

APPENDIX G

Indigenous Workshop Materials, October 2018

Bay du Nord Development Project Environmental Impact Statement



Bay du Nord Development Project

Project Update and Interactive Workshop

October 2018

Agenda

Topic	Time
Introductions	9:00-9:10 am
Safety Moment	9:10-9:15 am
Project Update	9:15-9:30 am
Interactive Workshop	9:30-11:30 am
Review of Feedback/Input from Interactive Workshop	11:30 am – 12:30 pm
Lunch	12:30 pm

Safety Moment – Fall Safety Tips

ON THE ROAD

Poor visibility – Vision can be obscured by lower light, falling leaves, rain, fog and snow. Shorter days mean it's more difficult to see cyclists, pedestrians and wildlife (moose, deer). Slow down if you can't see well. Use dimmed headlights in bad weather and wear sunglasses to avoid glare. Clear frost.

Watch out for children



shutterstock - 310296167

Be aware of road conditions – Pavement may be wet, covered by leaves, frost or black ice. Slow down, drive defensively and keep a safe distance from car in front



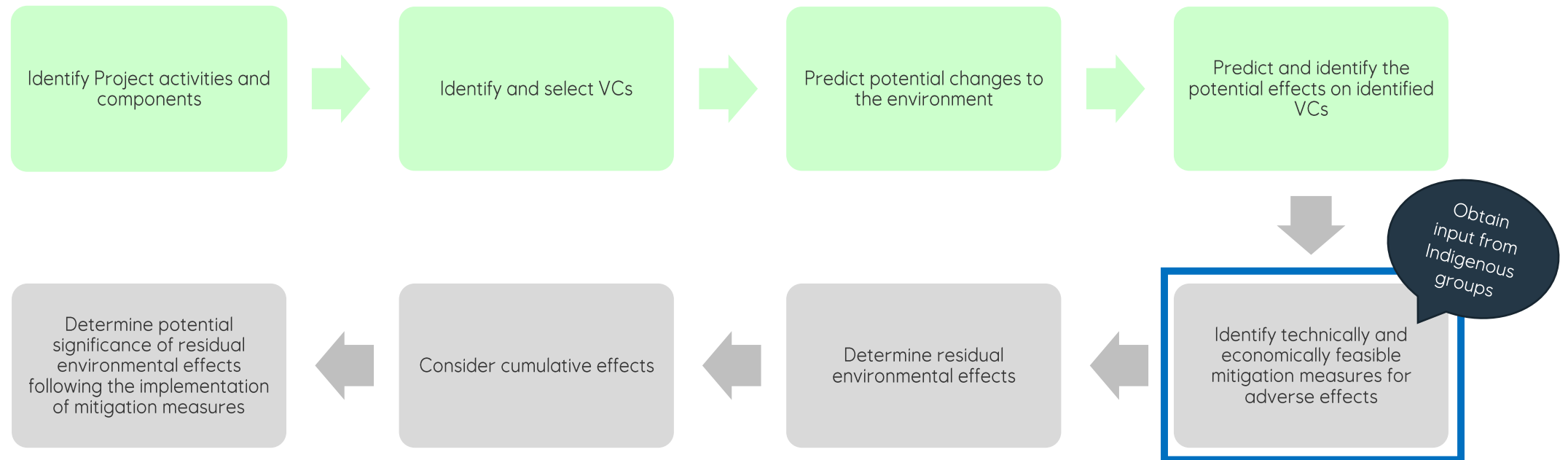
Winterize your vehicle: Check washer fluid, lights and wiper blades. Prepare a winter emergency kit for your automobile.

Project Update

- Draft Environmental Impact Statement (EIS) Guidelines were issued on 09-Aug-2018, and Indigenous Groups had the opportunity to review and provide input to the Canadian Environmental Assessment Agency (the Agency).
- The Agency issued the Final EIS Guidelines on 26-Sept-2018.
- EIS preparation is currently ongoing.
- Drill cuttings and spill trajectory modelling were required under the Final EIS Guidelines, however, we are also undertaking the following modelling, which will be included in the EIS:
 - Air emissions
 - Produced water dispersion modelling
 - Sound
- **Project video**

Environmental Interactions and Mitigation Measures

- The purpose of this interactive workshop is to review the key environmental interactions, potential environmental effects and proposed mitigation measures, and get your feedback/input.



Project Phases

Project Phase	Common Activities	Anticipated Duration
Offshore Construction, Installation and, Hook-up and Commissioning (HUC)	<ul style="list-style-type: none"> • Installation of subsea equipment (e.g. drilling templates, flowlines, riser bases, pumps, moorings, fibre optic cable) • Hook-up of flowlines between drilling templates to risers and the production ship • Leak testing flowlines • Installation of protection measures over flowlines (e.g. rock protection, concrete mattresses) or dredging for flowline installation 	<ul style="list-style-type: none"> • 5 years and likely limited to “summer” seasons • 2020 to 2025
Production and Maintenance Operations	<ul style="list-style-type: none"> • Power generation • Operation of utilities systems (e.g. heating, cooling, ventilation, power, corrosion protection) • Desalination of seawater for potable water • Waste generation and disposal (e.g. produced water, cooling water, desalination brine, deck drains, bilge water, etc.) • Maintenance and inspection activities (e.g. ROV inspections of subsea equipment) • Flaring associated with start-up, emergency and maintenance activities (e.g. cleaning wells) • Handling of cargo, fuel and chemicals • Offloading crude oil to shuttle tankers 	<ul style="list-style-type: none"> • 12 to 20 years • Starting in 2025
Drilling	<ul style="list-style-type: none"> • Mobilization of drilling rig • Discharge of water-based and synthetic based cuttings • Potential for one well flow test 	<ul style="list-style-type: none"> • 3 to 5 years • Starting in 2023 • Drilling between 10-30 wells

Project Phases

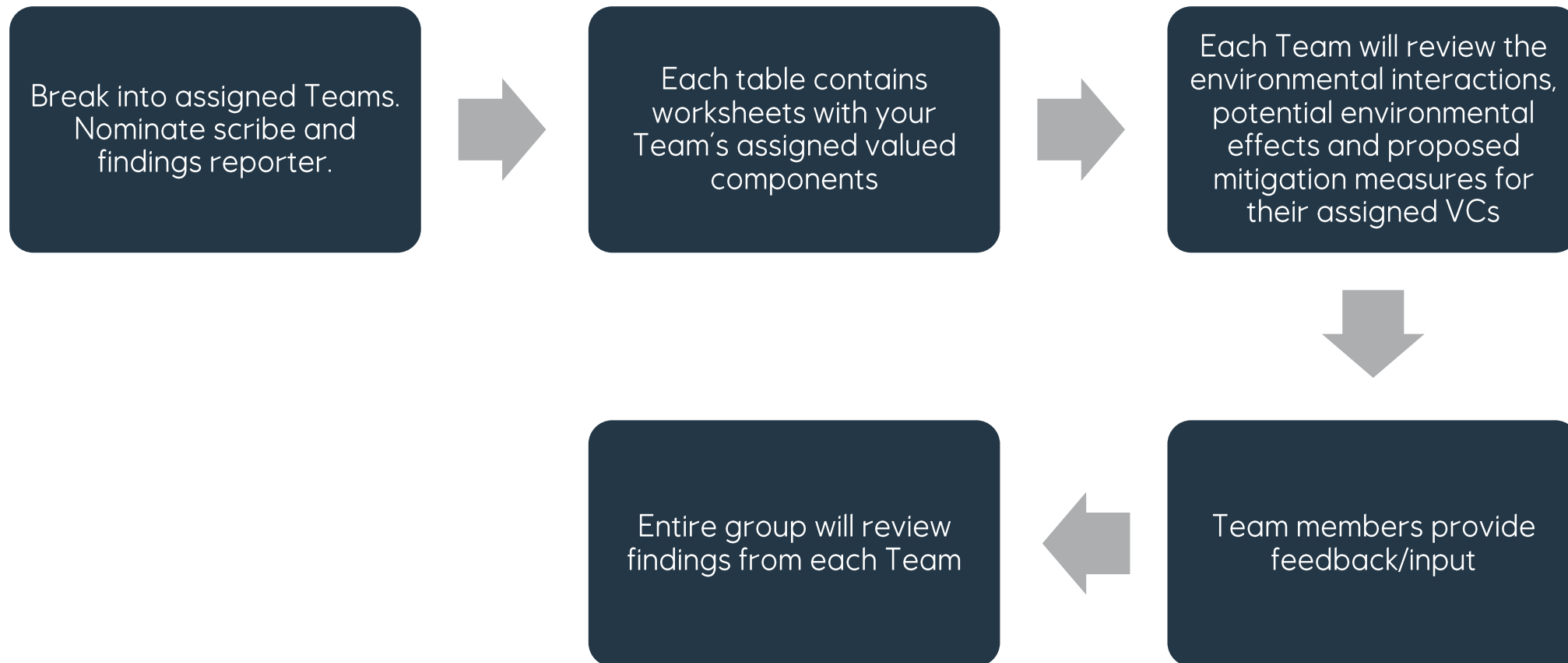
Project Phase	Common Activities	Anticipated Duration
Supply and Servicing	<ul style="list-style-type: none"> • Various vessels to support Project activities (e.g. supply and stand-by, construction, light intervention, flowline laying, geotechnical/seismic/seabed/environmental surveys, ice management) • Helicopter support 	<ul style="list-style-type: none"> • 17 to 25 years • Starting in 2020
Supporting Surveys and Activities	<ul style="list-style-type: none"> • Geophysical, geohazard, wellsite and seabed surveys • Seismic surveys • Vertical seismic profiling (VSP) surveys • Environmental surveys • Geotechnical surveys • Remotely operated vehicle (ROV) and/or autonomous underwater vehicle (AUV) surveys 	<ul style="list-style-type: none"> • Ongoing throughout life of Project • Occurring sporadically for short periods of time (e.g. 5 to 25 days)
Decommissioning	<ul style="list-style-type: none"> • Well decommissioning • Removing the production ship • Removing subsea infrastructure • Only one decommissioning phase – either at end of BdN activity or at end of future development 	<ul style="list-style-type: none"> • 2 to 4 years • To occur at end of Project life
Potential Future Development	<ul style="list-style-type: none"> • All activities associated with the previously discussed Project phases 	<ul style="list-style-type: none"> • Extension of Project life to 30 years total • Estimated to occur between 2035 and 2055

Valued Components

What is a valued component (VC)?

- Environmental component that is of ecological or socioeconomic important, and has the potential to be affected by project activities.
- The VCs outlined below were identified and selected early based on a number of key considerations and inputs including the EIS Guidelines, guidance from the regulators, Indigenous engagement and stakeholder engagement.
 1. Indigenous Peoples
 2. Special Areas
 3. Marine Fish and Fish Habitat (including Species at Risk)
 4. Marine and Migratory Birds (including Species at Risk)
 5. Marine Mammals and Sea Turtles (including Species at Risk)
 6. Marine Fisheries and Other Ocean Users
 7. Accidental Events
 8. Cumulative Effects
 9. Atmosphere Environment
 10. Effects of the Environment on the Project

Interactive Workshop



Equinor representatives will be embedded into each Team to facilitate discussion

Quebec City– Assigned Teams and Valued Components

Team #1	
Terri Lynn Morrison	Atmospheric Environment
Mathieu Gray-Lehoux	Marine Fish and Fish Habitat
Vincent Gerardin	Marine and Migratory Birds
Lawyer – Ekuanitshit	Marine Mammals and Sea Turtles
Ekuanitshit Representative #1	Special Areas
Ekuanitshit Representative #2	Marine Fisheries and Other Ocean Users
Sarah Zammit	Effects of the Environment on the Project
Joelle Guerin	
Mary Hatherly	
Kim Coady	

Note: The Accidental Events, Indigenous Peoples and Cumulative Effects VCs will be embedded into applicable VCs.

Interactive Workshop

- Teams to participate in breakout sessions to review proposed mitigation measures, and develop additional mitigation measures.
- Entire group to walkthrough a worksheet as an example.

Workshop Feedback

- To aid in continual improvement, we would like feedback on today's workshop, however, it is not mandatory to provide.
 - Feel free to fill out a feedback form on each table and we will collect after the workshop.
 - Alternatively, you can complete the feedback form after the session and email it to Mary Hatherly (mhat@equinor.com).

Next Steps

- Equinor will take all feedback/input associated with the workshop into consideration for the EIS.
- Equinor will prepare one summary document that contains feedback/input from the St. John's, Quebec City and Moncton workshops, and will provide to Indigenous Groups.
 - All feedback/input will be outlined, and whether it has been incorporated into the EIS.
 - If feedback/input was not incorporated into the EIS then a rationale will be provided.

Bay du Nord Development Project

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Table 1. Bay du Nord Development Project Phases

Project Phase	Common Activities	Anticipated Duration
Offshore Construction, Installation and, Hook-up and Commissioning (HUC)	<ul style="list-style-type: none"> • Installation of subsea equipment (e.g. drilling templates, flowlines, riser bases, pumps, moorings, fibre optic cable) • Hook-up of flowlines between drilling templates to risers and the production ship • Leak testing flowlines • Installation of protection measures over flowlines (e.g. rock protection, concrete mattresses) or dredging for flowline installation 	<ul style="list-style-type: none"> • 5 years and likely limited to “summer” seasons • 2020 to 2025
Production and Maintenance Operations	<ul style="list-style-type: none"> • Power generation • Operation of utilities systems (e.g. heating, cooling, ventilation, power, corrosion protection) • Desalination of seawater for potable water • Waste generation and disposal (e.g., produced water, cooling water, desalination brine, deck drains, bilge water) • Maintenance and inspection activities (e.g. ROV inspection of subsea equipment) • Flaring associated with start-up, emergency and maintenance activities (e.g. cleaning wells) • Handling of cargo, fuel and chemicals • Offloading crude oil to shuttle tankers 	<ul style="list-style-type: none"> • 12 to 20 years • Starting in 2025
Drilling	<ul style="list-style-type: none"> • Mobilization of drilling rig • Discharge of water-based and synthetic-based and cuttings • Potential for one well flow test 	<ul style="list-style-type: none"> • 3 to 5 years • Starting in 2023 • Drilling between 10-30 wells
Supply and Servicing	<ul style="list-style-type: none"> • Various vessels to support Project activities (e.g. supply and stand-by, construction, light intervention, flowline laying, geotechnical/seismic/seabed/environmental surveys, ice management) • Helicopter support 	<ul style="list-style-type: none"> • 17 to 25 years • Starting in 2020
Supporting Surveys and Activities	<ul style="list-style-type: none"> • Geophysical, geohazard, wellsite and seabed surveys • Seismic surveys • Vertical seismic profiling (VSP) surveys. • Environmental surveys • Geotechnical surveys • Remotely operated vehicle (ROV) and/or autonomous underwater vehicle (AUV) surveys 	<ul style="list-style-type: none"> • Ongoing throughout life of Project • Occurring sporadically for short periods of time (e.g. 5 to 25 days)
Decommissioning	<ul style="list-style-type: none"> • Well decommissioning • Removing the production ship • Removing subsea infrastructure. • Only one decommissioning phase – either at end of BdN activity or at end of future development 	<ul style="list-style-type: none"> • 2 to 4 years • To occur at end of Project life

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Potential Future Development	<ul style="list-style-type: none"> All activities associated with the previously discussed Project phases 	<ul style="list-style-type: none"> Extension of Project life to 30 years total Estimated to occur between 2035 and 2055
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Table 2. Other Projects and Activities Considered in the Cumulative Effects Assessment

Project/Activity	Overview
Hibernia Oilfield	<ul style="list-style-type: none"> Distance from Core BdN Development Area – 213 km Distance from Project Area – 157 km Production activities at this oilfield are planned to extend throughout the temporal duration of the BdN Project
Terra Nova Oilfield	<ul style="list-style-type: none"> Distance from Core BdN Development Area – 217 km Distance from Project Area – 166 km Production activities at this oilfield are planned to extend throughout the temporal duration of the BdN Project
White Rose Oilfield and Extension Project	<ul style="list-style-type: none"> Distance from BdN Development Area – km Distance from Project Area – 118 km Production activities at this oilfield are planned to extend throughout the temporal duration of the BdN Project
Hebron Oilfield	<ul style="list-style-type: none"> Distance from BdN Development Area – 212 km Distance from Project Area – 160 km Production activities at this oilfield are planned to extend throughout the temporal duration of the BdN Project
Offshore Petroleum Exploration –Geophysical and Other Exploration Activities	<ul style="list-style-type: none"> Offshore geophysical survey programs are often planned and conducted to get an overall understanding of regional geology and hydrocarbon potential, and to help identify sites or zones that may warrant further investigation For general illustration, over the period 2014 to 2017, approximately 1.8 million km of geophysical survey data (including 2D, 3D, side-scan sonar, multibeam, sub-bottom profiling, gravity and magnetic data, and controlled-source electromagnetic data) was collected in the Eastern Newfoundland offshore region and approximately 160,000 km of geophysical survey data was collected in the Jeanne d’Arc Basin It is likely that geophysical and other exploration activities will extend throughout the temporal duration of the BdN Project
Offshore Petroleum Exploration – Drilling	<ul style="list-style-type: none"> The Eastern Newfoundland offshore area is subject to on-going and planned future exploration drilling programs which were in progress, subject to EA review, or recently approved as of the time of writing As of September 1, 2018, a total of 456 wells had been drilled in the Canada-NL Offshore Area, including 171 exploration wells, 57 delineation wells, and 239 development wells. Over the three-year period of September 1, 2015 to September 1, 2018, 48 wells were drilled (or re-entered) in the Eastern Newfoundland and Jeanne d’Arc Basin C-NLOPB land tenure areas, including 9 exploration and/or delineation wells It is likely that exploration drilling programs will extend throughout the temporal duration of the BdN Project
Fishing Activity	<ul style="list-style-type: none"> Commercial fisheries within and around the Project are extensive and diverse Fishing activity will extend throughout the temporal duration of the BdN Project
Other Marine Vessel Traffic	<ul style="list-style-type: none"> This includes tanker traffic and supply vessels associated with the existing offshore oil developments, as well as cargo ships, cruise ships, other commercial and recreational vessels, naval vessels, and DFO research survey vessels Other marine vessel traffic activity will extend throughout the temporal duration the BdN Project
Hunting Activity	<ul style="list-style-type: none"> Wildlife (especially seabird) populations off NL are subject to hunting activity Although little or no hunting activity is expected to occur in the far offshore locations that comprise the Core BdN Development Area and Project Area, these activities do affect the bird and seal populations that occur in, and move to and through, the region Hunting activity will extend throughout the temporal duration of the BdN Project

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Table 3a. Atmospheric Environment

Environmental Interaction	Project Phase						Potential Environmental Effects	Proposed Mitigation Measures*
	Install and HUC	Production	Drilling	Supply and Servicing	Surveys	Decomm.		
<p>Combustion of fuel:</p> <ul style="list-style-type: none"> Vessels associated with installation/HUC, standby/support, crude offloading, surveys and decommissioning Helicopters Diesel engines or gas turbines on production ship (to be decided) Diesel engines on the drilling rig Relocation of production ship during decommissioning 	x	x	x	x	x	x	<ul style="list-style-type: none"> Changes in background concentration of air contaminants including NO₂, CO, PM_{2.5}, PM₁₀, SO₂, TPM, HCs and VOCs Greenhouse gases released to the atmosphere (e.g. CO₂, CH₄, N₂O) 	<ul style="list-style-type: none"> Use of energy efficient equipment Waste heat from engine/turbine exhaust will be used to heat systems on the production ship Air emissions will meet federal, provincial and international regulatory requirements, and the National Ambient Air Quality Objectives will be used as the benchmark for assessing air quality Sulphur content in diesel fuel for vessels will meet federal regulatory requirements
Flaring on the production ship		x					<ul style="list-style-type: none"> Changes in background concentration of air contaminants including NO₂, CO, PM_{2.5}, PM₁₀, SO₂, TPM, HCs and VOCs Greenhouse gases released to the atmosphere (e.g. CO₂, CH₄, N₂O) 	<ul style="list-style-type: none"> No flaring during routine operations and excess gas will be re-injected into the reservoir. Equinor Canada is evaluating flare pilot options – pilot flare vs pilotless flare. Use of high efficiency burners when flaring is required. Well clean-up activities will be done to the production ship; however, the option is available to flare from the drilling rig during well clean-up and/or well flow testing.
Formation flow test(s) on the drilling rig			x				<ul style="list-style-type: none"> Changes in background concentration of air contaminants including NO₂, CO, PM_{2.5}, PM₁₀, SO₂, TPM, HCs and VOCs Greenhouse gases released to the atmosphere (e.g. CO₂, CH₄, N₂O) 	<ul style="list-style-type: none"> It is anticipated that only 1 formation flow test would be required. Preferred option is to complete formation flow test without flaring (depends on C-NLOPB data requirements). Use of high efficiency burners when flaring is required.
<p>Cumulative Effects</p> <ul style="list-style-type: none"> Offshore production facilities are located at distances greater than 100 km, and therefore cumulative effects on the atmospheric environment are not anticipated Activities such as geophysical surveys, exploration drilling and fishing may overlap with the Project Area, however, it will be on a short-term basis 	x	x	x	x	x	x	<ul style="list-style-type: none"> Potential environmental effects outlined above are applicable to cumulative effects (e.g. changes in background concentration of air contaminants, greenhouse gases released to the atmosphere) 	<ul style="list-style-type: none"> Mitigation measures outlined above are intended to avoid or reduce the potential effects of the Project, and therefore the Project's contribution to cumulative effects.

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Environmental Interaction	Project Phase						Potential Environmental Effects	Proposed Mitigation Measures*
	Install and HUC	Production	Drilling	Supply and Servicing	Surveys	Decomm.		
Indigenous Peoples								
Potential health and socioeconomic effects	x	x	x	x	x	x	<ul style="list-style-type: none"> No predicted interaction 	<ul style="list-style-type: none"> None required due to no predicted interaction
Physical and cultural heritage	x	x	x	x	x	x	<ul style="list-style-type: none"> No predicted interaction 	<ul style="list-style-type: none"> None required due to no predicted interaction
Current use of land and resources for traditional purposes	x	x	x	x	x	x	<ul style="list-style-type: none"> No predicted interaction 	<ul style="list-style-type: none"> None required due to no predicted interaction

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Table 3b. Atmospheric Environment – Feedback on Interactions and Mitigation Measures

Feedback on Interactions and Mitigation Measures

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Table 4a. Valued Component – Marine Fish and Fish Habitat (including Species at Risk)

Environmental Interaction	Project Phase						Potential Environmental Effects	Proposed Mitigation Measures	
	Install and HUC	Production	Drilling	Supply and Servicing	Surveys	Decomm.			
Changes to seabed habitat: <ul style="list-style-type: none"> • Site preparation • Installation of subsea infrastructure and protection measures • Decommissioning of subsea infrastructure and protection measures 	x						x	<ul style="list-style-type: none"> • Water quality (e.g. reduced visibility) • Behavioural change (e.g. temporary avoidance and feeding behaviour) • Sedimentation and/or burial of benthic species • Presence of subsea infrastructure and protection measures may locally increase habitat 	<ul style="list-style-type: none"> • Final layout design will take into consideration coral/sponge survey data • May include relocation of subsea infrastructure and/or subsea templates
Underwater sound generated: <ul style="list-style-type: none"> • Use of vessels for installation/HUC, standby/support, crude offloading and surveys • Production ship • Drilling rig • Supporting surveys (e.g. geohazard/wellsite, environmental, geotechnical/geological, VSP, ROV/AUV, etc.) • Decommissioning 	x	x	x	x	x		x	<ul style="list-style-type: none"> • Behavioural change (e.g. temporary avoidance of the area by mobile fish and invertebrate species, masking communication) 	<ul style="list-style-type: none"> • No mitigation measures are proposed
Underwater sound generated during seismic surveys					x			<ul style="list-style-type: none"> • Physical and/or behavioural effects to fish (e.g. scare fish, fish move out of the area) • Reduction in zooplankton, which are an important food source for fish and benthic species • Some fish/invertebrates have life stages in the planktonic phase 	<ul style="list-style-type: none"> • Comply with applicable mitigation measures outlined in DFO's Statement of Canadian Practice with respect to the Mitigation of Seismic Sound in the Marine Environment (SOCP): <ul style="list-style-type: none"> ◦ Ramp-up of the sound source will occur over a minimum time period of 20 minutes
Presence of production ship and drilling rig may create temporary refuge for fish and invertebrates		x	x					<ul style="list-style-type: none"> • May increase shelter and food, which in turn may increase distribution of benthic species 	<ul style="list-style-type: none"> • Potential positive effect, therefore mitigation measures not proposed
Lighting of production ship, drilling rig, vessels and flaring during production	x	x	x	x	x		x	<ul style="list-style-type: none"> • Creation of a "reef effect" – fish may aggregate underneath in response to increase foraging and shelter opportunities 	<ul style="list-style-type: none"> • Reduced lighting subject to worker and operational safety.

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Environmental Interaction	Project Phase						Potential Environmental Effects	Proposed Mitigation Measures
	Install and HUC	Production	Drilling	Supply and Servicing	Surveys	Decomm.		
							<ul style="list-style-type: none"> Evaluation of lighting reduction options (e.g. shading, use of spectral lighting, avoiding use of unnecessary lighting, and directional lighting). 	
Produced water discharge from the production ship		X					<ul style="list-style-type: none"> Changes in water quality Uptake of hydrocarbons and chemicals contained in produced water discharge Small plume of higher temperature water at discharge location 	<ul style="list-style-type: none"> Base case is to treat produced water using best treatment practices that are commercially available and economically feasible and discharge to marine environment. The design of the production ship will incorporate produced water re-injection (PWRI) system. The production ship will maintain the flexibility to treat and discharge to the marine environment if the PWRI system is unavailable. Treated produced water and cooling water will be combined prior to discharge, and samples will be collected prior to combining.
Discharges to the marine environment: <ul style="list-style-type: none"> Cooling water from the production ship and drilling rig Deck drainage, bilge and ballast water from production ship, drilling rig, vessels Testing and maintenance fluids from the production ship Sewage and food waste from the production ship, drilling rig and vessels Desalination brine from the production ship 	X	X	X	X	X		<ul style="list-style-type: none"> Changes in water quality Seawater intake may result in entrainment of marine organisms Organic enrichment of areas (sewage and food waste) Introduction of aquatic invasive species (ballast water) 	<ul style="list-style-type: none"> Use best treatment practices that are commercially available and economically feasible. Treat operational discharges prior to release (e.g. Offshore Waste Treatment Guidelines, federal regulations). Screen chemicals that may be discharged to the marine environment (e.g. Offshore Chemical Selection Guidelines). Appropriate handling, storage, transportation, and on-shore disposal of solid and hazardous waste. Sewage and grey water will be treated prior to discharge (e.g. Offshore Waste Treatment Guidelines, federal regulations). Ballast water will be managed in consideration of applicable Canadian and international ballast water management requirements to reduce the potential spread of invasive species.
Discharging drill cuttings			X				<ul style="list-style-type: none"> Sedimentation and/or burial of benthic species Contamination of seabed sediments 	<ul style="list-style-type: none"> Use best treatment practices for drill cuttings that are commercially available and economically feasible.

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Environmental Interaction	Project Phase						Potential Environmental Effects	Proposed Mitigation Measures
	Install and HUC	Production	Drilling	Supply and Servicing	Surveys	Decomm.		
								<ul style="list-style-type: none"> Synthetic-based mud-related drill cuttings will be returned to the drilling rig and treated prior to release and water-based mud-related cuttings will be discharged without treatment (e.g. Offshore Waste Treatment Guidelines). Determine if a subsea cuttings transport system is required.
Accidental events	x	x	x	x	x	x	<ul style="list-style-type: none"> Reduction in plankton and microbes, which are an important food source for fish and benthic species Some fish/invertebrates have life stages in the planktonic phase Hydrocarbon uptake by fish and invertebrates Synthetic based mud spill may result in smothering benthic species, chemical toxicity, and uptake 	<ul style="list-style-type: none"> Risk management proactively incorporated into the design, construction and operation stages of the Project Implementation of spill prevention measures in all Project activities. Develop and implement an Oil Spill Response Plan Training programs (e.g. emergency response procedure, deploying spill response equipment, oil spill surveillance and monitoring, oil and wildlife sampling procedures, etc.). Spill and emergency response drills/exercise at local and global levels: <ul style="list-style-type: none"> Regular exercises between vessels, drilling rig, production ship, onshore support teams and regulatory agencies. Annual spill response equipment deployment exercise near St. John's, NL, and in conjunction with other offshore operators. Spill reporting (e.g. internal and external).
Cumulative Effects <ul style="list-style-type: none"> Offshore production facilities are located at distances greater than 100 km, and therefore cumulative effects on marine fish and fish habitat are not anticipated Activities such as geophysical surveys, exploration drilling and fishing may overlap with the Project Area, however, it will be on a short-term basis 	x	x	x	x	x	x	<ul style="list-style-type: none"> Potential environmental effects outlined above are applicable to cumulative effects (e.g. sound, light emissions, discharges, interaction with benthic environment) 	<ul style="list-style-type: none"> Mitigation measures outlined above are intended to avoid or reduce the potential effects of the Project, and therefore the Project's contribution to cumulative effects.

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Environmental Interaction	Project Phase						Potential Environmental Effects	Proposed Mitigation Measures
	Install and HUC	Production	Drilling	Supply and Servicing	Surveys	Decomm.		
Indigenous Peoples								
Potential health and socioeconomic effects	X	X	X	X	X	X	<ul style="list-style-type: none"> Changes to marine habitat and associated impacts on quantity, quality and availability of fish species Potential adverse impact on FSC and commercial-communal licensed activities (both routine operations and accidental events) Reduced access to/availability of traditional foods – food security Potential contamination of fish species (accidental events) and associated adverse impacts on human health Psycho-social impact of accidental events causing loss of confidence in traditional foods 	
Physical and cultural heritage	X	X	X	X	X	X		
Current use of land and resources for traditional purposes	X	X	X	X	X	X	<ul style="list-style-type: none"> Potential reduction in availability, sufficiency of resources required to engage in traditional activities (e.g. harvesting, cultural events) Potential adverse impact on species of cultural importance affecting transmission of Indigenous Knowledge 	

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Table 4b. Feedback on Interactions and Mitigation Measures – Marine Fish and Fish Habitat (including Species at Risk)

Feedback on Interactions and Mitigation Measures

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Table 5a. Valued Component – Marine and Migratory Birds (including Species at Risk)

Environmental Interaction	Project Phase						Potential Environmental Effects	Proposed Mitigation Measures
	Install and HUC	Production	Drilling	Supply and Servicing	Surveys	Decomm.		
Lighting: production ship, drilling rig and vessels	x	x	x	x	x	x	<ul style="list-style-type: none"> Attraction of birds to lighting could result in possible injury or mortality (e.g. strikes, strandings, disorientation) 	<ul style="list-style-type: none"> Reduced lighting subject to worker and operational safety. Evaluation of lighting reduction options (e.g. shading, use of spectral lighting, avoiding use of unnecessary lighting, and directional lighting). Routine searches by trained personnel for stranded birds on the production ship, drilling rig and supply vessels. An annual Seabird Handling Permit will be obtained from Canadian Wildlife Service. An annual report will be submitted to Canadian Wildlife Service. Equinor Canada is evaluating the use of bird deterrent technology on the production ship.
Flaring on the production ship		x					<ul style="list-style-type: none"> Attraction of birds to light and/or heat from flaring activities could result in possible injury or mortality 	<ul style="list-style-type: none"> No flaring during routine operations and excess gas will be re-injected into the reservoir. Equinor Canada is evaluating flare pilot options – pilot flare vs pilotless flare.
Sound generated from surveys (e.g. geohazard, seabed, seismic).					x		<ul style="list-style-type: none"> Exposure to noise within the water column may cause injury to birds (particularly diving birds), or disruptions to or changes to, their distributions and behaviours 	<ul style="list-style-type: none"> Ramp-up of the sound source will occur over a minimum time period of 20 minutes
Discharging produced water from the production ship.		x					<ul style="list-style-type: none"> Produced water may form sheen on water during calm conditions Changes in water quality 	<ul style="list-style-type: none"> Base case is to treat produced water using best treatment practices that are commercially available and economically feasible and discharge to marine environment. The design of the production ship will incorporate produced water re-injection (PWRI) system. The production ship will maintain the flexibility to treat and discharge to the marine environment if the PWRI system is unavailable.

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Environmental Interaction	Project Phase						Potential Environmental Effects	Proposed Mitigation Measures
	Install and HUC	Production	Drilling	Supply and Servicing	Surveys	Decomm.		
								<ul style="list-style-type: none"> Treated produced water and cooling water will be combined prior to discharge, and samples will be collected prior to combining.
Discharges to the marine environment: <ul style="list-style-type: none"> Deck drainage, bilge and ballast water from production ship, vessels and drilling rig and vessels Testing and maintenance fluids from the production ship Sewage and food waste from the production ship, drilling rig and vessels 	X	X	X	X	X		<ul style="list-style-type: none"> Changes in water quality May enhance local food supply for birds (sewage and food waste), however, may also increase predator species 	<ul style="list-style-type: none"> Use best treatment practices that are commercially available and economically feasible. Treat operational discharges prior to release (e.g. Offshore Waste Treatment Guidelines, federal regulations). Screen chemicals that may be discharged to the marine environment (e.g. Offshore Chemical Selection Guidelines). Appropriate handling, storage, transportation, and on-shore disposal of solid and hazardous waste. Sewage and grey water will be treated prior to discharge (e.g. Offshore Waste Treatment Guidelines, federal regulations).
Helicopter and vessel transit to/from the production ship and/or drilling rig	X	X	X	X	X	X	<ul style="list-style-type: none"> Temporary loss of useable habitat and increased energy expenditure of birds to escape reactions, increased heart rate, and lower food intake due to interruptions Disturbance to nesting colonies Behaviour effects (e.g. flushing of breeding birds from the nest, foraging and provisioning rates) 	<ul style="list-style-type: none"> There is no critical habitat (per Species at Risk Act) identified within the Project Area. Helicopter flight paths and supply vessel transit routes will avoid passing within 300 m of established migratory bird nesting colonies during the nesting period as per provincial regulatory requirements, and federal guidelines.
Presence of production ship, drilling rig and vessels	X	X	X	X	X	X	<ul style="list-style-type: none"> Avoidance due to sensory disturbance Creation of new foraging opportunities for predator species from “artificial reef” effect Create new habitat for roosting and resting 	<ul style="list-style-type: none"> Equinor Canada is evaluating the use of bird deterrent technology on the production ship
Accidental Events	X	X	X	X	X	X	<ul style="list-style-type: none"> Direct physical exposure of birds to oil within the affected area Oil may also affect habitat and food sources 	<ul style="list-style-type: none"> Risk management proactively incorporated into the design, construction and operation stages of the Project, including spill prevention and response. Implementation of spill prevention measures in all Project activities.

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Environmental Interaction	Project Phase						Potential Environmental Effects	Proposed Mitigation Measures
	Install and HUC	Production	Drilling	Supply and Servicing	Surveys	Decomm.		
								<ul style="list-style-type: none"> • Develop and implement an Oil Spill Response Plan. • Training programs (e.g. emergency response procedure, deploying spill response equipment, oil spill surveillance and monitoring, oil and wildlife sampling procedures, seabird observation, etc.). • Spill and emergency response drills/exercise at local and global levels: <ul style="list-style-type: none"> ○ Regular exercises between vessels, drilling rig, production ship, onshore support teams and regulatory agencies. ○ Annual spill response equipment deployment exercise near St. John's, NL, and in conjunction with other offshore operators. • Spill reporting (e.g. internal and external).
Cumulative Effects <ul style="list-style-type: none"> • Offshore production facilities are the located at distances greater than 100 km, and therefore cumulative effects on the migratory and marine birds are not anticipated • Activities such as geophysical surveys, exploration drilling and fishing may overlap with the Project Area, however, it will be on a short-term basis 	x	x	x	x	x	x	<ul style="list-style-type: none"> • Potential environmental effects outlined above are applicable to cumulative effects (e.g. light emissions, discharges, flaring) 	<ul style="list-style-type: none"> • Mitigation measures outlined above are intended to avoid or reduce the potential effects of the Project, and therefore the Project's contribution to cumulative effects.
Indigenous Peoples								
Potential health and socioeconomic effects	x	x	x	x	x	x	<ul style="list-style-type: none"> • Potential for disturbance of nesting sites or injury or mortality events affecting availability of resource for food, social, ceremonial purposes • Potential adverse impacts on health due to decline in food resources – food security 	
Physical and cultural heritage	x	x	x	x	x	x		

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Environmental Interaction	Project Phase						Potential Environmental Effects	Proposed Mitigation Measures
	Install and HUC	Production	Drilling	Supply and Servicing	Surveys	Decomm.		
Current use of land and resources for traditional purposes	x	x	x	x	x	x	<ul style="list-style-type: none"> • Potential reduction in availability, sufficiency of marine and migratory bird resources required to engage in traditional activities (e.g. harvesting, cultural events) • Potential adverse impact on species of cultural importance affecting transmission of Indigenous Knowledge 	

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Table 5b. Feedback on Interactions and Mitigation Measures – Marine and Migratory Birds (including Species at Risk)

Feedback on Interactions and Mitigation Measures

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Table 6a. Valued Component – Marine Mammals and Sea Turtles (including Species at Risk)

Environmental Interaction	Project Phase						Potential Environmental Effects	Proposed Mitigation Measures
	Install and HUC	Production	Drilling	Supply and Servicing	Surveys	Decomm.		
Underwater sound generated: <ul style="list-style-type: none"> • Use of vessels for installation/HUC, standby/support, crude offloading and surveys • Production ship • Drilling rig • Decommissioning 	x	x	x	x	x	x	<ul style="list-style-type: none"> • May result in physical effects (e.g. hearing impairment) • May result in behavioural changes (e.g. avoidance, reduced communication) • May result reduced food sources due to scaring/movement of fish to same sound • Unlikely to result in physical (e.g. hearing impairment) or behavioural changes (e.g. masked communication) 	<ul style="list-style-type: none"> • Underwater sound generated during these activities is temporary. Sound is lower compared to seismic surveys, and unlikely to cause physical effects • No mitigation measures are proposed.
Underwater sound generated during surveys (i.e. geohazard/wellsite, seabed, environmental, geotechnical/geological).					x		<ul style="list-style-type: none"> • Physical effects (e.g. temporary reduction in hearing sensitivity, hearing impairment) • Behaviour effects (e.g. changes in behaviour and distribution, masked communication) • Closer line spacing, smaller equipment with lower sound levels and occur over a shorter time compared to a seismic survey • Unlikely to result in physical (e.g. hearing impairment) or behavioural changes (e.g. masked communication) 	<ul style="list-style-type: none"> • Underwater sound generated during these activities temporary. Sound is lower compared to seismic surveys, and unlikely to cause physical effects • No mitigation measures are proposed
Underwater sound generated during VSP and seismic surveys					x		<ul style="list-style-type: none"> • Physical effects (e.g. temporary reduction in hearing sensitivity, hearing impairment) • Behaviour effects (e.g. changes in behaviour and distribution, masked communication) 	<ul style="list-style-type: none"> • Mitigation measures outlined in DFO's Statement of Canadian Practice with respect to the Mitigation of Seismic Sound in the Marine Environment (SOCP): <ul style="list-style-type: none"> ○ Marine mammal and sea turtle observers (MMOs) (seismic surveys only) ○ Ramp-up of the sound source will occur over a minimum time period of 20 minutes ○ MMOs will implement a pre-ramp up watch of 60 minutes prior to ramp-up (seismic surveys only) ○ Ramp-up will be delayed if any marine mammal or sea turtle is detected within the 500 m safety zone around sound source ○ Shut down of the sound source if a endangered or threatened marine mammal or sea turtle listed as endangered or threatened is detected within the 500 m safety zone around the sound source

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Vessel traffic	x	x	x	x	x	x	<ul style="list-style-type: none"> Physical contact with a vessel during transit, which could cause injury or mortality 	<ul style="list-style-type: none"> There is no critical habitat (per Species at Risk Act) identified within the Project Area. In the unlikely event of a collision with a marine mammal or sea turtle, Equinor Canada will contact DFO.
Discharging produced water from the production ship.		x					<ul style="list-style-type: none"> Uptake of hydrocarbons and chemicals contained in discharges Changes in water quality 	<ul style="list-style-type: none"> Base case is to treat produced water using best treatment practices that are commercially available and economically feasible and discharge to marine environment. The design of the production ship will incorporate produced water re-injection (PWRI) system. The production ship will maintain the flexibility to treat and discharge to the marine environment if the PWRI system is unavailable. Treated produced water and cooling water will be combined prior to discharge, and samples will be collected prior to combining.
Discharges to the marine environment: <ul style="list-style-type: none"> Production chemicals from the production ship Deck drainage, bilge and ballast water from production ship, vessels and drilling rig Testing and maintenance fluids from the production ship Sewage and food waste from the production ship, drilling rig and vessels 	x	x	x	x	x		<ul style="list-style-type: none"> Changes in water quality Introduction of aquatic invasive species (ballast water) Seawater intake may result in entrainment of marine organisms Organic enrichment of areas (sewage and food waste) 	<ul style="list-style-type: none"> Use best treatment practices that are commercially available and economically feasible. Treat operational discharges prior to release (e.g. Offshore Waste Treatment Guidelines, federal regulations). Screen chemicals that may be discharged to the marine environment (e.g. Offshore Chemical Selection Guidelines). Appropriate handling, storage, transportation, and on-shore disposal of solid and hazardous waste. Sewage and grey water will be treated prior to discharge (e.g. Offshore Waste Treatment Guidelines, federal regulations). Ballast water will be managed in consideration of applicable Canadian and international ballast water management requirements to reduce the potential spread of invasive species.
Accidental Events		x	x				<ul style="list-style-type: none"> Direct physical exposure to oil within the affected area Oil may also affect habitat and food sources or result in the consumption of contaminated prey Reduction in plankton and microbes, which are an important food source 	<ul style="list-style-type: none"> Risk management proactively incorporated into the design, construction and operation stages of the Project, including spill prevention and response. Develop and implement an Oil Spill Response Plan. Training programs (e.g. emergency response procedure, deploying spill response equipment, oil spill surveillance and monitoring, oil and wildlife sampling procedures, etc.).

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									<ul style="list-style-type: none"> Spill and emergency response drills/exercise at local and global levels: <ul style="list-style-type: none"> Regular exercises between vessels, drilling installation, production ship, onshore support teams and regulatory agencies. Annual spill response equipment deployment exercise near St. John's, NL, and in conjunction with other offshore operators. Spill reporting (e.g. internal and external).
Cumulative Effects <ul style="list-style-type: none"> Offshore production facilities are located at distances greater than 100 km, however, underwater sound is anticipated to be minor due to separation distances Activities such as geophysical surveys, exploration drilling and fishing may overlap with the Project Area, however, it will be on a short-term basis 	x	x	x	x	x	x	<ul style="list-style-type: none"> Potential environmental effects outlined above are applicable to cumulative effects (e.g. sound, discharges, vessel traffic) 	<ul style="list-style-type: none"> Mitigation measures outlined above are intended to avoid or reduce the potential effects of the Project, and therefore the Project's contribution to cumulative effects. 	
Indigenous Peoples									
Potential health and socioeconomic effects	x	x	x	x	x	x	<ul style="list-style-type: none"> Potential adverse impacts on marine mammal food resources (due to accidental events) and associated adverse impacts on human health 		
Physical and cultural heritage	x	x	x	x	x	x	<ul style="list-style-type: none"> 		
Current use of land and resources for traditional purposes	x	x	x	x	x	x	<ul style="list-style-type: none"> Potential reduction in availability, sufficiency of marine mammals/sea turtle resources required to engage in traditional activities (e.g. harvesting, cultural events and practices) Potential adverse impact on species of cultural importance affecting transmission of Indigenous Knowledge 		

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Table 6b. Feedback on Interactions and Mitigation Measures – Marine Mammals and Sea Turtles (including Species at Risk)

Feedback on Interactions and Mitigation Measures

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Table 7a. Valued Component – Special Areas

Environmental Interaction	Project Phase						Potential Environmental Effects	Proposed Mitigation Measures
	Install and HUC	Production	Drilling	Supply and Servicing	Surveys	Decomm.		
Changes to seabed habitat: <ul style="list-style-type: none"> • Site preparation • Installation of subsea infrastructure and protection measures • Decommissioning of subsea infrastructure and protection measures 	x					x	<ul style="list-style-type: none"> • Water quality (e.g. reduced visibility) • Behavioural change (e.g. temporary avoidance and feeding behaviour) • Sedimentation and/or burial of benthic species • Presence of subsea infrastructure and protection measures may locally increase habitat 	<ul style="list-style-type: none"> • Final layout design will take into consideration coral/sponge survey data • May include relocation of subsea infrastructure and/or subsea templates
Presence of production ship and drilling rig may create temporary refuge for fish and invertebrates		x	x				<ul style="list-style-type: none"> • May increase shelter and food, which in turn may increase distribution of benthic species 	<ul style="list-style-type: none"> • Potential positive effect, therefore mitigation measures not proposed
Produced water discharge from the production ship		x					<ul style="list-style-type: none"> • Changes in water quality • Uptake of hydrocarbons and chemicals contained in produced water discharge • Small plume of higher temperature water at discharge location 	<ul style="list-style-type: none"> • Base case is to treat produced water using best treatment practices that are commercially available and economically feasible and discharge to marine environment. • The design of the production ship will incorporate produced water re-injection (PWRI) system. • The production ship will maintain the flexibility to treat and discharge to the marine environment if the PWRI system is unavailable. • Treated produced water and cooling water will be combined prior to discharge, and samples will be collected prior to combining.
Discharges to the marine environment: <ul style="list-style-type: none"> • Cooling water from the production ship and drilling rig • Deck drainage, bilge and ballast water from production ship, drilling rig, vessels • Testing and maintenance fluids from the production ship • Sewage and food waste from the production ship, drilling rig and vessels • Desalination brine from the production ship 	x	x	x	x	x		<ul style="list-style-type: none"> • Changes in water quality • Seawater intake may result in entrainment of marine organisms • Organic enrichment of areas (sewage and food waste) • Introduction of aquatic invasive species (ballast water) 	<ul style="list-style-type: none"> • Use best treatment practices that are commercially available and economically feasible. • Treat operational discharges prior to release (e.g. Offshore Waste Treatment Guidelines, federal regulations). • Screen chemicals that may be discharged to the marine environment (e.g. Offshore Chemical Selection Guidelines). • Appropriate handling, storage, transportation, and on-shore disposal of solid and hazardous waste.

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Environmental Interaction	Project Phase						Potential Environmental Effects	Proposed Mitigation Measures
	Install and HUC	Production	Drilling	Supply and Servicing	Surveys	Decomm.		
								<ul style="list-style-type: none"> Sewage and grey water will be treated prior to discharge (e.g. Offshore Waste Treatment Guidelines, federal regulations). Ballast water will be managed in consideration of applicable Canadian and international ballast water management requirements to reduce the potential spread of invasive species.
Discharging drill cuttings			x				<ul style="list-style-type: none"> Sedimentation and/or burial of benthic species Contamination of seabed sediments 	<ul style="list-style-type: none"> Use best treatment practices for drill cuttings that are commercially available and economically feasible. Synthetic-based mud-related drill cuttings will be returned to the drilling rig and treated prior to release and water-based mud-related cuttings will be discharged without treatment (e.g. Offshore Waste Treatment Guidelines). Determine if a subsea cuttings transport system is required.
Accidental Events	x	x	x	x	x	x	<ul style="list-style-type: none"> Direct physical exposure of fish and fish habitat, marine and migratory birds, marine mammals and sea turtles to oil within the affected area Oil may also affect habitat and food sources or result in the consumption of contaminated prey Change in habitat quality due to oiling Reduction in plankton and microbes, which are an important food source for fish, benthic species and marine mammals. Some fish/invertebrates have life stages in the planktonic phase. Hydrocarbon uptake Synthetic based mud spill may result in smothering benthic species, chemical toxicity, and uptake 	<ul style="list-style-type: none"> Risk management proactively incorporated into the design, construction and operation stages of the Project Implementation of spill prevention measures in all Project activities. Develop and implement an Oil Spill Response Plan Training programs (e.g. emergency response procedure, deploying spill response equipment, oil spill surveillance and monitoring, oil and wildlife sampling procedures, etc.). Spill and emergency response drills/exercise at local and global levels: <ul style="list-style-type: none"> Regular exercises between vessels, drilling rig, production ship, onshore support teams and regulatory agencies. Annual spill response equipment deployment exercise near St. John's, NL, and in conjunction with other offshore operators. Spill reporting (e.g. internal and external).

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Environmental Interaction	Project Phase						Potential Environmental Effects	Proposed Mitigation Measures
	Install and HUC	Production	Drilling	Supply and Servicing	Surveys	Decomm.		
Cumulative Effects <ul style="list-style-type: none"> Offshore production facilities are located at distances greater than 100 km, and therefore cumulative effects on special areas is are not anticipated Activities such as geophysical surveys, exploration drilling and fishing may overlap with the Project Area, however, it will be on a short-term basis 	x	x	x	x	x	x	<ul style="list-style-type: none"> Potential environmental effects outlined above are applicable to cumulative effects (e.g. sound, light emissions, discharges, interaction with benthic environment) 	<ul style="list-style-type: none"> Mitigation measures outlined above are intended to avoid or reduce the potential effects of the Project, and therefore the Project's contribution to cumulative effects.
Indigenous Peoples								
Potential health and socioeconomic effects	x	x	x	x	x	x	<ul style="list-style-type: none"> Potential adverse impacts on marine habitat, fish, marine and migratory birds, sea turtles and prey species may reduce quantity, quality of traditional food resources – health and socio-economic impacts Potential adverse impacts on FSC and commercial-communal species – health and socio-economic impacts Psycho-social impacts of accidental events reducing confidence in and use of traditional foods – food security 	
Physical and cultural heritage	x	x	x	x	x	x		
Current use of land and resources for traditional purposes	x	x	x	x	x	x	<ul style="list-style-type: none"> Changes to quantity, quality, and availability of species of cultural importance, affecting sufficiency of resources required to engage in traditional activities Potential adverse impact on species of cultural importance affecting transmission of Indigenous Knowledge 	

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Table 7b. Special Areas – Feedback on Interactions and Mitigation Measures

Feedback on Interactions and Mitigation Measures

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Table 8a. Valued Component – Marine Fisheries and Other Ocean Users

Environmental Interaction	Project Phase						Potential Environmental Effects	Proposed Mitigation Measures
	Install and HUC	Production	Drilling	Supply and Servicing	Surveys	Decomm.		
Fishing gear, vessels and equipment	x	x	x	x	x	x	<ul style="list-style-type: none"> • Damage to fishing gear, vessels and equipment from Project activities • Economic effects 	<ul style="list-style-type: none"> • Establish a safety zone/exclusion zone in accordance with Canadian and international regulations and notify applicable regulatory authorities (e.g. add to marine navigational charts). • Determine whether trawl protection is required. • Develop and implement a compensation program for damages resulting from Project activities. • Implement a standard marine communication protocol. • Surveys outside the safety/exclusion zone will use a single point of contact. • Issue Notices to Shipping and Notices to Mariners (where appropriate).
Commercial fishing grounds	x	x	x	x	x	x	<ul style="list-style-type: none"> • Loss to access to important and established fishing grounds • Economic effects 	<ul style="list-style-type: none"> • Ongoing communication with commercial fishers. • Ongoing communications with the NAFO Secretariat, through DFO. • Determine need for a Fisheries Liaison Officer during drilling rig movement from NL port to its offshore location.
Biophysical effects on the presence, abundance, distribution and/or quality of marine fish species or other resources	x	x	x	x	x	x	<ul style="list-style-type: none"> • Economic effects 	<ul style="list-style-type: none"> • Refer to mitigation measures associated with Marine Fish and Fish Habitat, and specifically interactions associated with lighting and routine discharges to the marine environment.
Government and industry research programs	x	x	x	x	x	x	<ul style="list-style-type: none"> • Disturbance to implementing research programs, which will affect research results and associated management decisions 	<ul style="list-style-type: none"> • Ongoing communication with regulatory agencies (e.g. DFO research surveys, DND offshore military exercises).
Accidental Events	x	x	x	x	x	x	<ul style="list-style-type: none"> • Impede ability of fishers to harvest fish • Affects the biological health of commercial fish species • Reduction of marketability of commercial fish products • Damage to fishing vessels and gear • Direct economic effects if delays or closures to fishing occur 	<ul style="list-style-type: none"> • Develop and implement a compensation program for damages resulting from Project activities. • Risk management proactively incorporated into the design, construction and operation stages of the Project, including spill prevention and response. • Develop and implement an Oil Spill Response Plan.

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Environmental Interaction	Project Phase						Potential Environmental Effects	Proposed Mitigation Measures
	Install and HUC	Production	Drilling	Supply and Servicing	Surveys	Decomm.		
							<ul style="list-style-type: none"> Perception of contamination of commercial fish species, which may affect the price and volume of catch that harvesters can market Interference with marine research activities or offshore military exercises 	<ul style="list-style-type: none"> Training programs (e.g. emergency response procedure, deploying spill response equipment, oil spill surveillance and monitoring, oil and wildlife sampling procedures, etc.). Spill and emergency response drills/exercise at local and global levels: <ul style="list-style-type: none"> Regular exercises between vessels, drilling installation, production ship, onshore support teams and regulatory agencies. Annual spill response equipment deployment exercise near St. John's, NL, and in conjunction with other offshore operators. Spill reporting (e.g. internal and external).
Cumulative Effects <ul style="list-style-type: none"> Offshore production facilities are located at distances greater than 100 km, and therefore cumulative effects on marine fisheries and other ocean users is are not anticipated Activities such as geophysical surveys, exploration drilling and fishing may overlap with the Project Area, however, it will be on a short-term basis 	x	x	x	x	x	x	<ul style="list-style-type: none"> Potential environmental effects outlined above are applicable to cumulative effects 	<ul style="list-style-type: none"> Mitigation measures outlined above are intended to avoid or reduce the potential effects of the Project, and therefore the Project's contribution to cumulative effects.
Indigenous Peoples								
Potential health and socioeconomic effects	x	x	x	x	x	x	<ul style="list-style-type: none"> Potential socio-economic impacts of reduced access to resource/adverse impacts – interference with commercial-communal fishing activities Potential socio-economic impacts associated with reduction in quantity or quality of resource (decline in catch rates due to project activities and accidental events) Potential for gear damage or loss Potential adverse impacts on marketability of commercial species (accidental events) Reduction of marketability of commercial fish products 	<ul style="list-style-type: none"> Communication Plan Develop and implement a compensation program for damages resulting from Project activities.

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Environmental Interaction	Project Phase						Potential Environmental Effects	Proposed Mitigation Measures
	Install and HUC	Production	Drilling	Supply and Servicing	Surveys	Decomm.		
							<ul style="list-style-type: none"> • Damage to fishing vessels and gear • Direct economic effects if delays or closures to fishing occur • 	
Physical and cultural heritage	x	x	x	x	x	x		
Current use of land and resources for traditional purposes	x	x	x	x	x	x		

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Table 8b. Feedback on Interactions and Mitigation Measures – Marine Fisheries and Other Ocean Users

Feedback on Interactions and Mitigation Measures

Disclaimer: The information contained in these Worksheets is presented for discussion purposes only and may not reflect the final contents of the Environmental Impact Statement prepared for the Bay du Nord Development Project. In particular, the proposed mitigation measures set out in these worksheets represent a range of potential options/responses currently under consideration by Equinor Canada. They are not and should not be interpreted as the official position of Equinor Canada or as indicative of a preferred or decided course of action by Equinor Canada.

Table 9a. Effects of the Environment on the Project

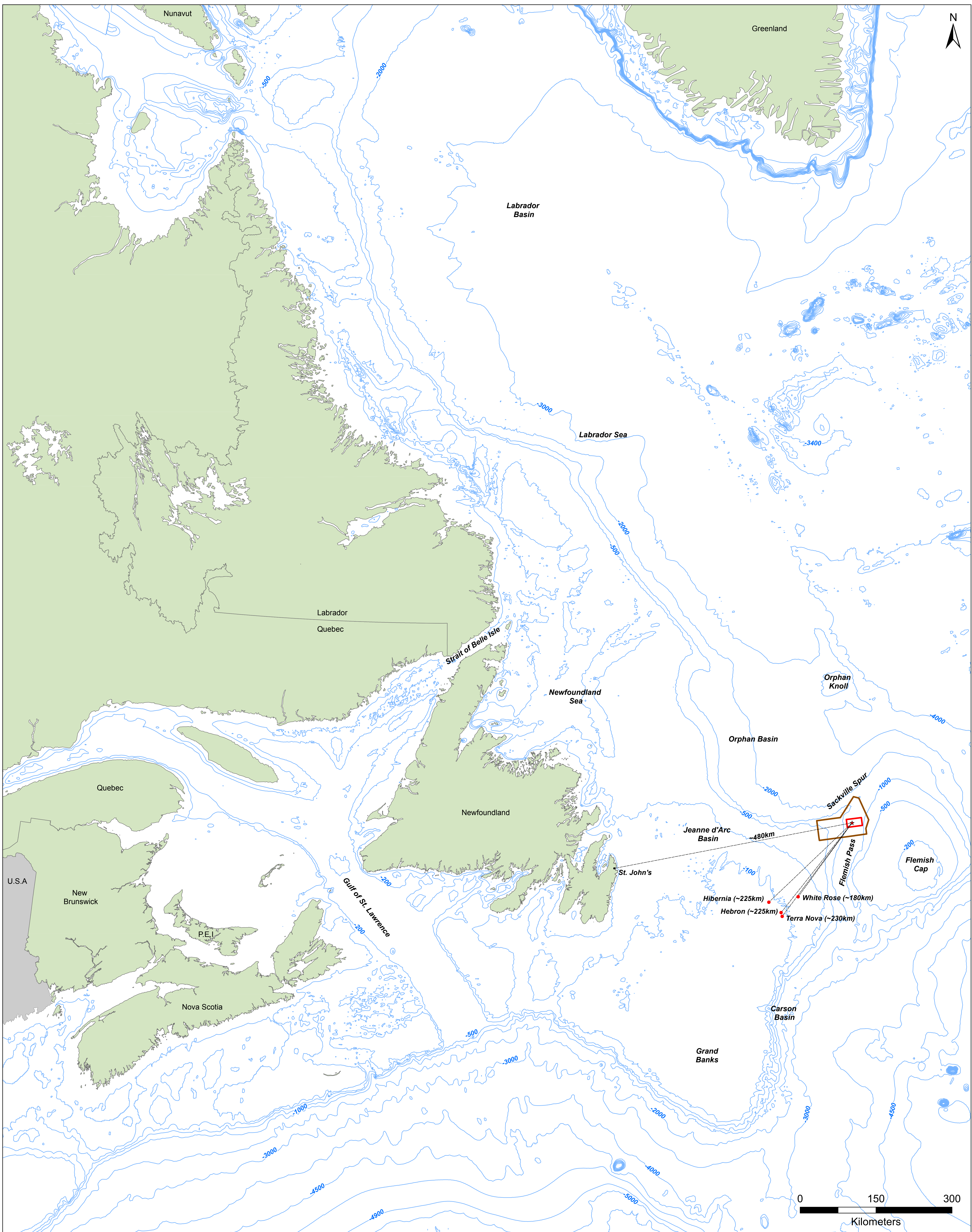
Environmental Interaction	Project Phase						Potential Environmental Effects	Proposed Mitigation Measures
	Install and HUC	Production	Drilling	Supply and Servicing	Surveys	Decomm.		
Seismicity and geohazards	x	x	x	x	x	x	<ul style="list-style-type: none"> Project Area has been classified as having a relatively low seismic hazard, however, if a seismic event occurred it could result in seafloor instability and disrupt Project equipment and activities Earthquakes significant enough to trigger submarine landslides or tsunamis have not occurred within 1,000 km of the Project Area (since the inception of the database in 1985) 	<ul style="list-style-type: none"> Design of the production ship (e.g. deep water, environmental conditions). Selection criteria for drilling rig, supply vessels and other vessels (e.g. deep water, environmental conditions). Obtain Certificate of Fitness for production ship, drilling rig and subsea infrastructure from C-NLOPB. Physical environment data observations, weather forecasting, and reporting will be conducted in consideration with the Offshore Physical Environmental Guidelines. Ability to quick disconnect production ship and/or drilling rig in event of an emergency. Implementation of an Ice Management Plan. Ability to suspend or modify operations due to weather or environmental conditions.
Climatology, weather and oceanographic conditions	x	x	x	x	x	x	<ul style="list-style-type: none"> Adverse weather and oceanographic conditions (e.g. high winds, large waves, other severe weather) can affect operations and pose risks to human health, safety and the environment 	
Sea ice and icebergs	x	x	x	x	x	x	<ul style="list-style-type: none"> Project Area is subject to seasonal intrusions of sea ice and icebergs and can pose significant risk to operations offshore NL 	

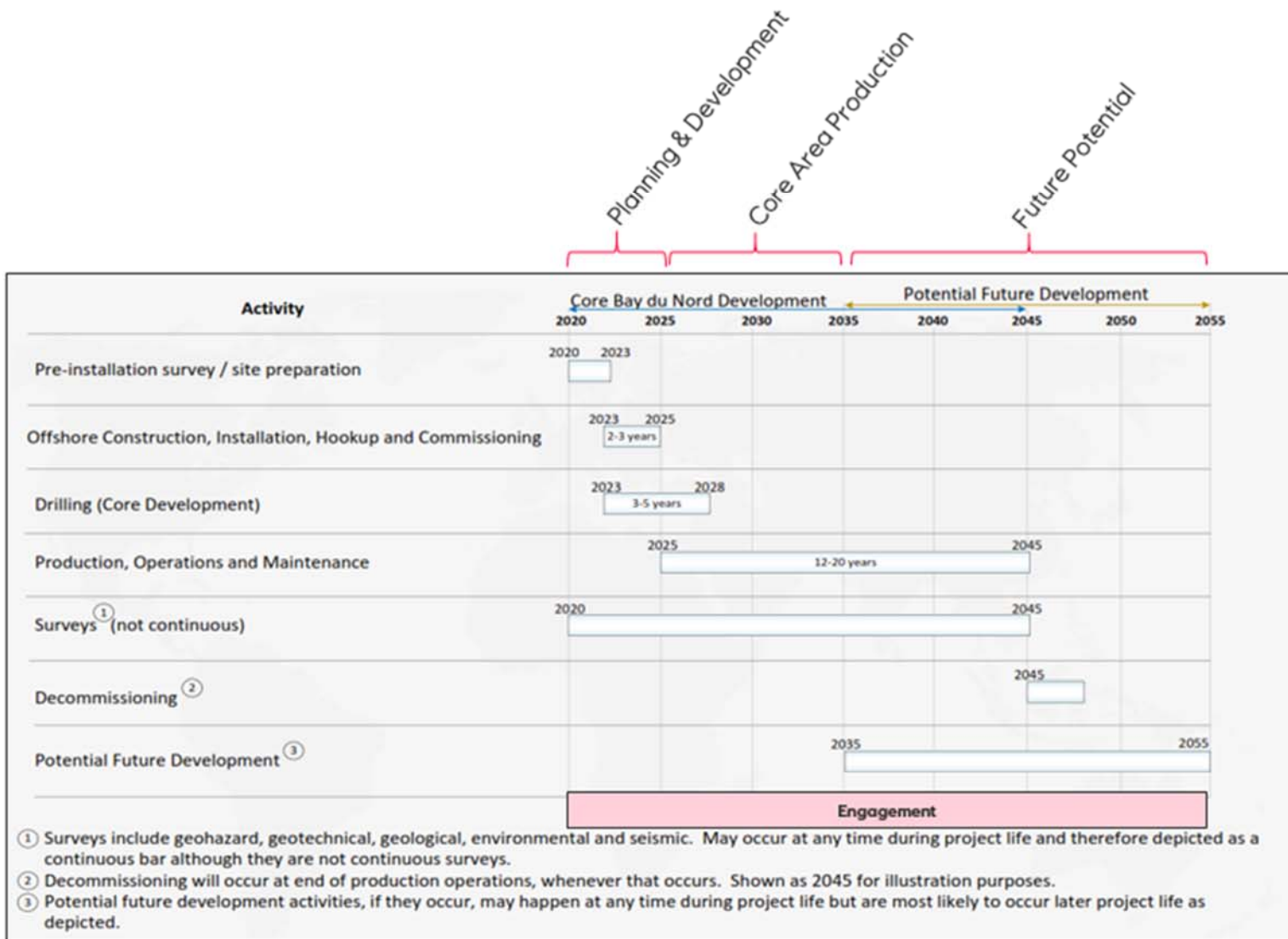
Disclaimer: The information contained in these Worksheets is presented for discussion purposes only and may not reflect the final contents of the Environmental Impact Statement prepared for the Bay du Nord Development Project. In particular, the proposed mitigation measures set out in these worksheets represent a range of potential options/responses currently under consideration by Equinor Canada. They are not and should not be interpreted as the official position of Equinor Canada or as indicative of a preferred or decided course of action by Equinor Canada.

Table 9b. Feedback on Interactions and Mitigation Measures – Effects of the Environment on the Project

Feedback on Interactions and Mitigation Measures

Disclaimer: The information contained in these Worksheets is presented for discussion purposes only and may not reflect the final contents of the Environmental Impact Statement prepared for the Bay du Nord Development Project. In particular, the proposed mitigation measures set out in these worksheets represent a range of potential options/responses currently under consideration by Equinor Canada. They are not and should not be interpreted as the official position of Equinor Canada or as indicative of a preferred or decided course of action by Equinor Canada.





Preliminary Project Schedule

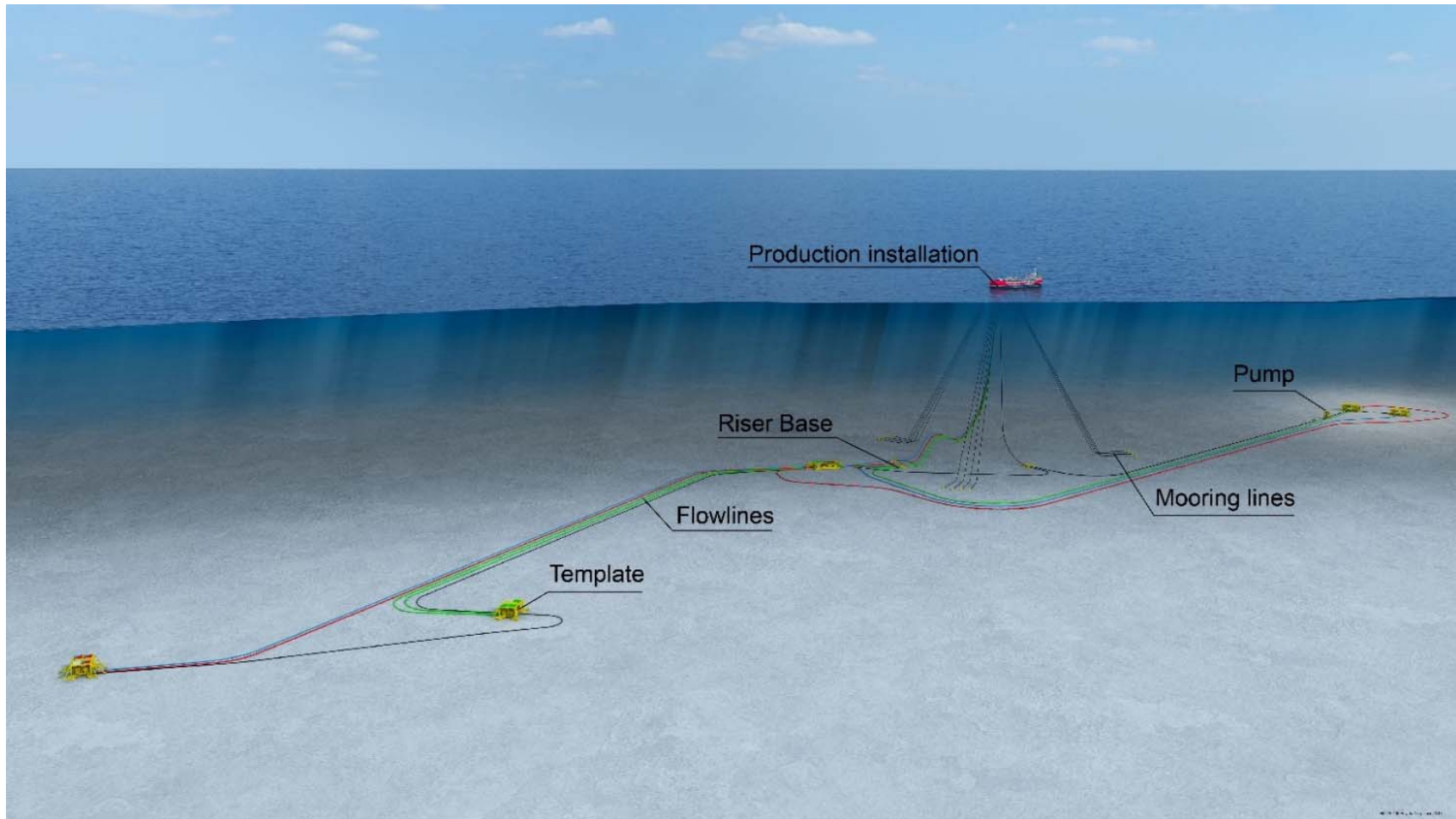
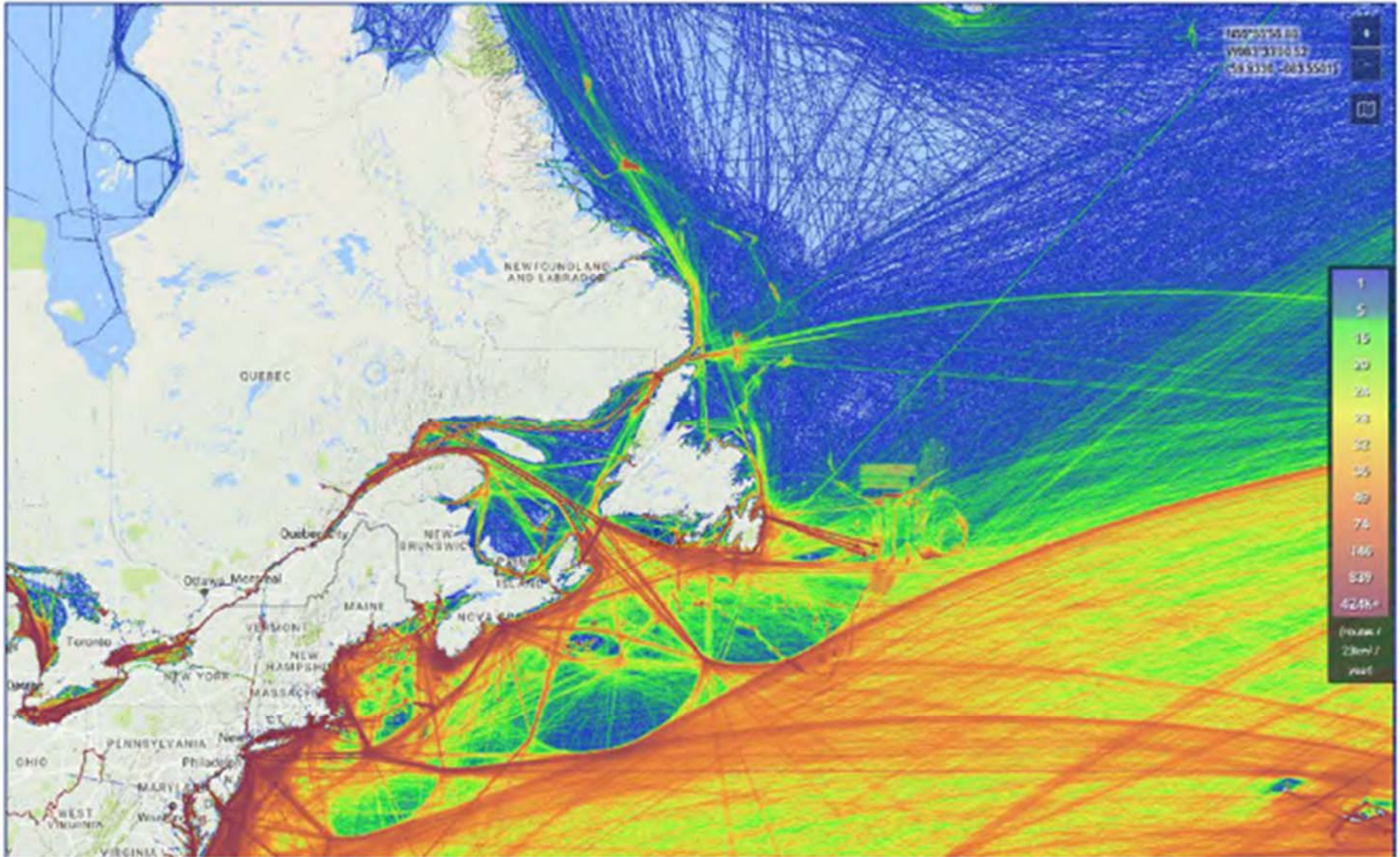
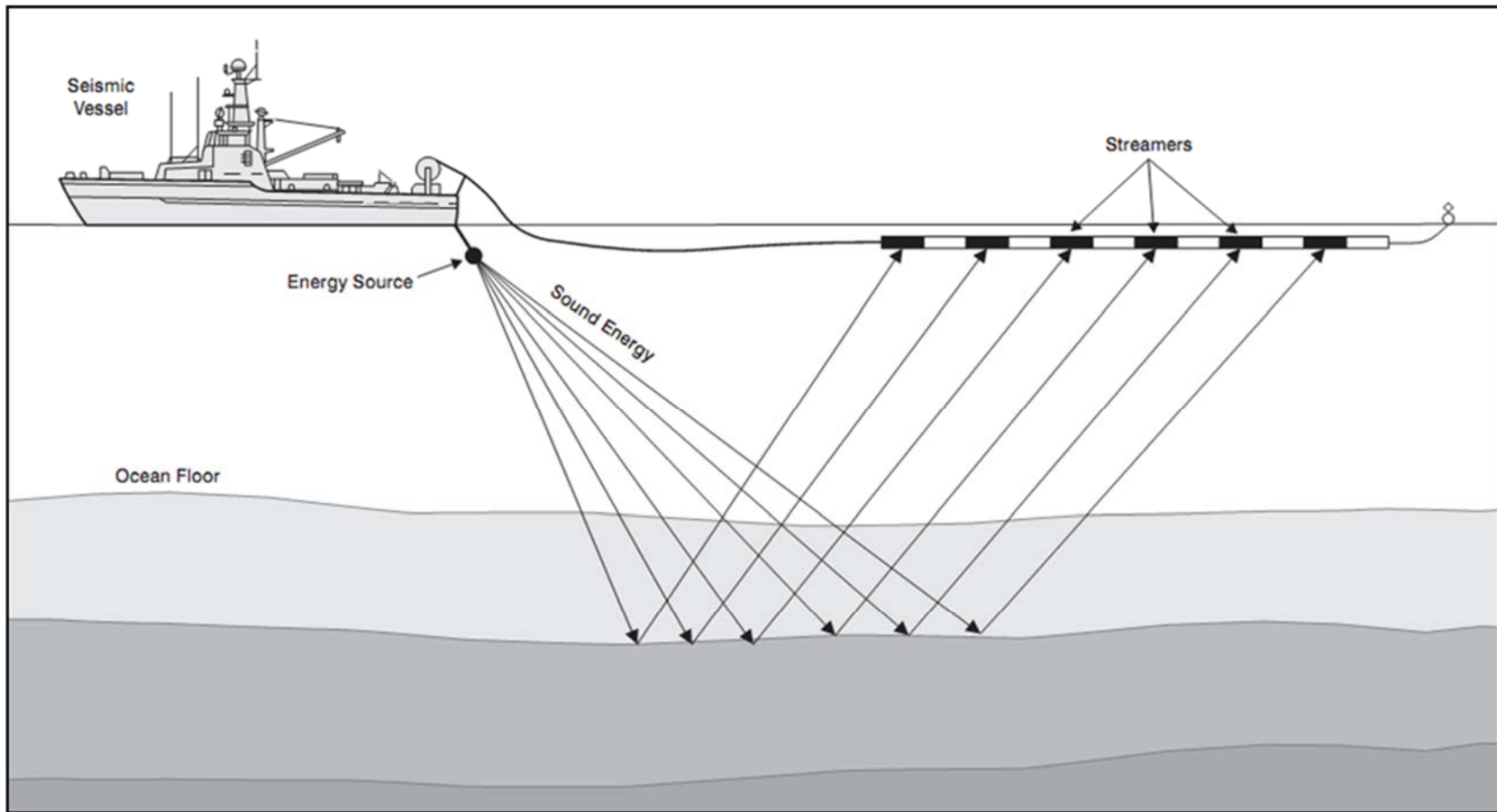


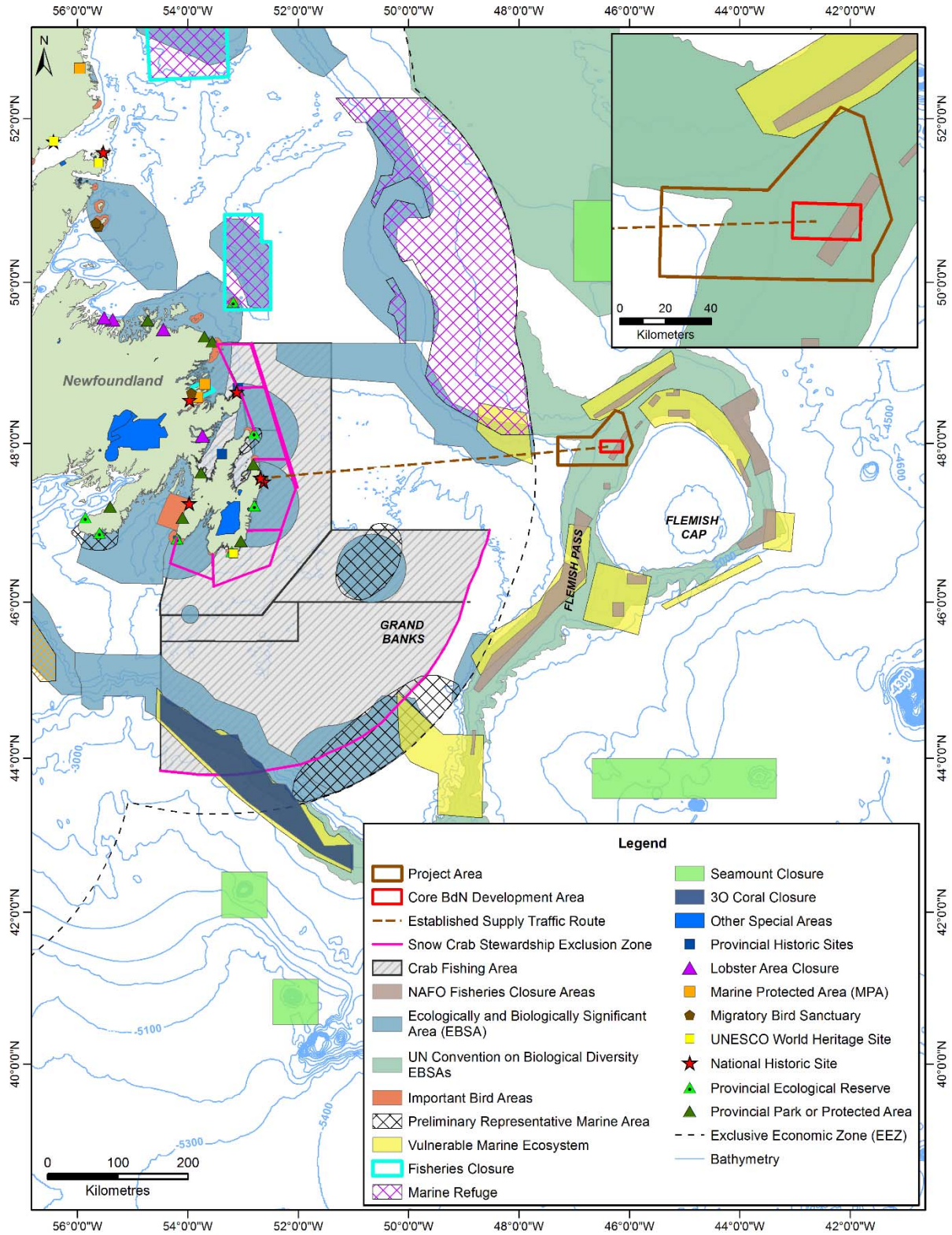
Illustration of a Typical Subsea Development - Representative of the Core Bay du Nord Development (Not to Scale)



International Shipping Lanes



Conceptual Illustration of a Typical Offshore Seismic Survey



Overview of Special Areas



**BAY DU NORD DEVELOPMENT PROJECT CEAR #80154
OCTOBER WORKSHOP REPORT**

December 14, 2018

Bay du Nord Development Project CEAR #80154 Report on October 2018 Workshops

Background

In mid-October, 2018, Equinor Canada (Equinor) held three ½ day workshops (the Workshops) specifically focussed on the potential environmental effects and proposed mitigation measures associated with the Bay du Nord Development Project, CEAR #80154 (the Project). The Workshops were held in St. John's, NL (October 11th), Quebec City, QC (October 16th) and Moncton, NB (October 19th). Each Workshop was immediately preceded by a 1-day session in the particular location held by 5 Operators (Nexen Energy ULC, BP Canada Energy Group ULC, Husky Oil Operations Ltd, ExxonMobil Canada Ltd and Equinor Canada) to discuss aspects of the various ongoing Exploration Drilling programs in the Flemish Pass and other areas in the offshore.

Each of the Indigenous groups listed in Bay du Nord Environmental Impact Statement Guidelines (the Guidelines) issued by the Canadian Environmental Assessment Agency on September 26, 2018 were invited to attend one Workshop in a convenient location. Representatives of the following Indigenous groups participated in the Workshops:

- Mi'gmawe'l Tplu'taqnn Incorporated
- Elsipogtog First Nation
- Wolastoqey Nation in New Brunswick
- Peskotomuhkati Nation at Skutik
- Mig'mawei Mawiomi Secretariat
- Première Nation des Innus de Nutashkuan
- Innu Nation
- Nunatsiavut Government
- NunatuKavut Community Council
- Miawpukek First Nation

In addition, Shared Value Solutions and The First Nations of Quebec and Labrador Sustainable Development Institute (FNQLSDI) also participated in the Workshops. A representative of CEAA attended each Workshop.

Approach and Methods

The Workshops were based on materials prepared by Equinor, including a power point presentation and individual worksheets. Each worksheet focussed on one of the following 7 Valued Components (VCs) identified in the Guidelines:

- Atmospheric Environment
- Marine Fish and Fish Habitat
- Marine and Migratory Birds
- Marine mammals and Sea Turtles
- Special Areas
- Marine Fisheries and other Ocean Users
- Effects of the Environment on the Project

The predicted environmental effects of each phase of the Project upon the specific VC and associated proposed mitigation measures as identified by Equinor were set out in the individual worksheets. All materials were translated into French. Materials used at the Workshop will be included in an appendix to the EIS.

Each Workshop began with the delivery of a brief power point presentation and video providing updated information on the Project and relevant regulatory processes. The remainder of the Workshop was devoted to a discussion of the worksheets. To facilitate this discussion, participants at the St. John's and Moncton Workshops were divided into breakout groups (3 – 4 individuals, including a representative of Equinor Canada) and each group was assigned 2 or 3 VCs for consideration. Breakout groups were asked to review the identified environmental effects and mitigation measures for accuracy and completeness, note any gaps and recommend additions and revisions. Groups were also invited to propose mitigation measures and strategies directed at identifying and addressing potential interactions with Indigenous groups (specifically, impacts on rights, health and socio-economic conditions, culture and heritage and current use of land and resources for traditional purposes). Each group prepared a short report on its findings and recommendations which was then presented to the larger group for discussion. Due to the small number of participants in Quebec City, the potential effects and mitigation measures associated with VCs of particular interest were discussed by the group as a whole.

Since not all Indigenous groups were able to attend the Workshops, following the conclusion of the sessions, Equinor transmitted electronic copies of all workshop materials to each Indigenous group listed in the Guidelines together with an invitation to provide additional comments. Comments received in response to this invitation have been included in this Report.

The results of the Workshops have been summarized and consolidated into this Report (characterized as comments or recommendations). Comments and recommendations have not been attributed to any identified Workshop participant or Indigenous group but are organized by reference to VC and subject-matter. It is Equinor's intention to include the Workshop report as an Appendix to the EIS and comments and recommendations will be integrated into the relevant chapters of the EIS where appropriate.

Summary of Workshop Discussion

A. *General Comments*

Generally, the Workshop format was well received. However, participants who completed evaluation forms indicated that a full day workshop would be more effective and encourage a more robust discussion/consideration of materials. In addition, it was recommended that Workshop materials such as the Worksheets be circulated in advance to allow participants time to review. With respect to Workshop Materials, participants found the Project video and power point to be informative. The general content of the Worksheets was characterized as clear and helpful – however all participants indicated that most of the identified environmental interactions would be relevant during all phases of the Project. In addition, although not associated with any specific VC, participants expressed interest in learning more about Equinor and its global offshore activities, employment opportunities associated with the Bay du Nord project, studies undertaken by Equinor in support of the EIS and other regulatory processes applicable to Project approval. A general theme expressed by participants was the need for ongoing engagement with Indigenous groups and the value of collection and integration of Indigenous Knowledge into the EIS and generally throughout the EA process.

B. *Specific VC Comments*

The following sections set out the various comments/recommendations made by the representatives of the Indigenous Groups listed in the Guidelines who participated in the Workshops. These are organized by reference to specific VCs without attribution to named participants or groups. Where appropriate comments/recommendations have been further classified by reference to specific subject-matters. Responses provided by Equinor follow the specific comment.

1. VC - Atmospheric Environment

a. **Fuel combustion:**

- Comment: Will there be a commitment to BATA (Best Available Technology) in the EIS?
Equinor Response: Yes

- Comment: Will there be a commitment to minimize overall emissions?
Equinor Response: Yes
- Comment: Has Equinor considered diesel emissions and new BlueTec technology used by Mercedes Benz and others?
Equinor Response: Equinor will likely not propose that technology

b. Cumulative Effects

- Comment: Is it likely that seismic programs could affect salmon migration patterns?
Equinor Response: This is highly unlikely as disturbance will only be temporary.
- Recommendation: Equinor needs to take into account air emissions associated with implementation of provincial Advance 2030 Program.

c. Climate Change:

- Comment: What about the potential impact on climate change? How does this Project relate to Canada's global commitment to reduce GHGs? If the project proceeds, each barrel will have an indirect effect on GHG emissions.
Equinor Response: Equinor is committed to sustainable development and to low carbon. It is government's decision whether project will be permitted to proceed and consideration of contribution to climate change will be one criterion in making that determination.

d. Indigenous Peoples Interactions

- Recommendation: EIS should focus on the shoreline to determine potential interactions.
Equinor Response: EIS will consider interactions both in the Project Area and the RSA (which for Indigenous peoples includes the entirety of the Atlantic region).
- Comment: Groups are generally concerned with the potential impacts of atmospheric emissions on salmon, American eel and Right Whales.
Equinor Response: Potential effects upon these species will be considered in the EIS.
- Comment: If there are no stationary air monitoring stations, the ongoing effect of atmospheric conditions is unknown.
Equinor Response: Air emissions modelling undertaken for the EIS may provide insights.
- Comment: If there is a spill and in-situ burning and VOC evaporation occurs, will this have an effect on coastal communities?
Equinor Response: This will be considered in EIS.

2. VC - Marine and Migratory Birds

a. Lighting:

- **Recommendation:** EIS should elaborate on bird deterrent technology.
Equinor Response: Bird deterrent technology will be discussed in the EIS but Equinor does not plan to use Bird Deterrents during routine operations.
- **Recommendation:** There should be third party representatives for routine bird searches and monitoring programs.
- **Recommendation:** If lighting reductions are implemented, these should be compared to other offshore production facilities to determine their effectiveness.

b. Flaring:

- **Comment:** Are bird migration times and possible interactions with prey species factored into Project schedule?
Equinor Response: No, not for flaring as routine flaring will not be conducted.
- **Recommendation:** If pilot flare is selected, this should be incorporated into the Bird Observation Program.
Equinor Response: Yes, if a pilot flare is selected this will be considered in the design of the bird observation program.

c. Sound:

- **Comment:** Has CWS looked into the effect of seismic on diving birds?
Equinor Response: Equinor does not know whether CWS has done any research/investigation into this matter.

d. Produced Water Discharge:

- **Recommendation:** Equinor should commit to the Best Available Technology and Best Practices to deal with produced water.
Equinor Response: Equinor's commitment to best available technology and best practices generally will be discussed in the EIS.
- **Recommendation:** If a sheen is observed, Equinor should consider deploying booms.
- **Recommendation:** Equinor should consider the effect on sediment surface for materials that are originally liquid but may turn to solids and accumulate on the seabed.
- **Comment:** Are there any safety issues associated with breaking down H₂O (into hydrogen and oxygen) before discharging produced water?

e. Presence of Production Ship:

- Recommendation: If Bird Deterrents are used, they should be localized so as not to affect birds farther away.
Equinor Response: Equinor does not plan to use bird deterrents during routine operations.

f. Discharges to Marine Environment:

- Recommendation: Equinor should commit to best treatment practices.
Equinor Response: This will be discussed in the EIS.

g. Helicopter and Vessel Transit:

- Comment: Has Equinor considered timing restrictions to avoid interference during nesting period?

h. Accidental Events:

- Comment: The EIS should include the scenario involving spills from transiting vessels.
Equinor Response: This will be considered in the EIS.

i. Cumulative Effects:

- Recommendation: If a new, unanticipated production facility is planned within 100 km of the proposed Bay du Nord, it will need to be assessed.
- Recommendation: Equinor needs to take into account air emissions associated with implementation of provincial Advance 2030 Program.

j. Interactions with Indigenous Peoples:

- Recommendation: Ensure review process is implemented to confirm that processes are being followed.
Equinor Response: There will be an Environmental Effects Monitoring Program (EEM) designed for the Project.
- Recommendation: There should be communication with all Indigenous Groups in the event of a major spill.
Equinor Response: The EIS will address this matter.
- Recommendation: All groups should be involved in the development of a communication plan/protocol.
Equinor Response: The EIS will address this matter.

- Recommendation: If a major spill occurs, there should be local monitoring in coastal areas by relevant Indigenous Groups.
- Recommendation: Equinor should continue to stay on top of best practices and new technology throughout the life of the Project

3. VC - Marine Mammals and Sea Turtles

- Comment: What are the standard mitigations if marine mammals observed in area?
Equinor Response: Equinor will comply with all regulatory standards.
- Recommendation: There is a need for training of marine mammal observers and fisheries liaison officers.
- Comment: Can sound kill?
Equinor Response: Yes, but the potential adverse effects of sound on marine mammals and fish will be mitigated by ramp-up.
- Recommendation: The EIS needs to reflect the significance of marine mammals and seals to Indigenous groups – in particular, whales, walrus and seal are significant (Inuit) for food, social and ceremonial purposes.
Equinor Response: The EIS will take into account the cultural importance of identified marine mammals
- Recommendation: Vessel traffic needs to be addressed – develop mitigations applicable to encounters between vessels and marine mammals.
Equinor Response: The EIS will address this point.
- Recommendation: There is a need for continuous monitoring of discharges and for an onboard physical observer.
Equinor Response: Equinor will follow all relevant regulatory guidelines and submit regular compliance and monitoring reports to the C-NLOPB.
- Recommendation: There should be regular reporting to the communities. Equinor and communities should work together to develop a communications protocol.
Equinor Response: This will be considered in the EIS.
- Recommendation: EIS should take into account the cultural importance of right whales and seals.
Equinor Response: The EIS will take into account the cultural importance of identified marine mammals.

- Comment: There is a need for effective monitoring programs.
- Recommendation: there should be automatic sensors on platforms to detect the presence of migratory birds.
Equinor Response: Equinor is investigating the use of technology such as avian radar to monitor the presence of migratory birds.

4. VC - Marine Fish and Fish Habitat

a. General:

- Comment: Need to recognize the links (biological and otherwise) between the ocean and the St. Lawrence seaway and the importance of these links for understanding of Project impacts on marine mammals and fish.
- Comment: Need to understand that while there are species of traditional/cultural/spiritual importance to all groups (e.g. salmon), there are also species which are of commercial importance.
Equinor Response: The EIS will address this matter.
- Recommendation: Protect water at all costs – all sea creatures are important and must be protected.
- Comment: There is concern that the presence of the production ship and drill rig may create temporary habitat and attract invasive species.

b. Data:

- Comment: There are clear data gaps, so it is difficult to find answers to many concerns. It is important to take an ecosystem approach and to use the most up-to-date data.
- Recommendation: Equinor should support university/Indigenous groups in collection of data samples.

c. Oil Spill Response Plan:

- Recommendation: The Oil Spill Response Plan needs to factor in the human element.
Equinor Response: Equinor is committed to a culture of safety – all are encouraged to report safety violations and stop work in unsafe conditions without fear of reprisal. Equinor's goal is to prevent rather than to react to accidents so there will be extensive and regular training.

- **Recommendation:** There should be a local capping stack (e.g., along Canadian eastern seaboard) or Equinor should have its own capping stack specific to the Bay du Nord Project.
- **Comment:** Is the Oil Spill Response Plan subject to periodic review and updating?
Equinor Response: yes, the plan is subject to continuous review and revision where required.

d. Sponges and Coral:

- **Comment:** Will there be any new data collected by Equinor (specific to sponges and coral and benthic data) or will the EIS rely on existing data?
Equinor Response: A coral survey has recently been completed and the results will be included in the EIS. With respect to benthic data, Equinor will use existing data but will also collect new data before disturbing the seabed. There will also be follow-up and monitoring and Indigenous groups will be engaged to seek input on terms of follow-up.

e. Sound:

- **Recommendation:** A major concern is cumulative effects so need to work with other operators to gather data on effects of sound on fish and other species.
- **Recommendation:** Need for more data to understand impact of sound on salmon migration patterns.
- **Recommendation:** Need to collect data on impact of sound on all potentially affected species.
- **Recommendation:** To the extent possible, avoid critical times – migration and feeding times of salmon.

f. Accidental Events:

- **Comment:** What is the effect of dispersants on fish?
Equinor Response: The EIS will address this matter.
- **Recommendation:** Prey species (food source for salmon) should be tested for the presence of taint.
- **Comment:** Are any hazardous chemicals kept on board the FPSO or drill rig? If so, what are they used for? Equinor should provide a list of all on-board hazardous materials.

g. Cumulative Effects:

- Recommendation: Cumulative effects should be periodically assessed – recommend assessment in 5-year increments.
- Recommendation: Need for a global perspective on offshore development. Current EA process is deficient as project-focussed. While there are regional assessments ongoing or proposed for the offshore, these are deficient because they are limited to the offshore and do not consider impacts on potentially affected lands and waterways.
- Comment: The quality of cumulative effects assessment for fish and generally is problematic – just an add-on to Project-specific assessment.
- Comment: It is difficult to predict cumulative effects, particularly on salmon, due to data gaps.

h. Interactions with Indigenous Groups:

- Recommendation: Need for better data collection to determine baseline species health for those species harvested by Indigenous peoples (FSC and communal commercial). Current data is dated and has many gaps.
- Comment: Equinor needs to understand that fisheries is significant for the entire community – communal commercial fisheries do not benefit just the individual fisher but the entire community and revenues from communal commercial fisheries may be used to fund or supplement existing social programs in the community. As a result, any adverse impact on these species is experienced by entire community.
- Comment: Proponents need a better understanding of cultural, spiritual and traditional importance of certain species at the earliest stage in a project's design and planning. Traditional knowledge needs to be integrated into the EA process as soon as possible. Too often, traditional knowledge is not collected or considered until after the EIS has been submitted.
- Recommendation: There is a need for early and regular consultation with Indigenous groups to ensure their concerns and potential impacts on asserted and established rights are understood.
- Recommendation: Salmon is a species of critical importance so there should be a study on salmon.

- **Comment:** There is concern about potential contamination of fish from oil spill. This has a psycho-social impact which may result in loss of confidence in species. There may also be long-term socio-economic effects. Have there been any studies respecting long-term impacts of spills on fish?
Equinor Response: Equinor is aware of this concern and has conducted spill modelling to determine likely trajectory of spills and potential impacts on fish and marine life and habitat. Equinor has reviewed relevant studies and the EIS will contain a separate chapter on Accidental Events.
- **Comment:** With respect to physical and cultural heritage, Equinor needs to understand that current FSC species may not necessarily reflect what an Indigenous Group may choose to use in future. For example, crab was not necessary a traditional food stuff but is now consumed by younger generation.
- **Comment:** Indigenous groups maintain fishing licences overlapping/adjacent to the Project Area. Fish are harvested both commercially and as a source of traditional food. The potentially adverse effects from project activities could impact the use of these resources. Marine areas have been traditionally used by Mi'kmaq people as a source of medicinal plants and animals, food, and travel ways. There is also a cultural, spiritual and social importance of the Earth and its natural resources. Atlantic salmon are a species of special concern. They are important to the Mi'kmaq people historically, culturally, and for means of sustenance. The potential environmental effects as a result of activity in the project area may impact the migration patterns of this species.

5. VC - Marine Fisheries and other Ocean Users

a. Scope of Assessment:

- **Comment:** Is the assessment of commercial fisheries limited to the Project area or is it regional?
Equinor Response: The baseline will look at commercial fishing activities undertaken in or near the Project area. However, the assessment of impacts of the Project upon fish and fish habitat will consider both impacts from operations and accidental events so if an effect on species might have an indirect effect on communal commercial fishing outside the Project area that will be noted.
- **Comment:** Assessment should take into account the change in species distribution as this may affect fishing patterns – some communities noted invasive species such as striped bass which have adversely affected local commercial fisheries.

b. Mitigations:

- Comment: What are the main mitigations on adverse impacts on commercial fisheries?
Equinor Response: compensation guidelines and communications with fishers and marine users.

- Recommendation: Any compensation plan or guideline must address compensation reflective of the significance of affected species to Indigenous groups.

- Comment: There is a need for specificity as to how compensation is quantified. How do you quantify a cultural loss?

- Recommendation: Indigenous groups need to be involved in the development of compensation guidelines.

6. VC - Special Areas

- Recommendation: Figures should show NAFO divisions, crab area and vessel traffic.
Equinor Response: These figures will be included in the EIS.

- Recommendation: Equinor should try and obtain a list of all proposed MPAs from DFO to get some sense of what is important in the offshore area.
Equinor Response: Equinor will have access to all publicly available information re: MPAs and will consider this in the EIS.

- Comment: Have northern bottlenose whales been seen in or near the proposed Project area? If they have been seen in the area, it is important to identify the habitat as it tends to be specific. Perhaps DFO could supply this information. There is concern due to VSPs/seismic testing so that use of Passive Acoustic Monitoring may be required.

7. VC - Effects of the Environment on the Project

- Comment: How is sea icing on the FPSO handled?
Equinor Response (provided after the Workshop): In order for sea spray icing or atmospheric icing to occur, certain meteorological conditions (wind, humidity, precipitation, temperature) must be present. The FPSO is designed in accordance with recognized standards to handle certain extreme icing loads, including the buildup of ice, should it occur. Operating experience for other drilling and production facilities in the offshore area indicates that the observed icing is significantly less than allowed in the design of the facilities. However, if the meteorological conditions are present, visual monitoring for the buildup of icing will be carried out, and if required, the ice will be removed.