Canada announced a new *Impact Assessment Act* (IAA). The new impact assessment process will consider a range of environmental, health, social, and economic effects of projects and whether a project's potential adverse effects in areas of federal jurisdiction are in the public interest. The determination of public interest will be guided by the extent to which a project's effects are adverse and the measures to mitigate adverse effects, its contribution to sustainability, the project's impact on Indigenous groups and their rights and impacts on Canada's ability to meet its environmental obligations and climate changes commitments (climate change considerations would be integrated in the impact assessment process). The Canadian Environmental Assessment Agency will be replaced with the Impact Assessment Agency of Canada. The new IAA is not expected to come into force until spring 2019. It is assumed that this Project and EIS will continue to be assessed under CEAA 2012.

Table 1.2 Summary of Key Relevant Offshore Legislation and Guidelines

Legislation / Guideline	Regulatory Authority	Relevance	Potentially Applicable Permitting Requirement(s)
Canada-Newfoundland Atlantic Accord Implementation Act (S.C. 1987, c. 3) and the Canada-Newfoundland and Labrador Atlantic Accord Implementation Newfoundland and Labrador Act (R.S.N.L. 1990, c. C-2)	Natural Resources Canada / Newfoundland and Labrador Department of Municipalities and Environment	The Accord Acts give the C-NLOPB the authority and responsibility for the management and conservation of the petroleum resources offshore Newfoundland and Labrador in a manner that protects health, safety, and the environment while maximizing economic benefits. The Accord Acts are the governing legislation under which various regulations are established to govern specific petroleum exploration and development activities.	The regulatory approvals identified below may be required pursuant to section 142 of the *Canada-Newfoundland Offshore Petroleum Resources Accord Implementation Act*, section 135 of the *Canada-Newfoundland Offshore Petroleum Resources Accord Implementation* (Newfoundland and Labrador) *Act,* and the regulations made under the Accord Acts.
Newfoundland Offshore Petroleum Drilling and Production Regulations (and associated Guidelines)	C-NLOPB	These regulations outline the various requirements that must be adhered to when conducting exploratory drilling for and/or production of petroleum.	The primary regulatory approvals necessary to conduct an offshore drilling program are an Operations Authorization (OA) and a Well Approval (ADW) pursuant to the Accord Acts and these regulations.
Newfoundland Offshore Certificate of Fitness Regulations	C-NLOPB	These regulations outline the associated requirements for the issuance of a Certificate of Fitness to support an authorization for petroleum exploration in the Newfoundland offshore area. The Regulations are implemented to require that the equipment and/or installation of exploratory equipment is fit for the purposes for which it is intended to be used and may be operated safely without posing threat to persons or the environment in a specified location and timeframe.	A Certificate of Fitness will be required in support of the Project.
Offshore Waste Treatment Guidelines (NEB et al. 2010)	NEB / C-NLOPB / CNSOPB	These guidelines outline recommended practices for the management of waste materials from oil and gas drilling and production facilities operating in offshore areas regulated by the C-NLOPB and CNSOPB. The OWTG were prepared in consideration of the offshore waste / effluent management approaches of other jurisdictions, as well as available waste treatment technologies, environmental compliance requirements, and the results of environmental effects monitoring programs in Canada and	Adherence to OWTG

Legislation / Guideline	Regulatory Authority	Relevance	Potentially Applicable Permitting Requirement(s)
		internationally. The OWTG specify performance expectations for the following types of discharges associated with exploration drilling: • emissions to air • drilling muds and solids • bilge water, ballast water and deck drainage • well treatment fluids • cooling water • desalination brine • sewage and food wastes • water for testing of fire control systems • naturally occurring radioactive material	
Offshore Chemical Selection Guidelines for Drilling and Production Activities on Frontier Lands (NEB et al. 2009)	NEB / C-NLOPB / CNSOPB	These guidelines provide a framework for chemical selection that minimizes the potential for environmental effects from the discharge of chemicals used in offshore drilling and production operations. An operator must meet the minimum expectations outlined in the OCSG as part of the authorization for any work or activity related to offshore oil and gas exploration and production. Any chemicals intended for discharge to the marine environment must • be included on the Oslo and Paris Commissions Pose Little or No Risk (PLONOR) to the Environment List • meet certain requirements for hazard classification under the Offshore Chemical Notification Scheme • pass a Microtox test (i.e., toxicity bioassay) • undergo a chemical-specific hazard assessment in accordance with UK Offshore Chemical Notification Scheme models and/or • have the risk of its use justified through demonstration to the C-NLOPB that discharge of the chemical will meet OCSG objectives.	Adherence to OCSG

Legislation / Guideline	Regulatory Authority	Relevance	Potentially Applicable Permitting Requirement(s)
Compensation Guidelines Respecting Damage Relating to Offshore Petroleum Activity (Compensation Guidelines) (C-NLOPB and CNSOPB 2017b)	C-NLOPB / CNSOPB	These guidelines describe compensation sources available to potential claimants for loss or damage related to petroleum activity offshore Newfoundland and Labrador and Nova Scotia; and outline the regulatory and administrative roles which the Boards exercise respecting compensation payments for actual loss or damage directly attributable to offshore operators.	Adherence to Compensation Guidelines
Environmental Protection Plan Guidelines (NEB 2011)	C-NLOPB / CNSOPB / NEB	These guidelines assist an operator in the development of an Environmental Protection Plan (EPP) that meets the requirements of the Accord Acts and associated regulations and the objective of protection of the environment from its proposed work or activity.	Adherence to Environmental Protection Plan Guidelines
Statement of Canadian Practice with respect to the Mitigation of Seismic Sound in the Marine Environment (SOCP)	Fisheries and Oceans Canada (DFO) / Environment and Climate Change Canada (ECCC) / C-NLOPB / CNSOPB	The SOCP specifies the minimum mitigation requirements that must be met during the planning and conduct of marine seismic surveys, in order to reduce effects on life in the oceans. These mitigation measures are also typically applied to walk-away VSP operations and wellsite surveys. These mitigation requirements focus on planning and monitoring measures to avoid interactions with marine mammal and sea turtle species at risk where possible and reduce adverse effects on species at risk and marine populations.	Adherence to SOCP

An EA under the Newfoundland and Labrador *Environmental Protection Act* is not anticipated to be required based on the proposed Project scope. BP will not be constructing onshore facilities as part of the Project. No provincial or municipal permits are currently anticipated to be required for the Project, including for the onshore supply base which will be sited at an existing facility. There are two supply bases on the east coast of the Island of Newfoundland, which have been providing support to offshore oil and gas activity in Newfoundland and Labrador since the early 1990s. These are third-party facilities that have the necessary permits and approvals to undertake activities related to offshore oil and gas projects. No additional modifications or changes to existing third-party facilities resulting in environmental impacts from supply bases will be required for the purpose of supporting this Project. The supply base and associated activities are therefore not considered to be within the scope of the Project assessment.

1.5.3 Other Applicable Regulatory Requirements

As defined by the Accord Acts, the Newfoundland and Labrador offshore area regulated by the C-NLOPB includes the greater of lands within Canada's 200 nm EEZ or to the edge of the continental margin (i.e., offshore zone that separates the continental crust from the deep ocean floor). CEAA 2012 defines federal lands as those lands that include the continental shelf of Canada. Therefore, the Project will be carried out on federal lands under the jurisdiction of the C-NLOPB. There is no federal funding involved in this Project.

In addition to the OA and ADW from the C-NLOPB pursuant to the Accord Acts, and EA approval under CEAA 2012, the Project is potentially subject to other federal and provincial legislative and regulatory requirements as presented in Table 1.3.

Table 1.3 Summary of Other Potentially Relevant Federal and Provincial Legislation

Legislation	Regulatory Authority	Relevance	Potentially Applicable Permitting Requirement(s)
Canada Oil and Gas Operations Act, R.S., 1985, c. O-7	Natural Resources Canada	The Act is intended to promote, in respect of the exploration for and exploitation of oil and gas: (a) safety, particularly by encouraging persons exploring for and exploiting oil or gas to maintain a prudent regime for achieving safety; (b) the protection of the environment; (c) the safety of navigation in navigable waters; (d) the conservation of oil and gas resources; (e) joint production arrangements; (f) economically efficient infrastructures.	No specific permitting requirements are anticipated under this legislation although new legislation (*Energy Safety and Security Act*; *Regulations Establishing a List of Spill-treating Agents*) will have implications for spill prevention and response (see below).
Canada Shipping Act, 2001		The *Canada Shipping Act, 2001* is intended to promote safety in marine transportation and protect the marine environment from damage due to navigation and shipping activities.	PSVs (and the MODU itself while in transit) are required to comply with the Act and associated regulations.

Legislation	Regulatory Authority	Relevance	Potentially Applicable Permitting Requirement(s)
Canadian Environmental Protection Act, 1999 (CEPA)	ECCC	CEPA pertains to pollution prevention and the protection of the environment and human health to contribute to sustainable development. Among other items, CEPA provides a wide range of tools to manage toxic substances, and other pollution and wastes, including disposal at sea.	Disposal at Sea Permits (under the *Disposal at Sea Regulations* pursuant to CEPA) have not been required in the past for exploration drilling projects. Therefore, such a permit is not anticipated to be required in support of the Project.
Fisheries Act	DFO / ECCC (administers section 36, specifically)	The *Fisheries Act* contains provisions for the protection of fish, shellfish, crustaceans, marine mammals, and their habitats. Under the *Fisheries Act*, no person shall carry on any work, undertaking, or activity that results in serious harm to fish that are part of a commercial, recreational, or Aboriginal fishery, or to fish that support such a fishery, unless this activity has been authorized by the Minister of Fisheries and Oceans. Section 36 of the *Fisheries Act* pertains to the prohibition of the deposition of a deleterious substance into waters frequented by fish.	Authorization from the Minister of Fisheries and Oceans under section 35(2) of the *Fisheries Act* has not been required in the past for offshore exploration drilling projects. Therefore, such an authorization is not anticipated to be required in support of the Project.
Migratory Birds Convention Act, *1994* (MBCA)	ECCC	Under the MBCA, it is illegal to kill migratory bird species not listed as game birds or destroy their eggs or young. The Act also prohibits the deposit of oil, oil wastes or any other substance harmful to migratory birds in any waters or any area frequented by migratory birds.	The salvage of stranded birds during offshore Project operations may require a handling permit under section 4(1) of the *Migratory Birds Regulations* pursuant to the MBCA.
Navigation Protection Act (NPA)	Transport Canada	The NPA is intended to protect specific inland and nearshore navigable waters (as identified on the list of “Scheduled Waters” under the NPA) by regulating the construction of works on those waters and by providing the Minister of Transport with the power to remove obstructions to navigation.	No applicable permitting requirements under the NPA have been identified for the Project, as the Project Area is located offshore, outside of the Scheduled Waters specified in the NPA.
Oceans Act	DFO	The *Oceans Act* provides for the integrated planning and management of ocean activities and legislates the marine protected areas program, integrated management program, and marine ecosystem health program. Marine protected areas are designated under the authority of the *Oceans Act*.	No applicable permitting requirements under the *Oceans Act* have been identified for the Project.

Legislation	Regulatory Authority	Relevance	Potentially Applicable Permitting Requirement(s)
Species at Risk Act (SARA)	DFO / ECCC / Parks Canada	SARA is intended to protect species at risk in Canada and their "critical habitat" (as defined by SARA). All activities must comply with SARA. Section 32 of the Act provides a complete list of prohibitions. Under SARA, proponents are required to complete an assessment of the environment and demonstrate that no harm will occur to listed species, their residences or critical habitat or identify adverse effects on specific listed wildlife species and their critical habitat, followed by the identification of mitigation measures to avoid or minimize effects.	Under certain circumstances, the Minister of Fisheries and Oceans may issue a permit under section 73 of SARA authorizing an activity that has potential to affect a listed aquatic species, any part of its critical habitat, or the residences of its individuals. However, such a permit is not anticipated to be required in support of this Project.
Regulations Establishing a List of Spill-treating Agents, SOR/2016-108	ECCC	The Minister of the Environment has determined that certain spill treating agents (as listed in the Regulations) are acceptable for use in Canada's offshore. As a result, the C-NLOPB is able to authorize the use of one or more of the two spill-treating agent products listed in Schedule 1 of the Regulations to respond to an oil spill.	Specific implications for spill prevention and response, should BP request to deploy dispersants in the unlikely event of an oil spill.
Energy Safety and Security Act, S.C. 2015, c. 4	Natural Resources Canada	The *Energy Safety and Security Act* aims to strengthen the safety and security of offshore oil production through improved oil spill prevention, response, accountability, and transparency and amends the Accord Acts and the *Canadian Oil and Gas Operations Act* with the intent of updating, strengthening and increasing the level of transparency of the liability regime that is applicable to spills and debris in the offshore areas.	Financial Responsibility and Financial Resources requirements. It establishes a legal framework to permit the safe use of spill-treating agents in specific circumstances.
Newfoundland and Labrador (NL) *Endangered Species Act* (NL ESA)	NL Department of Fisheries and Land Resources	The NL ESA provides special protection for native plant and animal species considered to be endangered, threatened or vulnerable in the province.	No applicable permitting requirements under the NL ESA have been identified for the Project.
Seabird Ecological Reserve Regulations, NLR 66/97	NL Department of Fisheries and Land Resources	These Regulations prohibit or limit industrial development and certain activities that can cause disturbance to breeding seabirds, including but not limited to boat traffic and low-flying aircraft near the colonies during the breeding season.	PSVs and helicopters will comply with regulatory requirements. No applicable permitting requirements under the *Seabird Ecological Reserve Regulations* have been identified for the Project.

In February 2018, the Government of Canada announced changes to the *Fisheries Act*. Key changes proposed for the Fisheries Act focus on: returning to comprehensive protection against harming all fish and fish habitat; strengthening the role of Indigenous peoples in project reviews, monitoring and policy development; and clarifying and modernizing enforcement powers to address emerging fisheries issues and to align with current provisions in other legislation (Fisheries and Oceans Canada (DFO) 2018).

Also in February 2018, the Government of Canada announced changes to the *Navigation Protection Act*. The key change of the proposed *Canadian Navigable Waters Act* is focused on defining all waters as a

navigable water to better protect the right to travel on all navigable waters in Canada, including extra protections for those waterways most important to Canadians and Indigenous peoples (Environment and Climate Change Canada 2018).

These proposed regulatory changes are not likely to affect permitting requirements for the Project.

1.6 Applicable Guidelines and Resources

The Project may be subject to other applicable guidelines and resources that will be used to inform the EA process, including government guidelines, Indigenous engagement guidelines, and other relevant studies.

1.6.1 Government Guidelines

In addition to the EIS Guidelines (Agency 2018) developed for the Project (refer to Appendix A), other guidance developed by the Agency and federal government has been used during the preparation of the EIS:

- The Operational Policy Statement, *Addressing "Purpose of" and "Alternative Means" under the Canadian Environmental Assessment Act, 2012* (Agency 2015a), was consulted with respect to the assessment of Project alternatives (refer to Section 2.9).
- The Operational Policy Statement, *Determining Whether a Designated Project is Likely to Cause Significant Environmental Effects under the Canadian Environmental Assessment Act, 2012* (Agency 2015b), was considered in defining criteria or established thresholds for determining the significance of residual adverse environmental effects.
- The Operational Policy Statement, *Assessing Cumulative Environmental Effects under the Canadian Environmental Assessment Act, 2012* Agency 2016a), was taken into consideration during the development of the cumulative effects assessment scope and methods.
- The Agency's *Technical Guidance for Assessing Physical and Cultural Heritage or any Structure, Site or Thing that is of Historical, Archaeological, Paleontological or Architectural Significance under the Canadian Environmental Assessment Act, 2012* (Agency 2015c) was consulted with respect to the consideration of effects on heritage and culture.
- The Agency's *Technical Guidance for Assessing the Current Use of Lands and Resources for Traditional Purposes under the Canadian Environmental Assessment Act, 2012* (Agency 2016b) was consulted with respect to the consideration of effects on Indigenous Peoples.
- *Environment and Climate Change Canada-Canadian Wildlife Service's Oiled Birds Protocol and Procedures for Handling and Documenting Stranded Birds Encountered on Infrastructure Offshore Atlantic Canada* (ECCC 2016).
- *Health Canada's Useful Information for Environmental Assessments* (Health Canada 2010) was consulted with respect to the consideration of effects on quality, noise and Aboriginal health.

1.6.2 Indigenous Engagement Guidelines

Pertinent guidelines which influenced the EA process with respect to Indigenous engagement include:

- *Aboriginal Consultation and Accommodation - Updated Guidelines for Federal Officials to Fulfill the Duty to Consult* (Aboriginal Affairs and Northern Development Canada 2011)
- *Reference Guide: Considering Aboriginal Traditional Knowledge in Environmental Assessments Conducted Under the Canadian Environmental Assessment Act, 2012* (Agency 2015d)
- *The Government of Newfoundland and Labrador's Aboriginal Consultation Policy on Land and Resource Development Decisions* (Government of Newfoundland and Labrador 2013)

1.6.3 Other Relevant Studies

Environmental assessment of Newfoundland offshore oil and gas activities started approximately 35 years ago. Key environmental studies relevant to this EA include:

- Orphan Basin Exploration Drilling Program Environmental Assessment (LGL 2005)
- Flemish Pass Exploration Drilling Project (Statoil Canada Ltd 2017)
- Eastern Newfoundland Offshore Exploration Drilling Project (ExxonMobil Canada Properties 2017)
- Nexen Energy ULC Flemish Pass Exploration Drilling Project (Nexen Energy ULC 2018)
- Eastern Newfoundland Strategic Environmental Assessment (AMEC 2014)
- White Rose Extension Project Environmental Assessment (Husky Energy 2012)
- Environmental Assessment of StatoilHydro Canada Ltd. Exploration and Appraisal / Delineation Drilling Program for Offshore Newfoundland, 2008-2016 (LGL 2008)
- Husky Delineation / Exploration Drilling Program for Jeanne d'Arc Basin Area, 2008-2017, Environmental Assessment (LGL 2007)
- Hebron Project Comprehensive Study Report (ExxonMobil Canada Properties 2011)

The information from the above reports, other relevant studies, and peer-reviewed literature have been reviewed and referenced as part of the EIS. None of the lands in the Project Area have been subject to a regional study as described in sections 73 to 77 of CEAA 2012. However, the Agency is planning to conduct a regional assessment of the Newfoundland and Labrador offshore area; information on the spatial scope or timing is not known as of September 2018.

1.7 References

Aboriginal Affairs and Northern Development Canada. 2011. Aboriginal Consultation and Accommodation - Updated Guidelines for Federal Officials to Fulfill the Duty to Consult.

Agency (Canadian Environmental Assessment Agency). 2015a. The Operational Policy Statement, Addressing "Purpose of" and "Alternative Means" under the *Canadian Environmental Assessment Act, 2012*.

Agency (Canadian Environmental Assessment Agency). 2015b. The Operational Policy Statement, Determining Whether a Designated Project is Likely to Cause Significant Environmental Effects under the *Canadian Environmental Assessment Act, 2012*.

Agency (Canadian Environmental Assessment Agency). 2015c. Technical Guidance for Assessing Physical and Cultural Heritage or any Structure, Site or Thing that is of Historical, Archaeological, Paleontological or Architectural Significance under the i.

Agency (Canadian Environmental Assessment Agency). 2015d. Reference Guide: Considering Aboriginal Traditional Knowledge in Environmental Assessments Conducted Under the *Canadian Environmental Assessment Act, 2012*.

Agency (Canadian Environmental Assessment Agency). 2016a. The Operational Policy Statement, Assessing Cumulative Environmental Effects Under the *Canadian Environmental Assessment Act, 2012*.

Agency (Canadian Environmental Assessment Agency). 2016b. Technical Guidance for Assessing the Current Use of Lands and Resources for Traditional Purposes under the *Canadian Environmental Assessment Act, 2012*.

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2.0 PROJECT DESCRIPTION

This section provides key Project information in support of this EIS, explaining the rationale and need for the Project, describing the location and nature of Project components and activities, including the management of emissions and discharges that would likely be generated by the Project. This section also provides detail on required personnel and the Project schedule and examines alternative means for carrying out the Project.

2.1 Rationale and Need for the Project

On November 9, 2016, the C-NLOPB announced BP had been awarded exploration rights to ELs 1145, 1146, 1148, and 1149 with a work expenditure bid of $425,805,000. The overall term of these ELs extends from January 15, 2017 to January 15, 2026, with the first period (period within which the work expenditure bid is committed for spending) ending January 15, 2023. The issuance of an EL confers the exclusive right to drill and test for petroleum within the EL. The interest owner is required to drill one exploratory well on or before the expiry date of the first period of the EL as a condition to maintaining tenure of the EL for the second term. The temporal scope of the Project extends to 2026.

The ELs in the Orphan Basin present potentially important geological formations and hydrocarbon reserves. Exploration drilling is required to determine the presence, nature, and quantities of the potential hydrocarbon resources within the ELs further to previous geophysical data that have been collected in the region. The exploration drilling program also presents an opportunity for the interest holders, including BP as operator, to fulfill their work expenditure commitments that must be met over the term of the EL period.

As indicated in Section 1.4, the Project is expected to result in several economic, social, and technological benefits realized on local, regional, and national scales, including a potential contribution to energy diversity and supply. Oil and natural gas are expected to play an important part in meeting energy demand for several decades. Exploration is a critical activity to enable continued oil and gas discoveries to maintain production to meet global demand for energy.

2.2 Project Location

BP proposes to drill up to 20 wells on ELs 1145, 1146, 1148, and 1149. These ELs cover 943,192 hectares (ha) and, at their shortest distance, are located approximately 343 km east of Newfoundland (refer to Figure 2.1). Water depths in the ELs range from 970 m to nearly 3,000 m.

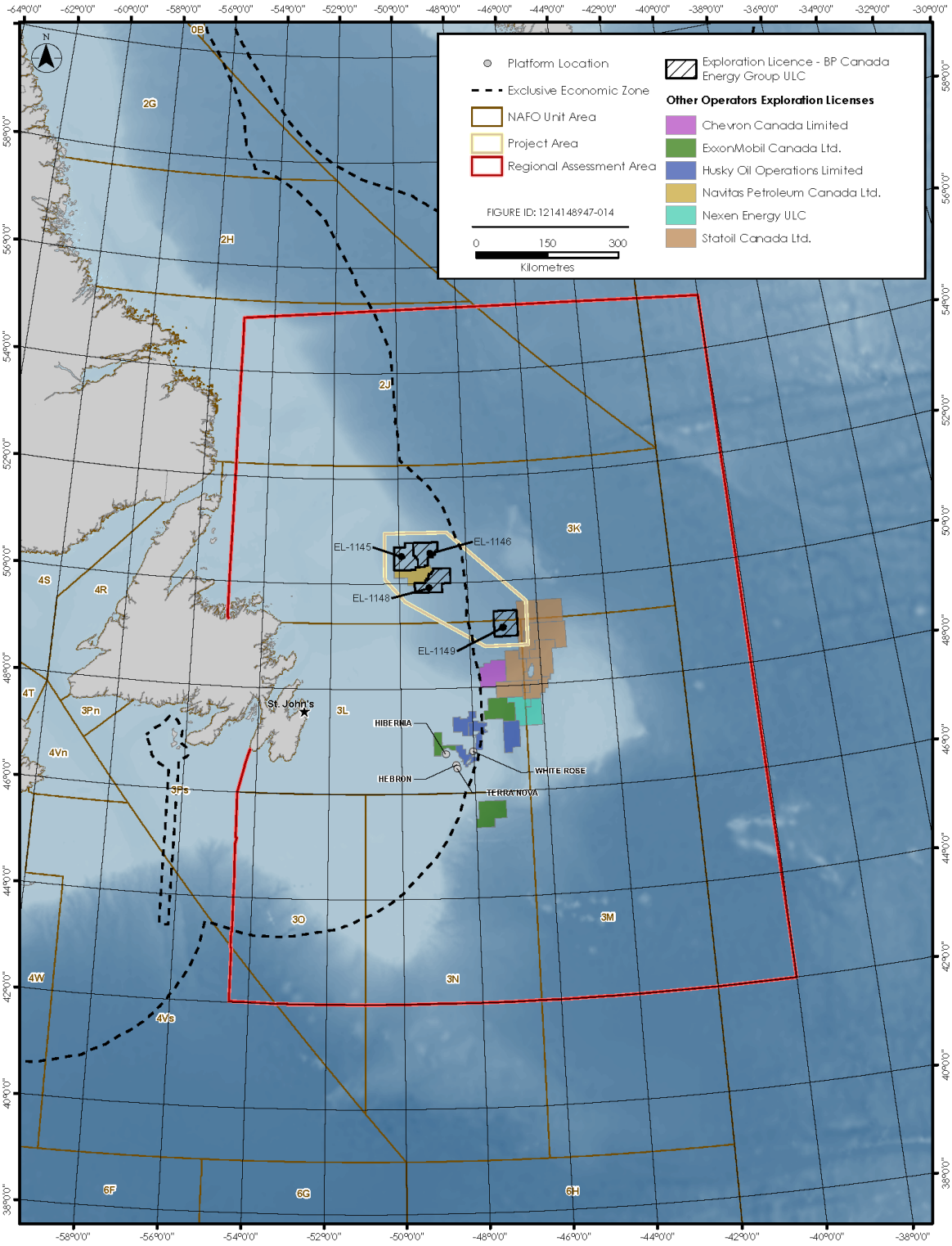


Figure 2.1 Project Area and Regional Assessment Area

Corner coordinates for the Project Area and four ELS are provided in Table 2.1.

Table 2.1 Project Area Coordinates

WGS 84		NAD83 UTM ZONE22N	
X	**Y**	**X**	**Y**
Project Area			
50° 25' 55.634" W	50° 57' 47.150" N	539879.34	5645874.69
48° 33' 55.067" W	50° 57' 47.112" N	670967.10	5648542.28
46° 17' 33.285" W	49° 35' 59.349" N	840097.99	5504788.98
46° 19' 24.131" W	48° 46' 12.260" N	843582.30	5412452.89
47° 32' 58.040" W	48° 46' 12.260" N	753521.20	5407640.85
49° 49' 41.068" W	49° 39' 12.035" N	584589.89	5500748.33
50° 25' 55.634" W	50° 50' 12.038" N	540624.92	5548422.36
EL 1145			
50° 8' 56.147" W	50° 41' 59.782" N	560103.1846	5616803.318
49° 49' 26.133" W	50° 41' 59.737" N	583054.6569	5617116.165
49° 49' 26.119" W	50° 46' 59.731" N	582907.6413	5626382.154
49° 34' 26.109" W	50° 46' 59.718" N	600530.9452	5626691.874
49° 34' 26.139" W	50° 31' 59.721" N	601065.5559	5598894.312
49° 31' 26.135" W	50° 31' 59.599" N	604609.054	5598959.852
49° 31' 26.136" W	50° 29' 59.595" N	604682.7346	5595253.476
49° 28' 26.133" W	50° 29' 59.590" N	608228.6342	5595325.013
49° 28' 26.137" W	50° 27' 59.592" N	608304.7243	5591618.864
49° 26' 56.135" W	50° 27' 59.657" N	610078.8697	5591657.638
49° 26' 56.152" W	50° 18' 59.659" N	610426.4625	5574980.007
49° 31' 26.157" W	50° 18' 59.599" N	605087.0801	5574869.57
49° 31' 26.160" W	50° 15' 59.599" N	605197.2239	5569310.408
50° 8' 56.202" W	50° 15' 59.800" N	560654.2526	5568620.87
EL 1146			
49° 34' 26.109" W	50° 46' 59.718" N	600530.9452	5626691.874
48° 50' 56.068" W	50° 46' 59.690" N	651636.3469	5627927.42
48° 50' 56.086" W	50° 35' 59.685" N	652228.3931	5607543.814
48° 55' 26.091" W	50° 35' 59.663" N	646921.1644	5607391.765
48° 55' 26.098" W	50° 32' 59.664" N	647076.6998	5601832.726

WGS 84		NAD83 UTM ZONE22N	
X	**Y**	**X**	**Y**
48° 59' 56.104" W	50° 32' 59.469" N	641763.9186	5601680.676
48° 59' 56.111" W	50° 29' 59.470" N	641913.6924	5596121.625
49° 8' 56.117" W	50° 29' 59.711" N	631276.3438	5595853.031
49° 8' 56.127" W	50° 20' 59.708" N	631691.6047	5579175.647
49° 14' 56.130" W	50° 20' 59.480" N	624577.8072	5578996.378
49° 14' 56.133" W	50° 18' 59.481" N	624664.9457	5575290.365
49° 26' 56.152" W	50° 18' 59.659" N	610426.4625	5574980.007
49° 26' 56.135" W	50° 27' 59.657" N	610078.8697	5591657.638
49° 28' 26.137" W	50° 27' 59.592" N	608304.7243	5591618.864
49° 28' 26.133" W	50° 29' 59.590" N	608228.6342	5595325.013
49° 31' 26.136" W	50° 29' 59.595" N	604682.7346	5595253.476
49° 31' 26.135" W	50° 31' 59.599" N	604609.054	5598959.852
49° 34' 26.139" W	50° 31' 59.721" N	601065.5559	5598894.312
EL 1148			
48° 59' 33.632" W	50° 16' 59.499" N	643006.9211	5572045.583
48° 29' 56.121" W	50° 16' 59.453" N	678179.521	5573109.158
48° 29' 56.170" W	49° 59' 59.479" N	679234.6286	5541612.216
48° 44' 33.676" W	49° 59' 59.515" N	661768.1882	5541057.395
48° 44' 56.199" W	49° 49' 59.501" N	661877.11	5522515.39
49° 32' 33.720" W	49° 49' 59.684" N	604799.3325	5521109.013
49° 32' 56.191" W	50° 0' 59.682" N	603955.4018	5541482.691
49° 14' 56.184" W	50° 0' 59.514" N	625446.9283	5541937.799
49° 14' 33.676" W	50° 3' 59.533" N	625764.0856	5547507.71
49° 11' 56.175" W	50° 3' 59.662" N	628894.8472	5547586.279
49° 11' 56.169" W	50° 5' 59.659" N	628805.5849	5551292.053
49° 8' 56.168" W	50° 5' 59.734" N	632381.1544	5551381.833
49° 8' 56.159" W	50° 8' 59.727" N	632243.4547	5556940.468
49° 7' 26.159" W	50° 8' 59.736" N	634029.3926	5556985.347
49° 7' 26.153" W	50° 10' 59.733" N	633936.2938	5560691.143
49° 2' 56.151" W	50° 10' 59.642" N	639290.4435	5560825.758

WGS 84		NAD83 UTM ZONE22N	
X	**Y**	**X**	**Y**
49° 2' 56.145" W	50° 12' 59.640" N	639193.5694	5564531.572
49° 1' 26.144" W	50° 12' 59.571" N	640977.0644	5564576.435
49° 1' 26.142" W	50° 13' 59.569" N	640927.988	5566429.336
EL 1149			
47° 16' 3.351" W	49° 25' 59.346" N	770592.7949	5482308.603
46° 37' 3.329" W	49° 25' 59.494" N	817703.7085	5484851.786
46° 35' 55.855" W	48° 57' 14.556" N	822163.8972	5431687.464
47° 16' 3.416" W	48° 56' 59.426" N	773243.5972	5428595.962

The Project will not take place on lands that have been subject to a regional study as described in sections 73-77 of CEAA, 2012. ELs 1145, 1146, and 1148 in the West Orphan Basin are located within the Northeast Newfoundland Slope Closure marine refuge, which was established in December 2017 (after Project planning was initiated) to protect corals and sponges from bottom-contact fishing gear. This marine refuge area does not include any prohibitions applicable to oil and gas exploration activities. BP will work closely with DFO and C-NLOPB to determine appropriate pre-drill survey requirements and mitigation / follow-up in consideration of the spatial overlap between this marine refuge area and the Project Area. EL 1149 in the East Orphan Basin is located beyond the boundaries of Canada's EEZ (200 nm limit). Aside from several subsea cables running through the Project Area there is no other infrastructure present. There are no known shipwrecks within the Project Area. Commercial fishing activities are concentrated primarily on the shelf break immediately west of ELs 1145 and 1148, with relatively little fishing historically occurring within the ELs themselves. More information on the physical, biological, and socio-economic characteristics of the Project Area can be found in Sections 5, 6, and 7 respectively.

Specific drill sites have not yet been finalized but will be located within the ELs identified on Figure 1.1, which are contained within the Project Area and Regional Assessment Area (RAA) boundaries delineated on Figure 2.1. Prospective areas will be selected to optimize the potential discovery of hydrocarbon reservoirs. Wellsites are located according to several factors, including:

- geophysical data
- geohazard data
- seabed baseline conditions, including environmental sensitivities and anthropogenic features
- regional well data

Prospective well locations within the ELs are being identified based on data obtained through two-dimensional (2D) and three-dimensional (3D) seismic surveys conducted between 2012 and 2015 within the Orphan and Flemish Pass Basins. These seismic data provide information about the subsurface formations and consequently will guide the strategy for selecting the locations of potential exploration wells. The presence of prospective hydrocarbon reserves depends upon a complex interaction of many factors

including time, pressure, source rock, migration pathways, reservoirs, and impermeable traps, all of which need to be accounted for in interpreting the geophysical data and deciding where to drill.

The selection of wellsite locations also considers potential geohazards. A geohazard is a feature or geological condition that could pose a potential hazard to drilling activity, up to the depth of the first pressure containment casing string (generally from the seabed to 900 to 1,200 m depth below mudline). Some examples of geohazards include: faults, erosion and truncation surfaces; gas charged sediments and hydrates; shallow water flow zones; seabed topography and soft seabed conditions; slump or scour features and mud slides; and abnormal pressure zones. These factors could affect the delivery of safe and efficient drilling operations. Geohazard analysis is being carried out using 3D seismic data and existing regional data, such as geotechnical cores and offset wells where available. Prior to any drilling activity, BP will conduct a comprehensive regional geohazard baseline review (GBR), followed by detailed geohazard assessments for each proposed wellsite.

A description of existing anthropogenic features, including unexploded ordnances, shipwrecks, and telecommunication cables has been carried out (refer to Sections 7.3.4 and 7.3.5). BP will conduct an imagery-based seabed survey at the proposed wellsite(s) to ground-truth the findings of the GBR. This includes confirming the absence of shipwrecks, debris on the seafloor, unexploded ordnance, and sensitive environmental features, such as habitat-forming corals or species at risk. The survey will be carried out prior to drilling and will encompass an area within a 500-m radius from the wellsite. If any environmental or anthropogenic sensitivities are identified during the survey, BP will notify the C-NLOPB immediately to discuss an appropriate course of action. This may involve further investigation and/or moving the wellsite if it is feasible to do so. This survey will also serve to provide baseline data for coral and sensitive benthic habitat that may be present and be used to inform discussions on potential follow-up and monitoring with respect to drill waste discharges (refer to Section 8, Marine Fish and Fish Habitat).

For the purpose of environmental assessment, a RAA has been defined as the main study area boundary for describing existing baseline conditions and assessing potential direct and cumulative environmental effects of the Project (refer to Figure 2.1). The RAA is the area within which residual environmental effects from Project activities and components may interact cumulatively with the residual environmental effects of other past, present, and future (i.e., certain or reasonably foreseeable) physical activities. The characteristics, distributions, and movements of the individual valued components (VCs) under consideration within a larger regional area, as well as the potential nature and geographic extent of an oil spill, also influence the definition of RAA boundaries.

The RAA extends from latitude 55.5° N to 42°N and from longitude 54.5°W to 40°W. Portions of the Island of Newfoundland are also included since oil spill modelling indicates that weathered oil could potentially reach the coast line in the unlikely event of an unmitigated oil spill. Section 4 of this EIS provides additional information on spatial boundaries used to evaluate potential environmental effects from the Project.

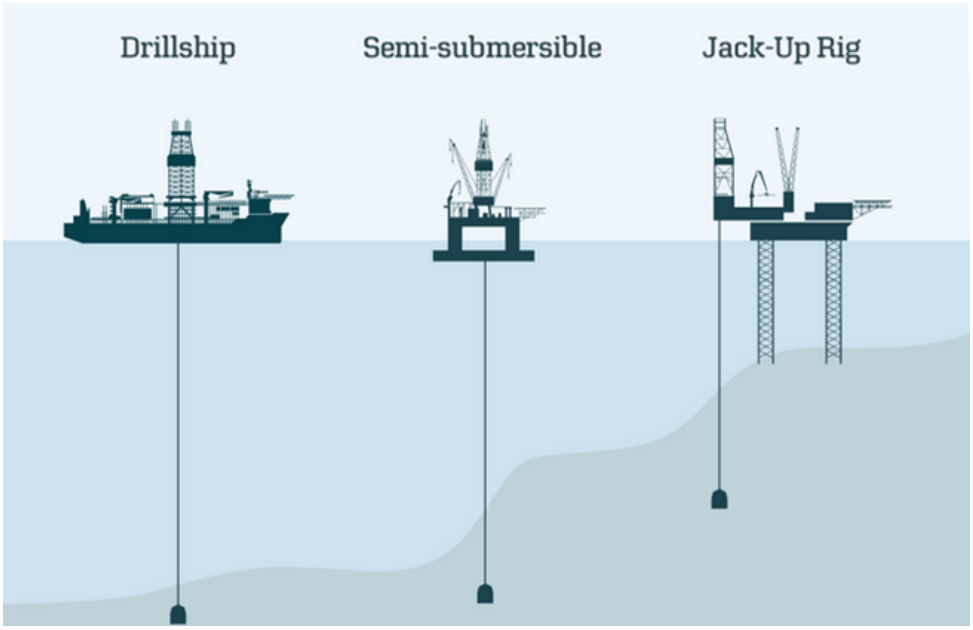
2.3 Project Components

The Project includes two main physical components: the drilling vessel and the offshore exploration wells. The Project also includes components for logistics support for servicing and supplying offshore activity. Logistics-related components include supply vessels and helicopters for the transportation of personnel and equipment, and a supply base in the St. John's, NL, region.

The offshore exploration wells are the only new pieces of infrastructure that need to be constructed as part of the Project. All other Project components, including the drilling vessel, supply vessels, helicopters, and supply base are pre-existing and will be used by the Project on a temporary basis through contractual arrangements.

2.3.1 Drilling Vessel

Within Atlantic Canadian waters, three main types of exploration drilling vessels are typically used. The selection of the drilling vessel generally depends on physical characteristics of the wellsite, including water depth and oceanographic conditions, and logistical considerations (e.g., rig availability). In shallow waters (less than 100 m), a jack-up rig is typically used; in deeper waters a semi-submersible rig or drillship is used. These drilling vessels (i.e., semi-submersible rigs, drillships, and jack ups) are often referred to as MODUs. A schematic of the three types of described MODUs is shown in Figure 2.2.



Source: Modified from Maersk Energy (n.d.)

Figure 2.2 Different Types of Drilling Vessels Used in Atlantic Canada Waters

BP has not yet selected the MODU that will be used to drill the wells for the Project. In consideration of the water depths in the ELs (up to approximately 3,000 m), it is expected that either a semi-submersible rig or a drillship will be used.

2.3.1.1 MODU Selection and Approval Process

To deliver the goal of drilling safe, compliant, and reliable wells, BP will use several criteria for MODU selection, focusing on regulatory compliance, meteorological and physical oceanographic conditions, and the technical capability of the MODU. The MODU is expected to be capable of ultra-deep-water drilling to accommodate the water depths and meteorological and oceanographic (metocean) conditions within the ELs. It is also expected to be winterized to allow year-round drilling if required.

Once the MODU has been identified, it will be subject to a BP internal rig intake process. The rig intake process provides the means to identify and effectively manage risks for rig start-ups and verify that contracted rigs conform to specified BP requirements and industry standards. Pursuant to the Accord Acts and the requirements of an OA, a Certificate of Fitness for the drilling vessel will be required, which will be issued by a recognized Certifying Authority prior to approval for use. A Certificate of Fitness will be obtained for the MODU from an independent third-party Certifying Authority prior to the commencement of drilling operations in accordance with the *Newfoundland Offshore Certificate of Fitness Regulations.*

Regardless of whether the MODU selected by BP is a semi-submersible rig or a drillship, it will, as a minimum, satisfy the operational requirements listed in Table 2.2.

Table 2.2 Operational Requirements for Mobile Offshore Drilling Unit

General: The MODU will be equipped with the following for the rig to operate:	
Drilling Mast	The support structure for the equipment used to lower and raise the drill string into and out of the wellbore.
Ballast Control	Maintains stability during operations.
Power System	Diesel generated power system to safely operate the MODU and all associated drilling equipment. The rig shall also be equipped with an emergency power system.
Positioning System	Dynamic positioning (DP) to maintain position under a range of meteorological and ocean conditions. Thrusters on the MODU are automatically controlled by the DP system to maintain the MODU in position. A variety of sensors, monitoring the ambient conditions and in combination with global positioning system (GPS) and acoustic referencing control the DP system.
Subsea Equipment	Inclusive of well control equipment such as blowout preventers (BOP), and a marine riser to act as a conduit from seafloor to rig floor. BOPs are devices installed on the wellhead that act as barriers to prevent the uncontrolled release of formation fluids escaping from the wellbore. These can take the form of an annular, pipe rams and blind shear rams.
Logistics Support: The MODU shall be equipped with the following to support drilling operations:	
Helicopter Deck and Refuelling Equipment	For safe landings and departures for helicopters which are used for transfer of personnel and equipment.
Storage Space	Houses material used in drilling operations. This can include bulk storage for liquids, such as drilling fluid, fuel oil, cement, etc., as well as drilling equipment, such as casing, drilling equipment, etc.
Cranes	To transfer equipment between the supply vessels and the MODU.
Waste Management Facilities	To allow for offshore treatment or temporary storage of hazardous and non-hazardous waste streams prior to shipment to shore or disposal in accordance with the OWTG.

Emergency and Lifesaving Equipment	Inclusive of firefighting equipment, lifeboats, and rafts for emergency evacuation.
Accommodation	Inclusive of welfare facilities, such as sleeping, washing, toilet and mess facilities, and recreational facilities and medical facilities. Accommodation facilities will be provided for a maximum of 200 persons on board. Potable water will be provided through an onboard desalinization unit and/or bottled water. Daily estimates for offshore potable water use range from approximately 27.2 m^3 to 136 m^3 for 200 persons, although the actual number of persons on board would likely be closer to 180.

Additional detail on the two types of MODUs which are currently under consideration for use by BP (i.e., semi-submersible drilling rig and drillship), is presented below.

2.3.1.2 Semi-Submersible MODU

A semi-submersible is characterized by a lower hull of separate pontoons with vertical columns supporting a large upper deck. The upper deck contains drilling equipment, equipment and material storage areas, and accommodation. During drilling operations, to ensure stability, the lower hull is submerged to a nominated depth using a ballast system and the semi-submersible's configuration minimizes the environmental loading compared to a ship-shaped hull, providing a relatively stable platform for drilling operations. Semi-submersible MODUs can either be moored in position over the drilling site using anchors, or, as is most likely the case for this drilling program, maintained on station by DP.

The standard mooring technique for a semi-submersible in water depths up to approximately 1,200 m is a multi-point mooring system using a combination of wire rope, chains, and anchors. The anchors are set in a pre-determined pattern using an anchor handling offshore vessel. Given the location and water depths of the Project Area, it is assumed that the MODU would employ a DP system for positioning, rather than using anchors.

In DP mode, the drilling vessel maintains position using thrusters positioned on the hulls, which are controlled by a computerized DP system using GPS and acoustic positioning data. The acoustic system transmits energy signals to transponders (receivers) positioned on the seafloor, which then send signals back to the transmitter allowing an accurate calculation of the position of the transponder relative to the vessel (Kongsberg Maritime 2016). This system is used to improve positioning accuracy and redundancy to keep the drilling vessel in its intended position.

Figure 2.3 is a photo of the *West Aquarius*, a semi-submersible drilling rig that has been employed by operators drilling in the Jeanne d'Arc Basin, as well as being contracted by BP for the Scotian Basin Exploration Project offshore Nova Scotia.

Source: Seadrill 2017

Figure 2.3 *West Aquarius* Semi-Submersible

2.3.1.3 Drillship

A drillship is a self-propelled drilling vessel with large variable deck load capacity to allow for increased storage of equipment and materials to drill ultra-deep-water wells with depths similar to those encountered within the ELs, and in remote locations. Drillships use DP to maintain position and rotate the ship over well centre to head the ship into prevailing weather, following shifts in wind or wave direction to minimize the pitch and roll motion. Drillships are different from typical offshore vessels, such as cargo vessels, by the presence of a drilling package and a moon pool. The moon pool is an opening in the bottom of the hull of the vessel, which allows direct access to the water, enabling drilling equipment on the vessel to connect to equipment on the seafloor to drill the well.

Figure 2.4 is a photo of the Stena *IceMax* drillship, which was contracted for use by Shell on the Shelburne Basin Venture Exploration Drilling Project offshore Nova Scotia.

Source: Chronicle Herald 2014

Figure 2.4 Stena *IceMax* Drillship

2.3.2 Offshore Exploration Wells

BP will drill up to 20 exploration wells within ELs 1145, 1146, 1148 and 1149 in phases over the term of the licences (2017 to 2026). The well design and location for the proposed wells have not yet been finalized. Well design depends on a number of factors including the geology of the formations. Indicative well casing plans are presented in Tables 2.3 and 2.4. Once confirmed, the details for the wells will be provided for review and approval to the C-NLOPB as part of the OA and ADW for each well submitted in association with the Project.

Table 2.3 Indicative Well Casing Plan for Project Wells – West Orphan Basin (1,360 m Water Depth)*

Section	Section Name	Drilling Fluid	Hole Size	Casing Size	Interval Length
1	Conductor Section	Seawater / WBM	42”	36”	80 m
2	Surface Casing	Seawater / WBM	26”	20”	810 m
3	Intermediate Casing	SBM / WBM	17 ½”	13 5/”8	1550 m
4	Production Hole	SBM / WBM	12 ¼”	9 5/8”	1,200 m
*Final well casing plan for each well may differ as Project planning advances and will be presented in ADW application					

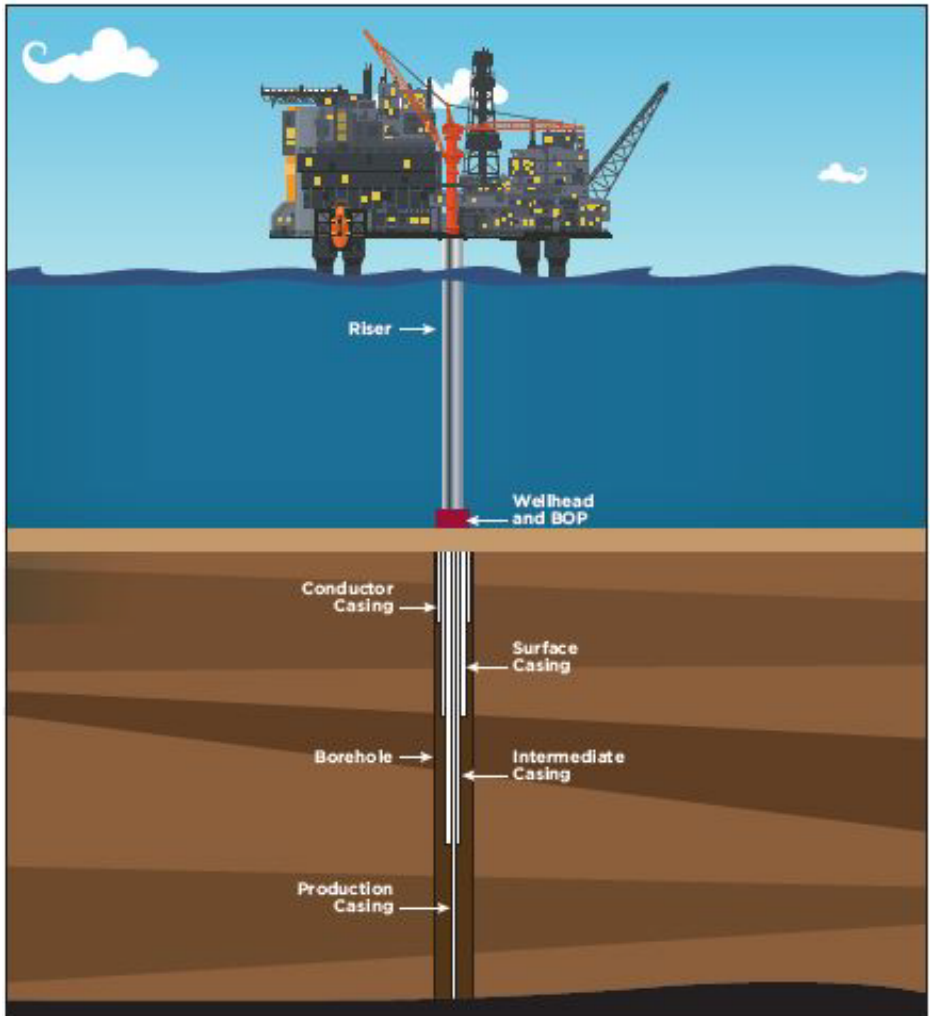
Table 2.4 Indicative Well Casing Plan for Project Wells – East Orphan Basin (2,785 m Water Depth)*

Section	Section Name	Drilling Fluid	Hole size	Casing Size	Interval Length
1	Conductor Section	Seawater / WBM	42”	36”	80 m
2	Surface Casing	Seawater / WBM	26”	20”	835 m
3	Intermediate Casing	SBM / WBM	17½”	13 5/8 “	1,000 m
4	Production Hole	SBM / WBM	12 1/4”	9 5/8 “	1,800 m
*Final well casing plan for each well may differ as Project planning advances and will be presented in ADW application					

Each section will be drilled with an increasingly smaller drill bit and the borehole is then secured with casing. Casing is the liner installed within the wellbore. It is made up of a series of steel pipes that form a major structural component of the wellbore that serves several important functions, such as preventing the formation from caving into the wellbore, isolating the different formations to prevent flow or cross flow of formation fluids, and providing a means of maintaining control of formation fluids and pressure as the well is drilled.

A schematic of a completed offshore well, showing typical casing configuration, is presented in Figure 2.5. This figure is illustrative and does not necessarily represent the Project casing design.

More information on the offshore wells and drilling process is provided in Section 2.4.2.



Source: CAPP 2017

Figure 2.5 Schematic of Completed Offshore Well Showing Casing Configuration

2.3.3 Supply and Servicing Components

Offshore drilling operations will be supported by logistics arrangements for supply and servicing activity. Such arrangements will allow the transportation and movement of equipment and personnel between the MODU and land to allow sufficient stocks of equipment and supplies to be maintained for reliable, ongoing drilling operations.

In accordance with the *Guidelines for the Preparation of an Environmental Impact Statement* issued to BP by the Agency (Agency 2018), activity within the supply base is not considered within the scope of this EIS. The supply base is described below with the intent to clarify PSV routes between the supply base and the Project Area. Supply and servicing components and activities included in the scope of assessment comprise PSV operations (e.g., loading, transit and unloading of vessels) and helicopter support (e.g., crew transport and delivery of supplies and equipment).

An onshore supply base will be used to support offshore drilling operations in Newfoundland and Labrador. The supply base serves as a location to temporarily store, stage, and load materials onto PSVs to be brought offshore. Likewise, the supply base serves as a location for materials to be returned onshore by PSVs, as needed, throughout the Project.

The Project will require support from PSVs for equipment and supplies and from helicopters for crew changes. Both PSV and helicopter operations will be based out of the St. John's region. Like the supply base, the helicopter and PSVs will be owned and operated by third-party service providers and will be used to support the Project on a temporary basis through contractual arrangements.

PSVs will be used to re-supply the MODU with equipment and supplies during the drilling program. The PSVs have not yet been identified; however, the fleet will be selected to fulfill the following functions for the MODU:

- supply food, fuel, dry bulk, drilling fluids and drilling tools and equipment
- waste transportation
- assist in emergency response situations
- monitor the safety zone around the MODU and intercept vessels if required

It is anticipated that two or three PSVs will be required in total. A standby vessel will remain on standby at the MODU at all times during drilling activities in the event that operational assistance or emergency response support is required. Figure 2.6 is a photo of a typical PSV that could be used on the Project. PSVs will undergo BP's internal marine assurance process, as well as additional inspections/audits inclusive of the C-NLOPB pre-authorization inspection process in preparation for the Project.

Source: DOF Group 2013

Figure 2.6 Typical Platform Supply Vessel

The PSVs selected for this Project will be equipped for safe all-weather operations, including stability in rough sea conditions and inclement weather. Measures to reduce superstructure icing hazards on PSVs will be implemented as necessary and may include (DFO 2012):

- reducing vessel speed in heavy seas
- placing gear below deck and covering deck machinery, if possible
- moving objects that may prevent water drainage from the deck
- making the ship as watertight as possible
- manual removal of ice if required under severe icing conditions

Helicopters will be used to transfer personnel and light supplies to and from the MODU and land. These will also be used for emergency support services, including medical evacuation from the MODU as well as search and rescue operations if requested by the Canadian authorities. Figure 2.7 shows a typical offshore helicopter that could be used to support the Project.

Additional details on supply and servicing activities are provided in Section 2.4.5.

Source: Cougar 2017

Figure 2.7 Typical Offshore Helicopter

2.4 Project Activities

2.4.1 MODU Mobilization and Drilling

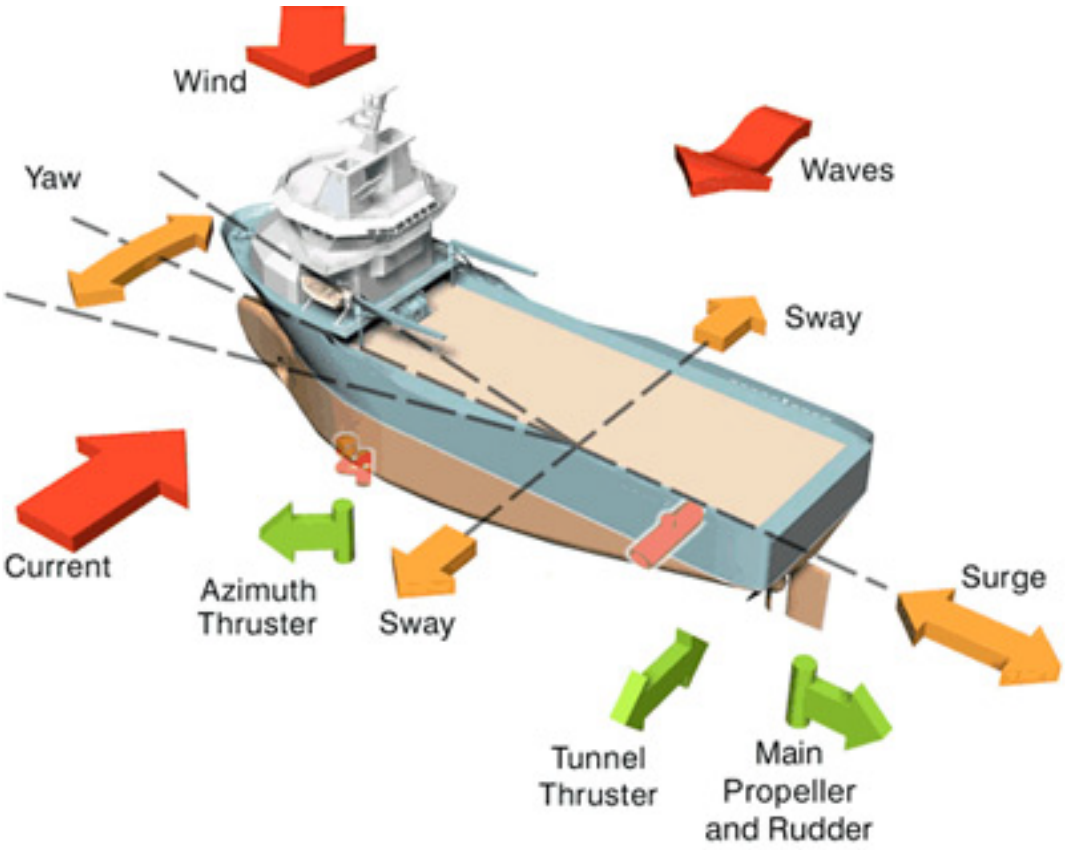
The MODU will be subject to the BP rig intake process as well as regulatory review and inspections that are required to deliver a Certificate of Fitness prior to approval for use. After permits, regulatory approvals, and authorizations have been obtained, the MODU will be mobilized to the drilling location.

As described in Section 2.2, drilling locations will be selected using geohazard data, geophysical data, and seabed baseline conditions. A remotely operated vehicle (ROV) seabed survey will be carried out once the

MODU is in place at a proposed wellsite, prior to drilling. If environmental or anthropogenic sensitivities are found during the pre-drill ROV survey, BP will notify the C-NLOPB immediately to discuss an appropriate course of action. This may involve further investigation and/or moving the wellsite if it is feasible to do so.

The MODU will be either towed or will move self-propelled to the drilling location. Once the MODU is in place, positioning and stability operations will occur. This will include ballasting to increase the stability of the MODU and implementing the DP system to maintain position.

The DP system is made up a series of thrusters, which operate to continually adjust the vessel to counteract current, waves and wind forces to maintain the position of the MODU. Figure 2.8 illustrates dynamic positioning forces (on a typical PSV) and does not represent the MODU or the configuration of thrusters for the Project, which have not yet been determined.



Source: Rigzone 2015

Figure 2.8 Dynamic Positioning Forces

In accordance with the *Newfoundland Offshore Petroleum Drilling and Production Regulations*, a safety zone (a 500-m radius from the well location) will be established around the MODU to prevent collisions between the MODU and other vessels (e.g., fishing, research, or cargo vessels) operating in the area. This safety zone will be established around the MODU during initial mobilization activities and drilling operations, including well evaluation and abandonment processes. The safety zone will be monitored by the standby vessel at the MODU. BP will provide details of the safety zone to the Marine Communication and Traffic Services for broadcasting and publishing in the Notice to Shipping and Notice to Mariners. Details of the safety zone will also be communicated during ongoing consultations with Indigenous and non-Indigenous fishers.

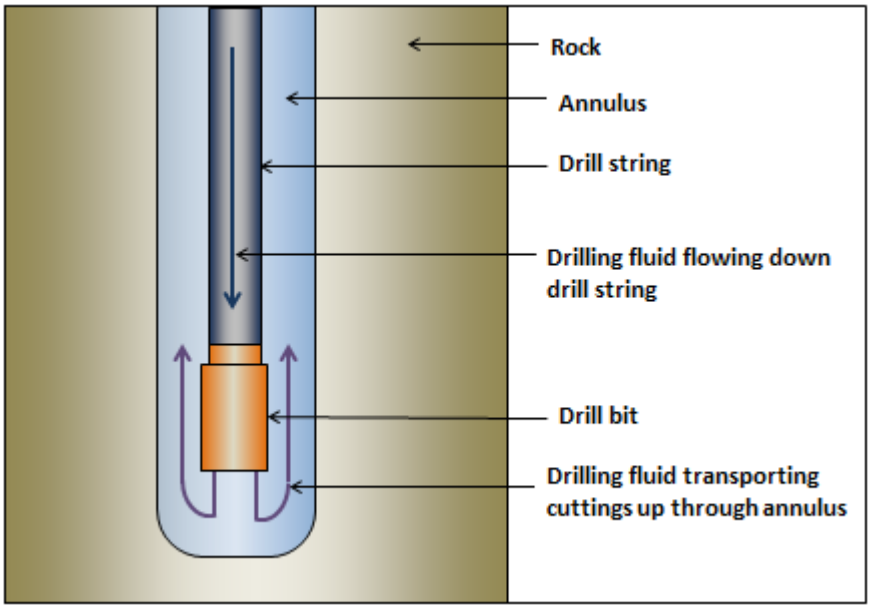
To maintain navigational safety at all times during the Project, obstruction lights, navigation lights, and foghorns will be kept in working condition on board the MODU and PSVs. Radio communication systems will be in place and in working order for contacting other marine vessels as necessary.

The MODU will be equipped with local communication equipment to enable radio communication between the PSVs and the MODU's bridge. Communication channels will also be put in place to enable communication between the MODU and shore.

Typically, oil and gas wells are drilled using a drill bit in sections of progressively smaller-diameter intervals. Drill bits are available in many sizes to drill different diameter holes. The top interval is drilled starting at the sea floor and has the largest diameter hole. The drill bit is controlled from the MODU through a series of joints of pipe, referred to as the drill string, which rotate the drill bit. The drill bit is lubricated by drilling fluids, also known as drilling "muds".

Drilling fluids are formulated according to the well design and the expected geological conditions. They comprise a base fluid, weighting agents, and other chemicals that give the drilling fluid the properties required to drill a well safely and efficiently. Several types of drilling fluids are available including water-based mud (WBM) and synthetic-based mud (SBM). A framework for chemical selection to minimize the potential for environmental effects from the discharge of chemicals in drilling fluids used in offshore operations is provided in the OCSG (refer to Section 2.9.3 for more information on chemical management).

Drilling fluids are pumped from the MODU through the drill string to the drill bit. As the drill bit rotates downward through the rock layers, it grinds the rock, breaking it up, which generates rock fragments known as drill cuttings. The drill cuttings are circulated by the drilling fluid out of the wellbore through the annulus, a process illustrated in Figure 2.9.



Source: BP 2016

Figure 2.9 Drilling Fluid Circulation

It is estimated that each well will take approximately 60 days to drill. The drilling of each well can be broken down into two phases: riserless drilling; and riser drilling. During riserless drilling, the well is drilled using an open system with no direct drill fluid return connection to the MODU. Riserless drilling is typically only carried out in the shallow sections of the well before the equipment that allows the riser to be connected to the well is installed. During riserless drilling, WBM is typically used as the drilling fluid and cuttings are discharged directly to the marine environment in accordance with regulatory guidelines. Once a wellhead has been installed, a blowout preventer (BOP) and a riser can be connected to the well. The riser is a conduit that allows drilling fluid and solids from the wellbore to be returned from the well to the surface. Drilling with a riser is therefore a closed loop system that allows drill fluids and cuttings to be returned to the MODU for treatment; therefore, either WBM or an alternative drilling fluid such as SBM can be used.

It is expected that the conductor and surface casing sections of wells drilled as part of the Project will be drilled riserless. During the riserless phase, the well will be drilled with either seawater and/or WBM. The drilling fluid is used to provide overbalance to the formation pressure with the hydrostatic pressure in the wellbore, keep the drill bit cool, and flush out cuttings from the wellbore. During the riserless phase, as there is no mechanism to return cuttings to the MODU, cuttings and any associated fluid will be discharged at the seafloor as is permitted by the OWTG.

The first section of the well will be the conductor section. The conductor section provides the initial structural foundation for the borehole and the foundation for the subsea wellhead. A large diameter hole, potentially 42” in diameter, will be drilled to approximately 100 m depth below the seafloor. Once the section has been drilled, the conductor pipe can be run and cemented to secure the wellbore. The conductor can also be “jetted” into place, which effectively means that the conductor string is directly drilled into place. No cement is required when the conductor string is jetted in place.

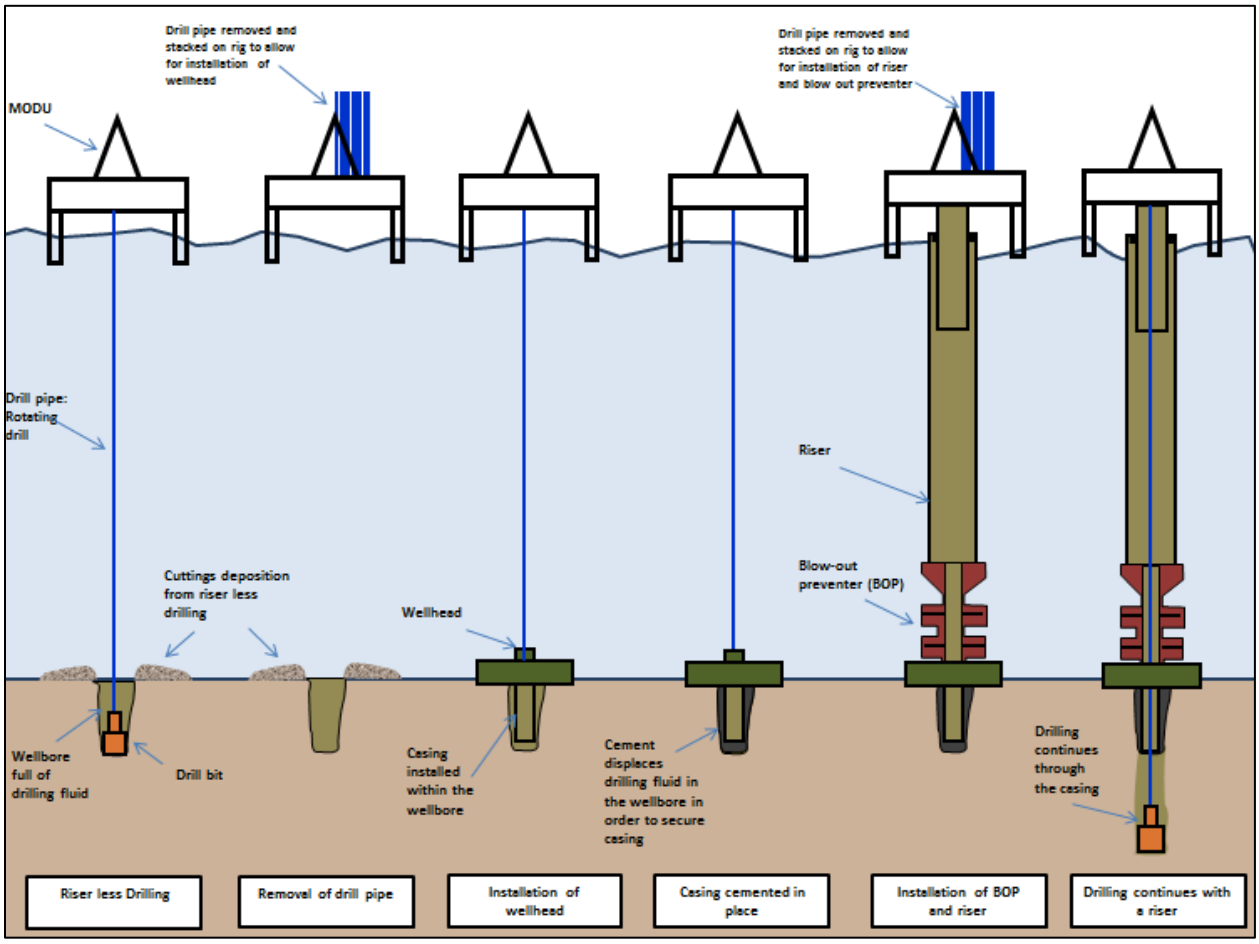
After the completion of the conductor section, a smaller size drill bit will be passed through the conductor, and a new hole is drilled to section total depth. Once the section is drilled, a surface casing string will be run and cemented to secure the wellbore. The cement is used to permanently seal the annular spaces between the casing and the wall of the borehole. It also seals the formation, preventing the loss of drilling fluid. To cement the casing in place, slurried cement is pumped through the casing and up into the annular space between the formation and the casing, displacing any drilling fluid. The cement fills the annular space and solidifies prior to drilling out the string. Excess cement is used to provide contingency in case irregularities in the formation wall result in the annual space being larger than expected; a shortage of cement slurry would result in failure of the operations as the space may not be adequately sealed. During the riserless phase, excess cement may be discharged to the seafloor.

The top of the surface string is connected to the wellhead. The high-pressure wellhead is a pressure-containing mechanism that is the receptacle for further full-length casing strings used in drilling the well. The wellhead will be lowered down with the surface casing string attached and landed onto the wellhead on the conductor. The surface casing section will be drilled with seawater or WBM, and like the conductor section, drill cuttings and associated fluids will be discharged to the seafloor as is permitted by the OWTG.

Once the surface casing has been installed, a BOP stack is run on the end of the drilling riser and connected to the wellhead. The riser creates a conduit back to the MODU. The BOP is a critical piece of safety equipment and is put in place to protect the crew and the environment against unplanned fluid releases from the well. It allows the wellbore to be closed through a series of rams and annular preventers, thereby closing the annulus, preventing any hydrocarbons from escaping the wellbore. More information on the BOP and additional well control features is provided in Section 2.5.

Once the riser and BOP have been installed, the drilling fluids and cuttings generated from the wellbore can be circulated back to the MODU for treatment. It is unknown at this stage which drilling fluids will be used to drill the remaining well sections. It is currently proposed that either a WBM or SBM will be used. The choice of which drilling fluids and other components of well design, such as section depths, will be determined by the specific geology and predicted pore pressures of each individual well. The process of drilling, casing, and cementing is continued for the remaining hole sections. This sequence of events is repeated until the total depth of the well is reached. For more information on drilling fluids and drilling waste management, refer to Section 2.8.2.

Figure 2.10 illustrates the drilling sequence described above. Further information about the Project wells is described in Section 2.3.2.



Source: Modified from Petroleum Club of Western Australia, Drilling for Oil and Gas

Figure 2.10 Drilling Sequence (Not to Scale)

If a planned section total depth cannot be reached, contingency casing sections will be available. A contingency string is effectively an additional string inserted into the well to enable the well to be drilled to total depth. Typical contingency strings include casing or liner sizes of 18", 11$^{3}/_{4}$", and 7". It is expected the well can be completed in four sections; however, there could be up to three additional sections if contingencies are required.

It is possible, in the event of well success, a planned sidetrack may be drilled to explore other areas of the reservoir that are nearby. In the event of sidetracking, a secondary wellbore will be “kicked-off” from the original wellbore using a similar methodology described above. The original wellbore will be abandoned using cement prior to side track drilling commencing. The details and design of the sidetrack will be contingent on the results of the original well and therefore have not yet been finalized. Once they have been established, plans and designs for the sidetrack will be submitted to C-NLOPB for approval.

2.4.2 Vertical Seismic Profiling

VSP may be carried out to facilitate the correlation of surface seismic data (recorded in time, milliseconds) to well data (recorded in depth, metres). This effectively allows an accurate correlation of seismic reflectivity events to geological formations encountered in the wellbore through time to depth calibration and matching of wavelet character between the surface seismic data and the VSP result.

VSP operations can be carried out in a number of ways; for the BP exploration wells it is likely that a stationary acoustic sound source will be deployed from the MODU while a number of receivers, positioned at different levels within the wellbore, will measure the travel time of the sound generated at the source as it arrives at those receivers. This form of VSP operation is referred to as zero-offset VSP. An offset VSP (also referred to as a walkaway VSP) could also be used in the exploration wells. This is where the acoustic source is used from a marine vessel and deployed at a distance of up to 8 km from the well.

Up to 12 compressed air sound sources may be used, each with a volume of up to 250 cubic inches. These multiple sources are tuned to one another to effectively simulate one larger air gun source array. These sound sources are generally positioned at 5 to 10 m below the water surface. VSP operations are typically short duration, normally taking no more than a day to complete the profiling. Longer duration VSP operations for additional characterization may be run, which could extend the duration of the VSP by a few additional days. VSP sound sources are typically smaller and survey duration significantly shorter than exploration seismic surveys (refer to Section 2.8.5 for more information on underwater sound generated by VSP).

VSP activity will be planned and conducted in consideration of the Statement of Canadian Practice with respect to the Mitigation of Seismic Sound in the Marine Environment (SOCP; DFO 2007). Specific details of the VSP program (e.g., frequency, air gun source array design) will depend on the geological target and the objectives of the VSP.

2.4.3 Well Evaluation and Testing

If the exploration drilling results indicate that hydrocarbons are present in the target formations, the wells will be evaluated and possibly tested to provide further information about the stratigraphic column, with special emphasis on reservoir characteristics. Well evaluation is an important component of exploration drilling as it helps to determine the viability of a prospect and commercial potential of the reservoirs.

There are several processes involved in well evaluation. While drilling, the well will be monitored and evaluated using “Measurement While Drilling and Logging While Drilling” techniques, mud logging, drilling parameters evaluation, and subsurface pressure evaluation activities. Wireline logging, VSP, and formation testing may be performed after drilling activity has been completed based on the results of the primary evaluation tools. VSP has been described above and is assessed as a separate activity in this EIS.

Well testing may be required for the Project. Well testing can be used to gather information about subsurface characteristics such as potential productivity, connected volumes, fluid properties, composition, flow, pressure, and temperature. This dynamic data set in turn enables the confirmation of data in logs and

cores assimilated during drilling activity, which in turn can build a comprehensive picture of reservoir potential. Well flow testing is required under the Accord Acts to convert an EL to a Significant Discovery Licence (SDL), to demonstrate the potential for sustained production.

It is not currently anticipated that well testing will be carried out on the wells drilled in the initial phase of the Project (i.e., one to two wells). In the event of well success in the initial wells, and if the need for well testing is identified, a well test program will be developed and executed on subsequent wells drilled as part of the primary term of the licence.

In the event that a well test is required, it will be subject to BP's process for well test planning, which is designed to promote safe and efficient well test operations. A key requirement of these processes is the use of process safety design methods to ensure effective barriers are in place for the well test activity and an internal approval process for any well test activity and any associated flaring. The internal approval process is designed to provide assurance that the minimum amount of flaring is carried out to obtain the needed data from the well test.

Where well testing is considered necessary, specialized equipment and services will be contracted to carry out the activity. Equipment that will be used in the well test will be designed to be able to safely control the maximum potential pressure that the reservoirs may be able to generate. It is likely that the well test operation will be run using conventional drill stem test tooling, subsea safety systems, and temporary surface flow equipment to manage and measure the well fluids, collect fluid samples, and necessary data sets.

The primary purposes of the drill stem test tools and tubing are: (i) to provide a controlled flow path for the reservoir fluids to surface; (ii) provide downhole shut in; (iii) facilitate well killing operations; and (iv) convey the data measurement instrumentation and specialized sampling equipment as close to the formation being tested as practically possible. At the seabed level, subsea tools will be placed inside the drilling BOP. These tools are primary safety tools that provide fast acting (emergency) isolation of the well fluids at subsea level and permit disconnection of the test string from the well if required. The subsea tools will also be designed to ensure the emergency BOP functions such as shearing and emergency disconnect are available for use during the well test. The well will subsequently be suspended or abandoned in accordance with the *Newfoundland Offshore Petroleum Drilling and Production Regulations*.

Any formation hydrocarbons, such as gas, oil, or formation water, that are brought to surface as part of the well test activity will be flared to enable their safe disposal. All flaring will be via one of two horizontal burner booms, to either a high efficiency burner head for liquids, or simple open-ended gas flare tips for gases. High efficiency combustion equipment will be used that will maximize complete combustion, thereby reducing the likelihood of black smoke in flaring activity and drop-out of un-combusted hydrocarbons liquids on to the sea surface.

Where it is carried out, it is likely that the full well testing operational process would occur over a one-month window after drilling is complete; however, it is possible that it could extend up to three months. This would include all testing through to well abandonment. Within this operational window, the well test process will vary in terms of activity and it is likely that there will be periods of short duration where flaring is required.

Flaring may be for operational purposes, such as flushing, or bleeding, where it will be carried out for between one and six hours each with low flow rates. Flaring may also be required during a series of separate periods of well test flow that could last up to two or three days for any one period. More information on flaring as part of well testing is provided in Section 2.8.1.

If well testing is required, BP will inform the C-NLOPB of any plans for well test flaring as part of the ADW process. BP will report on any flaring activity to the C-NLOPB.

An alternative to formation flow testing with flaring, which may be used on exploration wells to assess the discovered hydrocarbon resources and to potentially support an SDL application, is “Formation Testing While Tripping”. This kind of well test offers environmental, safety, and economic benefits as they may be conducted without the requirement for topside production equipment, flaring of hydrocarbons, and exposure of personnel to pressurized equipment containing live hydrocarbons.

2.4.4 Well Abandonment and Decommissioning

Once wells have been drilled to total depth and well evaluation programs completed (if applicable), the well will be plugged and abandoned in line with applicable BP practices and C-NLOPB requirements. Cement plugs will be placed above and between any hydrocarbon bearing intervals at appropriate depths in the well, as well as at the surface.

The abandonment program has not yet been defined. BP’s wellhead removal strategy for wellheads considers water depth and the likelihood of potential interactions with fishing activities. In water depths greater than 900 m, BP may seek approval from the C-NLOPB to leave the wellhead in place.

If approval is sought to leave the wellhead in place, the only infrastructure that will be left on the seafloor is a wellhead, which would be approximately 1.5 to 3.7 m in height and take up a permanent footprint of less than 1 m². All other subsea infrastructure, including the BOP, will be removed. The BOP will only be removed once the cement plugs are put in place and the casing pressure tested above the abandonment plugs to confirm plug integrity.

Final details about the well abandonment program will be confirmed to the C-NLOPB as planning continues.

2.4.5 Supply and Servicing

An existing supply base facility in the St. John’s region will be used to support logistical requirements for offshore operations. Supply base activities will be conducted by a third-party contractor and are outside the scope of this EIS.

2.4.5.1 Platform Supply Vessel Operations

The MODU will be supported by a fleet of PSVs to re-supply the drilling vessel with fuel, equipment, drilling mud, and other supplies during the drilling program, as well as removing waste. It is likely that two to three PSVs will be required, with one vessel on stand-by at the drilling vessel at all times. It is estimated that the PSVs will make a total of two to three round trips per week between the MODU and the supply base.

Typical PSVs travel at approximately 12 knots at service speed. It is therefore expected that a PSV could take approximately 16 to 20.5 hours to reach the Project Area from the onshore supply base. Common shipping routes will be used as practicable to reduce incremental marine disturbance, although most common vessel traffic routes are located either to the north or south of the Project Area (refer to Figure 7.34). Where these do not exist, PSVs will follow a straight-line approach to and from the Project Area (refer to Figure 2.11). Once in the Project Area, the PSVs will select the most appropriate route for reaching the destination. The PSVs will follow applicable Port Authority requirements when in a port and will be compliant with the *Eastern Canadian Vessel Traffic Services Zone Regulations* when operating in near-shore or harbour areas. PSV transit has an existing regulatory regime and best management practices and is an ongoing, routine activity among all operators in the region.

PSVs will undergo BP's internal marine assurance process as well as additional external inspections / audits inclusive of the C-NLOPB pre-authorization inspection process in preparation for the Project. Procedures will be in place to ensure that hoses are inspected and operated correctly to minimize the risk of an unintended release. The PSVs, MODU, and supply base will be equipped with primary spill contingency equipment.

Supplies will be loaded and unloaded onto PSVs using personnel and cranes for drilling materials and closed piping systems (e.g., pumps, hoses) for bulk powders, liquid supplies, and waste (e.g., drilling fluids). The PSVs will transfer diesel fuel, also referred to as marine gas oil, to the MODU from shore. Fuel is required offshore to power the MODU, including drilling equipment and thrusters. Fueling operations, according to standard vessel fueling procedures, are expected to take place up to two to three times per week by a third-party contractor.

2.4.5.2 Helicopter Traffic and Operations

Helicopters will be used for crew changes on a routine basis and to support medical evacuation from the MODU and search and rescue activities in the area, if required. It is anticipated that one to two helicopter trips per day would be required to transfer crew and any supplies not carried by the PSV to the MODU. The MODU will be equipped with a helideck for safe landings. Helicopter operations will be run out of St. John's International Airport. Refer to Figure 2.11 for potential routes to the Project Area.

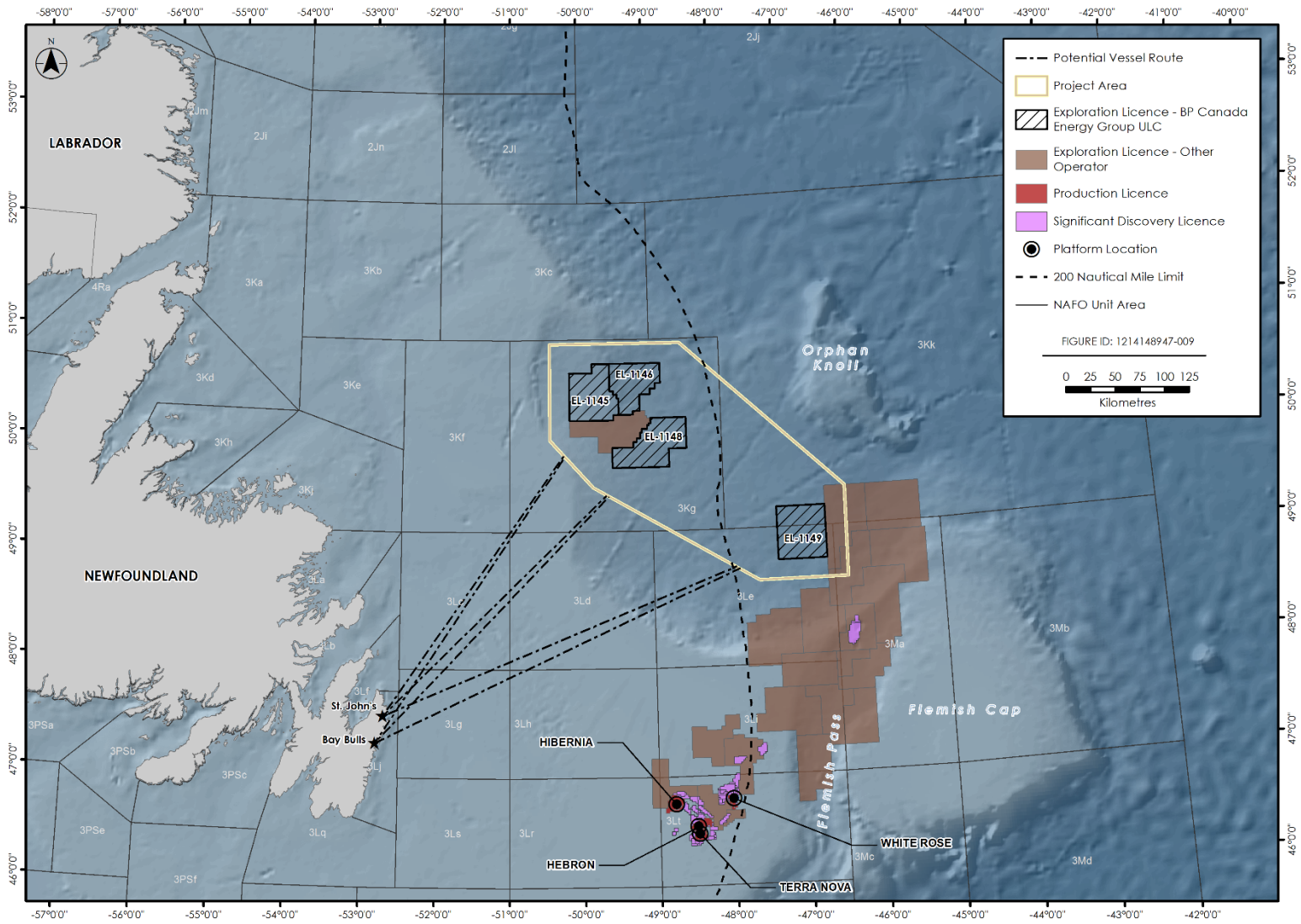


Figure 2.11 Potential Vessel and Helicopter Routes

Routes to the well locations from shore have not yet been finalized, as the well locations have not yet been confirmed. The maximum distance that a journey from St. John's International Airport to the farthest boundary of the ELs is 496 km. The maximum flight time is therefore expected to be approximately 2 hours. Military exclusion areas and areas of high environmental sensitivity have been identified and will be avoided as the helicopter flight paths are determined by the helicopter operators.

The helicopters that will make up the helicopter fleet have not yet been contracted; however, it is expected that the helicopters used by the Project will have a capacity of approximately 12 to 15 passengers and a maximum range of approximately 540 nm (1,000 km) without refuelling. Refuelling operations are expected to take place at St. John's International Airport; however, the MODU will be equipped with refuelling equipment.

2.5 Well Control and Blowout Prevention

A number of barriers are used in drilling operations to control formation pressure, including the drilling fluid and casing, and dedicated pressure control equipment. Formation pressures are managed to prevent a blowout, which is an uncontrolled flow of formation fluids. A blowout can occur when the specific well control barriers have failed.

Blowouts are prevented in the first instance using primary well control measures and procedures. This includes monitoring the formation pressure and controlling the density of the drilling fluid accordingly. The density, or weight, of the drilling fluid is adjusted to maintain an overbalance of pressure against the formation, which keeps the wellbore stable. If a primary barrier fails, the next line of defense is a BOP system, which is a secondary well control barrier.

A BOP is a mechanical device, which is designed to seal off the wellbore at the wellhead when required. The system is made up of a series of different types of closing mechanisms. These include rams, which are pistons that move horizontally across the top of the wellbore, creating a seal around the drill string. Blind shear rams are also used to sever the pipe in the drill string and create a seal. Blind shear rams are also used to seal the wellbore when no pipe is present. Annular preventers can also be used to physically close off the wellbore around various sizes of pipe.

The BOPs that will be used as part of the Project will comply with American Petroleum Institute (API) standards, specifically Standard 53 (Blowout Prevention Equipment Systems for Drilling Wells). For each well drilled as part of the Project, a BOP rated to 15,000 psi working pressure (which will be able to accommodate the anticipated formation pressures) will be installed and pressure tested. These BOPs will consist of a series of control measures, including hydraulically-operated valves and sealing mechanisms that are open to allow the mud to circulate during drilling, but can be quickly closed if reservoir fluids enter the wellbore, an event referred to as a "kick". If a kick occurs and additional controls are required, an annular preventer will be closed to prevent any further influx from the reservoir into the well if there is pipe in the wellbore. If no pipe is in the hole, blind shear rams will be closed. The next line of defense, provided there is pipe in the wellbore, are the pipe rams, of which there are multiple for redundancy. The last line of defense is the blind shear rams, which, if necessary, cut through the drill pipe and seal the well completely. There will also be a ram that is capable of cutting planned casing sizes, which is called a casing shear ram.

Prior to installation on the well, the BOP stack will be pressure tested on the MODU deck, and then again following installation on the well to test the wellhead connection with the BOP and operability on the seafloor. The BOP will be pressure tested periodically throughout the drilling program in line with the *Drilling and Production Guidelines* (C-NLOPB and CNSOPB 2017a). The Guidelines specify that further to the post-installation pressure test named above, pressure testing will occur before drilling out any string of casing; before commencing a formation flow test; following repairs or any event that requires disconnecting a pressure seal; and once every 14 operational days. Where well conditions or other hazards preclude pressure testing within the 14-day timeframe, the test may be delayed by no more than 7 days. Pressure testing will be conducted in line with the Guidelines and all pressure test details and results will be recorded.

When the BOP is initially installed, the ROV intervention capability for operating the BOP, if necessary, will also be tested. This is done by physically engaging the ROV control panel to function the controls. The BOP will only be removed once the well has been plugged and abandoned and the casing pressure tested above the abandonment plugs to confirm plug integrity.

A discussion of emergency response measures and strategies is presented in Section 15.3.

2.6 Project Personnel

The overall Project will be managed by BP through a multidisciplinary Project Team. The Project Team will include members of BP's Global Wells Organization who are responsible for delivering a consistent and standardized approach to the delivery of wells-related activity across the company. This team will be responsible for planning and delivering the Project as a whole; however, a number of contractors will be engaged to carry out specific components of the work. Key contractors include: the drilling contractor, who will provide and operate the MODU; well services providers who provide equipment and services to support drilling operations; and logistics contractors who provide and operate the supply base, PSVs and helicopters.

As the Project progresses, the number of BP and contractor personnel involved in the Project will change. The contractor providing the most personnel is the drilling contractor. During drilling operations, a maximum of 200 people (including BP staff, drilling contractor and well services providers) will work on board the MODU. A small number of BP personnel, such as drilling supervisors and drilling engineers, will work offshore on the MODU. BP and contractor personnel will be trained and capable of carrying out their functions.

During the drilling program, the offshore BP team led by the drilling supervisor, also known as the Wellsite Leader, is responsible for coordinating the overall execution of the drilling program and providing oversight of well-related operations. The Wellsite Leader interfaces with the drilling contractor offshore leadership team to oversee drilling so that it is carried out safely and efficiently and complies with all relevant regulations. The Wellsite Leader reports to the BP Well Superintendent, who is based onshore and is responsible for supervising the execution of the approved drilling program.

Offshore drilling contractor roles will include management positions, such as the Offshore Installation Manager, and Tool Pusher, who work with the BP drilling management team to deliver safe, reliable,

compliant drilling operations. The drilling contractor team will also include a number of roustabouts, technicians, and health, safety and environmental personnel. BP and drilling contractor personnel will also support drilling operations from offices onshore.

2.7 Project Schedule

BP proposes to commence exploration drilling with an initial well in 2020 pending regulatory approval to proceed. Up to 20 exploration wells could be drilled between 2020 and 2026, contingent on the drilling results of the initial well(s). Drilling activities will not be continuous and will be in part determined by rig availability and previous wells' results. It is anticipated that each well will take approximately 60 days to drill.

This EIS assumes year-round drilling, although BP's preference is to conduct drilling between May and October. VSP operations will take approximately one day per well and well testing, where required, would occur over a one to three-month period. Well abandonment will be conducted following drilling and/or well testing. Wells may be designed for suspension and re-entry, but this will be determined through further prospect evaluation.

Figure 2.12 shows key elements of the proposed Project schedule for the initial well drilling campaign.

Task	2017				2018				2019				2020			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Well Selection, Design and Planning																
Stakeholder and Indigenous Engagement																
Regulatory Permitting																
Logistics Preparation																
Exploration Drilling																
Well Abandonment and Reporting																

Figure 2.12 Planned Project Schedule (for Initial Well Drilling Campaign)

2.8 Emissions, Discharges and Waste Management

This section provides an overview of the key emissions, discharges and waste streams that are likely to originate from proposed Project activities as part of routine operations.

The key emission and waste streams from the Project have been classified into the following groups:

- atmospheric emissions
- drilling waste
- liquid discharges
- hazardous and non-hazardous waste
- sound emissions
- light and thermal emissions

Some wastes will be managed and disposed of directly offshore from the MODU and the PSVs, and some wastes will be brought to shore for disposal. Offshore waste discharges and emissions associated with the Project (i.e., operational discharges and emissions from the MODU and PSVs) will be managed in accordance with relevant regulations and municipal bylaws as applicable, including the OWTG and the *International Convention for the Prevention of Pollution from Ships* (MARPOL), of which Canada has incorporated provisions under various sections of the *Canada Shipping Act*. Waste not meeting legal conditions for discharge will not be discharged to the ocean and will be brought to shore for disposal.

Waste management plans and procedures will be developed as part of the Environmental Protection Plan (EPP) for the Project and implemented to define waste storage, transfer, and transportation measures.

Information on the releases, wastes, and discharges will be reported as part of a regular environmental reporting program in accordance with regulatory requirements as described in the OWTG.

2.8.1 Atmospheric Emissions

Key Project activities resulting in atmospheric emissions are:

- fuel combustion from engines associated with the MODU, PSVs, fixed and mobile deck equipment, and helicopters
- flaring during well test activity, in the event that well testing is required

Emissions from diesel combustion activity are likely to include carbon dioxide (CO_2), carbon monoxide (CO), sulphur dioxides (SO_X), nitrogen oxides (NO_X), and particulate matter (PM). Air emissions from the Project will adhere to applicable regulations and standards including the Newfoundland and Labrador *Air Pollution Control Regulations*, National Ambient Air Quality Objectives, Canadian Ambient Air Quality Standards, and applicable regulations under MARPOL.

Releases of greenhouse gases (GHGs) from diesel combustion activity and their accumulation in the atmosphere may affect emission reduction targets for GHGs that have been set or are being developed federally and provincially.

Marine engines are also subject to NO_X limits set by the International Maritime Organization (IMO) of the United Nations, with Tier II limits applicable in 2011 and Tier III limits that became applicable in 2016 in Emission Control Areas, which include the Canadian coast to the 200-nm (370 km) limit. On January 1, 2015, the sulphur limit in fuel in the Emission Control Areas in large marine diesel engines dropped from 1.0% to 0.1% in accordance with the *Vessel Pollution and Dangerous Chemicals Regulations* under the *Canada Shipping Act*. The IMO is also responsible for development of efficiency measures that will involve mandatory measures to increase energy efficiency on ships, a process that will reduce GHG emissions in the offshore.

Ultra-low sulphur diesel fuel will be used for the Project wherever practicable and available. Using ultra-low sulphur diesel instead of regular diesel will reduce the potential for adverse local air quality effects.

Atmospheric emissions from individual components are contingent on fuel consumption. Activity and therefore fuel consumption will be variable throughout the Project; however, expected emissions from individual components are presented below (Tables 2.5 and 2.6). Emission factors from US Environmental Protection Agency (US EPA) AP-42 (Fifth Edition, Volume 1, Chapter 3.4) and ECCC have been used to estimate the amount of carbon dioxide and other atmospheric emissions from MODU operations. Atmospheric emissions from the PSVs were estimated based on guidance from the US EPA (US EPA, 2009) and the emissions from the helicopters were estimated based on guidance from ECCC and other regulatory sources (ECCC, 2015; Swiss Confederation, 2015). It has been assumed that evaporation in diesel engines is negligible, and therefore only exhaust emissions have been considered.

Table 2.5 Gaseous Emissions Factors for Project Activities

Air Contaminant	Emission Factors		
	MODU (based on US EPA AP-42) (lb/MMBtu)	PSVs[b] (lb/MMBTU)	Helicopters (g/kg fuel)
CO_2	165	417	2,070[c]
CO	0.85	0.71	0.95[d]
NO_x	3.2	8.98	18[d]
SO_x	0.0505[a]	2.56	4[e]
PM	0.1	0.3	0.4[d]

[a] The emission factor for SO_2 in US EPA AP-42 is calculated based on $1.01S^1$, where S^1 is the Sulphur in the fuel oil. The emission factor assumes that all Sulphur in the fuel is converted to SO_2. It has been assumed that the Sulphur content of the fuel oil will be 0.05%. The emission factor for SO_2 is therefore 0.0505.

[b] US EPA. 2009. "Current Methodologies in Preparing Mobile Source Port-Related Emission Inventories."

[c] Environment and Climate Change Canada. 2015. National Inventory Report 1990-2013: Greenhouse Gases Sources and Sinks Part 2.

[d] Swiss Confederation. 2015. "Guidance on the Determination of Helicopter Emissions."

[e] Emission factor assuming all Sulphur is converted to SO_2. The Sulphur content of aviation fuel was assumed to be 4000 ppm, or 4 g/kg.

Table 2.6 Estimated Daily Criteria Air Contaminant Emissions for the MODU and Support Vessels and Helicopter

Source	Daily Fuel Consumption (tonnes)	Daily Energy Consumption (MMBtu)	CO_2 (tonnes per day)	CO (tonnes per day)	NO_X (tonnes per day)	SO_X (tonnes per day)	PM (tonnes per day)
MODU	76.4	3,248	253	1.59	3.76	0.23	0.20
PSV (assumes 2)	33.1	1,405	267	0.45	5.44	1.63	0.19
Helicopter	4.60	192	14.7	0.01	0.12	0.04	0.003
TOTAL	**114**	**4,844**	**534**	**2.05**	**9.31**	**1.9**	**0.40**

The MODU for the drilling program has not yet been identified and therefore exact fuel consumption data are not available. It is expected that daily fuel consumption for a semi-submersible DP-powered MODU (as an example) would be approximately 76 tonnes (86 m³). Daily fuel consumption by the *West Aquarius* drilling in deep waters offshore Nova Scotia for the Scotian Basin Exploration Project in 2018 averaged between approximately 35 m³ and 40 m³ in full drilling mode (some days less than 30 m³ daily fuel consumption) and between 55 m³ and 80 m³ when in standby mode, waiting on weather conditions.

It is possible that up to three PSVs will be required to support MODU operations. PSVs will make approximately two to three trips per week at a service speed of 12 knots and one PSV will remain on standby at the wellsite at all times. The furthest distance a PSV will travel from the onshore supply base to the drilling location, based on the boundaries of the ELs, is 496 km. PSV emissions will be dependent on the speed of the vessel; however, it has been assumed that on average, the PSVs will each consume approximately 16.5 tonnes of fuel per day.

A helicopter will be used to transport personnel to and from the MODU. It is expected that two round-trips will be required per day. The furthest distance that the helicopter will travel from St. John's to the drilling location, based on the boundaries of the ELs, is 496 km. It is likely that approximately 4.6 tonnes of fuel (based on two round-trips) could be used per day from St. John's to the wellsite and back again.

In terms of GHG emissions from routine activity, the Project is predicted to emit approximately 534 tonnes of CO_2 equivalent (CO_2 eq) per day (64,080 tonnes CO_2 eq per year) from fuel combustion for the MODU, helicopters and PSVs. For 2015, ECCC reported an annual GHG emission value for the province of Newfoundland and Labrador of 10,300 kilotonnes of CO_2 eq per year (28,219 tonnes of CO_2 eq per day); the total Canadian GHG inventory was 722,000 kilotonnes of CO_2 eq (Environment and Climate Change Canada 2017). Assuming two wells are drilled in any given year (approximately 60 days each), BP's predicted annual CO_2 emissions for the Project from routine activities therefore represent approximately 0.46% of Newfoundland and Labrador's average annual emissions and 0.009% of the national 2015 inventory.

It is not currently anticipated that well flow testing will be carried out on the wells drilled in the initial phase of the Project (i.e., one to two wells). In the event of well success in the initial wells, and if the need for well flow testing is identified, a well test program will be developed and executed on subsequent wells drilled as part of the primary term of the licence. If well flow testing is carried out, atmospheric emissions will be generated from flaring activity.

Well flow testing is a non-routine activity that occurs over a short period of time at the end of the drilling program. The well flow test window is likely to last no more than a month, although it could extend up to three months. Within this operational window, the well flow test process will vary in terms of activity and it is likely that there will be periods where flaring is required. Flaring may be for operational purposes, such as flushing or bleeding, and it would be carried out over one to six hours per flaring event, with low flow rates. Flaring may also be required during a series of separate well flow test periods that could last two or three days per period. If well flow testing is required, it is most likely that there is a single target containing hydrocarbons within each well which could be subject to a well flow test.

If a well flow test is desired, it will be subject to BP's process for well flow test planning, which is designed to promote safe and efficient well test operations. A key requirement of these processes is the use of process safety design methods and an internal approval process for any well test activity and associated flaring. Once the well design has been defined, a detailed well evaluation plan will be prepared and will be submitted for regulatory approval as part of the OA process.

For the purposes of quantifying GHG emissions from a non-routine flaring event for this assessment, it has been assumed that there would likely be one target in each well that could potentially be tested as part of the evaluation program, and that no more than 10,000 bbls (1,590 m³) of oil would be flared per target in each well. Based on a high heating value approach, the tonnes of CO_2 eq emitted as a result of flaring 10,000 bbls of oil from one target during a well flow test are 3,213 tonnes.

Assuming up to two wells could be drilled in any year, it is estimated that up to 6,427 tonnes of CO_2 eq could be released from non-routine flaring during well flow testing, per year. This represents approximately 0.06% of Newfoundland and Labrador's annual GHG emissions (10,300 kilotonnes CO_2 eq per year), as reported for 2015 (Environment and Climate Change Canada 2017).

The Government of Newfoundland and Labrador's Climate Change Action Plan (2011) identifies the following GHG reduction targets: 10% below 1990 levels by 2020; and 75-85 % below 2001 levels by 2050. Predicted CO_2 eq emissions from the Project represent a very minor increment to existing CO_2 eq levels for the Province and therefore are not expected to affect regional, provincial or federal emission targets.

There are three categories of magnitude described in the Agency's guidance (Agency 2003) for project-related GHGs: "low", "medium", and "high". In this EIS, these are attributed quantitatively based on evaluation of GHG emissions from other industrial facilities, provincial, national, and global quantities released, and regulatory thresholds (such as reporting thresholds for GHG emissions to provincial and federal programs). The quantity of the Project GHG emissions (on the basis of tonnes of carbon dioxide equivalents (CO_2 eq) per year) for this Project is based on the following criteria:

- less than 10,000 tonnes CO_2 eq per year is considered "low"
- between 10,000 and 500,000 tonnes CO_2 eq per year is considered "medium"
- greater than 500,000 tonnes CO_2 eq per year is considered "high"

The total GHG emissions from routine Project activities and non-routine Project flaring are estimated to be approximately 70,507 tonnes CO_2 eq per year ("medium" magnitude category using Agency criteria). BP's predicted annual CO_2 eq emissions for the Project therefore represent approximately 0.68% of Newfoundland and Labrador's average annual emissions and approximately 0.009% of the national 2015 inventory.

Compliance and reporting requirements related to GHG emissions are currently being reviewed and updated by the federal and provincial governments. BP will adhere to federal and provincial compliance and reporting requirements for emissions as applicable.

2.8.2 Drilling Waste Discharges

Several drilling related waste streams will be generated as part of the Project; including:

- drill cuttings
- drill fluids
- cement

All drilling related waste streams will be disposed of in accordance with the OWTG.

As described in Section 2.4.1, the shallow sections of the wells will be drilled with WBM or seawater, and then deeper sections with either WBM or SBM.

WBM is primarily made up of water (approximately 75%), which can be freshwater, seawater or brine. Barium sulphate (barite) is added to the water in WBM to control mud density and thus help balance formation pressures within the well. Bentonite clay is also added as a viscosifier, which thickens the mud to suspend and carry drill cuttings to the surface. Other substances can be added to the WBM to obtain the required drilling properties of the fluid, such as thinners, filtration control agents, and lubrication agents. The majority of WBMs discharged are classified under the Offshore Chemical Notification Scheme (OCNS) as substances that pose little or no risk to the environment (PLONOR).

SBM is a water-in-oil emulsion that contains non-aqueous (water insoluble) fluids manufactured through chemical processes. SBMs can be made up of internal olefins, alpha olefins, polyalphaolefins, paraffins, esters, or blends of these materials. The same weighting materials, such as barite, used in WBMs to control density are typically added to SBMs, as well as additives to manage viscosity, fluid loss, alkalinity, emulsion stability and wettability, where required. SBMs may be selected over WBM as they can offer improved lubricity, thermal stability, wellbore integrity, and protection against gas hydrates in the well.

It is proposed that cuttings will be disposed to the seabed along with associated WBM or seawater drilling fluids used in the initial riserless sections. Cuttings from subsequent sections drilled with the riser will be returned to the MODU for treatment.

The MODU will be equipped with specialized solids control equipment for cuttings management. Shale shakers will be used to recover drilling fluids from the cuttings. Shale shakers are made up of a system of coarse and fine mesh screens that collect cuttings and allow drilling fluids to pass through and be collected. The purpose of solids control is to quickly and simply remove as much of the drilling fluids as possible from the cuttings for re-use in the drilling process. Additional solids control equipment, such as centrifuges, may be required depending on the drilling fluid basis of design, and geological characteristics for reconditioning of the drilling fluid for re-use. Following treatment with solids control, WBM cuttings can be discharged to sea from the MODU through a caisson. Any excess or spent WBM may be discharged to the marine environment without treatment in line with the OWTG.

Additional treatment of cuttings will be required when SBM is used as the drilling fluid to enable disposal in accordance with the OWTG. SBM cuttings will only be discharged once the performance targets in the OWTG can be satisfied (e.g., 48-hour mass weighted average of retained “synthetic on cuttings” discharged

to sea not to exceed 6.9 g/100 g). The concentration of SBM on cuttings will be monitored on the MODU for compliance with the OWTG. It is expected that this SBM treatment will be done using a cuttings dryer, equipment that uses high-speed centrifuge technology to separate drilling fluid from the liquids. In accordance with the OWTG, no excess or spent SBM will be discharged to the sea. Spent or excess SBM that cannot be re-used during drilling operations will be brought back to shore for disposal.

Drill waste deposition modelling has been conducted to demonstrate the expected deposition of drill waste from the drilling program. Although the precise location of wellsites for the drilling program are not currently known, the drill waste modelling employed the same representative wellsites as used for the oil spill modelling exercise and acoustic assessment. Table 2.7 indicates the locations of representative wellsites for modelling.

Table 2.7 Drill Waste Deposition Modelling Locations

Location	EL	Water Depth (m)	UTM Easting	UTM Northing
Site 1 (West Orphan Basin)	EL 1145	1360	168454.17	5,608,064
Site 2 (East Orphan Basin)	EL 1149	2785	352,231	5,471,024

The provisional well design presented in Section 2.3.2 was used as the basis for the modelling work. It was assumed that SBM would be used once the riser is installed. The model accounted for likely discharges for the entire well, including WBM discharges at seafloor for initial hole sections (pre-riser installation), bulk WBM discharges, and treated SBM associated cuttings from the MODU, post-riser installation.

Currents assist the dispersion of drilling discharges in the water column by advection and mixing. Thus, the thickness of drill cuttings deposited on the seabed is very much dependent on the metocean conditions that occur at the time of discharge. Periods of low (benign) current conditions can increase sediment thicknesses and the impact on benthic communities due to smothering, whereas during periods of high (energetic) currents, dispersion and dilution of drilling discharges will reduce sediment thicknesses and burial impacts.

Thus the 5-year hindcast HYCOM current dataset was analyzed to find the most benign and energetic surface metocean conditions at each well location averaged over a 45-day period to cover the drilling duration and the associated start dates for these time periods were identified and used in the model simulations.

Based on the typical well design presented in Section 2.3.2, estimated quantities of cuttings that could be generated by drilling are presented below in Tables 2.8 and 2.9. Predictive dispersion modelling for cuttings discharges is presented in Appendix B with a summary provided below.

Table 2.8 Estimated Drill Cuttings Discharges Based on Typical Well Profile – West Orphan Basin

Hole Section	Interval Length	Type of Drilling Fluid Used	Cuttings Weight Total (MT)	Cuttings Volume (m^3)	Cuttings Weight per day (MT)	Cuttings volume per day (m^3)	Discharge Location
42”	80 m	Seawater / WBM	196.17	71.51	196.17	71.51	Seabed
26”	810 m	Seawater / WBM	761.17	277.47	380.59	138.74	Seabed
17 ½”	1,550 m	SBM	703.66	240.54	351.83	120.27	Water column
12 ¼”	1,200 m	SBM	266.94	91.25	66.73	22.81	Water column
Total cuttings discharge per well: 1928 MT Total estimate of synthetic on cuttings per well: 58 MT							

Table 2.9 Estimated Drill Cuttings Discharges Based on Typical Well Profile – East Orphan Basin

Hole Section	Interval Length	Type of Drilling Fluid Used	Cuttings Weight Total (MT)	Cuttings Volume (m^3)	Cuttings Weight per day (MT)	Cuttings volume per day (m^3)	Discharge Location
42”	80 m	Seawater / WBM	196.17	71.51	196.17	71.51	Seabed
26”	835 m	Seawater / WBM	784.67	286.03	392.33	143.02	Seabed
17 ½”	1,000 m	SBM	453.98	155.19	226.99	77.59	Water column
12 ¼”	1,800 m	SBM	400.41	136.68	100.10	34.22	Water column
Total cuttings discharge per well: 1835 MT Total estimate of synthetic on cuttings per well: 51 MT							

For both locations, two scenarios were modelled: one assuming the lowest (45-day period moving-average) ambient surface currents and one assuming the highest ambient surface current conditions over the 5-year period (2006 to 2010). More information on modelling methodology, environmental and engineering data input, and results can be found in Appendix B. Tables 2.10 and 2.11 summarize the predicted areal coverage of sedimentation for the West and East Orphan Basin wells, respectively. Tables 2.12 and 2.13 summarize the predicted maximum extent of deposition from the discharge point for both locations.

Table 2.10 West Orphan Basin – Predicted Areal Extent of Sedimentation from Drilling Discharges

Low Ambient Surface Currents				High Ambient Surface Currents			
Deposition thickness (mm)	Cumulative Area Exceeding			Deposition thickness (mm)	Cumulative Area Exceeding		
	ha	km²	m²		ha	km²	m²
0.001	3,470.1135	34.70113	34,701,135	0.001	2,149.3225	21.49322	21,493,225
0.01	954.2731	9.54273	9,542,731	0.01	745.1983	7.45198	7,451,983
0.1	73.1151	0.73115	731,151	0.1	92.5109	0.92511	925,109
0.2	44.9485	0.44949	449,485	0.2	44.7099	0.44710	447,099
0.5	16.6209	0.16621	166,209	0.5	15.7316	0.15732	157,316
1	8.0992	0.08099	80,992	1	5.7362	0.05736	57,362
2	2.5166	0.02517	25,166	2	2.2720	0.02272	22,720
5	0.8842	0.00884	8,842	5	0.9781	0.00978	9,781
10	0.4447	0.00445	4,447	10	0.5604	0.00560	5,604
20	0.2616	0.00262	2,616	20	0.2853	0.00285	2,853
50	0.1151	0.00115	1,151	50	0.1223	0.00122	1,223
100	0.0706	0.00071	706	100	0.0611	0.00061	611
200	0.0340	0.00034	340	200	0.0509	0.00051	509
500	0.0157	0.00016	157	500	0.0204	0.00020	204

Table 2.11 East Orphan Basin – Predicted Areal Extent of Sedimentation from Drilling Discharges

Low Ambient Surface Currents				High Ambient Surface Currents			
Deposition thickness (mm)	Cumulative Area Exceeding			Deposition thickness (mm)	Cumulative Area Exceeding		
	ha	km²	m²		ha	km²	m²
0.001	3,642.0817	36.42082	36,420,817	0.001	5,464.3237	54.64324	54,643,237
0.01	631.3922	6.31392	6,313,922	0.01	556.9042	5.56904	5,569,042
0.1	63.2136	0.63214	632,136	0.1	57.1931	0.57193	571,931
0.2	34.3524	0.34352	343,524	0.2	20.3689	0.20369	203,689
0.5	6.6198	0.06620	66,198	0.5	5.6181	0.05618	56,181
1	3.4878	0.03488	34,878	1	3.1599	0.03160	31,599
2	1.8914	0.01891	18,914	2	1.7083	0.01708	17,083
5	0.8542	0.00854	8,542	5	0.7626	0.00763	7,626
10	0.4576	0.00458	4,576	10	0.4144	0.00414	4,144
20	0.2440	0.00244	2,440	20	0.2237	0.00224	2,237
50	0.1220	0.00122	1,220	50	0.1093	0.00109	1,093

Low Ambient Surface Currents				High Ambient Surface Currents			
Deposition thickness (mm)	Cumulative Area Exceeding			Deposition thickness (mm)	Cumulative Area Exceeding		
	ha	km²	m²		ha	km²	m²
100	0.0706	0.00071	706	100	0.0534	0.00053	534
200	0.0407	0.00041	407	200	0.0381	0.00038	381
500	0.0102	0.00010	102	500	0.0203	0.00020	203

Table 2.12 West Orphan Basin – Predicted Maximum Extent of Deposition from the Discharge Point

Deposition thickness (mm)	Maximum Extent from Discharge Point (m)	
	Low Ambient Surface Currents	High Ambient Surface Currents
0.001	11,910	7,537
0.01	8,457	5,075
0.1	1,325	1,750
1	577	625
2.5	250	130
5	162	94
10	99	67
20	70	40
50	43	22
100	32	12
500	12	2

Table 2.13 East Orphan Basin – Predicted Maximum Extent of Deposition from the Discharge Point

Deposition thickness (mm)	Maximum Extent from Discharge Point (m)	
	Low Ambient Surface Currents	High Ambient Surface Currents
0.001	8,012	9,174
0.01	6,549	3,277
0.1	1,282	1,366
1	147	145
2.5	97	96
5	69	68
10	48	47
20	32	33
50	19	22

Deposition thickness (mm)	Maximum Extent from Discharge Point (m)	
	Low Ambient Surface Currents	High Ambient Surface Currents
100	8	14
500	2	7

The predicted deposition footprint of discharges from the top hole (riserless) sections discharged directly onto the seabed is localized around the wellhead location, whereas material from subsequent hole sections discharged from the MODU were spread over a much larger area.

The predicted areal coverages for cuttings thicknesses >1 mm ("visible" thickness threshold) were 8.1 and 5.7 ha for the lowest and highest ambient current scenarios and extended up to 577 and 635 m away from the West Orphan Basin wellsite, respectively. The predicted areal coverages for cuttings thicknesses >1 mm were 3.5 and 3.2 ha for the lowest and highest ambient current scenarios and extended up to 147 and 145 m away from the East Orphan Basin wellsite, respectively. These are substantially smaller areal coverages and distances than those predicted for the West Orphan Basin well location. This is attributable to the higher average seabed and surface current velocities at the East Orphan Basin well location, as well as the increased water depth, which all combine to increase the dispersion of discharged drill solids, thereby reducing drill solids deposition thicknesses in the 100 µm to 1 mm thickness size range.

At deposition thicknesses of approximately 6.5 mm or more, benthic communities comprised of sedentary or slow-moving species, may be smothered and the sediment quality will be altered in terms of nutrient enrichment and oxygen depletion organisms (Smit et. Al 2006 and 2008). It is predicted that sediment thicknesses of 6.5 mm could extend up to 128 m from the discharge point or cover an area of approximately 0.69 ha per well in West Orphan Basin, and 55 m from the discharge point or approximately 0.64 ha per well in East Orphan Basin under low ambient surface current conditions.

Thicknesses of 100 mm or greater are confined to a maximum distance of 32 m from the discharge site and aerial extent of 0.07 ha for West Orphan Basin. For East Orphan Basin, thicknesses of 100 mm or greater are confined to a maximum distance of 14 m from the discharge site and aerial extent of 0.07 ha. Differences in modelling results are attributed to differences in water depth (deeper water depth allows cutting particles from surface release to be distributed over a wider area) and current regimes (higher current regime aids dispersion) between the West and East Orphan Basin modelling sites.

These data are used to predict potential environmental effects on fish and fish habitat (particularly the benthic environment), as it pertains to burial and smothering (refer to Section 8). More information on drill waste deposition modelling for the Project can be found in Appendix B.

Cement is used in drilling operations to secure casing in the well, and to prevent the escape of hydrocarbons around the outside of the well casing. Cement is a safety critical barrier in the well as it prevents the escape of hydrocarbons. The use of excess cement helps to demonstrate that the cement job has been completed and that the annular space has been filled. In most cases, excess cement is used to provide contingency in case irregularities in the formation wall result in the annual space being larger than expected.

Excess cement slurry and drilled (hard) cement may be discharged to the seabed during the initial phases of the well, which will be drilled without a riser. The volume of cement discharged to the seafloor during the riserless sections of the well is expected to be in the range of approximately 200 tonnes. Once the riser has been installed, cement waste will be circulated back to the MODU. After every cementing operation, the cement unit will be cleaned (rinsed) to prevent cement from hardening in the tanks and lines. Each cleaning operation is estimated to result in a discharge of approximately 1 to 2 m³ of cement slurry from the MODU below the water surface. Unused cement bulks and additives will be transported to shore for future re-use or disposed at an approved facility.

There are no other options for cement management and discharge during the riserless phase of drilling; however, BP will use logging techniques to help improve the accuracy of calculations to estimate how much cement is required. This will help to manage the volume of excess cement. BP will visually monitor the extent of any discharged excess cement through the use of ROV surveys. An ROV survey will be conducted at the outset of drilling operations, once during drilling operations, and at the end of the drilling program.

2.8.3 Liquid Discharges

Several liquid wastes could be generated from the MODU and associated drilling equipment, and on the PSVs. Some of these liquid wastes can be discharged directly from the MODU or PSVs, following treatment where necessary, in accordance with the OWTG. Where discharges occur to the marine environment, effluent discharge points on a MODU are typically just below or above the sea surface. Specific discharge points will depend on the MODU design.

A short description of the major liquid discharge streams and the way in which they will be managed and disposed is shown in Table 2.14.

Liquid wastes, not approved for discharge in OWTG such as waste chemicals, cooking oils, or lubricating oils, will be transported onshore for transfer to an approved disposal facility. This is described in further detail in Section 2.8.4.

Table 2.14 Potential Project-Related Liquid Discharges

Discharge	Source and Characterization	Waste Management
Produced water	Produced water includes formation water encountered in a hydrocarbon bearing reservoir. Produced water would only be produced during well evaluation and testing processes when formation fluids are brought to surface.	Small amounts of produced water may be flared (although BP does not anticipate well test flaring for the initial wells). If volumes of produced water are large, some produced water may be brought onto the MODU for treatment so that it can be discharged according to the OWTG.

Discharge	Source and Characterization	Waste Management
Bilge and deck drainage water	Deck drainage is water on deck surfaces of the MODU from precipitation, sea spray or MODU activities such as rig wash-down, or from fire control system or equipment testing. Bilge water is seawater that may seep or flow into parts of the MODU. Water may pass through pieces of equipment into other spaces of the MODU. As it may contact equipment and machinery, deck drainage and bilge water may be contaminated with oil and other chemicals.	Deck drainage and bilge water will be discharged according to the OWTG which state that deck drainage and bilge water can only be discharged if the residual oil concentration of the water does not exceed 15 mg/L.
Ballast water	Ballast water is used in MODU and PSVs for stability and balance. It is taken up or discharged when the cargo is loaded or unloaded, or when extra stability is needed to manage weather conditions. The water typically does not contain hydrocarbons or chemicals as it is stored in dedicated tanks on the vessel.	Ballast water will be discharged according to IMO *Ballast Water Management Regulations* and Transport Canada's *Ballast Water Control and Management Regulations.* The MODU will carry out ballast tank flushing prior to arriving in Canadian waters.
Grey and black water	Black and grey water will be generated from ablution, laundry and galley facilities onboard the MODU and PSVs. Grey water will be generated from washing and laundry facilities, and black water includes sewage water generated from the accommodation areas.	Sewage will be macerated prior to discharge in accordance with MARPOL and OWTG.
Cooling water	Cooling water is seawater that is pumped onto the MODU and passed over or through equipment such as machinery engines using heat exchangers. Cooling water may be required on the MODU; however, volumes are likely to be minimal. Water may be treated through biocides or electrolysis prior to use.	Cooling water will be discharged according to the OWTG which states that any biocides used in cooling water are selected according to the OCSG. Cooling water is likely to be warmer than the ambient water temperature upon discharge but will be rapidly dispersed, reaching ambient temperatures.
BOP fluids	The BOP is regularly pressure and function tested. BOP fluids are released directly to the ocean during BOP installation and removal (approximately 728 bbl [116 m³] per well, during BOP operations and testing activity (approximately197 bbls [90 m³] per well) and non-routine BOP retrieval or riser unlatching (e.g., disconnect for weather – assumed once per well) (approximately 547 bbls (87 m³]). BOP control fluid would also be discharged to the marine environment if the BOP is activated in response to an emergency event. BOP fluids are typically freshwater based, seawater soluble chemicals.	BOP fluids and any other discharges from the subsea control equipment will be discharged according to OWTG and OCSG.
Well treatment and testing fluids	Well testing may be required as part of the Project to gather information about the subsurface characteristics, and to convert an EL to a SDL. Depending on well success, formation fluids, including hydrocarbons and associated water are likely to be brought to surface during a well test.	Any hydrocarbons, such as gas, oil or formation water that are brought to surface as part of well test activity will be flared for safe disposal. All flaring will be via one of two horizontal burner booms, to either a high efficiency burner head for liquids, or simple open-ended gas flare tips for gases to minimize fall out of un-combusted hydrocarbons. Flaring, if required, will be optimized to the amount necessary to characterize the well potential and as necessary for the safety of the operation.

2.8.4 Hazardous and Non-Hazardous Waste

Waste generated offshore on the MODU and PSVs will be handled and disposed in accordance with relevant regulations and municipal bylaws. Waste management plans and procedures will be developed and implemented to prevent unauthorized waste discharges and transfers. Putrescible solid waste, specifically food waste generated offshore on the MODU and PSVs, will be disposed according to OWTG and MARPOL requirements. In particular, maceration of kitchen waste will be conducted in accordance with MARPOL and OWTG. There will be no discharge of macerated food waste within 3 nm from land.

Non-hazardous wastes, such as other domestic wastes, packaging material, scrap metal, and other recyclables such as waste plastic for example, will be stored in designated areas on board the MODU. At scheduled intervals, waste will be transferred to the PSVs so that it can be transported to shore where it will be transferred to a third-party waste management contractor at an approved facility.

Some solid and liquid hazardous wastes are likely to be produced as part of the Project, including oily wastes (e.g., filters, rags and waste oil), waste chemicals and containers, batteries, biomedical waste, and spent drilling fluids. Biomedical waste will be collected onboard by the medical personnel and stored in special containers before being sent onshore for incineration. Hazardous wastes will be stored in designated areas on the MODU and will be transferred to shore on a PSV for disposal by a third-party contractor at an approved facility. Transfer of hazardous wastes will be conducted according to the *Transportation of Dangerous Goods Act.* Any applicable approvals for the transportation, handling and temporary storage, of these hazardous wastes will be obtained as required.

2.8.5 Sound Emissions

Underwater sound will be generated by the MODU and PSVs, as well as the air gun source array during VSP operations. The level of underwater sound generated by a MODU is influenced by the type of MODU and by the method of positioning on station (i.e., DP or mooring system). The extent to which sound travels is determined by environmental conditions, including water depths, salinity and temperature.

2.8.5.1 Fundamentals of Underwater Acoustics

Underwater sound can be characterized as either impulsive (e.g., from a seismic survey or VSP sound source) or non-impulsive (e.g., from drilling or transiting vessels). Sound levels are described using a variety of metrics such as sound pressure levels (SPLs), which represent only the pressure component of sound, and sound exposure levels (SELs), which is a measure of energy (pressure squared) that also takes into account the duration of the signal. SPLs can further be measured by either their root-mean-square (rms) pressure, which indicates an average SPL over a given period of time, or by their peak pressure (i.e., maximum wave amplitude) or peak-to-peak pressure (i.e., maximum negative to maximum positive wave amplitude). The SPL rms metric is generally considered more appropriate for measuring non-impulsive signals, as they are highly dependent on the time window that is applied. Peak SPLs are commonly used for impulsive sounds, as they provide information related to the instantaneous intensity of a sound; however, they do not account for the bandwidth or duration of the sound and are therefore, a poor indicator for perceived loudness. It is important to be aware which measure is in use when interpreting or comparing

any quoted sound level. In the biological-acoustic literature, levels of received air gun source array pulses are often described based on the “average” (rms) level, where the average is calculated over the duration of the pulse. The rms value for a given air gun pulse is typically approximately 10 dB lower than the peak level, and 16 dB lower than the peak-to-peak value (Greene 1997; McCauley et al. 1998, 2000), depending on the extent of the averaging window used in the rms calculation.

Sound level (magnitude) is typically measured on the decibel (dB) scale, with RMS SPL denoted by dB rms, peak SPLs denoted by dB peak, and peak to peak SPLs denoted by dB pk-pk in this document. The decibel scale is a logarithmic ratio scale of intensity and is relative and therefore only meaningful if a reference level is included. In underwater acoustics, a reference pressure of 1 µPa is commonly used to describe SPLs (Richardson et al. 1995), whereas a reference pressure of 20 µPa is used for sound in air. The logarithmic nature of the decibel scale means that every 10 dB increase in SPL is a ten-fold increase in acoustic power. However, the way an animal (including humans) perceives the “loudness” of a signal, is not the same as the measured signal strength. While 6 dB represents a doubling of signal strength or intensity, humans perceive a 10 dB increase as a doubling of sound “loudness”. Unlike SPLs, SELs are a measure of the total energy of one or multiple acoustic events over the duration of the event. Since energy is proportional to squared pressure and the reference time for SELs has been set to one second, SELs are presented in dB re 1 µPa²s. SELs can also be measured cumulatively, measuring the total sound energy at a receiver location over a period of time. Cumulative SELs (SEL_{cum}) capture the overall sound levels experienced by sound receivers as a result of multiple sound events over a period of time (Southall et al. 2007).

Terms referred to in underwater acoustics include both source and received levels. The source level usually represents the SPL at a distance of 1 m from the source, referenced to 1 µPa (e.g., 200 dB re 1µPa @ 1m). Source levels are usually derived from received levels obtained during field measurements at some distance from the source, and back-propagated to a distance of 1 m using an acoustic propagation model. This method can overestimate actual near-field source levels for complex sound sources such as seismic arrays, which are made up of multiple source elements (i.e., air gun source arrays); however, these considerations are incorporated into acoustic modelling when predicting sound propagation and transmission loss (see Appendix C). Received levels are usually measured at a receiver position or predicted through modelling based on estimated source levels, environmental conditions, distance to the receiver, and sound propagation or transmission loss over that distance.

The intensity of sound decreases as it travels through water as a result of spreading and attenuation; this is known as transmission loss. Transmission loss due to spreading can occur in one of two simplistic forms: spherical or geometric spreading loss; or cylindrical spreading loss (Richardson et al. 1995). Spherical spreading loss assumes a uniform environment, which is typically found in deep waters (typically >200 m). Cylindrical spreading loss occurs when a water body is non-homogenous such as in shallow coastal waters (<200 m) or in stratified water bodies. Under cylindrical spreading loss, sound is reflected or refracted off the sea surface, seabed, or off water layers of differing densities. As a result, if there are density gradients in the water column, sound can travel much farther than when the water column is mixed and homogeneous (WDCS 2004). In reality, transmission loss falls somewhere between these various forms.

JASCO Applied Sciences was engaged to characterize the existing underwater soundscape in the Project Area and predict underwater sound transmission loss for representative source levels for the MODU, VSP survey, and PSVs (Matthews et al. 2018; see Appendix C). Ambient sound levels and various contributors to the soundscape in the area were derived from acoustic data collected at two Environmental Studies Research Fund (ESRF) recording stations, near EL 1145 and EL 1149. Anthropogenic contributors to the soundscape during the ESRF study period (including vessel traffic, seismic surveys, and oil and gas extraction activity) and naturally occurring ambient sound contributors (including wind, other environmental phenomena, as well as fin whales) were discussed. Section 5.3.10 presents a summary of ambient underwater sound conditions based on Matthews et al. (2018).

A summary of expected source levels and transmission loss for the MODU, VSP survey, and PSVs is presented in the following sections; refer to Appendix C for more information.

2.8.5.2 MODU Sound Emissions

The MODU will use a DP system to maintain position while drilling. This involves the use of acoustic positioning systems, which use acoustic energy signals to determine the MODU location and control thrusters and propellers appropriately to maintain position.

The acoustic signals occur between transducers mounted in the hull of the MODU and the transponders fixed on the seafloor. Typically, two hull-mounted transducers are used for redundancy in case one fails, and between four and eight transponders are deployed on the seafloor. Depending on the model of transducers and the positioning setup used, frequencies generated by acoustic positioning transponders can vary between 18 and 36 kHz (Austin et al. 2012). It is likely that the hydroacoustic system employed for the Project will be one of the Kongsberg High Precision Acoustic Positioning systems (Kongsberg Maritime 2016), or something similar, operated in 'long-base-line' mode to accommodate the water depths. Manufacturer source sound pressure level specifications for this type of system have been reported as 206 dB re 1µPa @ 1 m SPL (Austin et al. 2012). Based on an empirical spreading loss equation (as obtained from field measurements; Warner and McCrodan 2011), transponder source levels of this magnitude have been modelled for operations of other exploration and production companies offshore Greenland, which show SPLs to decrease to below 160 dB re 1µPa SPL at distances greater than 40 m (Austin et al. 2012).

For the purpose of this assessment, it is assumed that the broadband source level for the MODU would be 196.7 dB re 1 µPa @ 1 m rms SPL. This MODU source level has been used in recent acoustic modelling studies conducted for offshore exploration drilling programs in the Scotian Basin (Zykov 2016) and in the Flemish Pass (Quijano et al. 2017) and is considered conservative for effects assessment purposes in that reported values have been lower. Based on measurements acquired during drilling of Shell Canada's Monterey Jack exploration well in the Scotian Basin, MacDonnell (2017) reported that the drillship Stena *IceMax* had a broadband source level of 187.7 dB re 1 µPa @ 1 m SPL. Similarly, Kyhn et al. (2011) reported that the drillship Stena Forth had broadband source levels of 184 dB re 1 µPa @ 1 m rms SPL during drilling and 190 dB re 1 µPa @ 1 m rms SPL during maintenance work. Previously reported sound levels produced by offshore drilling operations ranged from 130 to 190 dB re 1 µPa @ 1 m rms SPL (frequency range 10 to 10,000 Hz) (Richardson et al. 1995; Hildebrand 2009; OSPAR 2009).

2.8.5.3 VSP Survey Sound Emissions

Like 2D and 3D seismic surveys, VSP surveys use air gun source arrays. However, the associated size and total volume of the source array used during VSP are typically much smaller than in a traditional offshore seismic survey, and thus VSP operations tend to produce lower sound levels. In addition to using a smaller source array than traditional seismic surveys, VSP operations occur over much shorter time frames (e.g., days instead of months) and are conducted over a much smaller spatial scale (i.e., limited to the wellsite). Air gun source arrays used in offshore seismic surveys typically produce most sound energy in the frequency range of 5 to 300 Hz and at SPLs of approximately 245 to 260 dB peak re 1 µPa @ 1m in their primary radiation direction (calculated through back-propagation methods that likely typically overestimates actual sound levels in the near-field) (Lee et al. 2011). However, the pulses contain substantial energy up to 500 to 1,000 Hz and some energy at higher frequencies (Goold and Fish 1998; Potter et al. 2007; Hermannsen et al. 2015). Of particular relevance to an effects assessment is that air gun source arrays produce intermittent sounds, involving emission of a strong sound pulse for a small fraction of a second (10 to 20 microseconds; Caldwell and Dragoset 2000) followed by several seconds of near silence.

The VSP that BP is proposing to use for this Project will take approximately one day per well to complete and will be located directly above the wellsite. Further description of VSP is provided in Section 2.4.2. For the purpose of this assessment, it was assumed that a 1,500 in³ air gun source array with a source level (broadside; 10 to 2,000 Hz) of 247.8 dB re 1 µPa @ 1 m SPL_{peak} will be used for VSP survey operations (Matthews et al. 2018).

2.8.5.4 Platform Supply Vessels Sound Emissions

The specific PSVs to be used to support drilling operations are currently unknown. A representative vessel was chosen from the previous acoustic study conducted by JASCO for the Scotian Basin Exploration Drilling Project (Zykov 2016). The estimated source level spectra for the PSV were based on the bow and aft thrusters of the Damen platform supply vessel 3300CD. This vessel design has been in service for five to seven years and it has a similar power plant and thruster configuration to other PSVs currently used in the Newfoundland offshore area. The underwater acoustic assessment for the Project therefore assumed PSV source levels of 188.6 dB re 1 µPa @ 1 m rms SPL (refer to Appendix C).

2.8.5.5 Transmission Loss and Influence on the Ambient Soundscape

The accurate prediction of sound propagating away from the planned Project activities will depend, in part, on the particulars of the equipment and activities. However, because of the similarities in operations and environmental parameters, underwater sound assessments for the Scotian Basin (Zykov 2016) and the Flemish Pass exploration drilling projects (Matthews et al. 2017; Quijano et al. 2017) serve as a proxy of sound propagation features in the Orphan Basin. Transmission loss (TL) coefficients were calculated for the Project and compared to those calculated for Scotian Basin and Flemish Pass exploration drilling programs.

Sound from the proposed Project activities in EL 1145, EL 1146, and EL 1148 is expected to be "bounded" by the continental shelf, west of the site. More specifically, sound from the drilling program activities that reach the continental shelf, west of the Program Area, is predicted to rapidly attenuate between the 200 and 50 m isobaths. The bathymetric features around EL 1149 (such as the continental shelf, Flemish Pass, and Flemish Cap, more than 150 km away) are expected to have less influence on sound propagation in the area. Seasonal variation in the sound speed profile will lead to variation in how far sound propagates; sound is predicted to travel farther (i.e., less transmission loss) in winter than in summer (Matthews et al. 2018).

Considering all modelled Project activities, the TL coefficient calculated for the Project varies between 14.1 and 16.7 in EL 1145 and between 17.4 and 19.2 in EL 1149. As such, distances to sound levels isopleths are expected to be longer (due to less transmission loss (i.e., lower TL values) in EL 1145 than EL 1149. This is mainly due to the differences in water depth and sound speed profile between the two areas.

The TL coefficients for MODU operations in EL 1149 (17.4 to 17.9) are similar to those modelled in the Scotian Basin (Zykov 2016) and Flemish Pass (Matthews et al. 2017). Assuming that the same or similar MODU will be used by BP, it is expected that distances to sound level isopleths would be in the range of those predicted for May in Flemish Pass and for August in Scotian Basin (Matthews et al. 2018). Table 2.15 shows predicted 95% distances from MODU operations to rms SPL sound level isopleths for Flemish Pass in May (i.e., semi-submersible *West Aquarius*) and the Scotian Basin (semi-submersible Seadrill *West Sirius*) in August and February. Note that a 95% distance (i.e., R95% values in Tables 2.15 and 2.16) is the predicted range encompassing at least 95% of the area (in the horizontal plane) that would be exposed to sound at or above that level.

Table 2.15 Predicted 95% Distances from MODU Operations (Semi-submersible Platforms) to rms SPL Sound Level Isopleths for Flemish Pass in May and the Scotian Basin in August and February

rms SPL (dB re 1 µPa)	95% Horizontal Distance ($R_{95\%}$) Predicted in May in Flemish Pass[1] (km)	95% Horizontal Distance ($R_{95\%}$) for MODU Predicted in August in the Scotian Basin[2] (km)	95% Horizontal Distance ($R_{95\%}$) for MODU Predicted in February in the Scotian Basin[2] (km)
190	Not reached (Sites A & B)	<0.1 (Site A & B)	<0.1 (Sites A & B)
180	Not reached (Site A) 0.09 (Site B)	<0.1 (Site A & B)	<0.1 (Sites A & B)
160	0.15 (Sites A & B)	0.11 (Sites A & B)	0.11 (Sites A & B)
140	1.04 (Site A) 1.69 (Site B)	1.04 (Site A & B)	2.02 (Sites A & B)
120	38.07 (Site A) 40.58 (Site B)	24.0 (Site A) 26.7(Site B)	>150 (Sites A & B)

1 Refer to Table 13 in Matthews et al. (2017)

2 Refer to Tables 14 and 15 in Zykov (2016)

Tables 13, 14 and 15 referenced above also present R_{max} values, which are the maximum range at which a given sound level was encountered in the modelled maximum-over-depth sound field. Figure 8 in Zykov (2016) provides a schematic showing the difference in R_{max} versus $R_{95\%}$ values.

For the VSP operations, predicted TL coefficients for the Scotian Basin range between 17.6 and 17.8 (Zykov 2016) and between 16.5 and 17.3 in Flemish Pass (Matthews et al. 2017). The corresponding TL coefficient is similar in EL 1145 (16.7) and higher in EL 1149 (19.2). Assuming that the same or similar VSP air gun source array will be used by BP, it is expected that distances to sound level isopleths in EL 1145 (in June) would be in the range of those predicted for May in Flemish Pass (Matthews et al. 2017), and would be greater than predicted distances in the Scotian Basin (in both, August and February) (Zykov 2016). Once again, assuming the same or similar VSP air gun source array, distances to sound level isopleths in EL 1149 (in June) are expected to be shorter than those in May in Flemish Pass, and those in the Scotian Basin (in both, August and February) (Matthews et al. 2018). Table 2.16 shows predicted 95% distances from VSP operations to rms SPL sound level isopleths for Flemish Pass in May and the Scotian Basin in February and August; VSP operations assumed a 12-air gun source, 2,400 in³ array.

Table 2.16 Predicted 95% Distances from VSP Operations to rms SPL Sound Level Isopleths for Flemish Pass in May and the Scotian Basin in February and August

rms SPL (dB re 1 µPa)	95% Horizontal Distance ($R_{95\%}$) Predicted in May in Flemish Pass[1]	95% Horizontal Distance ($R_{95\%}$) Predicted in February in the Scotian Basin[2]	95% Horizontal Distance ($R_{95\%}$) Predicted in August in the Scotian Basin
200	0.04 (Sites A & B)	0.04 (Site A & B)	0.04 (Site A & B)
190	0.26 (Site A) 0.14 (Site B)	0.1 (Site A & B)	0.09 (Site A & B)
180	0.4 (Site A) 0.41 (Site B)	0.28 (Site A & B)	0.28 (Site A & B)
170	1.27 (Site A) 1.74 (Site B)	1.78 (Site A) 1.52 (Site B)	1.74 (Site A) 1.52 (Site B)
160	5.26 (Site A) 6.10 (Site B)	3.19 (Site A) 2.83 (Site B)	3.17 (Site A) 2.95 (Site B)

1 Refer to Table 13 in Matthews et al. (2017)

2 Refer to Table 11 in Zykov (2016)

Tables 11 and 13 referenced above also present R_{max} values, which are the maximum range at which a given sound level was encountered in the modelled maximum-over-depth sound field. Figure 8 in Zykov (2016) provides a schematic showing the difference in R_{max} versus $R_{95\%}$ values.

TL coefficients associated with PSVs in the Project Area were also calculated (15.9 in EL 1145 and 18.7 in EL 1149). Sound levels from PSVs were not estimated as a single source in the modelling studies for the Flemish Pass (Matthews et al. 2017) and Scotian Basin (Zykov 2016) projects; thus, comparison of TL for PSVs could not be made amongst different projects.

The two-year-long data set collected in 2015-2017 provides information on the ambient soundscape in the Newfoundland Orphan Basin Exploration Drilling Program Area. In general, the ambient sound levels are higher in winter than summer due to higher winds, higher sea states, and fin whale calls. Within distances of approximately 10-40 km from exploration of production oil and gas platforms, anthropogenic sounds are the dominant sources in the 45-2250 Hz band. The lower but non-negligible sound levels from oil and gas

platforms can be measured at distances greater than 40 km. When present, air gun array pulses from seismic surveys can increase the mean monthly sound pressure level by 20 dB or more over large areas (Matthews et al. 2018). Characteristics of the ambient soundscape are discussed in detail in Section 5.3.10.

The estimated broadband source levels associated with Project activities (196.7 dB re 1 µPa m for the MODU; 222.6 dB re 1 µPa²·s m for the VSP air gun source array; and 188.6 dB re 1 µPa m for PSVs) are higher than the ambient levels measured in 2015-2017. Therefore, these activities are expected to contribute to the soundscape in the Project Area during the course of the activities. VSP operations are expected to increase the ambient sound levels to a lesser extent than 2D or 3D exploratory seismic surveys because of their shorter operational timeframe and generally lower source levels. The MODU and associated vessel traffic will contribute to the soundscape for longer periods albeit at lower sound levels, than the VSP operations.

2.8.5.6 Atmospheric Sound

Atmospheric or in-air sound (e.g., sound above the sea surface) is not of particular concern given the relative low level of atmospheric sound sources (above sea level) and limited transmission of underwater sound through the air-sea interface. The nearest “residence” to the Project Area would be the SeaRose floating, production, storage and offloading (FPSO) vessel at Husky’s White Rose oil development field, approximately 250 km from EL 1149. Potential receptors associated with this development or coastal communities on the island of Newfoundland would not perceive atmospheric sound generated by Project activities due to separation distance.

Helicopter traffic associated with the Project will generate atmospheric sound emissions although the use of an existing operational airport (St. John’s International Airport) will reduce effects on human receptors. Effects of helicopter traffic (including atmospheric sound) on wildlife will be mitigated through avoidance of bird colonies (refer to Section 9.3).

2.8.6 Light and Thermal Emissions

Artificial lighting will be generated by the Project from several sources. MODU and PSV navigation and deck lighting will be operating 24 hours a day throughout drilling and PSV operations for maritime safety and crew safety.

Flaring activity during well flow testing, in the event that it is carried out, will generate light and thermal emissions on the MODU. Well flow testing, where it occurs, will be carried out on a temporary basis at the end of drilling operations. It is possible that there could be several, intermittent, short periods of flaring (lasting up to two or three days) during a one to three-month window at the end of drilling operations. It is not expected that well flow testing will take place on the first two wells drilled as part of the Project (refer to Section 2.4.3 for further information).

The Project will therefore result in an increase in night-time light levels, particularly within the Project Area where the MODU will be illuminated at night. The night sky in the Project Area is assumed to be a dark-sky site given the lack of offshore platforms and low level of vessel traffic activity in the area.

2.9 Alternative Means of Carrying out the Project

2.9.1 Options Analysis Framework

As required under section 19(1)(g) of CEAA 2012, every environmental assessment of a designated project must take into account alternative means of carrying out the project that are considered technically and economically feasible and consider the environmental effects of any such alternative means.

Consistent with the Agency's (2013b) Operational Policy Statement for Addressing "Purpose of" and "Alternative Means" under the *Canadian Environmental Assessment Act, 2012*, the process for consideration of alternative means of carrying out the Project includes the following steps:

- consideration of legal compliance, technical feasibility, and economic feasibility of alternative means of carrying out the Project
- description of each identified alternative to the extent needed to identify and compare potential environmental effects
- consideration of the environmental (including socio-economic) effects of the identified technically and economically feasible alternatives of carrying out the Project; this includes potential adverse effects on potential or established Aboriginal and Treaty rights and related interests (where this information has been provided)
- selection of the preferred alternative means of carrying out the Project, based on the relative consideration of effects

There are several components of the Project that remain to be finalized. Some options under review will be confirmed to C-NLOPB as part of the OA and ADW process (e.g., wellsite location).

2.9.2 Identification and Evaluation of Alternatives

As per the EIS Guidelines, the analysis of alternative means considers the following alternative means of carrying out the Project:

- drilling fluid selection (e.g., WBM or SBM)
- drilling unit selection
- drilling waste management
- water management and effluent discharge
- alternative platform lighting options (including flaring) to reduce attraction and associated mortality of birds

A consideration of legal compliance, technical feasibility and economic feasibility, as well as the environmental effects (where applicable) of each alternative means is described for each option.

Technical feasibility considers criteria which could influence safe, reliable, and efficient operations. Technology must be available and proven for use in a similar environment and activity set (i.e., offshore drilling in deep water), and cannot compromise personnel and process safety for it to be considered.

Economic feasibility considers capital and operational project expenditure. Project expenditure can be impacted directly (e.g., equipment and personnel requirements) and indirectly (e.g., schedule delays).

Each option for the alternative means identified above is summarized in a tabular format. The preferred alternative means form the basis for the Project to be assessed (i.e., assumed to be the base case that is assessed for environmental effects in Chapters 8 to 13 of this EIS).

2.9.2.1 Drilling Fluids Selection

Both WBM and SBM could be used to drill wells associated with the Project. Drilling fluids are formulated according to the well design and the expected geological conditions. Both WBM and SBM are acceptable according to local regulations, provided that the components of the drilling fluids are selected according to criteria of the OCSG and their disposal is carried out according to the OWTG.

Both drilling fluids are available within Newfoundland and Labrador; however, there are several factors that determine the technical feasibility of one drilling fluid relative to another. In general, SBM can enable more efficient drilling operations than WBM when drilling through challenging geological conditions, including areas containing hydrate shales.

A summary of the comparison between WBM and SBM is presented in Table 2.17. In consideration of the technical and economic advantages to using SBM, while recognizing it cannot be used to drill riserless sections of the well, the preferred option is to use WBM and SBM while drilling different sections of the well. The EIS therefore considers the use of both WBM and SBM in the effects assessment.

Table 2.17 Summary of Drilling Fluid Alternatives Analysis

Option	Legally acceptable?	Technically feasible?	Economically feasible?	Environmental Issues	Preferred Option
SBM only	**No**	Yes	Yes	SBM is not permitted for ocean discharge without treatment, therefore SBM cannot be used for riserless drilling where the cuttings are disposed directly on the seafloor	
WBM only	Yes	Yes – although potential challenges with borehole stability	Yes – although potential increased cost from non-productive time and losses	No substantial difference between options. Both are considered acceptable provided that appropriate controls are in place and chemicals are selected	

Option	Legally acceptable?	Technically feasible?	Economically feasible?	Environmental Issues	Preferred Option
WBM / SBM hybrid for different sections	Yes	Yes	Yes	in accordance with OCSG (EIS considers both WBM and SBM in effects assessment)	

2.9.2.2 Drilling Unit Selection

As indicated in Section 2.3.1, there are three main types of drilling units for offshore drilling: a jack-up rig, a semi-submersible drill rig, and a drillship.

BP has not yet selected the MODU that will be used to drill the wells for the NL Orphan Basin Exploration Drilling Program; however, in consideration of the water depths in the ELs (greater than 100 m), a jack-up rig is not a technically feasible option. Section 2.3.1.1 describes the MODU selection and approval process. Both a semi-submersible MODU and drillship are considered technically and economically feasible options and would have comparable environmental effects. The EIS therefore considers both drilling unit options in the effects assessment. Table 2.18 summarizes the comparison of drilling unit options.

Table 2.18 Summary of Drilling Unit Alternatives Analysis

Option	Legally acceptable?	Technically feasible?	Economically feasible?	Environmental Issues	Preferred Option
Jack-up Rig	Yes	No, given water depths of ELs	Not considered as option because not technically feasible.		
Semi-submersible	Yes	Yes	Yes	Both options are considered to be environmentally acceptable and would have comparable environmental effects in terms of lighting, emissions and discharges, and underwater sound (EIS considers both options in effects assessment)	
Drillship	Yes	Yes	Yes		

2.9.2.3 Drilling Waste Management

There are three main drilling waste management options for consideration:

- disposal at sea
- offshore reinjection
- ship- to-shore for onshore treatment/disposal

The preferred option varies depending on the type of drilling fluid used (e.g., WBM or SBM). In the event that different drilling fluids are used to drill different sections of the well, it is likely that a combination of drilling waste management options will be used.

Ocean disposal of WBM and SBM drilling waste (including required onboard treatment prior to disposal where applicable) is described in Section 2.8.2.

An alternative method of offshore disposal is cuttings reinjection. Reinjection involves slurrifying cuttings (i.e., mixing them with a liquid) and then pumping them into a dedicated well, designed for reinjection. Under pressurized conditions, cuttings pass into targeted formations down the well. Offshore injection of cuttings from fixed wellhead platforms is well proven, but subsea injection from MODUs is limited. The subsea injection equipment is very specialized (i.e., it requires a flexible injection riser and a specially designed wellhead) and has only been developed for water depths of 1,000 feet (305 m). All Project wells will be drilled at water depths much greater than 305 m; therefore, implementing subsea injection at these water depths would require the use of unproven technology. Equipment weight increases also considerably with the length of the pipe, so the use of a flexible pipe at deep water depths would be costly and require a large storage capacity on the rig. There would ultimately be a length limitation for deep-water applications. Special installation procedures may also be required. Therefore, subsea cuttings reinjection has never been developed for deep water either by operators or the service sector because the risked costs are too high especially for exploration drilling.

For onshore disposal, cuttings are shipped to shore using a PSV and then transported to an approved waste management facility for treatment and disposal. There are no approved treatment facilities for SBM waste in Newfoundland and Labrador, therefore the waste would have to be transported out of province. Ship-to-shore treatment of waste reduces offshore effects associated with drilling waste discharge; however, additional effects due to increased transportation (e.g., atmospheric emissions) and onshore treatment and disposal (e.g., habitat alteration) will be introduced instead. Ship-to-shore options are expected to be more expensive than the offshore options due to additional transportation costs. In general, ship-to-shore and associated onshore disposal presents a potentially higher operational risk option as it is dependent on a number of external factors, specifically onshore waste management facility availability and PSV availability. PSV transit may be affected by poor weather conditions, which could impact their ability to collect cuttings on a regular basis from the MODU. If cuttings cannot be removed from the MODU, drilling operations may have to stop. There is also additional health, safety and environmental risk introduced with respect to onshore disposal due to additional truck and vessel traffic, and additional exposure and handling of material.

Discharge to the water column following treatment (where applicable) to OWTG standards is the preferred option for cuttings generated as part of the Project and has been assessed as part of the Project (refer to Chapter 8). As noted in Section 2.4.1, during the riserless phase there is no mechanism to return cuttings to the MODU, therefore WBM cuttings and any associated fluid will be discharged at the seafloor as is permitted by the OWTG.

This analysis of alternative means for drilling waste management is summarized in Table 2.19.

Table 2.19 Summary of Drilling Waste Management Alternatives Analysis

Disposal Option	Legally acceptable?	Technically feasible?	Economically feasible?	Environmental Issues	Preferred Option
Discharge to water column (following treatment of SBM on cuttings)	Yes	Yes	Yes	Some localized effects are expected on the seafloor from discharge of cuttings (assessed in Section 8)	✓
Offshore Reinjection	Yes	No	Not considered as option because not technically feasible		✗
Ship-to-shore (SBM-associated cuttings)	Yes	Yes	Yes – but increased costs from increased transportation and operational delays	Some limited offshore effects are expected from increased transportation, and some onshore effects from transportation and onshore disposal of waste including increased health, safety and environment risks associated with truck and vessel traffic and exposure and handling of waste material	✗

2.9.2.4 Water Management

Section 2.8.3 describes effluent discharges that will be generated on the MODU and water management systems. Liquid wastes, not approved for discharge in the OWTG such as waste chemicals, cooking oils, or lubricating oils, will be transported onshore for transfer to an approved disposal facility. Liquid wastes that conform to the OWTG will be discharged from the MODU to the marine environment. Effluent discharge points on a MODU are typically just below or above the sea surface. Specific discharge points will depend on the MODU design; these locations are fixed and cannot be re-configured. Prior to the commencement of drilling program, Certificate of Fitness will be obtained for the MODU from an independent third-party

Certifying Authority (refer to Section 1.5.1) which will include confirmation that effluent discharge and water management systems comply with relevant legislation.

2.9.2.5 Offshore Vessel Lighting (including Flaring)

Lighting will be used on the MODU and the PSVs for navigation and deck lighting 24 hours a day throughout drilling and PSV operations for maritime safety and crew safety. Lighting is required under Canadian and international law to minimize the risk of collisions between offshore vessels.

Alternative MODU lighting techniques have been tested elsewhere in the industry. In the North Sea, spectral modified lighting has been tested on offshore platforms and has demonstrated a reduced effect on marine birds; particularly the use of green and blue light (Marquenie et al. 2014). Spectral modified lighting has satisfied regulatory requirements in a number of regions, including in the Netherlands, Germany and in the United States; however, implementation in the offshore oil and gas industry has been restricted by commercial availability, limited capability in extreme weather, safety concerns around helicopter approach and landing, and lower energy efficiency (Marquenie et al. 2014).

BP will not be the owner of the MODU or PSVs chosen to support Project-related exploration drilling activities and has not yet made any direct inquiries with vendors regarding the availability of spectral modified lights for use in association with the Project. The MODU used for the Project will be an existing drilling unit contracted through a third-party drilling contractor and selected based on technical capabilities as well as safety considerations. BP is not aware of any operating MODUs currently equipped with spectral modified lighting that have the technical capability to support the Project.

Options to reduce lighting on the MODU as far as practicable will be considered; however, it will be maintained at a level that will not impede the safety of the workforce or drilling operations (see Table 2.20). The EIS considers the environmental effects associated with standard MODU lighting (refer to Chapter 9).

Table 2.20 Summary of Lighting Alternatives Analysis

Disposal Option	Legally acceptable?	Technically feasible?	Economically feasible?	Potential Environmental Issues	Preferred Option
Standard MODU lighting	Yes	Yes	Yes	Some localized visual effect is expected which could affect migratory birds (assessed in Section 9)	✓
Spectral modified lighting	Yes	No – limited capabilities in extreme weather; safety concerns with helicopter approach and landing	No – not considered as commercially viable yet	Not considered as option because not feasible	✗

Flaring, if required, will also contribute to platform lighting and potential attraction of birds. Well testing is required by the C-NLOPB to declare a significant discovery and to convert an EL to an SDL (refer to Section 2.4.3 for more information on well testing). When well flow testing is carried out, flaring is required to safely dispose of hydrocarbons that may come to surface. Not flaring is therefore not an option for this well test. An alternative to a formation flow test with flaring is a formation test while tripping where flaring is not carried out as part of the well test. However, a formation test while tripping does not provide the same data as formation flow testing with flaring and therefore may not be a suitable alternative in all cases. BP will consider this well test option on a case by case basis to ensure well testing meets C-NLOPB requirements.

If flaring is required, an alternative option could be to manage the timing of flaring activity. Flaring could be planned such that it doesn't commence during periods of poor visibility including at night and during inclement weather to reduce light generated during flaring. However, once the well test with flaring begins, data gathered during the well test could be compromised if the well flow was restricted during this test period (i.e., restricted to certain weather conditions). This could mean prolonged well test activity (i.e., greater than one month as currently predicted), which could also increase operational costs and risks.

Flaring, if required, is expected to be brief and intermittent in nature (lasting two to three days at a time), which could occur several times in the well flow test period, which in total is expected to last between one to three months. If BP intends to flare, it will notify the C-NLOPB in accordance with "Measures to Protect and Monitor Seabirds in Petroleum-Related Activity in the Canada-NL Offshore Area". When flaring, BP uses a water curtain to protect personnel and equipment on the MODU by limiting the transfer of radiated heat from the flare, thereby mitigating risk of fire. A secondary benefit of a water curtain may be potential deterrence of birds from the general vicinity of the flare based on the positioning of the water curtain. A water curtain could therefore be considered to be a technically and economically feasible option as a flare shield to reduce adverse effects of flaring on birds.

Flaring alternatives are provided in Table 2.21. The analysis of Project effects (refer to Chapter 9) assumes there will be flaring during well testing. However, it is not currently anticipated that well testing will be carried out on the wells drilled in the initial phase of the Project (i.e., one to two wells).

Table 2.21 Summary of Flaring Alternative Analysis

Disposal Option	Legally acceptable?	Technically feasible?	Economically feasible?	Environmental Issues	Preferred Option
No flaring	**No**	Not considered as option due to regulatory and safety requirements; current regulatory practice requires formation flow test with flaring to secure Significant Discovery Licence. Industry continues to advocate for alternative methods.			
Formation testing while tripping	Yes	Yes – although may not fulfill C-NLOPB data requirements in all cases	Yes	No flaring therefore reduced light and atmospheric emissions and reduced risk of bird attraction and mortality	

Disposal Option	Legally acceptable?	Technically feasible?	Economically feasible?	Environmental Issues	Preferred Option
Reduced flaring (i.e., no flaring during night time or inclement weather)	Yes	Yes – although activity could give result to compromised data	Yes – but increased MODU costs and risk of delays	Reduced flaring would still result in some measure of light and atmospheric emissions	
Flaring as required with flare shield (water curtain)	Yes	Yes	Yes	Some limited offshore effects are expected from the light and atmospheric emissions generated during flaring. These are expected to be intermittent and brief in duration over a temporary period at the end of drilling (assessed in Section 9)	

2.9.3 Chemical Management

The details of chemicals to be used in the Project have not yet been confirmed and potential alternatives have not yet been identified. A drilling fluid and cementing contractor for the Project has not yet been selected, and the drilling fluid basis of design for the wells is under development. As planning for the Project continues, BP will follow chemical management and selection processes to define the ways in which chemicals will be chosen and used.

Chemical management processes will be defined prior to the start of any drilling activity and will be conducted in accordance with applicable legislation as summarized in Table 2.22.

Table 2.22 Applicable Offshore Chemical Management Legislation and Guidelines

Legislation	Regulatory Authority	Relevance
Canadian Environmental Protection Act, 1999 (CEPA)	ECCC	Provides for the notification and control of certain manufactured and imported substances. The Domestic Substances List is a list of substances approved for use in Canada. Schedule 1 includes a list of substances that are considered toxic and subsequent restrictions or phase out requirements
Fisheries Act	DFO; ECCC	Prohibits the deposition of toxic or harmful substances into waters containing fish
Hazardous Product Act	Health Canada	Standards for chemical classification and hazard communication
Migratory Birds Convention Act, *1994* (MBCA)	ECCC	Prohibits the deposition of harmful substances in waters or areas frequented by migratory birds

Legislation	Regulatory Authority	Relevance
Pest Control Products Act	Health Canada	Regulates the importation, sale and use of pest control products, including products used as biocides offshore
Offshore Chemical Selection Guidelines (OCSG)	C-NLOPB	Framework for the selection of drilling and production chemicals for use and possible discharge in offshore areas

At a minimum, selection of drilling chemicals will be in accordance with the OCSG. The OCSG establishes a procedure and criteria for offshore chemical selection. The objective of the guidelines is to promote the selection of lower toxicity chemicals to minimize the potential environmental impact of a discharge where technically feasible. Furthermore, BP will document the process used to evaluate prospective chemicals.

2.9.3.1 Proposal for Use: Initial Screening and Regulatory Controls Identification

A screening of the proposed chemical will be carried out to determine whether it is restricted through any of the other elements of legislation as listed in Table 2.22. This includes specific aspects of the use of the chemical, including likely volume demand and discharge assumptions.

In accordance with the regulations, certain restrictions, controls and prohibitions, in agreement with applicable regulatory agencies, will be placed on:

- chemicals which will be used as a biocide
- chemicals which have not been approved for use in Canada previously (i.e., are not registered on the Domestic Substances List) or have not been used previously for the purpose which is proposed
- chemicals which have been identified as toxic under Schedule 1 of CEPA. In the event that a chemical is proposed for use that is listed under Schedule 1 of CEPA, BP will consider alternative means of operation, and/or will evaluate less toxic alternatives

2.9.3.2 Chemicals Intended for Marine Discharge: Toxicity Assessment

Following the initial screening activity to identify any restrictions, controls and prohibitions on proposed chemicals, BP will conduct a further assessment for chemicals that will be discharged to the marine environment. This assessment will be carried out to evaluate the potential toxicity of proposed chemicals (and any constituents of the chemical as applicable), and to establish if additional restrictions, controls or prohibitions are required.

In accordance with the OCSG chemical selection framework, any chemicals intended for discharge to the marine environment shall be reviewed against a number of criteria. Chemicals that are intended for discharge to the marine environment must:

- be included on the OSPAR PLONOR list
- meet certain requirements for hazard classification under the OCNS
- pass a Microtox test (i.e., toxicity bioassay)

- undergo a chemical-specific hazard assessment in accordance with the OCNS model
- have the risk of its use justified through demonstration to the Board that discharge of the chemical will meet OCSG objectives

BP will ensure each criterion is reviewed in turn.

- OSPAR PLONOR List: If a proposed chemical is included on the OSPAR PLONOR list, it will be considered acceptable for use and discharge in line with OCSG.
- OCNS Hazard Classification: If BP proposes the use of a chemical which will be discharged to the marine environment that is not included on the OSPAR PLONOR list, BP will review the hazard classification in line with the OCNS. This scheme ranks chemical products according to a hazard quotient (HQ) based on a range of physical, chemical and ecotoxological properties of products, including toxicity, biodegradation and bioaccumulation information.
- The Chemical Hazard and Risk Management model is used to determine the HQ which is subsequently used to rank chemicals into groups, linked to their expected hazard rating. If the chemical that is proposed for use is ranked as being least hazardous under the OCNS scheme (i.e., C, D, or E, gold or silver), BP will consider the chemical acceptable for use and discharge in line with the OCSG.
- Risk Justification: Where a chemical is identified for potential use which is not ranked as C, D, or E, or gold or silver under the OCNS scheme, BP will consider alternative means of operation, and/or will evaluate less toxic alternatives. If it is not possible to identify alternatives, BP will conduct a hazard assessment to determine its suitability of use in line with the OCSG. The hazard assessment process will be documented and will be provided to the C-NLOPB to allow them to evaluate whether that the objectives of OCSG have been met.
- Microtox Test and Chemical-Specific Hazard Assessment: In the event that a chemical is proposed for use which does not have an OCNS rating, BP will work with the chemical contractors to carry out a Microtox test to determine the potential toxicity of the chemical. If the chemical passes the test and is considered non-toxic, restrictions will be placed on discharge volumes and time limits in line with the OCSG. If the chemical does not pass the test, it will be subject to a hazard assessment as per OCSG to determine suitability for use.

The OCSG apply to the following categories of chemicals which could be used as part of the Project:

- drilling fluids, including sweeps and displacement fluids
- cementing
- blowout preventer fluids
- remotely operated vehicles fluids
- rig washes, pipe dopes, jacking greases and hydraulic fluids used to control wellheads and blowout preventers
- chemicals used in the actual production of hydrocarbons, those generated offshore (such as sodium hypochlorite)

The OCSG do not apply to the following categories of chemicals:

- the selection of domestic chemicals and other chemicals that are used on an installation that are not directly associated with drilling activities, such as those used for accommodations, catering, equipment and facility maintenance (e.g., lubricants, paints, etc.), safety systems and laboratory operations
- the selection of chemicals that are used on PSVs and helicopters

The specific types and volumes of chemicals to be used are not currently known. A Material Safety Data Sheet will be available for chemicals present on the PSVs and MODU. The inventory of chemicals on board the MODU will be monitored regularly and an annual report will be submitted to the C-NLOPB to outline each chemical used including the hazard rating, quantity used, and its ultimate fate.

2.10 Environmental Management

2.10.1 BP's Operating Management System

BP's OMS establishes the environmental and social requirements for BP's projects and operations. BP's OMS includes practices that set out requirements and guidance for how BP identifies and manages environmental, social, and human rights risks and impacts. It includes requirements for HSSE management, social responsibility, and operational reliability, as well as requirements for other operational aspects, for example, maintenance requirements, contractor relations, and organizational learning. Effective implementation of the OMS that delivers improved environmental performance is required to support BP's commitment to its long-term goal of "No Damage to the Environment".

The OMS helps BP to manage and reduce risks throughout its activities globally, as well as continuously improve the quality of its operating activities. It sets out consistent principles and processes that are applied across BP Group. Principles and policies under the OMS are designed to simplify the organization, improve productivity and enable consistent execution and focus throughout BP. The OMS defines the requirements of what a BP operation needs to do across eight focus areas under the categories of people, plant, process and performance (elements of operating) illustrated in Figure 2.13. The elements of operating are used to inform the performance improvement cycle which sets out how BP should operate.

Figure 2.13 BP's OMS Framework

The OMS includes requirements and guidance for the identification and management of environmental and social impacts within BP. These include topics such as management of drilling waste, wastewater and cultural heritage.

BP's ability to be a safe and responsible operator depends, in part, on the capability and performance of contractors and suppliers. Contractors and suppliers can make up a major part of the workforce throughout the life of a project or operation.

BP's OMS also defines requirements and practices for working with contractors. Contracts will include clear and consistent information, setting out specific details of BP's expectations. Contracts will be awarded following a bidding and contract tender evaluation process, which will take account of factors such as safety, technical quality, and cost. Contractors and subcontractors will be required to demonstrate conformance with the requirements that have been established, including HSSE standards and performance requirements. Bridging documents are necessary in some cases to define how BP's safety management systems and those of BP's contractors will co-exist to manage risk on a site.

Contractors, such as drilling and well services contractors, will be accountable for the development and delivery of their safety management systems. Contractors will be responsible for carrying out self-verification activity to assess conformance with their contractual requirements. Contractor safety performance is assessed and reviewed by BP using a number of leading and lagging indicators. BP will carry out reviews and assurance activity throughout the duration of the contract.

2.10.2 HSSE Management Planning

In accordance with corporate and regulatory requirements, BP will develop environmental management plans to verify that appropriate measures and controls are in place to reduce the potential for environmental effects as well as to provide clearly defined action plans and emergency response procedures to protect human and environmental health and safety. As part of the Operations Authorization process for exploration drilling under the Accord Acts, and in accordance with the *Drilling and Production Guidelines* (C-NLOPB and CNSOPB 2017a) BP will submit the following plans to the C-NLOPB for review and acceptance:

- Environmental Protection Plan (EPP)
- Safety Plan
- Incident Management Plan (IMP)
- Spill Response Plan (SRP)
- Canada-Newfoundland and Labrador Benefits Plan (refer to Section 1.4.6)

2.10.2.1 Environmental Protection Plan

The EPP will be prepared in accordance with the *Environmental Protection Plan Guidelines* (NEB et al. 2011b) and will serve as a tool to communicate Project requirements and commitments for environmental management and protection to Project personnel (including BP staff and contractors), regulatory agencies, and stakeholders. The EPP is a project-specific document used to implement and track compliance with applicable regulatory requirements (including conditions imposed by the Minister of Environment and Climate Change in the EA Decision Statement at the end of the EA process) and as well as commitments made by BP during the EA process and subsequent approval process with the C-NLOPB. It will also provide detail about how BP global requirements will be used in local procedures and practices. The EPP will identify roles and responsibilities for personnel, monitoring requirements, reporting and notification procedures to regulators and stakeholders. The EPP will also become the mechanism for capturing post-EIS updates on environmental sensitivities and required mitigation (e.g., adaptive management).

2.10.2.2 Safety Plan

The Safety Plan, to be prepared in accordance with the *Safety Plan Guidelines* (NEB et al. 2011a), will present BP's plan for managing safety and risk during the drilling program and describe responsibilities and expectations for employees and contractors. The Safety Plan will describe processes associated with hazard identification and risk management, training and competency of personnel, incident reporting and investigation, and compliance and performance monitoring. The Safety Plan will also describe facilities and equipment critical to safety and describe the system in place for inspection, testing and maintenance.

2.10.2.3 Incident Management Plan

The IMP will describe the overarching response measures to respond to an emergency event, irrespective of the size, complexity, or type of incident. Specifically, it will define the response organization and roles and responsibilities and will include notification and reporting procedures. The IMP will be compiled on the basis of a hazard identification and risk assessment process to support the identification of the full range of potential hazards. The IMP will be the umbrella document containing the plans that form the Project's emergency response documentation. The IMP will provide details of BPs onshore response support to the incident site and will also be linked to the site specific MODU Emergency Response Plan. The IMP will describe the Incident Command System structure and will detail alignment with federal and provincial regulators as per the structure in place with the C-NLOPB.

2.10.2.4 Spill Response Plan

The SRP provides the BP Incident Management Team and response personnel with tactical and strategic guidance regarding response management, capabilities and resources in the unlikely event of an oil spill. The SRP will detail the response strategy(s) for a range of potential spill scenarios based on a risk assessment of the Project, up to, and including, the worst credible-case discharge. The scenarios will consider the type and amount of material that could be spilled, the fate and transport of the spilled material, and the potential impacts of a spill, taking into account contributing factors such as seasonality in weather conditions, sea states, currents, presence of environmental and socio-economic sensitivities, etc. The development of the strategies in the SRP will be based on the results of a project-specific Spill Impact Mitigation Assessment (SIMA) (also referred to as a Net Environmental Benefits Analysis).

The SRP will define the notification, activation and mobilization procedures to be followed if an unintended release occurs. It will identify oil spill response personnel, their roles and responsibilities, including response training and exercise programs. The SRP will describe the location, mobilization, and deployment of equipment and personnel and will include information about how to monitor and predict spill movement to facilitate an effective response.

BP will include tactical response measures within the SRP to clarify procedures and tactics for safely responding to different spill scenarios. The plan will include information how a sampling and monitoring program will be established, if necessary. Specific tactical response planning that will be included in the SRP includes: offshore mechanical containment and recovery; surface and/or subsurface dispersant application; in-situ burning; shoreline clean up and shoreline protection; and oil spill waste management (including handling capabilities). A Wildlife Response Plan will also be developed as part of the SRP.

Supplementing the SRP will be a number of Source Control Contingency Plans (SCCPs), which will include specific details on how to respond to a major spill event such as a blowout incident. Plans which constitute the SCCPs include a Relief Well Plan, Capping and Containment Response Plan, and an ROV Intervention System for Emergency BOP Activation Plan. More information on BP's IMP and SRP is included in Section 15.3 of this EIS.

2.10.3 Standard Mitigative Measures and Best Practices

Given the history of exploration and production projects offshore Atlantic Canada, and, in particular, offshore Newfoundland and Labrador, most potential environmental interactions and mitigation measures are well understood. Many potential adverse environmental effects identified in this EIS can be managed effectively with standard operating procedures and standard mitigation measures, many of which are captured in BP's own policies and procedures and/or regulatory guidelines. Section 1.5 of this EIS describes the offshore regulatory framework administered by the C-NLOPB. Adherence to key guidelines such as the OWTG and OCSG, along with MARPOL requirements, will reduce or eliminate adverse environmental effects of waste discharges on the marine environment. Adherence to the SOCP (DFO 2007) during VSP surveys will reduce adverse environmental effects on marine fish, mammals and sea turtles. Where necessary, site- or Project-specific mitigation measures have also been proposed in this EIS.

A summary of general standard mitigation measures to be implemented by BP on this Project is presented in Table 2.23. Additional mitigation measures specific to VCs assessed in this EIS are presented in Sections 8 to 13. Spill prevention and response measures are discussed in Chapter 15. A complete summary of mitigative commitments presented in this EIS is included in Chapter 18.

Table 2.23 Standard Mitigation Measures

General
Contractors and subcontractors will be required to demonstrate conformance with the requirements that have been established, including HSSE standards and performance requirements.
A Certificate of Fitness will be obtained for the MODU from an independent third-party Certifying Authority prior to the commencement of drilling operations in accordance with the *Newfoundland Offshore Certificate of Fitness Regulations*.
The observation, forecasting and reporting of physical environment data will be conducted in accordance with the *Offshore Physical Environment Guidelines* (NEB et al. 2008).
BP and contractors working on the Project will regularly monitor weather forecasts to forewarn PSVs, helicopters and the MODU of inclement weather or heavy fog before it poses a risk to their activities and operations. Extreme weather conditions that are outside the operating limits of PSVs or helicopters will be avoided, if possible. Captains / Pilots will have the authority and obligation to suspend or modify operations in case of adverse weather or poor visibility that compromises the safety of PSV, helicopter, or MODU operations.
BP will prepare and submit an Ice Management Plan as part of the application for Drilling Program Authorization as per the *Offshore Physical Environment Guidelines* (NEB et al. 2008). This Plan, which will form part of the Safety Plan submission, will include details on sea ice / iceberg monitoring and detection, and risk assessment, mitigation, and contingency procedures.
Safe work practices will be implemented to reduce exposure of personnel to lightning risk (e.g., restriction of access to external areas on the MODU or PSV during thunder and lightning events).
Prior to any drilling activity, BP will conduct a comprehensive regional GBR, followed by detailed geohazard assessments for each proposed wellsite.
Project-related damage to fishing gear, if any, will be compensated in accordance with the *Compensation Guidelines with Respecting Damages Relating to Offshore Petroleum Activity* (C-NLOPB and CNSOPB 2017b).
Presence and Operation of the MODU
A safety zone will be established around the MODU in accordance with the *Newfoundland Offshore Petroleum Drilling and Production Regulations* SOR/2009-316.

BP will provide details of the safety zone to the Marine Communication and Traffic Services for broadcasting and publishing in the Notices to Shipping and Notices to Mariners. Details of the safety zone will also be communicated during ongoing engagement with commercial and Indigenous fishers.
To maintain navigational safety at all times during the Project, obstruction lights, navigation lights and foghorns will be kept in working condition on board the MODU and PSVs. Radio communication systems will be in place and in working order for contacting other marine vessels as necessary.
The MODU will be equipped with local communication equipment to enable radio communication between the PSVs and the MODU's bridge. Communication channels will also be put in place for internet access and enable communication between the MODU and shore.
BP will conduct an imagery-based seabed survey at the proposed wellsite(s) to confirm the absence of shipwrecks, debris on the seafloor, unexploded ordnance, and sensitive environmental features, such as habitat-forming corals or species at risk. The survey will be carried out prior to drilling and will encompass an area within a 500-m radius from the wellsite. If any environmental or anthropogenic sensitivities are identified during the survey, BP will notify the C-NLOPB immediately to discuss an appropriate course of action. This may involve further investigation and/or moving the wellsite if it is feasible to do so.
Artificial lighting will be reduced to the extent that worker safety and safe operations are not compromised.
VSP Surveys
VSP activity will be planned and conducted in consideration of the SOCP (DFO 2007).
Waste Management
Air emissions from the Project will adhere to applicable regulations and standards including the Newfoundland and Labrador *Air Pollution Control Regulations*, National Ambient Air Quality Objectives, Canadian Ambient Air Quality Standards, regulations under MARPOL and the intent of the Global Gas Flaring Reduction Partnership.
Offshore waste discharges and emissions associated with the Project (i.e., operational discharges and emissions from the MODU and PSVs) will be managed in accordance with relevant regulations and municipal bylaws as applicable, such as the OWTG and MARPOL, of which Canada has incorporated provisions under various sections of the *Canada Shipping Act*. Waste discharges not meeting legal requirements will not be discharged to the ocean and will be brought to shore for disposal.
Selection and screening of chemicals to be discharged, including drill fluids, will be in accordance with the *Offshore Chemical Selection Guidelines* (NEB et al. 2009). Where feasible, lower toxicity drilling muds and biodegradable and environmentally friendly properties activities within muds and cements will be used. The chemical components of drilling fluids, where feasible, will be those that have been rated as being least hazardous under the Offshore Chemical Notification Scheme (OCNS) and Pose Little or No Risk to the Environment by the Convention for the Protection of the Marine Environment of the North-East Atlantic
SBM drill cuttings will be returned to the MODU and treated in accordance with the OWTG before being discharged into the marine environment. The concentration of SBM on cuttings will be monitored onboard the MODU, and in accordance with OWTG, no excess or spent SBM will be discharged, and any of this excess or spent SBM that cannot be reused will be brought back to shore for disposal. WBM drill cuttings will be discharged without treatment.
Excess cement may be discharged to the seabed during the initial phases of the well, which will be drilled without a riser. Unused cement bulks and additives will be transported to shore for future re-use or disposed at an approved facility.
Small amounts of produced water may be flared. If volumes of produced water are large, some produced water may be brought onto the MODU for treatment so that it can be discharged in line with the OWTG.
Deck drainage and bilge water will be discharged according to the OWTG which state that deck drainage and bilge water can only be discharged if the residual oil concentration of the water does not exceed 15 mg/L.
Ballast water will be discharged according to IMO *Ballast Water Management Regulations* and Transport Canada's *Ballast Water Control and Management Regulations.* The MODU will carry out ballast tank flushing prior to arriving in Canadian waters.

Putrescible solid waste, specifically food waste generated offshore on the MODU and PSVs, will be disposed of according to OWTG and MARPOL requirements. Maceration of kitchen waste will be conducted in accordance with MARPOL and OWTG. There will be no discharge of macerated food waste within 3 nm from land.
Sewage will be macerated in accordance with MARPOL and in line with the OWTG prior to discharge.
Cooling water will be discharged in line with the OWTG, which states that any biocides used in cooling water are selected in line with a chemical management system developed in line with the OCSG.
BOP fluids and any other discharges from the subsea control equipment will be discharged according to OWTG and OCSG.
Liquid wastes, not approved for discharge in OWTG such as waste chemicals, cooking oils or lubricating oils, will be transported onshore for transfer to an approved disposal facility.
Biomedical waste will be collected onboard by the doctor or medic and stored in special containers before being transported onshore for incineration.
Transfer of hazardous wastes will be conducted according to the *Transportation of Dangerous Goods Act.* Any applicable approvals for the transportation, handling, and temporary storage of these hazardous wastes will be obtained as required.
Supply and Servicing Operations
PSVs will undergo BP's internal verification process as well as additional external inspections / audits inclusive of the C-NLOPB pre-authorization inspection process in preparation for the Project.
PSVs will follow established shipping lanes in proximity to shore.
During transit to/from the Project Area, PSVs will travel at vessel speeds not exceeding 22 km/hour (12 knots), except as needed in the case of an emergency. In the event that a marine mammal or sea turtle is detected in proximity to the vessel, vessel speed will be reduced.
Lighting on PSVs will be reduced to the extent that worker safety and safe operations is not compromised.
Well Abandonment and Decommisioning
A seabed survey will be conducted at the end of the drilling program using an ROV to survey the seabed for debris.
Once wells have been drilled to total depth and well evaluation programs completed (if applicable), the well will be plugged and abandoned in line with applicable BP practices and C-NLOPB requirements. The final well abandonment program has not yet been finalized; however, these details will be confirmed to the C-NLOPB as planning for the Project continues.
Note: Refer to Table 18.2 for a complete list of mitigative measures for the Project including Project-specific mitigation.

Ongoing consultation and engagement with Indigenous communities, fisheries stakeholders and regulatory agencies throughout the planning and implementation of the drilling program will also help to identify appropriate mitigation measures. Standard and specific mitigation measures to be implemented to reduce potential adverse environmental effects of the Project will be incorporated into the Project EPP.

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3.0 CONSULTATION AND ENGAGEMENT

BP recognizes the importance of early and ongoing engagement with Indigenous groups and stakeholders that continues over the life of the Project. BP believes it is important to build positive relationships with Indigenous groups and key stakeholders to facilitate the exchange of information and understand concerns and priorities so that these can be incorporated as appropriate in the planning and operation of the Project.

BP's key objectives for stakeholder and Indigenous engagement are to:

- provide appropriate information in a timely manner to relevant, interested and affected parties based on the nature, location and duration of the Project
- create an understanding of BP's proposed drilling operations and address questions and concerns that arise
- obtain information and feedback from interested and affected parties including but not limited to local, traditional, and Indigenous knowledge that can improve BP's understanding of the local environment and potential interactions
- provide feedback to interested and affected parties so they understand how BP has represented and responded to their input

The EIS Guidelines also describe expectations and requirements around public participation and Indigenous engagement including the collection and incorporation of community knowledge and Indigenous knowledge in the EIS and documentation of issues and concerns raised.

This section of the EIS discusses ongoing and proposed engagement with stakeholders and Indigenous groups and summarizes issues and concerns raised during engagement.

3.1 Government Departments and Agencies

Federal, provincial and municipal government departments and agencies identified during the Project planning and EIS preparation stages include those that:

- have a regulatory mandate concerning the authorization of Project activities
- have technical knowledge concerning the assessment or mitigation of environmental effects and/or
- are involved in Crown consultation

To date, BP has met with Agency, the C-NLOPB, DFO, ECCC, and Natural Resources Canada in planning and developing the EIS to obtain relevant baseline information and/or guidance in EIS methods and approach. A log of EIS-related engagement activities with government departments and agencies is provided in Table 3.1. Various government departments and agencies also participated in the review of the Project Description and draft EIS guidelines. Comments provided during these review processes and meetings were considered in the preparation of the EIS.

Key items for discussion with government departments and agencies during preparation of the EIS included discussions around the newly designated Northeast Newfoundland Slope Closure, the use of pre-drill ROV surveys to characterize surrounding benthic habitat, and spill modelling assumptions and approach. BP will continue to engage subject matter experts and regulators within government departments and agencies to seek guidance during EIS preparation and review, and to inform post-EIS regulatory approvals and ongoing Project planning.

Representatives from the Agency, C-NLOPB, DFO and ECCC also attended each of the three workshops held with Indigenous groups in Moncton, NB (April 12, 2018); Quebec City, QC (April 18, 2018); and St. John's, NL (April 20, 2018). These workshops were organized by BP and other operators with the Agency and other regulators to help streamline engagement with Indigenous groups in consideration of the various exploration programs planned in the eastern Newfoundland offshore area and a future regional study of exploration drilling being undertaken by the Agency. More information on these workshops is presented in Section 3.2.

BP is planning to host a meeting with regulatory agencies in the Fall of 2018 to present an overview of the EIS and the results of spill modelling. Additional future engagement with government departments and agencies will occur through the EIS review process and preparation of follow-up and monitoring programs.

Table 3.1 Communications with Government Departments and Agencies

Date	Method	Purpose
Canadian Environmental Assessment Agency (Agency)		
November 3, 2017	In-Person/Face-to-Face	Meeting to introduce Newfoundland Orphan Basin Exploration Project and discuss Project Description scoping and timing.
March 5-6, 2018	Various Emails between BP and the Agency	BP requested copies of public, regulatory and Indigenous comments on Equinor's (formerly Statoil Canada Ltd.) Flemish Pass Exploration Drilling Project EIS to understand key issues which may be applicable to the Newfoundland Orphan Basin Exploration Drilling Program. The Agency provided electronic copies via email.
March 20, 2018	Phone Call	Presentation via WebEx on proposed spill modelling approach and inputs.
March 28, 2018	Email	Emailed PDF copy of slides presented during March 20th Webex meeting and requested preliminary comments or questions. No formal review requested by BP at this time.
April 20, 2018	In-Person/Face-to-Face	Workshop with Indigenous groups, regulatory agencies, and other NL operators to discuss exploration drilling and issues of concern for Indigenous groups. Questions were asked regarding drilling operations and the regulatory process. Key issue for discussion was potential effects on Atlantic salmon and the request for industry investment to understand and mitigate adverse effects on Atlantic salmon populations.
May 3, 2018 May 9, 2018	Email, Phone Call	Email from Agency to BP offering formal technical review of spill modelling prior to EIS submission. BP declined offer of review process prior to EIS submission but indicated BP is reviewing modelling conducted by other operators in the NL offshore as well as regulatory information requests related to past modelling. BP will provide updates to government departments and agencies and present results of modelling when available.

Date	Method	Purpose
May 2018	Various Emails between BP and the Agency	BP requested copies of public, regulatory and Indigenous comments on Nexen Energy ULC's EIS to understand key issues which may be applicable to the Newfoundland Orphan Basin Exploration Drilling Program. The Agency provided electronic copies via email.
June 21, 2018	Email	Email update on EIS preparation and indicating target of end of September for EIS submission.
Canada-Newfoundland Offshore Petroleum Board (C-NLOPB)		
November 29, 2017	In-Person/Face-to-Face	Met with C-NLOPB to introduce BP and the Newfoundland Orphan Basin Exploration Project. C-NLOPB discussed their preferred approach for regulatory review and recommended frequent dialogue during application preparation process.
March 20, 2018	Phone Call	Presentation via WebEx on proposed spill modelling approach and inputs.
March 28, 2018	Email	Emailed PDF copy of slides presented during March 20th Webex meeting and requested preliminary comments or questions. No formal review requested at this time.
April 19, 2018	In-Person/Face-to-Face	Meeting to provide status update on EIS preparation and approach
April 20, 2018	In-Person/Face-to-Face	Workshop with Indigenous groups, regulatory agencies, and other NL operators to discuss exploration drilling and issues of concern for Indigenous groups. Questions were asked regarding drilling operations and the regulatory process. Key issue for discussion was potential effects on Atlantic salmon and the request for industry investment to understand and mitigate adverse effects on Atlantic salmon populations.
Fisheries and Oceans Canada (DFO)		
November 28, 2017	In-Person/Face-to-Face	Introductory meeting with DFO to introduce BP and the Newfoundland Orphan Basin Exploration Program. BP presented preliminary project information and inquired if there were any particular sensitive or emerging issues from DFO's perspective. DFO indicated that Atlantic salmon migration has become an emerging issue raised by Indigenous communities on other exploration drilling projects, although not sure if this is a substantive issue for BP's project. DFO indicated they were working to develop standard mitigation/best practices for corals and sponges that could be applied to all projects and would be based on past learnings. DFO indicated they endeavor to be efficient in giving expert advice and look for opportunities to streamline efforts, particularly where there are several similar projects in an area. In their review and advice on regulatory applications, DFO hopes to build on vast experience and lessons learned.
November 30, 2017	Email	Emailed DFO to request information on a proposed fisheries closure area that had been communicated to BP via fisheries stakeholder meetings.
January 22, 2018	Phone Call	Call to discuss DFO expectations around benthic mitigation and monitoring in consideration of marine refuge designation. DFO confirmed marine refuge would not restrict exploration activities but mitigation should be in place to reduce adverse effects on benthic environment.
March 20, 2018	Phone Call	Presentation via WebEx on proposed spill modelling approach and inputs.

Date	Method	Purpose
March 28, 2018	Email	Emailed PDF copy of slides presented during March 20th Webex meeting and requested preliminary comments or questions. No formal review requested at this time.
Environment and Climate Change Canada (ECCC)		
November 28, 2017	In-Person/Face-to-Face	Introductory meeting for BP to introduce the company and preliminary project information and understand ECCC's potential interests and concerns.
March 20, 2018	Phone Call	Presentation via WebEx on proposed spill modelling approach and inputs.
March 28, 2018	Email	Emailed PDF copy of slides presented during March 20th Webex meeting and requested preliminary comments or questions. No formal review requested at this time.
Natural Resources Canada		
March 20, 2018	Phone Call	Presentation via WebEx on proposed spill modelling approach and inputs.
March 28, 2018	Email	Emailed PDF copy of slides presented during March 20th Webex meeting and requested preliminary comments or questions. No formal review requested at this time.

3.2 Indigenous Groups

BP recognizes the potential for Project activities (including potential accidental events) to affect Indigenous peoples and acknowledges the importance of engaging Indigenous groups to communicate Project details and obtain their views on potential effects of changes to the environment on Indigenous peoples and potential adverse impacts of the Project on asserted or established Aboriginal and/or Treaty rights.

The EIS Guidelines (Section 5.1) specify that BP engage the following Indigenous groups:

Newfoundland and Labrador

- Labrador Inuit (Nunatsiavut Government)
- Labrador Innu (Innu Nation)
- NunatuKavut Community Council
- Qalipu Mi'kmaq First Nation Band
- Miawpukek Mi'kmamawey Mawi'omi (Miawpukek First Nation) (MFN)

Nova Scotia

- 11 Mi'kmaq First Nation groups represented by Kwilmu'kw Maw-klusuaqn Negotiation Office (KMKNO):
  - Acadia First Nation
  - Annapolis Valley First Nation
  - Bear River First Nation
  - Eskasoni First Nation
  - Glooscap First Nation
  - Membertou First Nation

  - Paq'tnkek Mi'kmaw Nation
  - Pictou Landing First Nation
  - Potlotek First Nation
  - Wagmatcook First Nation
  - We'koqma'q First Nation
- Millbrook First Nation
- Sipekne'katik First Nation

New Brunswick

- Eight Mi'gmaq First Nations represented by Mi'gmawe'l Tplu'taqnn Inc. (MTI):
  - Fort Folly First Nation
  - Eel Ground First Nation
  - Pabineau First Nation
  - Esgenoôpetitj First Nation
  - Buctouche First Nation
  - Indian Island First Nation
  - Eel River Bar First Nation
  - Metepnagiag Mi'kmaq First Nation
- Elsipogtog First Nation
- Five Maliseet First Nation groups represented by Wolastoqey Nation in New Brunswick (WNNB):
  - Kingsclear First Nation
  - Madawaska Maliseet First Nation
  - Oromocto First Nation
  - St. Mary's First Nation
  - Tobique First Nation
- Woodstock First Nation
- Peskotomuhkati Nation at Skutik (Passamaquoddy)

Prince Edward Island

- Two Mi'kmaq First Nation groups represented in consultation by Mi'kmaq Confederacy of PEI (MCPEI):
  - Abegweit First Nation
  - Lennox Island First Nation

Quebec

- Three Mi'gmaq First Nation groups represented by Mi'gmawei Mawiomi Secretariat (MMS):
  - Micmas of Gesgapegiag
  - La Nation Micmac de Gespeg
  - Listuguj Mi'gmaq Government
- Les Innus de Ekuanitshit
- Première Nation des Innus de Nutashkuan

BP initiated engagement with all the above groups in November 2017, prior to filing the Project Description, with the objective of providing early notification and introducing the Project, obtaining early feedback on

potential interests and concerns, and understanding individual groups' preferred method of communication and engagement.

Figures 7.44 and 7.45 in Section 7.4 show the locations of these communities. Community profiles for each of these Indigenous groups are also presented in Section 7.4, including location and proximity to the Project Area; existing health and socio-economic conditions; current use of lands for traditional purposes; commercial communal and food, social or ceremonial fishing licences; and physical and cultural heritage. A statement of known asserted or established Aboriginal and/or Treaty rights for each Indigenous group is presented in Table 3.2.

Table 3.2 Statement of Known Asserted or Established Aboriginal and/or Treaty Rights

Region/Group	First Nation/Inuit Group	Asserted or Established Aboriginal and/or Treaty Rights
Newfoundland and Labrador	Labrador Inuit (Nunatsiavut Government)	• The Labrador Inuit have established Aboriginal rights under section 35 of the *Constitution Act, 1982*, and beneficiaries of the *Labrador Inuit Land Claims Agreement* (LILCA) have treaty rights within the Labrador Inuit Settlement Area (LISA) as set out in the Agreement, including the right to harvest species throughout the LISA.
	Labrador Innu (Innu Nation)	• Innu Nation asserts Aboriginal rights to land and resources within Labrador and to resources along the Labrador coast. This includes the right to hunt, fish, and gather throughout its traditional territory.
	NunatuKavut Community Council	• The NunatuKavut Community Council asserts Aboriginal and treaty rights to land and resources within Labrador and to resources along the Labrador coast. This includes the right to hunt, fish, and gather throughout its traditional territory.
	Qalipu Mi'kmaq First Nation	• The Qalipu Mi'kmaq First Nation asserts Aboriginal rights, including the right to hunt, fish, and gather.
	Miawpukek First Nation	• The Miawpukek First Nation asserts Aboriginal rights, including the right to hunt, fish, and gather.
Mi'kmaq of Nova Scotia	Acadia First Nation	• The Mi'kmaq of Nova Scotia have established Aboriginal and Treaty rights. This includes a right to fish for a "moderate livelihood" which flows from the Peace and Friendship Treaties, and an Aboriginal right to fish for food, social or ceremonial (FSC) purposes. • The following Indigenous communities in Nova Scotia hold commercial communal licenses for swordfish in NAFO divisions that overlap with the exploration licenses included in the Project Area: Paq'tnkek Mi'kmaw Nation, Pictou Landing First Nation, Wagmatcook First Nation, Millbrook First Nation, and Sipekne'katik First Nation.
	Annapolis Valley First Nation	
	Bear River First Nation	
	Eskasoni First Nation	
	Glooscap First Nation	
	Membertou First Nation	
	Potlotek First Nation	
	Waycobah First Nation	
	Paq'tnkek Mi'kmaw Nation	
	Pictou Landing First Nation	

Region/Group	First Nation/Inuit Group	Asserted or Established Aboriginal and/or Treaty Rights
	Wagmatcook First Nation	
	Millbrook First Nation	
	Sipekne'katik First Nation	
Mi'kmaq of Prince Edward Island	Abegweit First Nation	• The Mi'kmaq of PEI have a right to fish for a "moderate livelihood" which flows from the Peace and Friendship Treaties, and an Aboriginal right to fish for FSC purposes.
	Lennox Island First Nation	
Mi'gmaq of New Brunswick	Fort Folly First Nation	• The Mi'gmaq of New Brunswick have a right to fish for a "moderate livelihood" which flows from the Peace and Friendship Treaties, and an Aboriginal right to fish for FSC purposes.
	Eel Ground First Nation	
	Pabineau First Nation	
	Esgenoôpetitj First Nation	
	Buctouche First Nation	
	Indian Island First Nation	
	Eel River Bar First Nation	
	Metepngiag First Nation	
	Elsipogtog First Nation	
Wolastoqiyik of New Brunswick (Maliseet)	Kingsclear First Nation	• The Wolastoqiyik have Aboriginal rights under Section 35 of the Constitution Act, 1982, and Peace and Friendship Treaty rights, which include the right to fish for a "moderate livelihood".
	Madawaska Maliseet First Nation	
	Oromocto First Nation	
	St. Mary's First Nation	
	Tobique First Nation	
	Woodstock First Nation	
Peskotomuhkati Nation at Skutik (Passamaquoddy)	Peskotomuhkati	• The Peskotomuhkati Nation asserts Aboriginal rights to land and resources, including the right to hunt, fish, and gather throughout its traditional territory.
Mi'gmaq of Quebec	Micmacs of Gesgapegiag	• The Mi'gmawei Mawiomi Secretariat (MMS) signed a Framework Agreement for a comprehensive claim with Canada (2012) that includes the Gaspe Peninsula and westward down the St. Lawrence River as well as Anticosti Island. • Mi'gmaq First Nations have a right to fish for a "moderate livelihood" which flows from the Peace and Friendship Treaties and an Aboriginal right to fish for FSC purposes.
	La Nation Micmac de Gespeg	
	Listuguj Mi'gmaq Government	
Innu of Quebec	Les Innus de Ekuanitshit	• The Innu of Quebec assert Aboriginal rights, including the right to hunt, fish, and gather throughout its traditional territory. • The Innu of Quebec claim a territory that extends over areas of Labrador and Quebec, including Anticosti Island in the Gulf of St. Lawrence.
	Première Nation des Innus de Nutashkuan	

BP is committed to ongoing engagement with Indigenous groups not only during the EA process but throughout the life of the Project. BP also recognizes that Indigenous groups are involved in engagement with other oil and gas companies ("operators") proposing similar exploration work in the eastern Newfoundland offshore area. Therefore, early in the planning process, it was determined that collaboration of operators on engagement would help to reduce multiple engagement requests on Indigenous groups. BP has sought opportunities to coordinate Indigenous engagement efforts for this Project with ExxonMobil Canada Ltd., Equinor (formerly Statoil Canada Ltd.), Husky Oil Operations, and Nexen Energy (referred to hereafter as the "other NL operators" unless otherwise stated) who are proposing exploratory drilling programs in the Flemish Pass and Jeanne d'Arc Basins. One example of this coordinated engagement effort was the delivery of workshops organized with the Agency and held in Moncton, NB (April 12, 2018); Quebec City, QC (April 18, 2018); and St. Johns, NL (April 20, 2018) to which the 41 Indigenous groups and government agencies identified above were invited. These workshops were intended to introduce BP and the other NL operators and their proposed exploration drilling programs, improve an understanding of exploration drilling, and identify and discuss concerns of Indigenous groups. Participants and key issues are summarized as applicable in Sections 3.2.1 to 3.2.7.

BP has notified, and will continue to notify, each of the identified Indigenous groups about key steps in the EIS development process and of opportunities to provide comments on key documents. BP has also contacted each of the Indigenous groups to request any existing Indigenous knowledge they wish to share with BP that may be helpful to the Project and understanding its potential effects including: information to help improve BP's understanding of each community's social, cultural and economic conditions; information related to current use of lands and resources for traditional purposes; and/or any concerns regarding potential impacts of the Project on potential or established Aboriginal and/or Treaty rights. At the time of EIS preparation, BP, in collaboration with other NL operators, have initiated discussions with some Indigenous communities about the completion of an Indigenous Knowledge Study which would focus on marine species of Indigenous interest within the eastern Newfoundland offshore area.

A description of key engagement activities with each Indigenous group is presented below, along with a summary of key issues and concerns raised by each group.

3.2.1 Newfoundland and Labrador Indigenous Groups

A summary of engagement with Newfoundland and Labrador Indigenous groups is provided in Table 3.3. A workshop to introduce BP and the other NL operators and their proposed exploration drilling programs to Newfoundland and Labrador Indigenous groups was held in St. John's, NL on April 20, 2018. The Agency facilitated this workshop, where various operators presented to representatives from the Innu Nation, NunatuKavut Community Council, Miawpukek First Nation, Qalipu First Nation, and Millbrook First Nation (NS Mi'kmaq First Nation), and discussed issues of concern to the Indigenous participants.

Table 3.3 Summary of Engagement with Newfoundland and Labrador Indigenous Groups

Date	Method	Purpose
Labrador Inuit (Nunatsiavut Government)		
November 7, 2017	Email with Attached Letter	Letter with map to introduce the Project and request preferences for engagement
December 6, 2017	Email from Nunatsiavut Government	Indicated Nunatsiavut Government has a specific interest in the project and would like to be involved in consultations and providing input.
January 23, 2018	Email with Attached Letter	Provided notification on filing of Project Description; a link to Canadian Environmental Assessment Registry (CEAR) website for public comment period; and January 2018 newsletter.
January 31, 2018	Email	Provided status update for all oil and gas projects offshore eastern Newfoundland and Labrador, including the Newfoundland Orphan Basin Exploration Drilling Program.
March 7, 2018	Email with Attached Letter	Provided update on issuance of EIS Guidelines by Agency and proposed VCs for EIS. Also expressed interest in receiving information to improve BP's understanding of potential effects on the community including, but not limited to, potential effects on Aboriginal and/or Treaty rights. Included offer to meet with group upon request.
June 5, 2018	Email	Provided status update for all oil and gas projects offshore eastern Newfoundland and Labrador, including the Newfoundland Orphan Basin Exploration Drilling Program.
June 5, 2018	Email	Provided draft community profile for EIS for review and comment by July 2, 2018.
July 10, 2018	Email from Nunatsiavut Government	Received comments on draft community profile.
August 27, 2018	Email	Invitation to a technical workshop coordinated by BP and other NL operators to follow up on the CEAA-sponsored workshops held in April 2018. Purpose is to provide project updates and follow up on issues discussed at the April workshops and provide more technical information on: spill modelling, preparedness and response; environmental monitoring; and well abandonment.
Labrador Innu (Innu Nation)		
November 7, 2017	Email with Attached Letter	Letter with map to introduce the Project and request preferences for engagement
December 5, 2017	Phone Call	Phone call to confirm receipt of introductory letter and discuss interests.
January 23, 2018	Email with Attached Letter	Provided notification on filing of Project Description; a link to CEAR website for public comment period; and January 2018 newsletter.
January 31, 2018	Email	Provided status update for all oil and gas projects offshore eastern Newfoundland and Labrador, including the Newfoundland Orphan Basin Exploration Drilling Program.
March 7, 2018	Email with Attached Letter	Provided update on issuance of EIS Guidelines by Agency and proposed VCs for EIS. Also expressed interest in receiving information to improve BP's understanding of potential effects on the community including, but not limited to, potential effects on Aboriginal and/or Treaty rights. Included offer to meet with group upon request.

Date	Method	Purpose
April 20, 2018	Workshop: St. John's, NL	Agency-facilitated workshop with Indigenous groups, regulatory agencies and other NL operators to provide an overview of proposed exploration drilling programs in the offshore of Newfoundland and Labrador and discuss issues of concern to Indigenous groups including the regulatory process, drilling operations, emergency preparedness and response, potential cumulative effects, potential effects of exploration drilling on Atlantic salmon, and the inclusion of Indigenous knowledge.
May 28, 2018	Email	Email to follow up on Agency-facilitated workshop with copy of presentation (English and French).
June 5, 2018	Email	Provided status update for all oil and gas projects offshore eastern Newfoundland and Labrador, including the Newfoundland Orphan Basin Exploration Drilling Program.
June 5, 2018	Email	Provided draft community profile for EIS for review and comment by July 2, 2018.
August 27, 2018	Email	Invitation to a technical workshop coordinated by BP and other NL operators to follow up on the CEAA-sponsored workshops held in April 2018. Purpose is to provide project updates and follow up on issues discussed at the April workshops and provide more technical information on: spill modelling, preparedness and response; environmental monitoring; and well abandonment.
NunatuKavut Community Council		
November 7, 2017	Email with Attached Letter	Letter with map to introduce the Project and request preferences for engagement
December 4, 2017	Phone Call	Phone call to confirm receipt of letter and discuss interests.
January 23, 2018	Email with Attached Letter	Provided notification on filing of Project Description; a link to CEAR website for public comment period; and January 2018 newsletter.
January 31, 2018	Email	Provided status update for all oil and gas projects offshore eastern Newfoundland and Labrador, including the Newfoundland Orphan Basin Exploration Drilling Program.
March 7, 2018	Email with Attached Letter	Provided update on issuance of EIS Guidelines by Agency and proposed VCs for EIS. Also expressed interest in receiving information to improve BP's understanding of potential effects on the community including but not limited to potential effects on Aboriginal and/or Treaty rights. Included offer to meet with group upon request.
April 20, 2018	Workshop: St. John's, NL	Agency-facilitated workshop with Indigenous groups, regulatory agencies and other NL operators to provide an overview of proposed exploration drilling programs in the offshore of Newfoundland and Labrador and discuss issues of concern to Indigenous groups including the regulatory process, drilling operations, emergency preparedness and response, potential cumulative effects, potential effects of exploration drilling on Atlantic salmon, and the inclusion of Indigenous knowledge.
May 28, 2018	Email	Email to follow up on Agency-facilitated workshop with copy of presentation (English and French).
June 5, 2018	Email	Provided status update for all oil and gas projects offshore eastern Newfoundland and Labrador, including the Newfoundland Orphan Basin Exploration Drilling Program.

Date	Method	Purpose
June 5, 2018	Email	Provided draft community profile for EIS for review and comment by July 2, 2018.
August 27, 2018	Email	Invitation to a technical workshop coordinated by BP and other NL operators to follow up on the CEAA-sponsored workshops held in April 2018. Purpose is to provide project updates and follow up on issues discussed at the April workshops and provide more technical information on: spill modelling, preparedness and response; environmental monitoring; and well abandonment.
Miawpukek First Nation (MFN)		
November 7, 2017	Email with Attached Letter	Letter with map to introduce the Project and request preferences for engagement
December 1, 2017	Phone Call	Introductory phone call in which MFN expressed concern about potential effects of a spill on traditional “in-river” fisheries and the need for more recent and accurate studies on salmon migration. MFN also confirmed they fish commercially for swordfish and other species in 3PS, and are looking to expand fishing into more areas that are within the Project Area.
January 23, 2018	Email with Attached Letter	Provided notification on filing of Project Description; a link to CEAR website for public comment period; and January 2018 newsletter.
January 31, 2018	Email	Provided status update for all oil and gas projects offshore eastern Newfoundland and Labrador, including the Newfoundland Orphan Basin Exploration Drilling Program.
February 7, 2018	Letter from MFN	Letter to NL operators (including BP) to express concerns related to proposed offshore exploration projects including effects on: Aboriginal rights and interests, FSC and commercial fishing, Atlantic salmon, Atlantic eel, cold water corals, species at risk, marine mammals, marine birds, community wellbeing, and socio-economic conditions. Letter also included descriptions of tasks and budget deemed necessary for meaningful consultation.
March 7, 2018	Email with Attached Letter	Provided update on issuance of EIS Guidelines by Agency and proposed VCs for EIS. Also expressed interest in receiving information to improve BP’s understanding of potential effects on the community including but not limited to potential effects on Aboriginal and/or Treaty rights. Included offer to meet with group upon request.
March 15 – April 5, 2018	Emails	Email exchanges between MFN and NL operators (including BP) to plan a meeting in response to letter received February 7, 2018.
April 20, 2018	Workshop: St. John’s, NL	Agency-facilitated workshop with Indigenous groups, regulatory agencies and other NL operators to provide an overview of proposed exploration drilling programs in the offshore of Newfoundland and Labrador and discuss issues of concern to Indigenous groups including the regulatory process, drilling operations, emergency preparedness and response, potential cumulative effects, potential effects of exploration drilling on Atlantic salmon, and the inclusion of Indigenous knowledge.
April 28, 2018	Email	Email on behalf of BP and other NL operators to provide PDF copy of slide presentation from Agency-facilitated workshop in St. John’s on April 20, 2018.
May 28, 2018	Email	Email to follow up on Agency-facilitated workshop with copy of presentation (English and French).

Date	Method	Purpose
June 5, 2018	Email	Provided status update for all oil and gas projects offshore eastern Newfoundland and Labrador, including the Newfoundland Orphan Basin Exploration Drilling Program.
June 5, 2018	Email	Provided draft community profile for EIS for review and comment by July 2, 2018.
June 11, 2018	Email from MFN	Email response from MFN regarding draft community profile for EIS indicating they did not have the capacity to review the community profile and recommending meaningful engagement and Indigenous knowledge study.
June 12, 2018	Email	Email response on behalf of BP and Husky (to June 11 email) clarifying intent of June 5, 2018 seeking comment on draft community profile for EIS.
July 17, 2018	In-Person/Face-to-Face	Meeting with MFN and NL operators (including BP) to provide an overview presentation of the various offshore exploration drilling programs proposed for eastern Newfoundland offshore area and discuss Miawpukek interests, concerns and opportunities associated with these drilling programs.
August 9, 2018	Email	Email on behalf of BP and other NL operators to follow up on July 17th meeting including proposal to provide support for continued engagement, Indigenous knowledge and other opportunities.
August 16, 2018	Email with Attached Letter from MFN	Letter to BP and other NL operators from the Chief following up on the July 17th meeting, thanking them for meeting, reiterating concerns, and outlining steps and timeline for a process agreement.
August 17, 2018	Email	Shared proponents' notes from July 17th meeting.
August 27, 2018	Email	Invitation to a technical workshop coordinated by BP and other NL operators to follow up on the CEAA-sponsored workshops held in April 2018. Purpose is to provide project updates and follow up on issues discussed at the April workshops and provide more technical information on: spill modelling, preparedness and response; environmental monitoring; and well abandonment.
August 28, 2018	Email with Attached Letter	Response from MFN to funding proposal sent on behalf of BP and other NL operators on August 9, 2018.
Qalipu Mi'kmaq First Nation		
November 7, 2017	Email with Attached Letter	Letter with map to introduce the Project and request preferences for engagement
January 23, 2018	Email with Attached Letter	Provided notification on filing of Project Description; a link to CEAR website for public comment period; and January 2018 newsletter.
January 31, 2018	Email	Provided status update for all oil and gas projects offshore eastern Newfoundland and Labrador, including the Newfoundland Orphan Basin Exploration Drilling Program.
March 7, 2018	Email with Attached Letter	Provided update on issuance of EIS Guidelines by Agency and proposed VCs for EIS. Also expressed interest in receiving information to improve BP's understanding of potential effects on the community including but not limited to potential effects on Aboriginal and/or Treaty rights. Included offer to meet with group upon request.
April 20, 2018	Workshop: St. John's, NL	Agency-facilitated workshop with Indigenous groups, regulatory agencies and other NL operators to provide an overview of proposed exploration drilling programs in the offshore of Newfoundland and Labrador and discuss issues of concern to Indigenous groups including

Date	Method	Purpose
		the regulatory process, drilling operations, emergency preparedness and response, potential cumulative effects, potential effects of exploration drilling on Atlantic salmon, and the inclusion of Indigenous knowledge.
May 28, 2018	Email	Email to follow up on Agency-facilitated workshop with copy of presentation (English and French).
June 5, 2018	Email	Provided status update for all oil and gas projects offshore eastern Newfoundland and Labrador, including the Newfoundland Orphan Basin Exploration Drilling Program.
June 5, 2018	Email	Provided draft community profile for EIS for review and comment by July 2, 2018.
June 13, 2018	Email from Qalipu First Nation	Email response from the Qalipu Mi'kmaq First Nation indicating the draft community profile information for the EIS appears to be correct.
August 27, 2018	Email	Invitation to a technical workshop coordinated by BP and other NL operators to follow up on the CEAA-sponsored workshops held in April 2018. Purpose is to provide project updates and follow up on issues discussed at the April workshops and provide more technical information on: spill modelling, preparedness and response; environmental monitoring; and well abandonment.

A summary of key issues and concerns raised by Newfoundland and Labrador Indigenous groups, either directly to BP or to the Agency during the EA process to date, and how these are being addressed, is provided in Table 3.4. This includes questions and concerns raised during the April 2018 workshop where comments may not be attributable to a specific community. Key issues raised in the workshop revolved around the following main themes: environmental effects of offshore exploration drilling; baseline data and monitoring; accidental events; potential impacts on species of interest, such as Atlantic salmon; and the inclusion of Indigenous knowledge.

Table 3.4 Summary of Issues and Concerns from Newfoundland and Labrador Indigenous Groups

Question/Comment	Response
Nunatukavut Community Council	
Consider migratory routes of marine species when planning drilling projects.	Migratory routes of marine species are discussed in Sections 6.1 to 6.3 and are taken into consideration when assessing impacts of routine activities and accidental events.
Traditional knowledge should be incorporated into planning.	BP recognizes the value of traditional knowledge and continues to work with Indigenous communities to obtain traditional knowledge relevant to the Project.
Labrador Inuit (Nunatsiavut Government)	
Concerned about issues surrounding species that are of importance to commercial and subsistence fisheries, most notably migratory species.	Effects of Project activities on species of commercial, recreational and Aboriginal (CRA) importance are assessed in Chapter 8 (Marine Fish and Fish Habitat) and Section 15.5.1 (accidental effects on marine fish and fish habitat). Additional information on Project effects on Indigenous fisheries is provided in Chapter 12 (Indigenous Peoples and Community Values) and Section 15.5.4 (accidental effects on Indigenous peoples and community values).

Question/Comment	Response
Recommend assessment of accidental events include potential impacts on three Nunatsiavut commercial fishing enterprises in NAFO areas 2GHJ3KL and potential impacts to subsistence/commercial species including cod, and populations of SARA-listed species (including blue whale and North Atlantic right whale) that may migrate through any potentially impacted area within the Marine Zone identified in the Labrador Inuit Land Claim Agreement.	Spill fate and behaviour modelling has been conducted for the Project (refer to Appendix D) and taken into consideration in the impact assessment of accidental events on marine fish and fish habitat (Section 15.5.1), marine and migratory birds (Section 15.5.2), marine mammals and sea turtles (Section 15.5.3) and Indigenous peoples and community values (Section 15.5.4).
Recommend potential impacts of an underwater blowout are modelled and considered in effects assessment. Impact assessment on coastal zones, including seasonal or temporary residences should be completed through consultation with the Nunatsiavut Government.	Spill fate and behaviour modelling has been conducted for the Project (refer to Appendix D) for various spill scenarios including a subsea well blowout. This analysis includes stochastic modelling to determine the probability of oil reaching shorelines. As shown in Section 15.4 and Appendix D, there is no predicted interaction with the Marine Zone or lands identified in the Labrador Inuit Land Claim Agreement.
Will be looking at modelling of worst case scenario and associated impact assessment on both commercial and subsistence species harvested by Labrador Inuit.	Spill fate and behaviour modelling has been conducted for the Project (refer to Appendix D) and taken into consideration in the impact assessment of accidental events on marine fish and fish habitat (Section 15.5.1), marine and migratory birds (Section 15.5.2), marine mammals and sea turtles (Section 15.5.3) and Indigenous peoples and community values (Section 15.5.4).
Should consider climate change in description of physical environment and effects assessment. Also consider effects of climate change on project itself.	Section 5.4 of the EIS describes the climatology of the RAA and Section 5.9 specifically discusses climate change as it may pertain to the Project. Chapter 16 of the EIS assesses effects of the environment (which can be influenced by climate change) on the Project itself.
Miawpukek First Nation	
Concerns include potential impacts on Aboriginal rights and interests, FSC fishing, commercial fishing, Atlantic salmon, Atlantic eel, cold water corals, species at risk, marine mammals, marine birds, community wellbeing, and socio-economic conditions.	The selection of VCs and corresponding effects assessment addresses all of these components of concern. Refer to Chapters 8 to 13 for an assessment of effects from routine Project activities and Section 15.5 for an assessment of accidental effects.
Concerned about risks from vessel traffic, seismic testing, spills, drilling mud, physical destruction of corals and catastrophic well blowouts.	The EIS assess potential effects from routine operations including vessel traffic (supply and servicing), seismic testing (VSP surveys), and drilling mud (discharges) and discusses mitigation that BP will employ to reduce adverse environmental effects from these activities. Potential Project-related effects on corals are assessed in Section 8 (Marine Fish and Fish Habitat). Accidental events including spills and blowouts are assessed in Chapter 15.
Very concerned with potential impacts to Atlantic salmon including direct project effects and cumulative effects, particularly given current poor condition of salmon and their decline in Conne Brook.	BP shares concerns regarding declining Atlantic salmon populations and recognizes there are uncertainties and complexities regarding the cause(s) of the decline. Project effects on Atlantic salmon are assessed in Chapter 12 and Section 15.5.4. Cumulative effects are assessed in Chapter 14.

Question/Comment	Response
There is value in consulting with community members to improve their understanding of drilling activities and to obtain traditional knowledge related to fishing.	Refer to Table 3.3 for a record of engagement with MFN and other NL Indigenous groups to date. Section 3.2.9 describes planned future engagement.
What are the existing environmental baseline studies?	Chapter 6 describes the existing baseline environment for the biological environment. No field work has been conducted as part of this EIS.
Are there statistics available on accident/incident reporting?	Section 15.2.2. includes statistics on accidental spills including spills offshore Newfoundland and Labrador to date.
What environmental monitoring programs are put in place during operations and post-well abandonment?	Environmental monitoring programs include environmental compliance monitoring and, where there may be uncertainty around effects predictions or prescribed mitigation, environmental effects monitoring. Monitoring and follow-up programs are summarized in Section 18.2.
Qalipu Mi'kmaq First Nation	
Process to identify, mitigate and monitor effects should be developed for the Project Area and supply base.	The onshore supply base is outside the scope of this EIS. However, activities at the supply base are expected to comply with applicable local, provincial and federal regulatory requirements as applicable. Refer to Chapters 8 to 13 for an assessment of effects from routine Project activities within the Project Area and Section 15.5 for an assessment of accidental effects.
Effects of project on marine environment may include changes to water quality, fish and fish habitat, marine plants, migratory birds and marine mammals and increased contributions to atmospheric emissions.	The selection of VCs and corresponding effects assessment addresses these components of concern. Refer to Chapters 8 to 13 for an assessment of effects from routine Project activities and Section 15.5 for an assessment of accidental effects. Atmospheric emissions are addressed in Section 2.8.1.
Emergency response plans for incidents at the supply base, nearshore installations and transportation routes should be developed.	Emergency response plans are prepared as part of the OA process with the C-NLOPB and consider onshore and offshore Project components and activities.
Compensation should be provided in instances where fishing success is negatively affected as a direct result of the undertaking.	Project-related damage to fishing gear, if any, will be compensated in accordance with the *Compensation Guidelines with Respect to Damages Relating to Offshore Petroleum Activity* (C-NLOPB and CNSOPB 2002).
Concern expressed about exploration drilling in protected areas and land tenure process for exploration licences.	The land tenure process for exploration licences is outside the scope of this EIS. Refer to Chapter 11 for an assessment of Project activities on Special Areas.
Un-attributable Comments Raised in April 2018 Workshop	
There is a need to consider effects at sensitive periods (e.g., when salmon are in the area).	The effects assessment considers seasonal sensitivities for species.
Concern expressed about effects of dispersants on fish and clarification on decision-making process concerning dispersant application.	Section 15.3.3.3 describes the dispersant planning and application process and includes a discussion of effects of dispersants.

Question/Comment	Response
Concern expressed about potential effects on the shrimp fishery.	Northern shrimp is recognized as a key fishery species (refer to Section 7.1.7). Effects on Indigenous (FSC and commercial communal) and commercial fisheries are assessed in Chapters 12 and 13, respectively.
Questions about follow-up programs to determine effects after drilling.	Follow-up programs are generally proposed where there may be uncertainty around effects prediction or mitigation effectiveness. Section 18.2 summarizes proposed follow-up programs for the drilling program.
Question about availability of suitable baseline data to allow comparison with monitoring results.	Chapter 6 describes the existing baseline environment for the biological environment. No field work has been conducted as part of this EIS. A pre-drill survey at each wellsite will provide baseline data on the benthic environment.
Current environmental effects monitoring focuses on health effects, but little is known about behavioural effects.	The EIS acknowledges the uncertainty around behavioural effects on marine fish, mammals and sea turtles, particularly with regard to underwater sound emissions.
Questions raised about cumulative accidental events (more than one event occurring at once).	Given the low likelihood of a spill occurring for even one physical activity in the RAA, the likelihood of spills occurring from multiple physical activities in such a way that residual environmental effects have potential to overlap spatially or temporally is considered remote. In the event of a Tier 2 or Tier 3 incident (refer to Section 15. 3.1), other oil and gas operations in the region may be suspended, thereby further limiting the risk of more than one event occurring at once.
Questions about capping stack availability (and storage location) and how a capping stack is installed on a damaged well.	Section 15.3.3.2 describes well intervention strategies including the use of a capping stack and logistics associated with deployment. BP and the other NL operators are planning a workshop with interested Indigenous groups for the fall of 2018 which would focus on emergency planning and response.
A precautionary approach is called for in evaluating potential effects on Atlantic salmon given endangered status of populations, lack of data on migration routes and overwintering locations, high rates of at-sea mortality, and lack of information on specific effects of offshore drilling on this species.	Chapter 12 of the EIS assesses potential effects on Atlantic salmon and Chapter 6.1.9 acknowledges uncertainty around salmon migration and overwintering. BP (in cooperation with other NL operators) is discussing potential opportunities for Indigenous knowledge and research studies related to Atlantic salmon. These would be conducted outside of the EIS but results could be factored into environmental management planning and future environmental assessments.
Indigenous knowledge about salmon populations has not been factored into management planning and environmental assessments.	See above response.
Opportunities for research funding should be identified to improve Atlantic salmon knowledge and recovery.	See above response.
The value of Indigenous knowledge should not be discounted due to distance between an Indigenous community and project activities.	BP continues to engage with Indigenous groups in NL, NS, PEI, NB and Quebec (see Sections 3.2.1 to 3.2.9 for past and planned Indigenous engagement).
Important to consider effects on ecosystem level, not just focusing on a few species; Indigenous knowledge can contribute to an ecosystem perspective.	The EIS considers tropic linkages and key marine assemblages in addition to focusing on specific species present in the RAA (e.g., see Section 6.1).

3.2.2 Mi'kmaq of Nova Scotia

A summary of engagement with the Mi'kmaq of Nova Scotia is provided in Table 3.5. Initial outreach involved correspondence with each of the 13 individual First Nations. Subsequent engagement with 11 of the 13 Mi'kmaw First Nations represented by the KMKNO was coordinated through the KMKNO. BP is also engaging with Sipekne'katik and Millbrook First Nations separately.

A workshop to introduce BP and the other NL operators and their proposed exploration drilling programs to Indigenous groups in Nova Scotia, New Brunswick and Prince Edward Island was held in Moncton, NB on April 12, 2018. The Agency facilitated this workshop where various operators presented to representatives from the Peskotomuhkati Nation, WNNB, MTI, Atlantic Policy Congress of First Nation Chiefs Secretariat, KMKNO, and MCPEI; and discussed issues of concern to the Indigenous participants.

Table 3.5 Summary of Engagement with the Mi'kmaq of Nova Scotia

Date	Method	Purpose
All Nova Scotia Mi'kmaq First Nations (Individual Chiefs)		
November 7, 2017	Email with Attached Letter	Letter with map to introduce the Project and request preferences for engagement; KMKNO was copied on correspondence, excluding letters sent to Sipekne'katik and Millbrook First Nations.
KMKNO		
January 23, 2018	Email with Attached Letter	Provided notification on filing of Project Description; a link to CEAR website for public comment period; and January 2018 newsletter.
January 31, 2018	Email	Provided status update for all oil and gas projects offshore eastern Newfoundland and Labrador, including the Newfoundland Orphan Basin Exploration Drilling Program.
March 7, 2018	Email with Attached Letter	Provided update on issuance of EIS Guidelines by Agency and proposed VCs for EIS. Also expressed interest in receiving information to improve BP's understanding of potential effects on the community including but not limited to potential effects on Aboriginal and/or Treaty rights. Included offer to meet with group upon request.
April 12, 2018	Workshop: Moncton, NB	Agency-facilitated workshop with Indigenous groups, regulatory agencies and other NL operators to provide an overview of proposed exploration drilling programs in the offshore of Newfoundland and Labrador and discuss issues of concern to Indigenous groups including the regulatory process, drilling operations, emergency preparedness and response, potential cumulative effects, potential effects of exploration drilling on Atlantic salmon, and the inclusion of Indigenous knowledge.
May 28, 2018	Email	Email to follow up on Agency-facilitated workshop with copy of presentation (English and French).
June 5, 2018	Email	Provided status update for all oil and gas projects offshore eastern Newfoundland and Labrador, including the Newfoundland Orphan Basin Exploration Drilling Program.
June 5, 2018	Email	Provided draft community profiles for Nova Scotia Mi'kmaq First Nations represented by KMKNO for EIS for review and comment by July 2, 2018.

Date	Method	Purpose
August 27, 2018	Email	Invitation to a technical workshop coordinated by BP and other NL operators to follow up on the CEAA-sponsored workshops held in April 2018. Purpose is to provide project updates and follow up on issues discussed at the April workshops and provide more technical information on: spill modelling, preparedness and response; environmental monitoring; and well abandonment.
Millbrook First Nation		
November 7, 2017	Email with Attached Letter	Letter with map to introduce the Project and request preferences for engagement.
December 8, 2017	Phone Call	Interested in Newfoundland Orphan Basin Exploration Program; will apply for CEAA funding.
January 23, 2018	Email with Attached Letter	Provided notification on filing of Project Description; a link to CEAR website for public comment period; and January 2018 newsletter.
January 31, 2018	Email	Provided status update for all oil and gas projects offshore eastern Newfoundland and Labrador, including the Newfoundland Orphan Basin Exploration Drilling Program.
March 7, 2018	Email with Attached Letter	Provided update on issuance of EIS Guidelines by Agency and proposed VCs for EIS. Also expressed interest in receiving information to improve BP's understanding of potential effects on the community including but not limited to potential effects on Aboriginal and/or Treaty rights. Included offer to meet with group upon request.
April 20, 2018	Workshop: St. John's, NL	Agency-facilitated workshop with Indigenous groups, regulatory agencies and other NL operators to provide an overview of proposed exploration drilling programs in the offshore of Newfoundland and Labrador and discuss issues of concern to Indigenous groups including the regulatory process, drilling operations, emergency preparedness and response, potential cumulative effects, potential effects of exploration drilling on Atlantic salmon, and the inclusion of Indigenous knowledge.
May 28, 2018	Email	Email to follow up on Agency-facilitated workshop with copy of presentation (English and French).
June 5, 2018	Email	Provided status update for all oil and gas projects offshore eastern Newfoundland and Labrador, including the Newfoundland Orphan Basin Exploration Drilling Program.
June 5, 2018	Email	Provided draft community profile for EIS for review and comment by July 2, 2018.
August 27, 2018	Email	Invitation to a technical workshop coordinated by BP and other NL operators to follow up on the CEAA-sponsored workshops held in April 2018. Purpose is to provide project updates and follow up on issues discussed at the April workshops and provide more technical information on: spill modelling, preparedness and response; environmental monitoring; and well abandonment.
Sipekne'katik First Nation		
November 7, 2017	Email with Attached Letter	Letter with map to introduce the Project and request preferences for engagement.

Date	Method	Purpose
November 21, 2017	Email with Attached Letter from Sipekne'katik First Nation	Letter sent from Chief acknowledging receipt of introductory letter from BP and expressing interest in the project as it may potentially impact rights. Sipekne'katik is interested in learning more about potential project-related impacts on fish and fish habitat specific to commercial fisheries species, food social and ceremonial species, and species at risk and will contact BP's Indigenous Relations Advisor to arrange for an introductory meeting.
January 23, 2018	Email with Attached Letter	Provided notification on filing of Project Description; a link to CEAR website for public comment period; and January 2018 newsletter.
January 31, 2018	Email	Provided status update for all oil and gas projects offshore eastern Newfoundland and Labrador, including the Newfoundland Orphan Basin Exploration Drilling Program.
February 6, 2018	Email with Attached Letter from Sipekne'katik First Nation	Sipekne'katik forwarded BP a copy of the comment form submitted to CEA Agency which indicated Sipekne'katik's comments and concerns about the project. These include: potential impacts to fish/fish habitat, marine mammals, migratory birds, species at risk, and adverse effects on FSC and/or commercial communal fisheries in the event of an accident or malfunction.
March 7, 2018	Email with Attached Letter	Provided update on issuance of EIS Guidelines by Agency and proposed VCs for EIS. Also expressed interest in receiving information to improve BP's understanding of potential effects on the community including but not limited to potential effects on Aboriginal and/or Treaty rights. Included offer to meet with group upon request.
June 5, 2018	Email	Provided status update for all oil and gas projects offshore eastern Newfoundland and Labrador, including the Newfoundland Orphan Basin Exploration Drilling Program.
June 5, 2018	Email	Provided draft community profile for EIS for review and comment by July 2, 2018.
June 11-July 26, 2018	Emails	Email exchanges with Sipekne'katik to organize a meeting to discuss the Project.
August 27, 2018	Email	Invitation to a technical workshop coordinated by BP and other NL operators to follow up on the CEAA-sponsored workshops held in April 2018. Purpose is to provide project updates and follow up on issues discussed at the April workshops and provide more technical information on: spill modelling, preparedness and response; environmental monitoring; and well abandonment.

A summary of key issues and concerns raised by the Mi'kmaq of Nova Scotia, either directly to BP or to the Agency during the EA process to date, and BP's response, is provided in Table 3.6. This includes issues and concerns raised during the April 2018 workshop where comments may not be attributable to a specific community. Key issues raised in the workshop revolved around the following themes: environmental effects of offshore exploration drilling; baseline data and monitoring; accidental events; potential impacts on species of interest, such as Atlantic salmon; and the inclusion of Indigenous knowledge.

Table 3.6 Summary of Issues and Concerns from the Mi'kmaq of Nova Scotia

Question/Comment	Response
KMKNO	
Mi'kmaq of Nova Scotia are very concerned with potential impacts to Mi'kmaq fishing activity, Atlantic salmon, and American eel.	Chapter 12 (Indigenous Peoples and Community Values) assesses effects of Project activities on Indigenous fishing and species of interest with a focus on Atlantic salmon and American eel.
Sipekne'katik First Nation	
Interest in learning more about possible project impacts to fish/fish habitat specific to commercial fisheries species, and FSC species.	Effects of Project activities on species of CRA importance are assessed in Chapter 8 (Marine Fish and Fish Habitat) and Section 15.5.1 (accidental effects on marine fish and fish habitat) as well as Chapter 12 (Indigenous Peoples and Community Values) and Section 15.5.4 (accidental effects on Indigenous peoples and community values).
Also concerned about potential effects on marine mammals, migratory birds, and species at risk.	Refer to Chapter 9 (Marine and Migratory Birds) and Chapter 10 (Marine Mammals and Sea Turtles) for an assessment of routine Project activities. Potential effects associated with accidental events on these components are assessed in Section 15.5.2 and 15.5.3. Species at risk are addressed within their respective chapters.
A negative impact to FSC and/or communal commercial, moderate livelihood fisheries in event of accident/malfunction could cause the fishery to shut down and would result in changes to health and socio-economic conditions. An accident/malfunction could impact current use of lands and resources for traditional purposes (e.g., cause the fishery to shut down) and impact rights.	Section 15.5.6 assesses potential effects associated with accidental events on Indigenous fisheries and includes consideration of potential health and socio-economic conditions of affected Indigenous communities.
Millbrook First Nation	
Concerned about Atlantic salmon but would like to see focus on snow crab and tuna as well.	Effects of Project activities on species of CRA importance including snow crab and tuna are assessed in Chapter 8 (Marine Fish and Fish Habitat) and Section 15.5.1 (accidental effects on marine fish and fish habitat) as well as Chapter 12 (Indigenous Peoples and Community Values) and Section 15.5.4 (accidental effects on Indigenous peoples and community values).
Un-attributable Comments Raised in April 2018 Workshop[1]	
Traditional knowledge is not a term selected by Indigenous people; "Indigenous knowledge system" is a more appropriate term and it represents a holistic approach to study as opposed to an item of information included in a report.	The EIS acknowledges the value of traditional knowledge (which may be non-Indigenous), as well as Indigenous knowledge, and considers and incorporates those elements in the EIS, where possible.
Expressed concern about lack of plans to monitor environmental effects and build capacity of Indigenous communities.	Follow-up programs are generally proposed where there may be uncertainty around effects prediction or mitigation effectiveness. Section 18.2 summarizes proposed follow-up programs for the drilling program.

Question/Comment	Response
Early engagement is key to success which requires earlier availability of funding; funding is also required to support research.	BP initiated Indigenous engagement during the preparation of the Project Description document and continues to engage with interested Indigenous groups. BP, in collaboration with other NL operators, is working with communities to identify potential industry-funded research opportunities.
Atlantic salmon potentially use the area for more than just migration (e.g., potential feeding area). Given lack of information on salmon and research on effects of exploration on this species, there is uncertainty about impact predictions.	BP shares concerns regarding declining Atlantic salmon populations and recognizes there are uncertainties and complexities regarding the cause(s) of the decline. Chapter 12 of the EIS assesses potential effects on Atlantic salmon and acknowledges uncertainty around salmon migration and overwintering. BP (in cooperation with other NL operators) is discussing potential opportunities for Indigenous knowledge and research studies related to Atlantic salmon. These would be conducted outside of the EIS but results could be factored into environmental management planning and future environmental assessments.
As ocean users, BP (and other operators) should demonstrate a value on Atlantic salmon and share a concern for the species. Due to declining population status, Atlantic salmon is not harvested in much of Nova Scotia and New Brunswick; Indigenous communities want to see populations recover so they can resume harvesting activities.	See above response with regard to attention given to Atlantic salmon in the EIS and potential funding and research opportunities.
Cultural impacts of development needs to be considered; this is revealed through community engagement, not a database.	Chapter 12 and Section 15.5.6 assesses potential effects of the Project on Indigenous peoples and community values, including socio-economic effects. BP continues to engage with interested Indigenous communities to better understand potential direct and indirect community impacts of offshore exploration drilling programs.
[1]Millbrook First Nation was unable to attend the workshop in Moncton, NB on April 12, 2018 and instead attended the workshop in St. John's, NL on April 20, 2018. Refer to Table 3.4 for questions and comments raised in that workshop.	

3.2.3 Mi'kmaq of Prince Edward Island

A summary of engagement with the Mi'kmaq of Prince Edward Island is provided in Table 3.7.

A workshop to introduce BP and the other NL operators and their proposed exploration drilling programs to Indigenous groups in Nova Scotia, New Brunswick and Prince Edward Island was held in Moncton, NB on April 12, 2018. The Agency facilitated this workshop where various operators presented to representatives from the Peskotomuhkati Nation, WNNB, MTI, Atlantic Policy Congress of First Nation Chiefs Secretariat, KMKNO, and MCPEI; and discussed issues of concern to the Indigenous participants.

Table 3.7 Summary of Engagement with the Mi'kmaq of Prince Edward Island

Date	Method	Purpose
Abegweit First Nation		
November 7, 2017	Email with Attached Letter	Letter with map to introduce the Project and request preferences for engagement

Date	Method	Purpose
Lennox Island First Nation		
November 7, 2017	Email with Attached Letter	Letter with map to introduce the Project and request preferences for engagement
Mi'kmaq Confederacy of PEI (MCPEI)		
December 8, 2017	Email with Attached Letter from MCPEI	Acknowledgement of project; MCPEI will defer to Indigenous People of NL, however, expressed concern about impact of drilling projects on migrating salmon population
January 23, 2018	Email with Attached Letter	Provided notification on filing of Project Description; a link to CEAR website for public comment period; and January 2018 newsletter.
January 31, 2018	Email	Provided status update for all oil and gas projects offshore eastern Newfoundland and Labrador, including the Newfoundland Orphan Basin Exploration Drilling Program.
March 7, 2018	Email with Attached Letter	Provided update on issuance of EIS Guidelines by Agency and proposed VCs for EIS. Also expressed interest in receiving information to improve BP's understanding of potential effects on the community including but not limited to potential effects on Aboriginal and/or Treaty rights. Included offer to meet with group upon request.
March 20, 2018	Email with Attached Letter from MCPEI	MCPEI response to March 7, 2018 letter from BP indicating MCPEI has no traditional knowledge of the area but that they have significant environmental concerns and would like more information. They also stressed the importance of proper consultation with the Indigenous people of Newfoundland.
April 12, 2018	Workshop: Moncton, NB	Agency-facilitated workshop with Indigenous groups, regulatory agencies and other NL operators to provide an overview of proposed exploration drilling programs in the offshore of Newfoundland and Labrador and discuss issues of concern to Indigenous groups including the regulatory process, drilling operations, emergency preparedness and response, potential cumulative effects, potential effects of exploration drilling on Atlantic salmon, and the inclusion of Indigenous knowledge.
May 28, 2018	Email	Email to follow up on Agency-facilitated workshop with copy of presentation (English and French).
June 4, 2018	In-Person/Face-to-Face	Meeting to provide update on BP's drilling operations in Nova Scotia and plans for exploration drilling in Newfoundland and Labrador.
June 5, 2018	Email	Provided status update for all oil and gas projects offshore eastern Newfoundland and Labrador, including the Newfoundland Orphan Basin Exploration Drilling Program.
June 5, 2018	Email	Provided draft community profiles for Abegweit and Lennox Island for EIS for review and comment by July 2, 2018.
June 13, 2018	Email from MCPEI	MCPEI responded with edits to the draft community profiles for Lennox Island and Abegweit First Nations to be used in the EIS.
August 27, 2018	Email	Invitation to a technical workshop coordinated by BP and other NL operators to follow up on the CEAA-sponsored workshops held in April 2018. Purpose is to provide project updates and follow up on issues discussed at the April workshops and provide more technical information on: spill modelling, preparedness and response; environmental monitoring; and well abandonment.

A summary of key issues and concerns raised by the Mi'kmaq of Prince Edward Island, either directly to BP or to the Agency during the EA process to date, and how these are being addressed, is provided in Table 3.8. Refer to Table 3.6 for issues and concerns raised during the April 13, 2018 workshop that MCPEI attended.

Table 3.8 Summary of Issues and Concerns from the Mi'kmaq of Prince Edward Island

Question/Comment	Response
MCPEI	
Concerned about impact of project on migrating salmon population.	The EIS recognizes the importance of Atlantic salmon to Indigenous peoples. Effects of Project activities on species of CRA importance including Atlantic salmon are assessed in Chapter 8 (Marine Fish and Fish Habitat) and Section 15.5.1 (accidental effects on marine fish and fish habitat) as well as Chapter 12 (Indigenous Peoples and Community Values) and Section 15.5.4 (accidental effects on Indigenous peoples and community values). BP (in cooperation with other NL operators) is discussing potential opportunities for Indigenous knowledge and research studies related to Atlantic salmon. These would be conducted outside of the EIS but results could be factored into environmental management planning and future environmental assessments.
Concerned about BP's emergency response capabilities	Section 15.3 of the EIS describes BP's contingency planning and emergency response capabilities. Additional detail will be provided in a Project-specific Incident Management Plan and Spill Response Plan to be prepared as part of the OA process with the C-NLOPB.

3.2.4 Mi'kmaq of New Brunswick

A summary of engagement with the Mi'kmaq of New Brunswick is provided in Table 3.9. Consultation and engagement with the First Nations represented by MTI occurred with MTI. Elsipogtog First Nation has been engaged separately from MTI.

Table 3.9 Summary of Engagement with the Mi'kmaq of New Brunswick

Date	Method	Purpose
MTI		
November 7, 2017	Email with Attached Letter	Letter with map to introduce the Project and request preferences for engagement
January 23, 2018	Email with Attached Letter	Provided notification on filing of Project Description; a link to CEAR website for public comment period; and January 2018 newsletter.
January 31, 2018	Email	Provided status update for all oil and gas projects offshore eastern Newfoundland and Labrador, including the Newfoundland Orphan Basin Exploration Drilling Program.
March 7, 2018	Email with Attached Letter	Provided update on issuance of EIS Guidelines by Agency and proposed VCs for EIS. Also expressed interest in receiving information to improve BP's understanding of potential effects on the community including but not limited to potential effects on Aboriginal and/or Treaty rights. Included offer to meet with group upon request.

Date	Method	Purpose
April 12, 2018	Workshop: Moncton, NB	Agency-facilitated workshop with Indigenous groups, regulatory agencies and other NL operators to provide an overview of proposed exploration drilling programs in the offshore of Newfoundland and Labrador and discuss issues of concern to Indigenous groups including the regulatory process, drilling operations, emergency preparedness and response, potential cumulative effects, potential effects of exploration drilling on Atlantic salmon, and the inclusion of Indigenous knowledge.
May 28, 2018	Email	Email to follow up on Agency-facilitated workshop with copy of presentation (English and French).
June 5, 2018	Email	Provided status update for all oil and gas projects offshore eastern Newfoundland and Labrador, including the Newfoundland Orphan Basin Exploration Drilling Program.
June 5, 2018	Email	Provided draft community profiles for Mi'kmaq of New Brunswick for EIS for review and comment by July 2, 2018.
June 28, 2018	Email from MTI	Email response to draft community profiles indicating that the draft profiles contain errors and improperly references an Indigenous Knowledge study completed for a project in New Brunswick, although MTI is unable to correct these errors due to limited capacity.
August 21, 2018	Email with Attached Letter	Email from MTI with engagement funding request for Scotian Basin and Newfoundland Orphan Basin drilling programs.
August 27, 2018	Email	Invitation to a technical workshop coordinated by BP and other NL operators to follow up on the CEAA-sponsored workshops held in April 2018. Purpose is to provide project updates and follow up on issues discussed at the April workshops and provide more technical information on: spill modelling, preparedness and response; environmental monitoring; and well abandonment.
Elsipogtog First Nation		
November 7, 2017	Email with Attached Letter	Letter with map to introduce the Project and request preferences for engagement
January 11, 2018	Phone Call	Received introductory letter and are interested in learning more about the Project.
January 23, 2018	Email with Attached Letter	Provided notification on filing of Project Description; a link to CEAR website for public comment period; and January 2018 newsletter.
January 31, 2018	Email	Provided status update for all oil and gas projects offshore eastern Newfoundland and Labrador, including the Newfoundland Orphan Basin Exploration Drilling Program.
March 7, 2018	Email with Attached Letter	Provided update on issuance of EIS Guidelines by Agency and proposed VCs for EIS. Also expressed interest in receiving information to improve BP's understanding of potential effects on the community including but not limited to potential effects on Aboriginal and/or Treaty rights. Included offer to meet with group upon request.
March 13, 2018	Email with Attached Letter from Elsipogtog First Nation	Letter emailed from Elsipogtog to BP to invite BP (and the other NL operators) to Kopit Lodge for an informational meeting on the offshore eastern exploration drilling projects. The letter also informs of a claim filed by Elsipogtog First Nation against provincial and federal governments seeking declaration of Aboriginal title and rights and a reminder that industry proponents must consult and meaningfully address concerns that could affect title and rights.

Date	Method	Purpose
March 28 – April 5, 2018	Emails	Various emails exchanged between Elsipogtog First Nation and BP (and ExxonMobil, Nexen, and Equinor) to arrange meeting logistics for a meeting with Elsipogtog First Nation for April 11, 2018.
April 9, 2018	Email from Elsipogtog First Nation	Emails from Kopit Lodge indicating that they are not able to proceed with proposed meeting with BP and other NL operators as planned for April 11, 2018.
April 10, 2018	Email	On behalf of BP and other NL operators acknowledged Elsipogtog First Nation / Kopit Lodge's decision to not proceed with the proposed meeting, but remain open to a future opportunity to meet. Provided information for Agency-organized workshop in Moncton on April 12. Noted the status of the various operator's EIS processes, indicating that BP's EIS is still under preparation.
June 5, 2018	Email	Provided status update for all oil and gas projects offshore eastern Newfoundland and Labrador, including the Newfoundland Orphan Basin Exploration Drilling Program.
June 5, 2018	Email	Provided draft community profile for EIS for review and comment by July 2, 2018.
August 27, 2018	Email	Invitation to a technical workshop coordinated by BP and other NL operators to follow up on the CEAA-sponsored workshops held in April 2018. Purpose is to provide project updates and follow up on issues discussed at the April workshops and provide more technical information on: spill modelling, preparedness and response; environmental monitoring; and well abandonment.

A summary of key issues and concerns raised by the Mi'kmaq of New Brunswick, either directly to BP or to the Agency during the EA process to date, and how these are being addressed, is provided in Table 3.10. Refer to Table 3.6 for issues and concerns raised during the April 12, 2018 workshop that was attended by a MTI representative.

Table 3.10 Summary of Issues and Concerns from the Mi'kmaq of New Brunswick

Question/Comment[1]	Response
MTI	
A number of culturally-significant species including Atlantic salmon, North Atlantic right whale and Atlantic bluefin tuna which we fish commercially or otherwise rely on for food or other purposes migrate throughout our territory and use offshore waters of NL and are potentially affected by the project.	The selection of VCs and corresponding effects assessment addresses these components of concern. Refer to Chapter 8 (Marine Fish and Fish Habitat) and Chapter 10 (Marine Mammals and Sea Turtles) for an assessment of effects from routine Project activities and Section 15.5 for an assessment of accidental effects. Chapter 12 (Indigenous Peoples and Community Values) recognizes potential effects on culturally significant species and Indigenous fishing activities.

Question/Comment[1]	Response
MTI	
Given the project has the potential to affect our Aboriginal and Treaty rights, our Mi'gmaq Indigenous Knowledge must be included in all project phases (e.g., baseline assessments, effects assessments, mitigation, environmental protection plans, and follow-up and monitoring). The environmental assessment should incorporate Indigenous knowledge collected according to our specific Mi'gmaq Indigenous Knowledge Study methodology and our input sought for socio-economic baseline characterization.	BP recognizes the value of Indigenous knowledge and continues to work with Indigenous groups to obtain Indigenous knowledge relevant to the Project.
Crown should require BP to incorporate impacts of the project to Aboriginal and Treaty rights including IK that must be collected according to our specific Mi'gmaq IKS methodology and our input to a meaningful socio-economic baseline into the EA.	See response above. Section 7.4 describes existing socio-economic conditions and Aboriginal and Treaty rights for Indigenous communities listed in the EIS Guidelines. Chapter 12 assesses potential effects of Project activities on Aboriginal and Treaty rights.
Elsipogtog First Nation	
Mi'kmaq Nation continues to hold Aboriginal title and rights in relation to the portion of Mi'kma'ki in New Brunswick known as District 6 or Sikniktuk. It is expected that the Crown and industry proponents will consult Elsipogtog and meaningfully address concerns about development activities in this territory that could affect title and rights.	Refer to Table 3.9 for a record of Engagement with Elsipogtog First Nation to date. BP will continue to engage with interested Indigenous groups throughout the life of the Project.

3.2.5 Wolastoqiyik of New Brunswick

A summary of engagement with the Wolastoqiyik of New Brunswick is provided in Table 3.11.

Table 3.11 Summary of Engagement with the Wolastoqiyik of New Brunswick

Date	Method	Purpose
Kingslear First Nation		
November 7, 2017	Email with Attached Letter	Letter with map to introduce the Project and request preferences for engagement
January 31, 2018	Email	Provided status update for all oil and gas projects offshore eastern Newfoundland and Labrador, including the Newfoundland Orphan Basin Exploration Drilling Program.
March 7, 2018	Email with Attached Letter	Provided update on issuance of EIS Guidelines by Agency and proposed VCs for EIS. Also expressed interest in receiving information to improve BP's understanding of potential effects on the community including but not limited to potential effects on Aboriginal and/or Treaty rights. Included offer to meet with group upon request.
June 5, 2018	Email	Provided status update for all oil and gas projects offshore eastern Newfoundland and Labrador, including the Newfoundland Orphan Basin Exploration Drilling Program.
June 5, 2018	Email	Provided draft community profile for EIS for review and comment by July 2, 2018.

Date	Method	Purpose
August 27, 2018	Email	Invitation to a technical workshop coordinated by BP and other NL operators to follow up on the CEAA-sponsored workshops held in April 2018. Purpose is to provide project updates and follow up on issues discussed at the April workshops and provide more technical information on: spill modelling, preparedness and response; environmental monitoring; and well abandonment.
Madawaska Maliseet First Nation		
November 7, 2017	Email with Attached Letter	Letter with map to introduce the Project and request preferences for engagement
January 31, 2018	Email	Provided status update for all oil and gas projects offshore eastern Newfoundland and Labrador, including the Newfoundland Orphan Basin Exploration Drilling Program.
March 7, 2018	Email with Attached Letter	Provided update on issuance of EIS Guidelines by Agency and proposed VCs for EIS. Also expressed interest in receiving information to improve BP's understanding of potential effects on the community including but not limited to potential effects on Aboriginal and/or Treaty rights. Included offer to meet with group upon request.
June 5, 2018	Email	Provided status update for all oil and gas projects offshore eastern Newfoundland and Labrador, including the Newfoundland Orphan Basin Exploration Drilling Program.
June 5, 2018	Email	Provided draft community profile for EIS for review and comment by July 2, 2018.
August 27, 2018	Email	Invitation to a technical workshop coordinated by BP and other NL operators to follow up on the CEAA-sponsored workshops held in April 2018. Purpose is to provide project updates and follow up on issues discussed at the April workshops and provide more technical information on: spill modelling, preparedness and response; environmental monitoring; and well abandonment.
Oromocto First Nation		
November 7, 2017	Email with Attached Letter	Letter with map to introduce the Project and request preferences for engagement
January 31, 2018	Email	Provided status update for all oil and gas projects offshore eastern Newfoundland and Labrador, including the Newfoundland Orphan Basin Exploration Drilling Program.
March 7, 2018	Email with Attached Letter	Provided update on issuance of EIS Guidelines by Agency and proposed VCs for EIS. Also expressed interest in receiving information to improve BP's understanding of potential effects on the community including but not limited to potential effects on Aboriginal and/or Treaty rights. Included offer to meet with group upon request.
June 5, 2018	Email	Provided status update for all oil and gas projects offshore eastern Newfoundland and Labrador, including the Newfoundland Orphan Basin Exploration Drilling Program.
June 5, 2018	Email	Provided draft community profile for EIS for review and comment by July 2, 2018.

Date	Method	Purpose
August 27, 2018	Email	Invitation to a technical workshop coordinated by BP and other NL operators to follow up on the CEAA-sponsored workshops held in April 2018. Purpose is to provide project updates and follow up on issues discussed at the April workshops and provide more technical information on: spill modelling, preparedness and response; environmental monitoring; and well abandonment.
St. Mary's First Nation		
November 7, 2017	Email with Attached Letter	Letter with map to introduce the Project and request preferences for engagement
January 31, 2018	Email	Provided status update for all oil and gas projects offshore eastern Newfoundland and Labrador, including the Newfoundland Orphan Basin Exploration Drilling Program.
March 7, 2018	Email with Attached Letter	Provided update on issuance of EIS Guidelines by Agency and proposed VCs for EIS. Also expressed interest in receiving information to improve BP's understanding of potential effects on the community including but not limited to potential effects on Aboriginal and/or Treaty rights. Included offer to meet with group upon request.
June 5, 2018	Email	Provided status update for all oil and gas projects offshore eastern Newfoundland and Labrador, including the Newfoundland Orphan Basin Exploration Drilling Program.
June 5, 2018	Email	Provided draft community profile for EIS for review and comment by July 2, 2018.
August 27, 2018	Email	Invitation to a technical workshop coordinated by BP and other NL operators to follow up on the CEAA-sponsored workshops held in April 2018. Purpose is to provide project updates and follow up on issues discussed at the April workshops and provide more technical information on: spill modelling, preparedness and response; environmental monitoring; and well abandonment.
Tobique First Nation		
November 7, 2017	Email with Attached Letter	Letter with map to introduce the Project and request preferences for engagement
January 31, 2018	Email	Provided status update for all oil and gas projects offshore eastern Newfoundland and Labrador, including the Newfoundland Orphan Basin Exploration Drilling Program.
March 7, 2018	Email with Attached Letter	Provided update on issuance of EIS Guidelines by Agency and proposed VCs for EIS. Also expressed interest in receiving information to improve BP's understanding of potential effects on the community including but not limited to potential effects on Aboriginal and/or Treaty rights. Included offer to meet with group upon request.
June 5, 2018	Email	Provided status update for all oil and gas projects offshore eastern Newfoundland and Labrador, including the Newfoundland Orphan Basin Exploration Drilling Program.
June 5, 2018	Email	Provided draft community profile for EIS for review and comment by July 2, 2018.

Date	Method	Purpose
August 27, 2018	Email	Invitation to a technical workshop coordinated by BP and other NL operators to follow up on the CEAA-sponsored workshops held in April 2018. Purpose is to provide project updates and follow up on issues discussed at the April workshops and provide more technical information on: spill modelling, preparedness and response; environmental monitoring; and well abandonment.
Wolastoqey Nation in New Brunswick (WNNB)		
January 23, 2018	Email with Attached Letter	Provided notification on filing of Project Description; a link to CEAR website for public comment period; and January 2018 newsletter.
January 31, 2018	Email	Provided status update for all oil and gas projects offshore eastern Newfoundland and Labrador, including the Newfoundland Orphan Basin Exploration Drilling Program.
March 7, 2018	Email with Attached Letter	Provided update on issuance of EIS Guidelines by Agency and proposed VCs for EIS. Also expressed interest in receiving information to improve BP's understanding of potential effects on the community including but not limited to potential effects on Aboriginal and/or Treaty rights. Included offer to meet with group upon request.
April 12, 2018	Workshop: Moncton, NB (participating on behalf of five-member communities and WNNB)	Agency-facilitated workshop with Indigenous groups, regulatory agencies and other NL operators to provide an overview of proposed exploration drilling programs in the offshore of Newfoundland and Labrador and discuss issues of concern to Indigenous groups including the regulatory process, drilling operations, emergency preparedness and response, potential cumulative effects, potential effects of exploration drilling on Atlantic salmon, and the inclusion of Indigenous knowledge.
May 28, 2018	Email	Email to follow up on Agency-facilitated workshop with copy of presentation (English and French).
June 12, 2018	Email from WNNB	Email from WNNB responding to community profiles sent to NB Maliseet First Nations, requesting an extension to July 13 to allow the communities to discuss as a group.
July 13, 2018	Email from WNNB	Email from WNNB providing suggested edits on draft community profiles sent to NB Maliseet First Nations.
August 27, 2018	Email	Invitation to a technical workshop coordinated by BP and other NL operators to follow up on the CEAA-sponsored workshops held in April 2018. Purpose is to provide project updates and follow up on issues discussed at the April workshops and provide more technical information on: spill modelling, preparedness and response; environmental monitoring; and well abandonment.
Woodstock First Nation		
November 7, 2017	Email with Attached Letter	Letter with map to introduce the Project and request preferences for engagement
January 11, 2018	Phone Call	Received introductory letter and are interested in learning more about the Project.

Date	Method	Purpose
January 23, 2018	Email with Attached Letter	Provided notification on filing of Project Description; a link to CEAR website for public comment period; and January 2018 newsletter.
January 31, 2018	Email	Provided status update for all oil and gas projects offshore eastern Newfoundland and Labrador, including the Newfoundland Orphan Basin Exploration Drilling Program.
March 7, 2018	Email with Attached Letter	Provided update on issuance of EIS Guidelines by Agency and proposed VCs for EIS. Also expressed interest in receiving information to improve BP's understanding of potential effects on the community including but not limited to potential effects on Aboriginal and/or Treaty rights. Included offer to meet with group upon request.
June 5, 2018	Email	Provided status update for all oil and gas projects offshore eastern Newfoundland and Labrador, including the Newfoundland Orphan Basin Exploration Drilling Program.
June 5, 2018	Email	Provided draft community profile for EIS for review and comment by July 2, 2018.
August 27, 2018	Email	Invitation to a technical workshop coordinated by BP and other NL operators to follow up on the CEAA-sponsored workshops held in April 2018. Purpose is to provide project updates and follow up on issues discussed at the April workshops and provide more technical information on: spill modelling, preparedness and response; environmental monitoring; and well abandonment.

A summary of key issues and concerns raised by the Wolastoqiyik of New Brunswick, either directly to BP or to the Agency during the EA process to date, and how these are being addressed, is provided in Table 3.12. Refer to Table 3.6 for issues and concerns raised during the April 12, 2018 workshop that was attended by a WNNB representative.

Table 3.12 Summary of Issues and Concerns from the Wolastoqiyik of New Brunswick

Question/Comment[1]	Response
WNNB	
Project is of concern because: • The Wolastoqey can no longer harvest Atlantic Salmon in the Wolastoq (Saint John River), a traditional food source in diet since time immemorial. • The Outer Bay of Fundy population of Atlantic salmon is considered endangered. • The Atlantic salmon may migrate from spawning rivers to New Brunswick in the area near the proposed project's exploration licences which has the potential to further endanger the population.	Project effects on Atlantic salmon are assessed in Chapter 12 and Section 15.5.4. Cumulative effects are assessed in Chapter 14. BP (in cooperation with other NL operators) is discussing potential opportunities for Indigenous knowledge and research studies related to Atlantic salmon. These would be conducted outside of the EIS but results could be factored into environmental management planning and future environmental assessments.

3.2.6 Peskotomuhkati Nation at Skutik (Passamaquoddy)

A summary of engagement with the Peskotomuhkati Nation is provided in Table 3.13.

To date, BP is not aware of any questions or comments specifically raised by the Peskotomuhkati Nation during BP's current EA process. However, a representative from Peskotomuhkati Nation attended the April 12, 2018 workshop; issues and concerns raised during that workshop are summarized in Table 3.6.

Table 3.13 Summary of Engagement with the Peskomuhkati Nation at Skutik (Passamaquoddy)

Date	Method	Purpose
November 7, 2017	Email with Attached Letter	Letter with map to introduce the Project and request preferences for engagement
December 11, 2017	Phone Call	Passamaquoddy First Nation indicated they lack capacity to deal with numerous consultation requests but will be participating in Project review.
January 23, 2018	Email with Attached Letter	Provided notification on filing of Project Description; a link to CEAR website for public comment period; and January 2018 newsletter.
January 31, 2018	Email	Provided status update for all oil and gas projects offshore eastern Newfoundland and Labrador, including the Newfoundland Orphan Basin Exploration Drilling Program.
March 7, 2018	Email with Attached Letter	Provided update on issuance of EIS Guidelines by Agency and proposed VCs for EIS. Also expressed interest in receiving information to improve BP's understanding of potential effects on the community including but not limited to potential effects on Aboriginal and/or Treaty rights. Included offer to meet with group upon request.
April 12, 2018	Workshop: Moncton, NB	Agency-facilitated workshop with Indigenous groups, regulatory agencies and other NL operators to provide an overview of proposed exploration drilling programs in the offshore of Newfoundland and Labrador and discuss issues of concern to Indigenous groups including the regulatory process, drilling operations, emergency preparedness and response, potential cumulative effects, potential effects of exploration drilling on Atlantic salmon, and the inclusion of Indigenous knowledge.
May 28, 2018	Email	Email to follow up on Agency-facilitated workshop with copy of presentation (English and French).
June 5, 2018	Email	Provided status update for all oil and gas projects offshore eastern Newfoundland and Labrador, including the Newfoundland Orphan Basin Exploration Drilling Program.
June 5, 2018	Email	Provided draft community profile for EIS for review and comment by July 2, 2018.
August 27, 2018	Email	Invitation to a technical workshop coordinated by BP and other NL operators to follow up on the CEAA-sponsored workshops held in April 2018. Purpose is to provide project updates and follow up on issues discussed at the April workshops and provide more technical information on: spill modelling, preparedness and response; environmental monitoring; and well abandonment.

3.2.7 Mi'kmaq and Innu of Québec

A summary of engagement with the Mi'kmaq and Innu of Québec is provided in Table 3.14.

A workshop to introduce BP and the other NL operators and their proposed exploration drilling programs to Quebec Indigenous groups was held in Quebec City, QC on April 18, 2018. The Agency facilitated this workshop where the five NL operators presented to representatives from the Prèmiere Nation des Innus de Nutashkuan, Les Innus de Ekuanitshit, the Mig'mawei Mawiomi Secretariat (MMS), and the Institut de développement durable des Premières Nations due Québec et du Labrador; and discussed issues of concern to the Indigenous participants.

Table 3.14 Summary of Engagement with the Mi'kmaq and Innu of Quebec

Date	Method	Purpose
Les Innus de Ekuanitshit		
November 7, 2017	Email with Attached Letter	Letter with map to introduce the Project and request preferences for engagement
January 23, 2018	Email with Attached Letter	Provided notification on filing of Project Description; a link to CEAR website for public comment period; and January 2018 newsletter.
January 31, 2018	Email	Provided status update for all oil and gas projects offshore eastern Newfoundland and Labrador, including the Newfoundland Orphan Basin Exploration Drilling Program.
March 7, 2018 March 14, 2018	Email with Attached Letter	Provided update on issuance of EIS Guidelines by Agency and proposed VCs for EIS. Also expressed interest in receiving information to improve BP's understanding of potential effects on the community including but not limited to potential effects on Aboriginal and/or Treaty rights. Included offer to meet with group upon request. Translation of letter sent on March 14, 2018.
April 18, 2018	Workshop: Quebec City, QC	Agency-facilitated workshop with Indigenous groups, regulatory agencies and other NL operators to provide an overview of proposed exploration drilling programs in the offshore of Newfoundland and Labrador and discuss issues of concern to Indigenous groups including the regulatory process, drilling operations, emergency preparedness and response, potential cumulative effects, potential effects of exploration drilling on Atlantic salmon, and the inclusion of Indigenous knowledge.
May 25, 2018	Email	Email to follow up on Agency-facilitated workshop with copy of presentation (English and French) and response to question regarding temporal scope of EIS.
June 5, 2018	Email	Provided status update for all oil and gas projects offshore eastern Newfoundland and Labrador, including the Newfoundland Orphan Basin Exploration Drilling Program.
June 6, 2018	Email	Provided draft community profile for EIS for review and comment by July 2, 2018.
July 3, 2018	Email with Attached Letter from Les Innus de Ekuanitshit	Provided comments to BP on draft community profile for the EIS and iterated concern with potential effects on migrating species passing through or in close proximity to the Project Area.

Date	Method	Purpose
August 28, 2018	Email	Invitation to a technical workshop coordinated by BP and other NL operators to follow up on the CEAA-sponsored workshops held in April 2018. Purpose is to provide project updates and follow up on issues discussed at the April workshops and provide more technical information on: spill modelling, preparedness and response; environmental monitoring; and well abandonment.
Première Nation des Innus de Nutashkuan		
November 7, 2017	Email with Attached Letter	Letter with map to introduce the Project and request preferences for engagement
January 23, 2018	Email with Attached Letter	Provided notification on filing of Project Description; a link to CEAR website for public comment period; and January 2018 newsletter.
January 31, 2018	Email	Provided status update for all oil and gas projects offshore eastern Newfoundland and Labrador, including the Newfoundland Orphan Basin Exploration Drilling Program.
March 7, 2018	Email with Attached Letter	Provided update on issuance of EIS Guidelines by Agency and proposed VCs for EIS. Also expressed interest in receiving information to improve BP's understanding of potential effects on the community including but not limited to potential effects on Aboriginal and/or Treaty rights. Included offer to meet with group upon request.
April 18, 2018	Workshop: Quebec City, QC	Agency-facilitated workshop with Indigenous groups, regulatory agencies and other NL operators to provide an overview of proposed exploration drilling programs in the offshore of Newfoundland and Labrador and discuss issues of concern to Indigenous groups including the regulatory process, drilling operations, emergency preparedness and response, potential cumulative effects, potential effects of exploration drilling on Atlantic salmon, and the inclusion of Indigenous knowledge.
May 25, 2018	Email	Email to follow up on Agency-facilitated workshop with copy of presentation (English and French) and response to question regarding temporal scope of EIS.
June 5, 2018	Email	Provided status update for all oil and gas projects offshore eastern Newfoundland and Labrador, including the Newfoundland Orphan Basin Exploration Drilling Program.
June 6, 2018	Email	Provided draft community profile for EIS for review and comment by July 2, 2018.
June 11, 2018	Email from the Première Nation des Innus de Nutashkuan	Provided comments to BP on the draft community profile for the EIS.
August 28, 2018	Email	Invitation to a technical workshop coordinated by BP and other NL operators to follow up on the CEAA-sponsored workshops held in April 2018. Purpose is to provide project updates and follow up on issues discussed at the April workshops and provide more technical information on: spill modelling, preparedness and response; environmental monitoring; and well abandonment.
Mi'gmawei Mawiomi Secretariat (MMS)		
November 7, 2017	Email with Attached Letter	Letter with map to introduce the Project and request preferences for engagement

Date	Method	Purpose
January 23, 2018	Email with Attached Letter	Provided notification on filing of Project Description; a link to CEAR website for public comment period; and January 2018 newsletter.
January 24, 2018	Email	MMS requested conference call with Jay Hartling to discuss all the offshore files they have received (including NL Orphan Basin).
January 31, 2018	Email	Provided status update for all oil and gas projects offshore eastern Newfoundland and Labrador, including the Newfoundland Orphan Basin Exploration Drilling Program.
March 7, 2018	Email with Attached Letter	Provided update on issuance of EIS Guidelines by Agency and proposed VCs for EIS. Also expressed interest in receiving information to improve BP's understanding of potential effects on the community including but not limited to potential effects on Aboriginal and/or Treaty rights. Included offer to meet with group upon request.
April 18, 2018	Workshop: Quebec City, QC	Agency-facilitated workshop with Indigenous groups, regulatory agencies and other NL operators to provide an overview of proposed exploration drilling programs in the offshore of Newfoundland and Labrador and discuss issues of concern to Indigenous groups including the regulatory process, drilling operations, emergency preparedness and response, potential cumulative effects, potential effects of exploration drilling on Atlantic salmon, and the inclusion of Indigenous knowledge.
May 25, 2018	Email	Email to follow up on Agency-facilitated workshop with copy of presentation (English and French) and response to question regarding temporal scope of EIS.
June 5, 2018	Email	Provided status update for all oil and gas projects offshore eastern Newfoundland and Labrador, including the Newfoundland Orphan Basin Exploration Drilling Program.
June 5, 2018	Email	Provided draft community profiles for EIS for review and comment by July 2, 2018.
July 23, 2018	Phone Call	General discussion on update of offshore exploration Projects, including the Newfoundland Orphan Basin Exploration Drilling Program.
August 27, 2018	Email	Invitation to a technical workshop coordinated by BP and other NL operators to follow up on the CEAA-sponsored workshops held in April 2018. Purpose is to provide project updates and follow up on issues discussed at the April workshops and provide more technical information on: spill modelling, preparedness and response; environmental monitoring; and well abandonment.

A summary of key issues and concerns raised by Mi'kmaq and Innu of Québec, either directly to BP or to the Agency during the EA process to date, and how these are being addressed, is provided in Table 3.15. This includes, but is not limited to, questions and concerns raised during the April 2018 workshop where comments may not be attributable to a specific community. Key questions and concerns raised in the workshop included questions around the regulatory licencing, environmental assessment and Indigenous engagement processes (including timing constraints); cumulative effects and an ecosystem approach to environmental assessment; and data gaps around Atlantic salmon and effects of drilling on the Gulf of St. Lawrence. Although not recorded in the table below, concerns were also raised during the workshop about how the Agency identified specific First Nations to be engaged for EAs of exploration drilling projects offshore Newfoundland; some participants commented that they do not support exploration drilling.

Table 3.15 Summary of Issues and Concerns from the Mi'kmaq and Innu of Québec

Question/Comment[1]	Response
Les Innus de Ekuanitshit	
Study of environmental effects on marine wildlife should go beyond the boundaries of the Project Area.	The EIS acknowledges that project-related effects can, in some cases, extend beyond the Project Area. Study boundaries for a Local Assessment Area (predicted extent of routine Project-related effects) and RAA (study area for cumulative effects and accidental events) are defined for each VC. Refer to Chapters 8 to 13.
Risks associated with a spill of gas, oil or other harmful substances should be given special attention.	Chapter 15 describes BP's risk management approach to reduce risk of accidental events occurring as well as BP's spill response approach in the unlikely event that a spill does occur. Environmental effects associated with a potential accidental event are assessed in Section 15.5.
Some of the environmental effects of the project may result in a decline in fish and avian resources upon which the Innu depend, or affect the quality of these resources. The Ekuanitshit consume several country foods including Atlantic salmon, migratory birds and eggs, and harp seal. Environmental effects of the project on fish as well as migratory birds could result in significant changes for the Innu of Ekuanitshit including cultural, social, health and economic.	Chapters 8, 9, and 10 of the EIS assess potential effects of routine Project activities on marine fish and fish habitat, marine and migratory birds, and marine mammals and sea turtles, respectively. Chapter 12 assesses effects of the Project on Indigenous peoples and community values, and considers potential cultural, social, health and economic changes on Indigenous communities. Effects of accidental events are assessed in Section 15.5.
The project will have an impact on various species of fish and birds whose migratory path is included in the exploration drilling area and so will also have an impact on ancestral hunting, fishing, and harvesting rights. This, in turn, will affect the transmission of our culture and way of life and quality of life of our community.	Refer to above response.
Concerned about potential effects on migrating species (namely salmon, marine mammals and birds) passing through or in close proximity to the Project Area.	Chapters 8, 9, and 10 of the EIS assess potential effects of routine Project activities on marine fish and fish habitat, marine and migratory birds, and marine mammals and sea turtles, respectively.
Première Nation des Innus de Nutashkuan	
Exploration drilling projects proposed offshore Newfoundland (including BP's) are likely to cause environmental impacts that may affect Aboriginal rights of the Nutashkuan Innu First Nation; these projects could also lead to cumulative effects.	Chapter 12 assesses effects of the Project on Indigenous peoples and community values, and considers potential cultural, social, health and economic changes on Indigenous communities. Cumulative effects are assessed in Chapter 14.
U-nattributable Comments Raised in April 2018 Workshop[2]	
Requested clarification on jurisdiction outside 200 nm EEZ.	Under the Accord Acts, the C-NLOPB regulates the Newfoundland and Labrador offshore area to the edge of the continental margin and therefore has jurisdiction over offshore petroleum activities outside the 200 nm EEZ in this area (refer to Section 1.5.3).

Question/Comment[1]	Response
Requested clarification on land tenure process for exploration licences.	Section 1.5.1 of the EIS describes the land tenure process for exploration licences and regulatory oversight of offshore petroleum activities by the C-NLOPB.
Requested clarification on how sensitive areas are identified before drilling and how a decision is made to move a well/authorize drilling in a sensitive area.	Section 2.2 of the EIS describes how prospective well locations are identified during planning and how a seabed survey is conducted at the wellsite prior to drilling to confirm the absence of sensitive environmental features.
Requested information on how spill response preparedness has changed in recent years.	Chapter 15 describes BP's risk management philosophy, and spill contingency measures, along with the C-NLOPB's special oversight measures. Lessons learned from previous accidental events (including the Deepwater Horizon incident in the Gulf of Mexico in 2010 – refer to Appendix E) have resulted in improvements in operational procedures, equipment, training, and oversight for the offshore petroleum industry in North America and other parts of the world.
Consultation should be with the users of the resource (community) not just the Chief	BP will continue to engage Indigenous communities throughout the life of the Project and will coordinate engagement activities to meet community needs.
Adequate time is needed to review large studies; difficult to review one project in isolation since the complete picture won't be known until all EIS documents have been submitted	CEAA 2012 has specific timeline requirements for Indigenous and public review during the EA process. Periodic updates provided to Indigenous groups and public stakeholders by BP during engagement activities are intended to help provide advance notice of review periods and improve an understanding of proposed Project activities in advance of EIS filing. Chapter 14 (Cumulative Effects Assessment) of this EIS considers BP's Newfoundland Orphan Basin Exploration Drilling Program in context of other proposed exploration drilling programs in the eastern Newfoundland offshore area.
Interested in receiving information on drilling locations and survey results post-EIS; how will consultation continue?	BP will continue to engage Indigenous communities throughout the life of the Project, as the Project advances beyond the regulatory approval phase and into operations.
Expressed concern that EAs rely on existing information and do not generate new data through baseline studies.	Chapters 5 to 7 describe the existing baseline physical, biological and socio-economic environments, including data sources and gaps. Baseline data collection programs must be commensurate with the scope and scale of Project activities and predicted environmental interactions. Given the scope and relative timing of exploration drilling programs (e.g., 60 days per well) and generally good understanding of environmental effects, it is not necessary to design elaborate data collection programs during EIS preparation. However, environmental data collected for the Project during the pre-drill survey and during monitoring and follow-up programs are shared publicly and can be used to inform future EAs and offshore activities.
EAs should be less compartmentalized and use ecosystem-based approach	This EIS is based on a structured approach consistent with international best practices and methods used for other recent exploration drilling programs in Atlantic Canada, which focus on assessment of VCs (refer to Section 4.2). However, within this approach, linkages between VCs are noted such that components are not assessed in isolation.

Question/Comment[1]	Response
There are data gaps on Atlantic salmon and their migratory patterns; need to present best available information and use precautionary principle.	The EIS acknowledges uncertainty around salmon migration. BP (in cooperation with other NL operators) is discussing potential opportunities for Indigenous knowledge and research studies related to Atlantic salmon. These would be conducted outside of the EIS but results could be factored into environmental management planning and future environmental assessments.
Request for information on risk of oil spill going into the Gulf of St. Lawrence.	Appendix D presents the fate and effects oil spill trajectory modelling (for unmitigated spills) for the Project. These results are summarized in Section 15.4 of the EIS. As shown by stochastic modelling, an unmitigated, worst credible spill is not predicted to result in oil reaching the Gulf of St. Lawrence.
EIS documents should include more information on bird distribution in the offshore and not just onshore colonies.	Section 6.2 of the EIS describes seasonal distribution of marine and migratory birds in the RAA, including maps of historical offshore observations.
Expressed concern around cumulative effects given the importance of the Grand Banks as a recruitment area for various species.	Chapter 4 of the EIS assesses cumulative effects of the Project in combination with other offshore projects and activities.
Expressed concern about whether climate change is factored into decisions about exploration.	Section 5.4 of the EIS describes the climatology of the RAA and Section 5.9 specifically discusses climate change as it may pertain to the Project. Chapter 16 of the EIS assesses effects of the environment (which can be influenced by climate change) on the Project itself.

3.2.8 Other Indigenous Organizations

In addition to the Indigenous groups identified by the Agency and discussed above in Sections 3.2.1 to 3.2.7, BP received correspondence from the Northern Peninsula (Mekap'sk) Mi'kmaq Band in Newfoundland and Labrador. Although not currently recognized as an "Indian Band" under the *Indian Act*, the Northern Peninsula Mi'kmaq Band has asserted Aboriginal Title and believes traditional and harvesting activities and cultural well-being would be at risk by potential adverse effects of the Project. In particular, they have expressed concern about potential impacts associated with spills and discharges on the aquatic, nearshore and offshore environments of the northern peninsula of Newfoundland. They have also requested capacity funding to support engagement and conduct an ecological knowledge and socio-economic study. BP has returned correspondence indicating they are willing to meet with the Northern Peninsula (Mekap'sk) Mi'kmaq Band to discuss any specific questions or comments they may have on the Project.

3.2.9 Planned Future Engagement with Indigenous Groups

BP will continue to notify, communicate with and engage the Indigenous groups identified in Section 3.2 about key steps in the EA process including opportunities to provide comment on key documents and/or information to be provided regarding their community. In the Fall of 2018, BP is planning to participate in another round of workshops with Indigenous communities which will focus on spill modelling, spill prevention and response, and follow-up and monitoring plans. BP will also continue to meet with interested

Indigenous groups as Project planning continues, particularly about mitigation, follow-up and response plans.

During the drilling program, BP will implement an Indigenous Communities Fisheries Communication Plan which will provide a framework for regular operational updates to Indigenous groups as well as emergency notifications, if needed.

3.3 Fisheries Stakeholders

A key form of mitigation of potential effects of the Project on fisheries is early and ongoing consultation with the fishing industry. The location and timing of fishing activities are important to consider when identifying potential fisheries stakeholders and scheduling meetings. The following is a list of fisheries stakeholders that have been engaged for the Project:

- One Ocean
- Fish, Food and Allied Workers-Unifor (FFAW-Unifor)
- Association of Seafood Producers (ASP)
- Ocean Choice International (OCI)
- Groundfish Enterprise Allocation Council (GEAC)
- Canadian Association of Prawn Producers (CAPP)

Table 3.16 provides a summary of engagement with fisheries stakeholders. Questions and concerns are summarized in Table 3.17.

Table 3.16 Summary of Engagement with Fisheries Stakeholders

Date	Method	Purpose
One Ocean		
October 4, 2017	In-Person/Face-to-Face	Introductory meeting to introduce BP and seek advice on fisheries consultation
October 27, 2017	Email with Attached Letter	Letter with map to introduce the Project and request introductory meeting
November 29, 2017	Email	One Ocean emailed information to BP that DFO previously shared with One Ocean on marine conservation planning efforts offshore Newfoundland and Labrador.
November 29, 2017	In-Person/Face-to-Face	Introductory meeting with OCI and One Ocean where BP introduced themselves and the NL Orphan Basin Exploration Program. OCI and One Ocean expressed concerns about fisheries closures and offshore oil programs infringing on their areas to be fished. OCI indicated that if BP is able to stay off the shelf break (heavy turbot fishing area), then there would be very little interaction with their fisheries. They recognize that oil industry is important to the NL economy and want to focus on how to work together to mitigate risks.
January 19, 2018	Email	Brief project update including notification of Project Description posting and link to CEAR website.

Date	Method	Purpose
February 7, 2018	Email	Email providing an update on the Project Description review process under CEAA 2012 and a link to BP's webpage for Newfoundland and Labrador. Also attached January 2018 newsletter and enquired about BP attending One Ocean working group meeting to present project.
February 8, 2018	Phone Call	Phone call to discuss One Ocean Working Group composition and if/when BP should present to the Working Group.
March 5, 2018	Email	Email to communicate Notice of Commencement and Release of EIS Guidelines.
April 23, 2018	Phone Call	Discussed opportunity to provide informational handout on the NL Orphan Basin Exploration Drilling Program for the upcoming Working Group meeting in May. BP is willing to meet with groups upon request but is aware of competing priorities for fishers.
April 26, 2018	Email	As a follow-up to phone conversation on April 23, One Ocean provided a link to communication protocol to be implemented in the event of a spill. BP provided notification of participant funding announcement from the CEA Agency for distribution to One Ocean members.
May 7, 2018	Email with Attached Letter	Emailed a handout for distribution to the One Ocean Working Group meeting on May 10, 2018. Handout provided a project overview (with map), update on the EA process and information on well control and spill response planning.
May 23, 2018	Email	Email to follow-up Working Group meeting on May 10, 2018. BP's information was tabled at the meeting and no questions or concerns were raised. BP requested consideration for presentation on EIS and spill modelling results at next meeting in September 2018.
July 31, 2018	Email	Email seeking input on potential meeting time and format with fisheries stakeholders on the EIS.
August 15, 2018	Email	One Ocean provided suggestions on timing and format of fisheries stakeholder engagement on the EIS.
August 30, 2018	Email	Email to provide update on EIS status and BP's intent to deliver a workshop in November presenting an overview of the EIS, spill modelling results, and spill prevention/spill response planning.
Association of Seafood Producers		
October 27, 2017	Email with Attached Letter	Letter with map to introduce the Project and request introductory meeting
November 30, 2017	In-Person/Face-to-Face	Introductory meeting to introduce BP and the Newfoundland Orphan Basin Exploration Program to the Association and to understand ASP's interests in the project and preferred communication approach. ASP represents seafood producers and to a lesser extent seafood harvesters therefore direct interaction with project activities would be limited. Cooperation and communication is key to successful coexistence of offshore oil and gas and fishing industries.
February 7, 2018	Email	Email providing an update on the Project Description review process under CEAA 2012 and a link to BP's webpage for Newfoundland and Labrador. Also attached January 2018 newsletter and offered to meet to discuss project.
March 5, 2018	Email	Email to communicate Notice of Commence and issuance of EIS Guidelines.

Date	Method	Purpose
August 30, 2018	Email	Email to provide update on EIS status and BP's intent to deliver a workshop in November presenting an overview of the EIS, spill modelling results, and spill prevention/spill response planning.
Canadian Association of Prawn Producers		
December 12, 2017	Email with Attached Letter	Introductory email with letter (and map) to introduce BP and the Newfoundland Orphan Basin Exploration Drilling Program.
January 19, 2018	Email	Brief update indicating filing of Project Description and including link to CEAR website.
February 7, 2018	Email	Email providing an update on the Project Description review process under CEAA 2012 and a link to BP's webpage for Newfoundland and Labrador. Also attached January 2018 newsletter and offered to meet to discuss project.
March 5, 2018	Email	Email to communicate Notice of Commencement and issuance of EIS Guidelines.
August 30, 2018	Email	Email to provide update on EIS status and BP's intent to deliver a workshop in November presenting an overview of the EIS, spill modelling results, and spill prevention/spill response planning.
Fish, Food and Allied Workers (FFAW-Unifor)		
October 27, 2017	Email with Attached Letter	Letter with map to introduce the Project and request meeting.
November 29, 2017	In-Person/Face-to-Face	Met with Robyn Lee (Petroleum Industry Liaison for FFAW-Unifor) to introduce BP and the NL Orphan Basin Exploration Program. FFAW-Unifor primarily represents "inshore" fisheries although they fish to the offshore. A committee of harvesters was established this year due to recent seismic issues and this group would be good candidate for meetings with BP. Discussed having a BP Drilling 101 presentation with committee in February 2018.
January 19, 2018	Email	Brief update indicating filing of Project Description and including link to CEAR website.
February 7, 2018	Email	Email providing an update on the Project Description review process under CEAA 2012 and a link to BP's webpage for Newfoundland and Labrador. Also attached January 2018 newsletter and offered to meet to discuss project.
March 5, 2018	Email	Email to communicate Notice of Commencement and issuance of EIS Guidelines.
August 30, 2018	Email	Email to provide update on EIS status and BP's intent to deliver a workshop in November presenting an overview of the EIS, spill modelling results, and spill prevention/spill response planning.
Groundfish Enterprise Allocation Council		
December 12, 2017	Email with Attached Letter	Introductory email with letter and map introducing BP and the Newfoundland Orphan Basin Exploration Drilling Project.
January 19, 2018	Email	Brief update indicating filing of Project Description and including link to CEAR website.
February 2, 2018	Email	Email from GEAC thanking BP for notification on Project Description filing and asking what the project footprint represents given the history of fishing activity in the area.

Date	Method	Purpose
February 5, 2018	Email	Email response to project footprint inquiry attaching map showing exploration licences (ELs) and explaining Project Area as a 20 km buffer around the ELs. Request for timing of conference call to discuss further.
February 7, 2018	Email	Email providing an update on the Project Description review process under CEAA 2012 and a link to BP's webpage for Newfoundland and Labrador. Also attached January 2018 newsletter. Also followed up on previous email to GEAC about spatial footprint of project activities and offered to meet to discuss.
February 7, 2018	Email	Email correspondence between BP and GEAC discussing fisheries species and locations relative to our Project Area to better understand potential interactions with fishing industry.
March 5, 2018	Email	Email to communicate Notice of Commencement and issuance of EIS Guidelines
May 7, 2018	Email with Attached Letter	Emailed a handout which provides a project overview (with map), update on the EA process and information on well control and spill response planning.
May 10, 2018	Email	Email exchanged initiated by Kris Vascotto asking if BP has specific well locations pinpointed yet to facilitate an understanding of potential interactions with fishing activities. GEAC will not be fishing in marine refuge area so interactions will be limited.
August 30, 2018	Email	Email to provide update on EIS status and BP's intent to deliver a workshop in November presenting an overview of the EIS, spill modelling results, and spill prevention/spill response planning.
Ocean Choice International		
October 27, 2017	Email with Attached Letter	Letter with map to introduce the Project and request meeting.
November 29, 2017	In-Person/Face-to-Face	Introductory meeting with OCI and One Ocean where BP introduced themselves and the NL Orphan Basin Exploration Program. OCI and One Ocean expressed concerns about fisheries closures and offshore oil programs infringing on their areas to be fished. OCI indicated that if BP is able to stay off the shelf break (heavy turbot fishing area), then there would be very little interaction with their fisheries. They recognize that oil industry is important to the NL economy and want to focus on how to work together to mitigate risks.
November 30, 2017	Email	As a follow-up from meeting on November 29, emailed coordinates of BP's exploration licences and Project Area.
January 19, 2018	Email	Brief project update including notification of Project Description posting and link to CEAR website.
February 7, 2018	Email	Email providing an update on the Project Description review process under CEAA 2012 and a link to BP's webpage for Newfoundland and Labrador. Also attached January 2018 newsletter and offered to meet to discuss project.
March 5, 2018	Email	Email to communicate Notice of Commencement and Release of EIS Guidelines.
August 30, 2018	Email	Email to provide update on EIS status and BP's intent to deliver a workshop in November presenting an overview of the EIS, spill modelling results, and spill prevention/spill response planning.

Table 3.17 summarizes key issues and concerns raised by fisheries stakeholders and BP's response.

Table 3.17 Summary of Issues and Concerns – Fisheries Stakeholders

Question/Comment	Response
Oil and gas and fisheries are important to the economy and there is lots of space to co-exist, but the key to success is cooperation and communication.	BP agrees that cooperation and communication is important and will continue to engage fisheries stakeholders to share Project details and facilitate coordination of information sharing. To help facilitate coordinated communication, BP will prepare a Fisheries Communication Plan. Refer to Section 13.3.1.2 for more information.
There is a history of fishing occurring in this area so would like to understand what the Project footprint represents.	Section 7.1 shows the Project Area relative to historical fishing in the area. As Project planning advances and specific well locations are identified, BP will communicate these details to fishers.
There is heavy fishing activity on the shelf break. If BP's wells are deeper than 1,500 m then there is likely not much interaction with fisheries.	See response above.
DFO fisheries closures are creating additional pressures on fisheries. Concerned about cumulative effects between fisheries closures and offshore oil programs infringing on area to be fished.	Chapter 14 (Cumulative Effects) acknowledges potential cumulative effects on commercial fisheries including the implementation of fisheries closures.
Interested in reviewing Fisheries Communication Plan and Oil Spill Response Plan.	BP will continue to engage fisheries stakeholders post-EIS as Project planning advances and these plans are drafted.
Maps with fisheries data and bathymetric contours plotted are helpful to guide discussions.	Section 7.1 shows the Project Area relative to historical fishing in the area. Maps with bathymetric contours and Project details will continue to be shared as engagement with fisheries stakeholders continues throughout the life of the Project.

BP will continue to notify fisheries stakeholders about key steps in the EA process including opportunities to provide comment on key documents. Upon completion of the EIS, BP is planning to share a summary of EIS results, including an overview of spill modelling results with interested fisheries stakeholders.

During the drilling program, BP will implement a Fisheries Communication Plan which will provide a framework for regular operational updates to fisheries stakeholders as well as emergency notifications if needed. Input will be sought from fisheries stakeholders during the development of the Fisheries Communication Plan.

3.4 Public Stakeholders

Public stakeholders include industry associations (e.g., Newfoundland and Labrador Oil and Gas Industries Association [NOIA], industry peers), non-governmental organizations (NGOs), broad-based Indigenous organizations (i.e. Native Friendship Centres).

Engagement with public stakeholders has been primarily through BP's external website (https://www.bp.com/en_ca/canada/who-we-are/offshore/bp-in-newfoundland-labrador.html) and the

publication of quarterly newsletters which are also posted on this website. BP also maintains a dedicated email to respond to information inquiries: NLInfo@bp.com.

BP will monitor activities and communications generated by public stakeholders and participate in local industry events as appropriate including supplier information sessions, seminars, and conferences. In June 2018 BP presented at the NOIA conference, providing an overview of its operations in Canada and offshore Newfoundland and Labrador. Table 3.18 summarizes key questions and issues raised by public stakeholders and BP's response.

Table 3.18 Summary of Issues and Concerns from Public Stakeholders

Stakeholder	Question/Comment	Response
Newfoundland and Labrador Oil & Gas Industries Association (NOIA)	Using previous data from previously completed C-NLOPB scoping documents, strategic environmental assessments (SEAs) (including Eastern Newfoundland SEA) and project-specific EAs of offshore exploration projects will eliminate duplication and delays, which is critical to the future development of NL's offshore resources.	The EIS draws extensively on existing reports including SEAs and other relevant EAs undertaken in Atlantic Canada and cross-references as applicable. Refer to Section 1.6.3 of the EIS for a list of key studies.

4.0 ENVIRONMENTAL EFFECTS ASSESSMENT AND METHODS

This Chapter outlines the scope of the Project and EA conducted in this EIS. It also describes the methods used to conduct the environmental effects assessment.

4.1 Scope of Assessment

This EIS has been prepared in accordance with the requirements of CEAA 2012 and the Project-specific Guidelines, *Guidelines for the Preparation of an Environmental Impact Statement pursuant to the Canadian Environmental Assessment Act, 2012* Newfoundland Orphan Basin Exploration Drilling Project, issued by the Agency on March 5, 2018 (see Appendix A), and other generic EA guidance documents issued by the Agency.

4.1.1 Scope of the Project

The Project under assessment is an offshore exploration drilling program which includes the drilling, testing, and abandonment of up to 20 exploration wells within a Project Area encompassing BP's offshore licences, ELs 1145, 1146, 1148, and 1149, in the Orphan Basin between 2019 and 2026. The Project Area is located approximately 343 km east of the island of Newfoundland, in the Northwest Atlantic Ocean (see Figure 2.1).

The scope of the Project to be assessed under CEAA 2012 and pursuant to the Accord Acts includes the following Project activities and components (refer to Chapter 2 for details):

- MODU mobilization and drilling
  - mobilization, operation (i.e., drilling), and demobilization of the MODU
  - establishment of a safety zone associated with MODU presence and operation
  - light and sound (atmospheric and underwater) emissions associated with MODU presence and operation
  - waste and water management, including discharge of drill muds and cuttings and other discharges and emissions
- Vertical seismic profiling (VSP) operations
- Well evaluation and testing
- Well abandonment and decommissioning
- Supply and servicing operations
  - loading, refueling, and operation of PSVs (for re-supply and transfer of materials, fuel, and equipment; on-site safety during drilling activities; and transit between the onshore supply base and the MODU)
  - helicopter support (for crew transport and delivery of supplies and equipment)

The assessment focuses on the potential environment effects associated with these activities and components which reflect the scope of the Project as described in the EIS Guidelines (Agency 2018) (Appendix A) and represent the routine physical activities that will take place throughout the life of the

Project. Potential environmental effects that could occur in the event of an accidental event are assessed separately.

4.1.2 Factors to be Considered

In accordance with Section 19 of CEAA 2012 and the EIS Guidelines, the EA of the Project is required to address the following factors:

- the environmental effects of the project, including the environmental effects of malfunctions or accidents that may occur in connection with the project and any cumulative environmental effects that are likely to result from the project in combination with other physical activities that have been or will be carried out
- the significance of the effects referred to in paragraph (a)
- comments from the public
- mitigation measures that are technically and economically feasible and that would mitigate any significant adverse environmental effects of the project
- the requirements of the follow-up program in respect of the project
- the purpose of the project
- alternative means of carrying out the project that are technically and economically feasible and the environmental effects of any such alternative means
- any change to the project that may be caused by the environment
- the results of any relevant study conducted by a committee established under section 73 or 74 [of CEAA 2012]
- any other matter relevant to the EA that the responsible authority requires to be taken into account

This EIS addresses the applicable factors outlined in Section 19 of CEAA 2012 and the EIS Guidelines (see Appendix A).

The scope of the factors to be considered focuses the EA on relevant issues and concerns. Under Section 5(1) of CEAA 2012, the environmental effects that are to be addressed in relation to an act or thing, a physical activity, a designated project, or a project are:

a) a change that may be caused to the following components of the environment that are within the legislative authority of Parliament:
    i. fish as defined in section 2 of the *Fisheries Act* and fish habitat as defined in subsection 34(1) of that Act
    ii. aquatic species as defined in subsection 2(1) of the *Species at Risk Act*
    iii. migratory birds as defined in subsection 2(1) of the *Migratory Birds Convention Act*, *1994*
    iv. any other component of the environment that is set out in Schedule 2 [of CEAA 2012]
b) a change that may be caused to the environment that would occur
    i. on federal lands
    ii. in a province other than the one in which the act or thing is done or where the physical activity, the designated project or the project is being carried out
    iii. outside Canada

c) with respect to Indigenous peoples, an effect occurring in Canada of any change that may be caused to the environment on:
    i. health and socio-economic conditions
    ii. physical and cultural heritage
    iii. the current use of lands and resources for traditional purposes
    iv. any structure, site or thing that is of historical, archaeological, paleontological, or architectural significance

Certain additional environmental effects must be considered under Section 5(2) of CEAA 2012 when carrying out a designated project requires a federal authority to exercise a power or perform a duty or function conferred on it under any Act of Parliament other than CEAA 2012. This applies to the Project. BP will require authorizations from the C-NLOPB under the *Canada-Newfoundland and Labrador Atlantic Accord Implementation Act* in order for the Project to proceed. No other authorizations are known to be required. Therefore, the following environmental effects have also been considered:

a) a change, other than those referred to in paragraphs 5(1)(a) and (b), that may be caused to the environment and that is directly linked or necessarily incidental to a federal authority's exercise of a power or performance of a duty or function that would permit the carrying out, in whole or in part, of the physical activity, the designated project or the project; and
b) an effect, other than those referred to in paragraph 5(1)(c), of any change referred to in paragraph (a) on:
    i. health and socio-economic conditions,
    ii. physical and cultural heritage, or
    iii. any structure, site or thing that is of historical, archaeological, paleontological, or architectural significance.

These categories of direct and indirect environmental effects have been considered in defining the scope of the EA, including the scope of factors to be considered.

4.2 Methods

4.2.1 Overview of Approach

The method used to conduct the EA for the Project is based on a structured approach consistent with international best practices and with the method used by Stantec for environmental assessments of projects assessed by the Agency, including Shell's Shelburne Basin Venture Exploration Drilling Project (Shell 2014), BP's Scotian Basin Exploration Drilling Project (BP 2016), Husky Energy Exploration Drilling Project (Husky Energy 2018 [pending]). The EA method is structured to:

- identify the issues and potential effects that are likely to be important
- consider key issues raised by Indigenous communities, stakeholders, and the public
- incorporate engineering design and programs for mitigation and follow-up into a comprehensive environmental planning process

This method is focused on the identification and assessment of potential adverse environmental effects of the Project on valued components (VCs). VCs are environmental attributes associated with the Project that are of value or interest because they have been identified to be of concern to Indigenous peoples, regulatory agencies, BP, resource managers, scientists, key stakeholders, and/or the public.

The potential environmental effects of Project activities and components are assessed in this EIS using a standard framework to facilitate assessment of each VC. Evaluation tables are used to document the environmental effects assessment. Residual Project-related environmental effects (i.e., those environmental effects that remain after application of mitigation measures) are characterized for each individual VC using specific analysis criteria (i.e., magnitude, geographic extent, duration, frequency, reversibility, and context). The significance of residual Project-related environmental effects is then determined based on pre-defined standards or thresholds (i.e., significance rating criteria). A precautionary approach has been applied to assessing and reducing environmental effects in planning and designing the Project and throughout the EA. This includes using standard equipment, methods, and technologies in Project design for which potential environmental interactions are well understood and managed through the use of proven mitigation. Using the precautionary approach, effects predictions and implementation of recommended mitigation were conservative in nature assuming that each VC is present in the Project Area and therefore potential for Project-VC interaction. The characterization of range of magnitude (range of natural variability) considers the reasonable worst-case scenario, and is therefore considered to provide a conservative indication of effects.

The environmental effects associated with potential accidental events as well as the effects of the environment on the Project are considered separately in this EIS (Chapters 15 and 16, respectively), but use the same methods as those described for routine activities.

Cumulative environmental effects are assessed in Chapter 14 and consider whether there is potential for the residual Project-related environmental effects to interact cumulatively with the residual environmental effects of other past, present, and future (i.e., certain or reasonably foreseeable) physical activities in the vicinity of the Project. The significance of any identified cumulative environmental effects is also assessed in Chapter 14.

Drill waste modelling completed in support of the Project is presented in Appendix B (and summarized in Section 2.8.2); acoustic modelling is presented in Appendix C (and summarized in Section 2.8.5) and cross-referenced where applicable throughout the EIS. Spill fate and behaviour modelling is presented in Appendix D and summarized in Section 15.4; potential environmental effects associated with an accidental event are assessed in Section 15.5.

4.2.2 Selection of Valued Components

In addition to the Section 5 requirements of CEAA 2012, the selection of VCs was determined in consideration of:

- regulatory guidance and requirements, including the Project-specific EIS Guidelines provided by the Agency (2018) and included in Appendix A

- technical aspects of the Project (i.e., the nature and extent of Project components and activities) (refer to Chapter 2)
- issues raised by regulatory agencies, key stakeholders, the public, and Indigenous peoples (refer to Chapter 3)
- existing physical (Chapter 5), biological (Chapter 6) and socio-economic (Chapter 7) conditions in the Project Area
- experience and lessons learned from environmental assessments for similar offshore projects (e.g., Husky Delineation/Exploration Drilling for Jeanne d'Arc Basin Area [LGL Limited 2007], Shell's Shelburne Basin Venture Exploration Drilling Project [Shell 2014], BP's Scotian Basin Exploration Drilling Project [BP 2016], Equinor's [formerly Statoil Canada Ltd.] Flemish Pass Exploration Drilling Program [Statoil 2017], and ExxonMobil's Eastern Newfoundland Offshore Exploration Drilling Project [ExxonMobil 2017]), as well as the strategic environmental assessment (SEA) completed for Eastern Newfoundland (Amec 2014)
- the professional judgment of the EA Study Team

The VCs assessed in this EIS and the rationale for their selection or exclusion are presented in Table 4.1. Sections of the EIS where VCs are addressed are also referenced.

The following VCs were selected to facilitate a focused and effective environmental effects assessment:

- Marine Fish and Fish Habitat
- Marine and Migratory Birds
- Marine Mammals and Sea Turtles
- Special Areas
- Indigenous Peoples and Community Values
- Commercial Fisheries and Other Ocean Users

Specific candidate VCs identified in the EIS Guidelines which were not selected as VCs in this EIS include marine plants, federal species at risk (which are assessed in the Marine Fish and Fish Habitat VC, Marine and Migratory Birds VC, and the Marine Mammals and Sea Turtles VC, rather than a stand-alone VC), air atmospheric environment, and the human environment. Marine plants are addressed, as relevant, in the Marine Fish and Fish Habitat VC.

With respect to the atmospheric environment, light and sound emissions are assessed in the context of the relevant biological VCs (e.g., receptors). Air emissions, including greenhouse gas emissions are addressed in Section 2.8.1 (predicted Project-related air emissions) and 5.3.10 (ambient air quality and emissions of existing offshore area production platforms) of this EIS. Air emissions from planned Project activities are expected to produce a very minor, localized effect on ambient air quality. However, due to the distance offshore and limited emissions predicted, air quality effects on onshore areas and receptors are very unlikely to occur. Predicted greenhouse gas emissions from the Project are not significant in comparison to GHG targets or average annual emissions for Newfoundland and Labrador. Therefore, the Project will have a negligible effect on current estimates of future global climate change (refer to Section 5.6 for a discussion on climate change).

Given the lack of predicted interactions with most aspects of the human environment (as demonstrated in Table 4.1), it was not selected as a VC. However, aspects of the human environment are described in the context of the baseline socio-economic environment in Chapter 7 and relevant environmental effects assessed in the Indigenous Peoples and Community Values VC (Chapter 12), and Commercial Fisheries and Other Ocean Users VC (Chapter 13).

Table 4.1 Selection of Valued Components

Environmental Components Specified in Final EIS Guidelines	VC Determination	Basis for Inclusion or Exclusion as a VC	Relevant EIS Section Reference(s)
Biophysical Environment			
Atmospheric Environment (including Air Quality, Sound, and Greenhouse Gas Emissions)	No dedicated VC has been selected for the atmospheric environment and climate. In consideration of the magnitude of potential emissions (see Section 2.8.1), the environmental setting and existing regulatory standards, it is concluded that the potential environmental effects on atmospheric environment and climate do not warrant focused EA. Atmospheric discharges are described in Section 2.8.1 and potential changes to the atmospheric environment are assessed where applicable in the context of other VCs.	Project-related vessel operations will take place in Canada's portion of the North American Emission Control Area, which was established under amendments to the *Dangerous Chemicals Regulations* pursuant to the *Canada Shipping Act* that were adopted in 2013 under Annex VI to MARPOL. New standards have been implemented for the Emission Control Area that are designed to reduce allowable emissions of key air pollutants by ships such that, by 2020, emissions of sulphur oxide will be reduced by 96% and nitrogen oxides by 80% (Government of Canada 2013). Exhaust emissions will comply with the Newfoundland and Labrador *Air Pollution Control Regulations, 2004*, Ambient Air Quality Objectives under the *Canadian Environmental Protection Act*, and relevant regulations under MARPOL. Flaring, if required, will be conducted in accordance with the *Drilling and Production Guidelines* (C-NLOPB and CNSOPB 2011). Given its distance offshore and the limited atmospheric emissions predicted for the Project, as described in Section 2.8.1, the Project Area does not contain receptors that would be sensitive to atmospheric emissions from Project activities and components. Changes to the atmospheric environment (sound and light) are assessed in the context of the relevant biological VCs (i.e., receptors).	*Section 2.8.1:* Description of Project atmospheric emissions *Sections 2.8.5* and *5.3.10:* Changes related to ambient sound levels *Section 5.3.10:* Existing conditions regarding the atmospheric environment and climate *Section 10.3:* Project-related changes to atmospheric sound levels and associated effects on the Marine Mammals and Sea Turtles VC *Section 9.3:* Project-related changes to atmospheric sound and lighting levels and associated effects on the Marine and Migratory Birds VC *Section 11.3:* Project-related changes to atmospheric sound and lighting levels and associated effects on the Special Areas VC *Chapter 16:* Effects of the environment on the Project
Marine Environment	No dedicated VC has been selected for the marine environment. To reduce redundancy and promote EA efficiency, environmental effects on the marine environment are assessed in the context of more specific marine VCs (i.e., Marine Fish and Fish Habitat, Marine Mammals and Sea Turtles, Marine and Migratory Birds, Special Areas, and, Commercial Fisheries and Other Ocean Users), where the analysis of effects and mitigation can be more specific, rather than as a stand-alone VC.	Aspects of the marine environment have potential to be affected by Project activities and components as well as accidental events associated with the Project. Potential changes to the benthic environment are assessed in the context of the Marine Fish and Fish Habitat VC. Potential changes to marine water quality are assessed in the context of the Marine Fish and Fish Habitat, Marine Mammals and Sea Turtles, Marine Birds, Special Areas, and Commercial Fisheries and other Ocean Users VCs. Potential changes to underwater ambient noise and vibration levels are assessed in the context of the Marine Fish and Fish Habitat, Marine Mammal and Sea Turtles, Marine and Migratory Birds, Special Areas, and Commercial Fisheries and Other Ocean Users VCs. Potential changes to important and critical habitat for marine species are assessed in the context of the relevant biological VC.	*Chapters 5, 6, and 7:* Description of biophysical and socio-economic aspects of the marine environment *Chapter 8*: Project-related environmental effects on the Marine Fish and Fish Habitat VC *Chapter 9*: Project-related environmental effects on the Migratory Birds VC *Chapter 10*: Project-related environmental effects on the Marine Mammals and Sea Turtles VC *Chapter 11*: Project-related environmental effects on the Special Areas VC *Chapter 13*: Project-related environmental effects on the Commercial Fisheries and other Ocean Users VC *Chapter 14:* Cumulative environmental effects *Chapter 15:* Environmental effects of potential accidental events
Fish and Fish Habitat	Environmental effects on fish (including applicable species at risk [SAR] and species of conservation concern [SOCC]) and fish habitat are assessed within the Marine Fish and Fish Habitat VC. The scope of this VC includes corals, sponges, and marine plants. This VC is included in consideration of its ecological importance, the socio-economic importance of commercial fisheries resources (i.e., target fish species), the legislated protection of fish and fish habitat and applicable SAR and SOCC, and the nature of potential Project-VC interactions.	Several species of fish and corals (including SAR and SOCC and species targeted for harvesting) are known to occur in and around the Project Area and have potential to be affected (including effects on fish habitat) by Project activities and components as well as accidental events associated with the Project. Project effects on fish and fish habitat, including species at risk and species of importance to commercial and subsistence fisheries (e.g., Atlantic salmon, Atlantic bluefin tuna, American eel) have been identified as an issue of concern during Indigenous and stakeholder engagement (refer to Chapter 3). Fish and fish habitat are protected under the *Fisheries Act*. Section 5(1)(a) of CEAA 2012 requires consideration of project-related environmental effects associated with a change to a component of the environment within the legislative authority of Parliament (e.g., fish and fish habitat as defined in the *Fisheries Act*, which includes corals, and aquatic species as defined in SARA, which includes marine plants).	*Section 6.1:* Existing conditions regarding fish and fish habitat *Chapter 8:* Project-related environmental effects on the Marine Fish and Fish Habitat VC *Chapter 12*: Project-related environmental effects on the Indigenous Peoples and Community Values VC *Chapter 13:* Project-related environmental effects on the Commercial Fisheries and Other Ocean Users *Chapter 14:* Cumulative environmental effects *Chapter 15:* Environmental effects of potential accidental events

Environmental Components Specified in Final EIS Guidelines	VC Determination	Basis for Inclusion or Exclusion as a VC	Relevant EIS Section Reference(s)
Marine Plants	No dedicated VC has been selected for marine plants. In consideration of the environmental setting and mitigation referred to in the next column, it has been determined that environmental effects on marine plants do not warrant focused assessment as a dedicated VC. Potential changes to marine plants are assessed, as applicable, in the context of the Marine Fish and Fish Habitat and Special Areas VCs.	Much of the Project Area is too deep for marine plants and/or contains soft substrates that are not conducive to marine plants (AMEC 2014). However, some areas, such as the Virgin Rocks EBSA in the RAA, support a relatively high abundance and diversity of marine plants (AMEC 2014). Marine plants are an important component of fish habitat. Mitigation measures for the protection of fish and fish habitat and special areas are also protective of marine plants. It is therefore anticipated that mitigation proposed for the Marine Fish and Fish Habitat VC are sufficient to mitigate environmental effects on marine plants.	*Section 6.1.4:* Existing conditions for marine plants Section 6.4: Existing conditions for Special Areas
Migratory Birds and their Habitat	Environmental effects on migratory birds (including applicable SAR and SOCC and migratory bird habitat) are assessed within the Marine and Migratory Birds VC. This VC is included in consideration of its ecological importance, the legislated protection of marine and migratory birds and other applicable SAR and SOCC, concerns raised during Indigenous and stakeholder engagement, and the nature of potential Project-VC interactions.	Several species of marine and migratory birds (including SAR and SOCC) are known to occur within the RAA and have potential to be affected by Project activities and components as well as accidental events associated with the Project. Project effects on marine and migratory birds (and their eggs) have been identified as an issue of concern during Indigenous and stakeholder engagement (refer to Chapter 3). Migratory birds are protected under the MBCA, and Section 5(1)(a) of CEAA 2012 requires consideration of project-related environmental effects associated with a change to a component of the environment within the legislative authority of Parliament (e.g., migratory birds as defined in the MBCA).	*Section 6.2:* Existing conditions regarding marine and migratory birds *Chapter 9:* Project-related environmental effects on the Marine and Migratory Birds VC *Chapter 14:* Cumulative environmental effects *Chapter 15:* Environmental effects of potential accidental events
Species at Risk	No dedicated VC has been selected for SAR and SOCC. To reduce redundancy and promote EA efficiency, environmental effects on SAR and SOCC are assessed as part of the Marine Fish and Fish Habitat, Marine Mammals and Sea Turtles, and Marine and Migratory Birds VCs, where the analysis of effects and mitigation can be more specific, rather than as a stand-alone VC. Effects and/or mitigation specific to SAR and SOCC will be highlighted, as applicable.	SAR and SOCC include the following: • federally protected species listed as “endangered”, “threatened”, or of “special concern” on Schedule 1 of SARA, and their critical habitat • species assessed as “endangered”, “threatened”, or of “special concern” by the federal COSEWIC • species listed as “endangered”, “threatened”, or “vulnerable” under the *Endangered Species List Regulations* pursuant to the NL ESA, which are provincially protected Several SAR and SOCC are known to occur within the RAA, including fish, marine mammals, sea turtles, and marine and migratory birds, and have potential to be affected by routine Project activities as well as accidental events associated with the Project. Project effects on SAR and SOCC (particularly blue whale, North Atlantic right whale, Atlantic salmon and American eel) have been identified as an issue of concern during Indigenous and stakeholder engagement (refer to Chapter 3). SAR and SOCC can be more vulnerable to changes in their habitat or population levels than secure species and therefore require special consideration. However, in general, potential environmental effects and mitigation measures taken to protect SAR and SOCC are also protective of secure species. Furthermore, where several of the species found in the RAA are considered SAR or SOCC (e.g., Marine Mammals and Sea Turtles), a separate VC to assess secure species and SAR/SOCC would be redundant. Potential changes to SAR/SOCC for these species are therefore assessed in the context of their respective biological VC.	*Sections 6.1.8, 6.2.4, 6.3.7:* Summary of marine species at risk and SOCC (including applicable species of fish, corals, mammals, turtles, and birds) with potential to be affected by the Project *Chapter 8:* Assessment of project-related environmental effects on fish and coral species at risk and SOCC *Chapter 9:* Project-related environmental effects on marine and migratory bird SAR and SOCC *Chapter 10:* Assessment of project-related environmental effects on marine mammal and sea turtle SAR and SOCC *Chapter 14:* Cumulative environmental effects *Chapter 15:* Environmental effects of potential accidental events
Marine Mammals	Environmental effects on marine mammals (including applicable SAR and SOCC) are assessed in the Marine Mammals and Sea Turtles VC. This VC is included in consideration of its ecological importance, the legislated protection of applicable SAR, concerns raised during Indigenous and stakeholder engagement, and the nature of potential Project interactions. Marine mammals and sea turtles are considered within the same VC due to the similarities in their potential interactions with the Project.	Several species of marine mammals (including SAR and SOCC) are known to occur in the RAA and have potential to be affected by Project activities and components as well as accidental events associated with the Project. Project effects on marine mammals (particularly blue whale, North Atlantic right whale, and harp seal), have been identified as an issue of concern during Indigenous and stakeholder engagement (refer to Chapter 3). Section 5(1)(a) of CEAA 2012 requires consideration of project-related environmental effects associated with a change to a component of the environment within the legislative authority of Parliament (e.g., aquatic species as defined in SARA).	*Section 6.3:* Existing conditions regarding marine mammals *Chapter 10:* Project-related environmental effects on the Marine Mammals and Sea Turtles VC *Chapter 14:* Cumulative environmental effects *Chapter 15:* Environmental effects of potential accidental events

Environmental Components Specified in Final EIS Guidelines	VC Determination	Basis for Inclusion or Exclusion as a VC	Relevant EIS Section Reference(s)
Sea Turtles	Environmental effects on sea turtles (including applicable SAR and SOCC) are assessed within the Marine Mammals and Sea Turtles VC. This VC is included in consideration of its ecological importance, the legislated protection of applicable SAR, and the nature of potential Project-VC interactions. Marine mammals and sea turtles are considered within the same VC due to the similarities in their potential interactions with the Project.	Sea turtles (including SAR and SOCC) are known to occur in the Project Area and have potential to be affected by Project activities and components as well as accidental events associated with the Project. Section 5(1)(a) of CEAA 2012 requires consideration of project-related environmental effects associated with a change to a component of the environment within the legislative authority of Parliament (e.g., aquatic species as defined in SARA).	*Section 6.3.6:* Existing conditions regarding sea turtles *Chapter 10:* Project-related environmental effects on the Marine Mammals and Sea Turtles VC *Section 15.5:* Environmental effects of potential accidental events *Chapter 14:* Cumulative environmental effects
Special Areas	Environmental effects on Special Areas are assessed within the Special Areas VC. This VC is included in consideration of its ecological and/or socio-economic importance, the legislated protection of applicable Special Areas, and the nature of potential Project-VC interactions.	Several Special Areas (i.e., areas designated as being of special interest due to their ecological and/or conservation sensitivities, including those protected under federal legislation) are known to occur in the RAA including but not limited to the Northeast Newfoundland Slope Closure marine refuge area which overlaps with the Project Area, have potential to be affected by Project activities and components as well as accidental events associated with the Project. Special Areas provide important for certain SAR / SOCC.	*Section 6.4:* Existing conditions regarding Special Areas *Chapter 11:* Project-related environmental effects on the Special Areas VC *Chapter 14:* Cumulative environmental effects *Chapter 15:* Environmental effects of potential accidental events
Indigenous Peoples	Environmental effects on Indigenous Peoples are assessed with respect to the Indigenous Peoples and Community Values VC. This VC is included in consideration of Indigenous peoples that reside in Newfoundland and Labrador, the Maritimes, and Quebec whose asserted or established Aboriginal or Treaty rights could potentially be affected by changes in the environment as a result of the Project.	There are several Indigenous groups residing in Newfoundland and Labrador, the Maritimes, and Quebec; many of these groups have expressed concerns about potential adverse environmental effects of the Project (see Section 3). Indigenous commercial communal fishing activity is known to occur in the vicinity of the Project Area and has potential to be affected by Project activities and components as well as accidental events associated with the Project. Project activities also have potential to interact with species traditionally harvested for food, social and ceremonial (FSC) purposes, particularly migratory species which may transit through the Project Area and be harvested elsewhere. Indigenous groups also expressed concern about potential adverse effects on Aboriginal rights and cultural, social, health and economic changes that could affect the quality of life within their communities. Section 5(1)(c) of CEAA, 2012 requires consideration of project-related environmental effects, with respect to Indigenous peoples, associated with a change to the environment health and socio-economic conditions, physical and cultural heritage, the current use of lands and resources for traditional purposes and any structure, site or thing that is of historical, archaeological, paleontological or architectural significance.	*Chapter 7:* Context for Indigenous organizations (including locations of reserves and communities) *Section 7.4:* Existing conditions regarding Indigenous resource use *Chapter 12:* Project-related environmental effects on Indigenous Peoples and Community Values VC *Chapter 14:* Cumulative environmental effects *Chapter 15:* Environmental effects of potential accidental events
Commercial Fisheries	Environmental effects on commercial fisheries are assessed in the Commercial Fisheries and Other Ocean Users VC. This VC is included in consideration of its economic importance and the potential for Project-VC interactions.	Commercial fishing activity occurs within the Project Area and RAA and has potential to be affected by Project activities and components as well as accidental events associated with the Project. Potential effects on commercial fisheries (particularly cumulative effects) have been raised during stakeholder engagement.	*Chapter 7:* Existing conditions regarding commercial fisheries *Chapter 13:* Project-related environmental effects on the Commercial Fisheries and Other Ocean Users VC *Chapter 14:* Cumulative environmental effects *Chapter 15:* Environmental effects of potential accidental events

Environmental Components Specified in Final EIS Guidelines	VC Determination	Basis for Inclusion or Exclusion as a VC	Relevant EIS Section Reference(s)
Human Environment (e.g., recreational activities, other ocean uses, socio-economic conditions, human health, physical and cultural heritage, and rural and urban settings)	No dedicated VC has been selected for human environment. In consideration of the environmental setting and the mitigation referred to in the next column, environmental effects on recreational activities, human health and socio-economic conditions, physical and cultural heritage, rural and urban settings do not warrant focused assessment. However, in consideration of potential interactions between the Project and other ocean users (e.g., shipping, research, oil and gas, military activities, ocean infrastructure), other ocean users are assessed in the Commercial Fisheries and Other Ocean Users VC.	Other ocean uses, including shipping, oil and gas activity, military activities, and research, occur within the RAA and have the potential to interact with Project components during routine and/or unplanned events. Recreational fisheries and other forms of recreation are not known to occur in the vicinity of the Project Area. These activities are generally located closer to the nearshore. However, mitigation measures for the Marine Fish and Fish Habitat VC, the Indigenous Peoples and Community Values VC, and the Commercial Fisheries and Other Ocean Users VC would be sufficient to mitigate environmental effects on recreational fisheries if applicable. Potential accidental events (i.e., spills) associated with the Project could result in contamination of fish species commonly harvested for human consumption through commercial, Indigenous, and/or recreational fisheries. However, in the event of an accidental spill that could potentially affect human health, measures would be taken (e.g., fisheries closures, exclusion zone) would be imposed thereby preventing contact with spilled oil and/or exposure to contaminated food sources. These potential effects are assessed in the context of the Indigenous Peoples and Community Values VC, and the Commercial Fisheries and Other Ocean Users VC. Due to its distance offshore, the Project is not expected to interact with rural and urban settings along the Newfoundland coastline and unlikely to affect receptors that would be sensitive to atmospheric air or noise emissions from routine Project activities and components, or from potential accidental events. Project activities and components are not anticipated to result in changes to the environment that would affect human health. Emissions will be in accordance with allowable concentrations stated in the OWTG. Potential indirect Project effects with respect to Indigenous health are addressed in the Indigenous Peoples and Community Values VC. Project activities and components are not anticipated to result in changes to the environment that would have an effect on physical and cultural heritage. There are no known shipwrecks or legacy sites within the Project Area. Information gathered pre-drill ROV site surveys in the Project Area will confirm the absence of geohazards (including cultural heritage resources on the seabed) before any seabed disturbance takes place. PSV and helicopter transport activities will not result in ground/seabed disturbance. Therefore, they will not affect heritage resources. The Project is expected to have economic benefits, including economic and contracting opportunities. Socio-economic benefits associated with the Project are discussed in Section 1.4.	*Section 1.4:* Benefits of the Project *Section 2.8:* Routine waste discharges and emissions associated with the Project *Chapter 7* Existing conditions regarding human environment *Chapter 13:* Project-related environmental effects on the Commercial Fisheries and Other Ocean Users VC *Chapter 15:* Spill response measures and Environmental effects of potential accidental events

4.2.3 Effects Assessment Framework

The following sections describe the structure of the effects assessment for each VC in Chapters 8 to 13.

4.2.3.1 Regulatory and Policy Setting

The regulatory context is described for each VC, including an overview of applicable regulations, policies, and/or administrative mechanisms. This section helps to establish key aspects of the scope of assessment, including relevant definitions under legislation, measurable parameters, and significance thresholds, where applicable.

4.2.3.2 The Influence of Consultation and Engagement on the Assessment

Specific issues that were raised during stakeholder and Indigenous consultation and engagement activities are summarized in this section, including the extent to which identification and consideration of these issues influenced the scope of the assessment for the VC.

4.2.3.3 Potential Effects, Pathways, and Measurable Parameters

Potential environmental effects arising from interactions between the Project and each selected VC are identified in their respective Chapters. For each VC, potential environmental effects are identified, and one or more measurable parameters are selected to facilitate quantitative or qualitative assessment of those effects. Measurable parameters for biophysical VCs include measures of ecosystem health and integrity. Where applicable, measurable parameters also reference regional, provincial and/or national objectives, standards or guidelines.

4.2.3.4 Boundaries

Environmental effects are evaluated within spatial and temporal boundaries. The spatial boundaries reflect the geographic range over which the Project's potential environmental effects may occur, recognizing that some environmental effects will extend beyond the Project Area. The temporal boundaries identify when an environmental effect may occur. The temporal boundaries are based on the timing and duration of Project activities and the nature of the interactions with each individual VC. Spatial and temporal boundaries are developed in consideration of:

- timing / scheduling of Project activities for all Project phases
- known natural variations of each VC
- information gathered on land and resource use
- recovery time from an environmental effect
- potential for cumulative environmental effects
- oil spill modelling conducted for the Project

Spatial Boundaries

The spatial boundaries for the Project to be assessed are defined below with respect to Project activities and components.

- **Project Area:** The Project Area (Figure 2.1) encompasses the immediate area within which Project activities and components may occur. Well locations have not been identified, but will occur within the ELs in the Project Area. Well locations have not yet been identified. As a subset of the Project Area, the wellsite is referenced in the assessment discussion, where relevant, to more appropriately characterize the associated effects. The Project Area is consistent for all VCs and includes ELs 1145, 1146, 1148, and 1149 as well as a 20 km buffer to help join non-contiguous ELs into a single Project Area.
- **Local Assessment Area (LAA):** The LAA is the maximum area within which environmental effects from routine Project activities and components can be predicted or measured with a reasonable degree of accuracy and confidence. It consists of the Project Area and adjacent areas where Project-related environmental effects are reasonably expected to occur based on available information including effects thresholds, predictive modelling and professional judgement. The LAA is defined for each VC.
- **Regional Assessment Area (RAA):** The RAA is the area within which residual environmental effects from Project activities and components may interact cumulatively with the residual environmental effects of other past, present, and future (i.e., certain or reasonably foreseeable) physical activities. Although the RAA is intended to be much broader than the LAA, which focuses on the extent of potential effects associated with routine Project activities for each VC, it is possible that effects from larger scale unplanned events (e.g., blowout) could extend beyond the RAA. The RAA is consistent for all VCs, except for the Indigenous People and Community Values VC which has a larger RAA to encompass the various Indigenous communities which have the potential to be affected by Project-related activities.

Temporal Boundaries

The temporal boundaries for the Project to be assessed encompass all Project phases, including well drilling, testing and abandonment. BP is currently planning a one-well program with an initial well proposed for 2020 but could potentially drill up to 20 wells between 2020 and 2026. Well testing (if required, dependent on drilling results) could also occur at any time during the temporal scope of this EIS. Wells may be decommissioned and abandoned at any time within the temporal boundaries. Each well is anticipated to take up to approximately 60 days to drill. Drilling operations will not be continuous throughout the seven-year scope of the Project and will depend partially on rig availability and results from previous wells. Although BP's preference is to conduct drilling between May and October, for the purpose of environmental assessment, it is assumed that Project activities could occur year-round.

4.2.3.5 Residual Effects Characterization

The criteria provided in Table 4.2 are used to support characterization of the nature and extent of residual environmental effects on each VC.

Table 4.2 Criteria used to Support Environmental Effects Assessment

Criteria	Description	Quantitative Measure or Definition of Qualitative Categories
Direction	The long-term trend of the residual environmental effect relative to baseline	Positive – a residual environmental effect that moves measurable parameters in a direction beneficial to [VC] relative to baseline Adverse – a residual environmental effect that moves measurable parameters in a direction detrimental to [VC] relative to baseline
Magnitude	The amount of change in measurable parameters or the VC relative to existing conditions	Negligible – no measurable change Biophysical VCs: Low – a detectable change but within the range of natural variability Moderate – a detectable change beyond the range of natural variability, but with no associated adverse effect on the viability of the affected population. High – measurable change that exceeds the limits of natural variability, with an adverse effect on the viability of the affected population. Socio-economic VCs: Low – A detectable change that is within the range of natural variability, with no associated adverse effect on the overall nature, intensity, quality / health or value of the affected component or activity. Moderate - A detectable change that is beyond the range of natural variability, but with no associated adverse effect on the overall nature, intensity, quality / health or value of the affected component or activity. High - A detectable change that is beyond the range of natural variability, with an adverse effect on the overall nature, intensity, quality / heath or value of the affected component or activity.
Geographic Extent	The geographic area in which a residual environmental effect occurs	Project Area – residual environmental effects are restricted to the Project Area Local Assessment Area – residual environmental effects extend into the LAA Regional Assessment Area – residual environmental effects extend into the RAA
Frequency	Identifies how often the residual effect occurs and how often during the Project	Unlikely event – effect is unlikely to occur Single event – effect occurs once Multiple irregular event – effect occurs at no set schedule Multiple regular event – effect occurs at regular intervals Continuous – effect occurs continuously
Duration	The period of time required until the measurable parameter or the VC returns to its existing condition, or the residual effect can no longer be measured or otherwise perceived	Short term - for duration of the activity, or for duration of accidental event Medium term - beyond duration of activity up to end of Project, or for duration of threshold exceedance of accidental event – weeks or months Long term - beyond Project duration of activity, or beyond the duration of threshold exceedance for accidental events - years Permanent - recovery to baseline conditions unlikely

Criteria	Description	Quantitative Measure or Definition of Qualitative Categories
Reversibility	Pertains to whether a measurable parameter or the VC can return to its existing condition after the project activity ceases	Reversible – will recover to baseline conditions before or after Project completion Irreversible – permanent
Ecological or Socio-economic Context	Existing condition and trends in the area where residual environmental effects occur.	Undisturbed – The VC is relatively undisturbed in the RAA, not adversely affected by human activity, or is likely able to assimilate the additional change Disturbed – The VC has been previously disturbed by human development or human development is still present in the RAA, or the VC is likely not able to assimilate the additional change

4.2.3.6 Significance Definition

In consideration of the Operational Policy Statement, Determining Whether a Designated Project is Likely to Cause Significant Environmental Effects Under the *Canadian Environmental Assessment Act, 2012* (Agency 2015), criteria or established thresholds for determining the significance of residual adverse environmental effects are identified for each VC and are included in the corresponding sections in the VC chapters (Chapters 8 through 13). These criteria or thresholds are defined using:

- available information on the status and characteristics of each VC
- scientific literature to assess and qualify significance of an effect (e.g., Southall et al. 2007; French-McCay 2009)
- applicable regulatory documents, environmental standards, guidelines, or objectives where available
- the professional judgment of the EA Study Team

These criteria or thresholds establish a level beyond which a residual environmental effect would be considered significant (i.e., an unacceptable change). Where pre-established standards or thresholds do not exist, significance criteria have been defined qualitatively and justifications for the criteria provided.

4.2.4 Existing Conditions

Existing conditions of the marine physical environment (Chapter 5), marine biological environment (Chapter 6) and socio-economic environment (Chapter 7) is described in provide the setting for the Project, support an understanding of the receiving environment, and provide context for the effects assessment. A brief overview of existing conditions is also provided for each VC in the VC Chapters, highlighting key information to support the assessment. Inclusion of information on existing conditions is intended to be relatively concise and focused on that which is necessary to assess the environmental effects of the Project and support recommendations for mitigation, monitoring and follow-up, as applicable.

4.2.5 Assessment of Project-Related Environmental Effects

The assessment of Project-related environmental effects follows a sequential process whereby potential interactions between each VC and the Project are identified, and where such interactions may exist, a more detailed assessment of those effects is completed to further characterize the effects.

For each VC, a table is used to list Project activities and components, and to identify potential interactions from those Project activities and components with the VC. Interactions are indicated by checkmarks and are discussed in the context of effects pathways, standard and Project-specific mitigation, and residual effects.

The assessment of potential environmental effects includes:

- identification of environmental effects pathways (i.e., identification of means by which the Project could result in an environmental effect on the VC)
- description of the mitigation proposed to reduce or eliminate potential environmental effects, including industry standards, best management practices, and environmental protection measures that BP will implement
- identification and characterization of the nature and extent of residual environmental effects (i.e., those effects that remain after the mitigation measures have been applied) through application of the specific criteria (i.e., magnitude, geographic extent, duration, frequency, reversibility, and context) introduced in Section 4.2.3.5
- application of VC-specific significance definition thresholds (Section 4.2.3.6) to determine the significance of the residual effects

The level of confidence is provided for each determination of significance, which is typically based on professional judgment, prior experience, and scope and quality of available information. Where a significant effect is predicted to occur, a determination of likelihood based on consideration of probability and certainty is provided.

4.2.5.1 Follow-up and Monitoring

Following the determination of significance, each VC Chapter also provides an overview discussion of environmental monitoring and/or follow-up programs where necessary for the VC.

Under CEAA 2012, follow-up programs are used to: verify predictions of environmental effects identified in the environmental assessment; and determine the effectiveness of mitigation measures. Compliance monitoring verifies whether required mitigation measures were implemented.

If follow-up is recommended, a preliminary and high-level overview of the program is provided including: objectives; planning and design; key areas of focus; implementation and schedule; the format, use and sharing of study results; and potential adaptive management approaches based on the results and findings of such programs.

4.2.6 Assessment of Accidental Events

Environmental effects associated with potential accidental events are assessed in Chapter 15. The focus of the assessment is on worst credible case accidental scenarios that could result in significant environmental effects. Interactions with VCs are identified for these scenarios, and potential environmental effects are assessed. A description of the mitigation and contingency plans is provided, and a conclusion

regarding the significance of potential residual environmental effects and their likelihood of occurrence is given.

4.2.7 Assessment of Effects of the Environment on the Project

Effects of the environment on the Project are assessed in Chapter 16. This section considers how local environmental conditions and natural hazards (e.g., extreme weather) could adversely affect the Project and thus result in potential effects on the environment (e.g., accidental events). Potential adverse effects of the environment on a project are typically a function of project design and environmental conditions (e.g., geology, ice conditions) that could affect the project. These effects are generally mitigated through engineering and environmental design criteria, industry standards, and environmental monitoring.

4.2.8 Assessment of Cumulative Environmental Effects

As required under Section 19(1) of CEAA 2012, the EIS assesses and evaluates cumulative environmental effects that are likely to result from the Project in combination with other physical activities that have been or will be carried out near the Project, as well as the significance of these potential effects.

The cumulative effects assessments for the VCs are provided together in Chapter 14, which also includes a detailed description of the methods used (Section 14.1), which are in accordance with the Agency's (2016) Operational Policy Statement, Assessing Cumulative Environmental Effects Under *CEAA 2012*. For the reasons stated in Section 4.2.2 and Table 4.1, candidate VCs not carried forward for the assessment of Project-specific effects have also not been selected as VCs for the cumulative effects assessment.

4.3 References

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