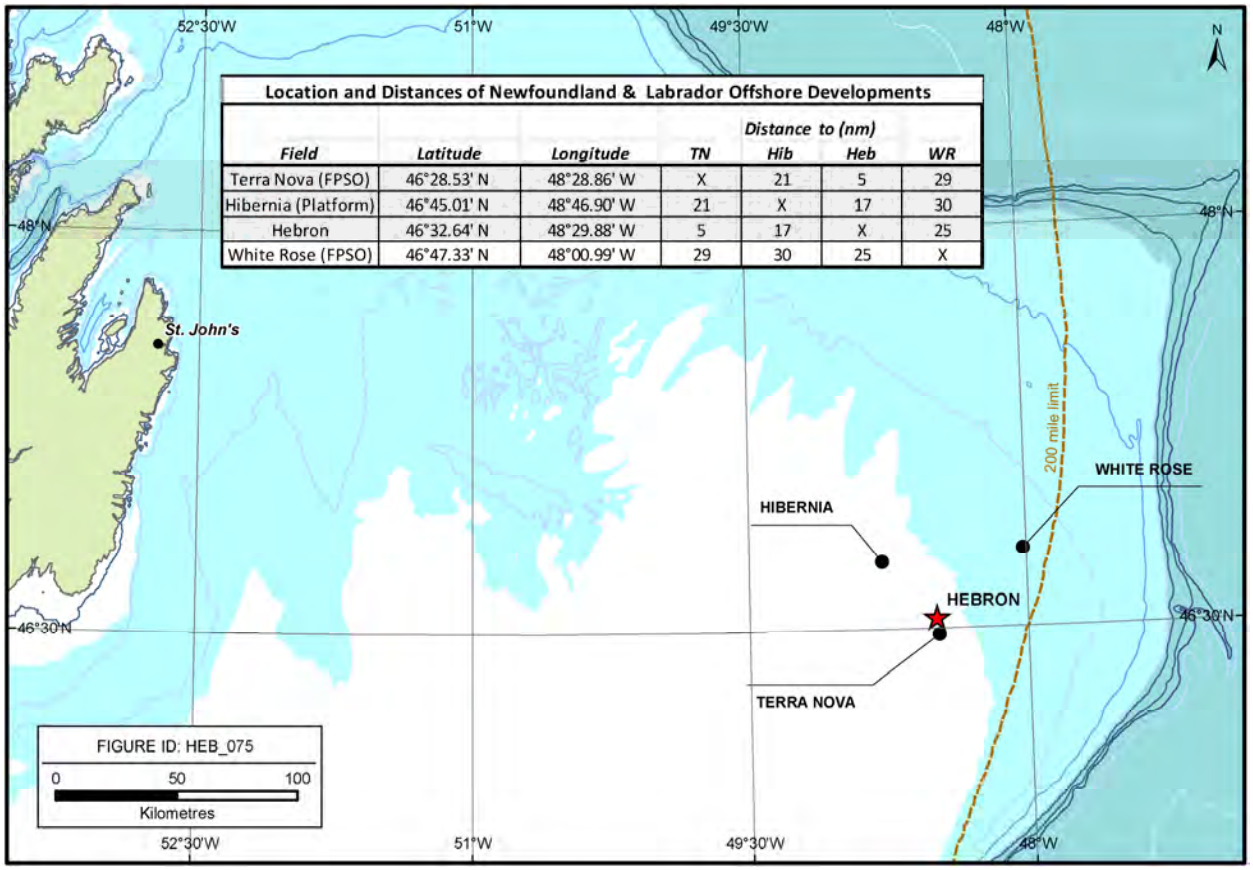
PROJECT OVERVIEW

The Hebron Project (the Project) is a proposed oil and gas development located offshore Newfoundland and Labrador, approximately 340 km east of St. John's. ExxonMobil Canada Properties (EMCP), as Operator, is leading development of the Project on behalf of the Hebron Project Proponents: ExxonMobil Canada Ltd.; Chevron Canada Limited; Petro-Canada Hebron Partnership through its managing partner Suncor Energy Inc. (Suncor); Statoil Canada Ltd.; and Nalcor Energy – Oil and Gas Inc.

The Hebron Platform will be situated approximately 9 km north of the Terra Nova Field, 32 km southeast of the Hibernia development and 46 km southwest of White Rose (Figure 1).



Location and Distances of Newfoundland & Labrador Offshore Developments

Field	Latitude	Longitude	Distance to (nm) TN	Hib	Heb	WR
Terra Nova (FPSO)	46°28.53' N	48°28.86' W	X	21	5	29
Hibernia (Platform)	46°45.01' N	48°46.90' W	21	X	17	30
Hebron	46°32.64' N	48°29.88' W	5	17	X	25
White Rose (FPSO)	46°47.33' N	48°00.99' W	29	30	25	X

Note: The distances in the inset table above are in nautical miles (1 nm = 1.85 km)

Figure 1 Location of the Hebron Field

The Hebron Project will be the fourth stand-alone development project on the Grand Banks and, considering the two tieback projects to the Hibernia and White Rose facilities, the sixth offshore petroleum project. If approved, the Hebron Project will extend the life of the offshore oil and gas industry in Newfoundland and Labrador. It represents an important next step in the development of a sustainable offshore oil and gas industry in Newfoundland and Labrador.

The intent is to develop the Hebron oil field using a concrete Gravity Base Structure (GBS) similar in concept to the existing Hibernia platform (Figure 2).

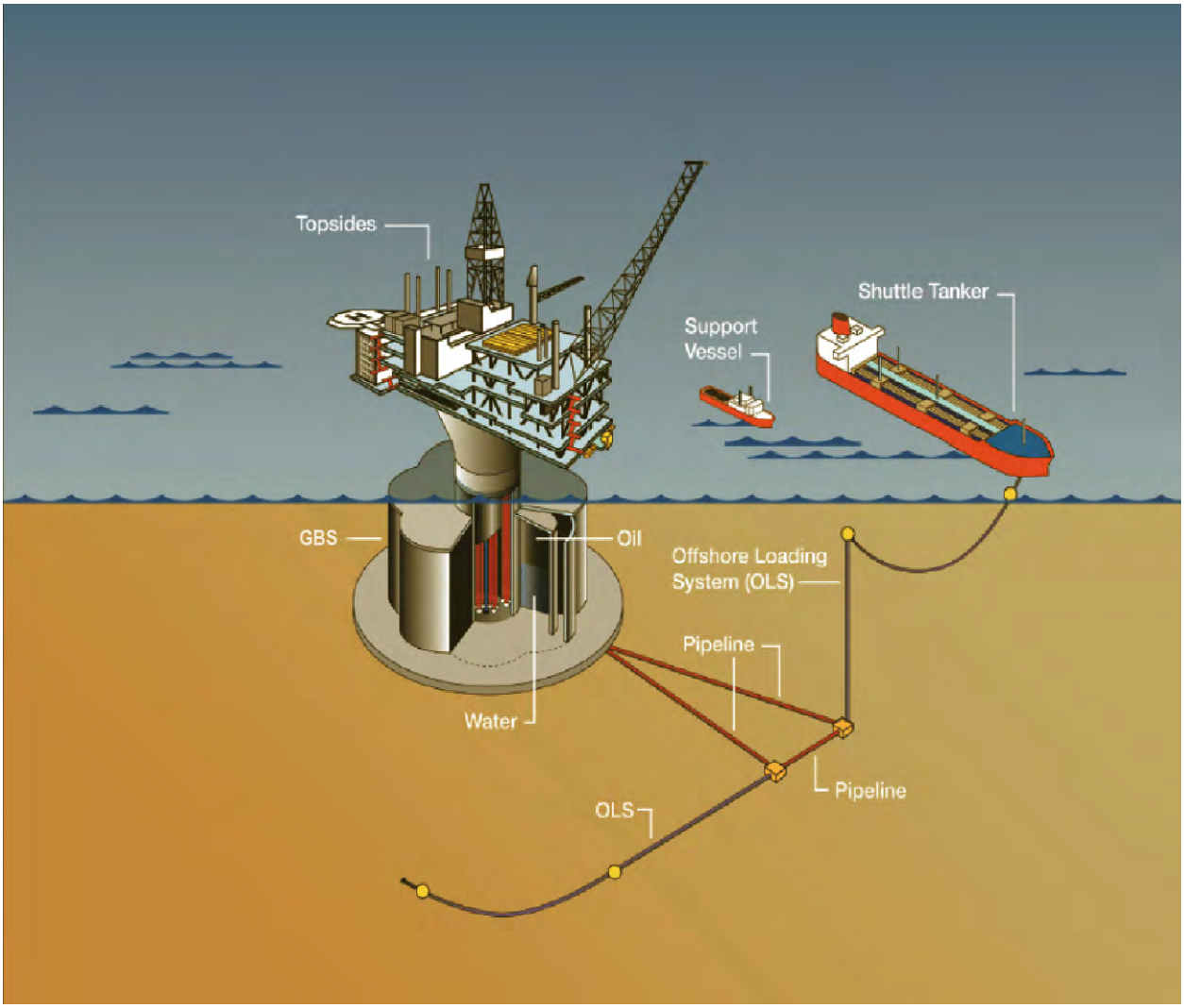


Figure 2 Stand-alone Gravity Base Structure Preliminary Development Layout

The GBS for the Hebron Project will be a reinforced concrete structure designed to withstand impacts from sea ice and icebergs and the meteorological and oceanographic conditions at the Hebron Field. It will accommodate up to 52 well slots with J-tubes inside the central shaft connected to the base of the GBS for potential future expansion. The GBS will be designed to store approximately 190,000 m^3 (1.2 Mbbl) of crude oil in multiple separate storage compartments. The currently planned Offshore Loading System (OLS) consists of two main offshore pipelines running from the GBS to separate riser bases (pipe line end manifolds) with an interconnecting offshore pipeline connecting the two pipe line end manifolds. The notional offloading rate of the system is 8,000 m^3/hr (50,300 bbl/hr).

The Topsides will hold the drilling support module, drilling equipment set, utilities and production module, flare boom and living quarters, including helideck and lifeboat stations. The Hebron production facilities will have the capacity to handle the predicted life-of-field production stream for 30 plus years. Based on the current initial development phase, it is expected the facility will be designed to accommodate an estimated production rate of 23,900 m^3/day of oil (150 kbd).

Construction activity is scheduled to begin at the existing site in Trinity Bay, the Nalcor Energy-Bull Arm Fabrication site, in 2011, with construction and fabrication continuing for approximately five years (at Bull Arm and other sites) and first oil targeted for 2017. Forecasted cumulative oil recovery for the initial development phase after 30 years of producing life ranges from 87 Mm^3 (548 MBO) to 140 Mm^3 (883 MBO) from an anticipated 41 wells. The Ben Nevis Pool within the Hebron Field is the core of the Hebron Project, and is anticipated to produce approximately 80 percent of the Hebron Project's crude oil.

PROJECT AREAS

Activities associated with the Hebron Project will occur in two distinct phases and Project Areas: the nearshore construction area at Bull Arm, Trinity Bay, for the GBS construction, Topsides assembly, installation and commissioning; and the offshore area on the Grand Banks, where the completed Hebron Platform will be installed and production of crude oil will occur.

NEARSHORE PROJECT AREA

The GBS will be constructed at the Bull Arm Facility, an existing fabrication facility owned by Nalcor Energy-Bull Arm Fabrication, with capabilities for steel and concrete construction, outfitting, fabrication, installation, at-shore hook-up and commissioning. The drydock site for GBS construction is situated at the Bull Arm Facility in Great Mosquito Cove (Figure 3).

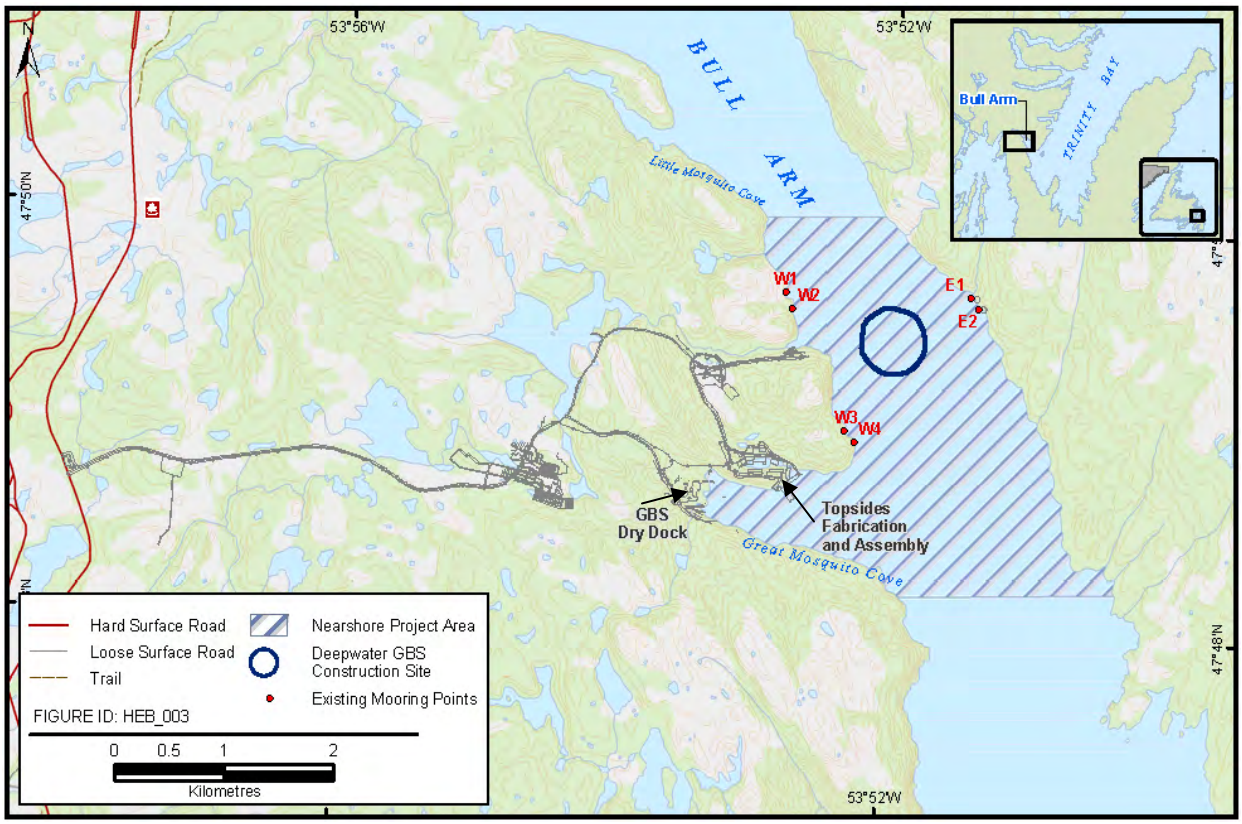


Figure 3 Nearshore Project Area

The current concept is to construct a rock-fill dike (or bund wall) with a centre impermeable core comprised of a cement slurry across the cove to form the wall of the basin; the drydock and immediate channel for towing the GBS out of Great Mosquito Cove may have to be enlarged. The pier in Back Cove, which is the site of the ferry terminal to transport workers to the GBS in the deepwater site, may require upgrading. After completion of the GBS base slab and lower caisson, the partially constructed GBS will be floated out of the drydock and towed to the deepwater site in Bull Arm itself, where it will be moored during final construction of the GBS. The requirement for additional moorings will be determined at the FEED stage. If additional moorings are required at the deepwater site, they will be constructed on land. Selected Topsides components will be fabricated at the Bull Arm fabrication facility; others will be fabricated offsite and will be transported to the Bull Arm fabrication facility for assembly. Following assembly and hook-up at the Topsides pier, the Topsides will be towed out to the deepwater site and mated with the GBS to form the Hebron Platform.

OFFSHORE PROJECT AREA

Once completed, the Hebron Platform will be towed offshore and installed at the Hebron Field (Figure 4). Offshore activities may include: site and clearance surveys; Platform commissioning and production operations; drilling of up to 52 wells from the Hebron Platform; construction, installation and operation of the OLS and tankers; supporting activities including remotely-operated vehicle surveys; and operation of support craft (*e.g.*, various vessels, and helicopters).

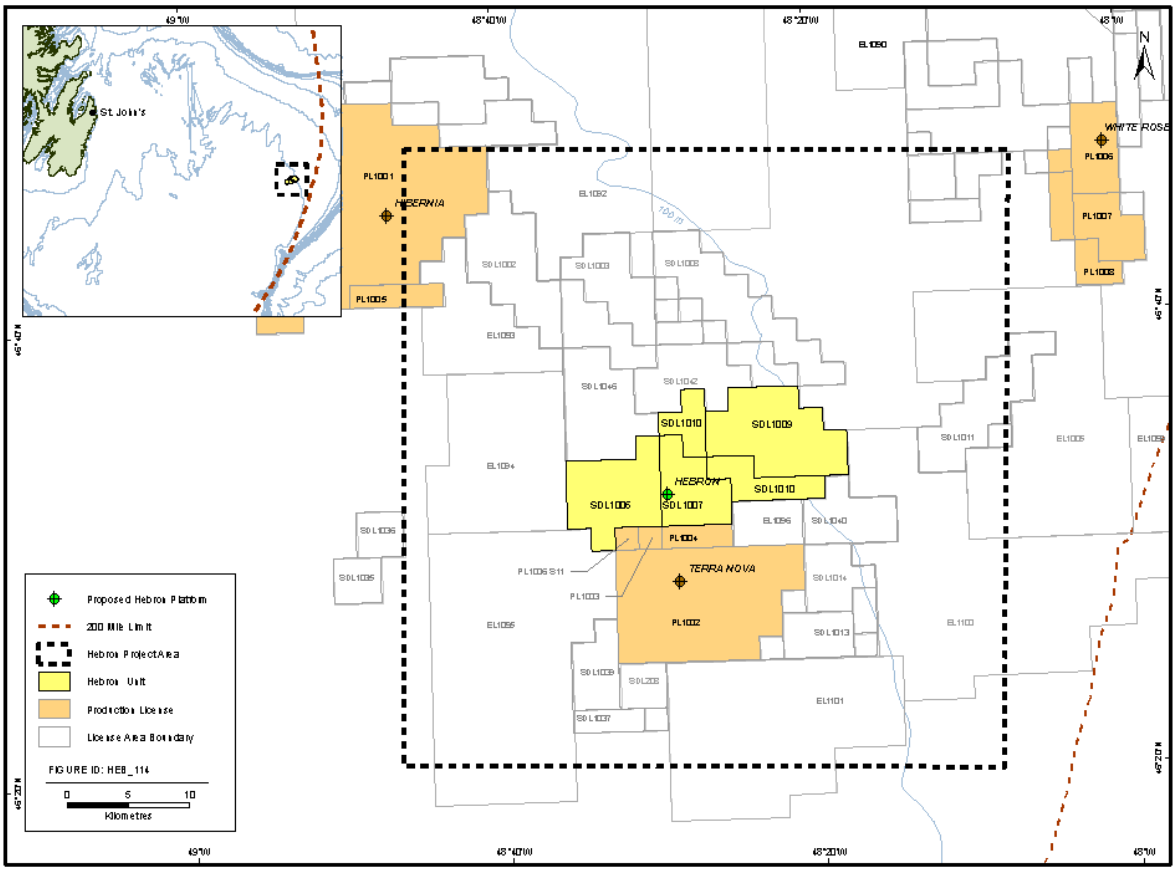


Figure 4 Hebron Offshore Project Area

Potential future developments, as part of the Hebron Project, include construction and installation of one or more excavated drill centres and subsea infrastructure, flowline installation and tieback to the Hebron Platform, as well as drilling activities by mobile offshore drilling units (MODUs). Potential modification of the Hebron Platform may also be required as well as the associated activities of environmental, geophysical and/or geotechnical surveys and support from vessels and helicopters.

ENVIRONMENTAL MANAGEMENT

EMCP, as operator of the Hebron Project, maintains a strong commitment to health, safety and environmental stewardship. The company conducts its business activities with a progressive approach and is committed to monitoring and continually improving its performance. Central to this commitment is a corporate Safety, Security, Health and Environment management system within the overall Operations Integrity Management System.

A Project-specific Environmental Management Plan will be developed for the Hebron Project based on detailed information and assessment of the Project. It will be supported by topic-specific plans such as a Waste Management Plan, Oil Spill Response Plan and Community Liaison Plan.

During construction, EMCP will implement an Environmental Protection Plan (EPP) for all activities at the Bull Arm Site. This EPP will be developed in consultation with regulators and area residents, in particular the commercial fish harvesters. The EPP will be approved by the Newfoundland and Labrador Department of Environment and Conservation and will be available to the public through the Department.

Offshore production activities are regulated pursuant to the *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) (Atlantic Accord Acts) and regulations prescribed thereunder and any guidelines provided by the C-NLOPB (*e.g.*, *Offshore Waste Treatment Guidelines* (OWTG) (National Energy Board (NEB) *et al.* 2010). The Hebron Project will develop and implement an EPP as per regulations issued under the *Accord Acts*.

ExxonMobil has a mature Operations Integrity Management System (OIMS) that emphasizes relentless attention to Safety and Environmental Protection, and is designed to minimize and mitigate accidental events from occurring. EMCP's emergency response philosophy is to minimize the impact of an emergency on people, environment and the corporation. Prior to commencement of drilling and production operations, EMCP will develop contingency plans that will serve as the guidelines for the company's response to an emergency at the Hebron Project. Contingency plans will be developed to address emergencies that will be identified in operations-specific hazard and risk analyses. The plans will outline the necessary procedures, personnel, equipment and logistics support required to respond to an emergency incident in a safe, prompt, and coordinated manner. The plans will be distributed to designated personnel who will be responsible for emergency response actions. The content of the plans will contain sufficient detail to enable personnel to respond in a coordinated and effective manner.

ENVIRONMENTAL ASSESSMENT

REGULATORY CONTEXT

Under the federal *Canadian Environmental Assessment Act*, the Hebron Project requires environmental assessment at a comprehensive study-level of assessment. The C-NLOPB and other federal Responsible Authorities have set out the required scope of this environmental assessment in a Scoping Document released in June 2009 (C-NLOPB *et al.* 2009). This Comprehensive Study Report (CSR) meets these requirements, as well as meeting the requirements of the C-NLOPB *Development Plan Guidelines* (C-NLOPB 2006).

CONSULTATION

EMCP recognizes the importance of communications with federal, provincial and municipal regulatory agencies, stakeholders and the public and accordingly, has conducted an extensive public and stakeholder consultation program associated with the Project. The program focused primarily on the geographic regions most likely to be affected by the Project, including the Isthmus region of the Island (Marystown and St. John's). However, a wider audience was reached through a number of meetings in other communities such as Corner Brook.

Meetings were held with environmental interest groups in the St. John's area. Most participants indicated a level of familiarity with the offshore petroleum industry and the environmental assessment process and acknowledged that many of the issues raised in previous assessments of offshore projects had been addressed by industry. Nonetheless, there is continuing concern regarding ongoing potential for an oil spill from a platform or tanker, as well as the incidence of sheens around platforms as a result of platform discharges (even when treated to regulated levels). These groups are interested in accessing raw data from monitoring programs, in addition to the environmental effects monitoring (EEM) program reports that are released to the public by the C-NLOPB.

Consultation has also been initiated with commercial fish harvesters (both those using the Bull Arm area and the offshore area), the Fish, Food and Allied Workers Union (FFAW) and One Ocean. In Bull Arm, the concerns are around potential interference with fishing activities during Platform construction. Offshore commercial fishers are concerned at the increasing level of offshore oil and gas activity as it affects their travel routes to and from fishing grounds and, to some extent, the placement and security of fishing gear. One Ocean, the fishing industry / offshore petroleum industry liaison organization, is addressing some of these concerns through the efforts of a working group.

ASSESSMENT METHODOLOGY

The scope of the Project includes a combination of works and activities that will take place in both the nearshore (construction) and offshore (installation and operations) environments. The potential environmental effects of each Project phase have been evaluated for each of the selected Valued Ecosystem Components (VECs). VECs are those components of the environment that are valued socially, economically, culturally

and/or scientifically and are of interest when considering the potential environmental effects of the Project.

VECs for this CSR reflect the issues raised by stakeholders, while providing a focus for the environmental assessment so that effects can be meaningfully evaluated. The VECs include Air Quality, Fish and Fish Habitat, Commercial Fisheries, Marine Birds, Marine Mammals and Sea Turtles, Species at Risk (SAR) and Sensitive or Special Areas.

The purpose of environmental assessment is to determine whether the Project is likely to result in a significant adverse residual environmental effect on the environment, as considered through the VECs. The criteria considered in this CSR include geographic extent, magnitude, duration, frequency and reversibility, as well as ecological or social context and the level of certainty in making the assessment of environmental effect. The environmental assessment of each VEC incorporates consideration of mitigation measures, accidental events and cumulative environmental effects.

THE PROJECT ENVIRONMENT

THE NEARSHORE STUDY AREA

The Bull Arm Facility is located at Bull Arm, a steep-sided narrow arm near the bottom of Trinity Bay. Trinity Bay is a large bay on the northeastern coast of Newfoundland with a length of approximately 100 km, orientated towards the northeast. Most of the shoreline is rocky and treed to the high tide mark before dropping off into relatively deep water. The tidal zone is mostly narrow and rocky. The shoreline is affected by landfast and pack ice. Eastern Newfoundland coastal areas are dominated by the southward flowing inner branch of the Labrador Current. The Nearshore Study Area is illustrated in Figure 5.

The east coast of Newfoundland experiences predominately southwest to west air flow throughout the year. However, local topography has a large influence on the wind direction and speed experienced within Bull Arm, Trinity Bay. Low pressure systems crossing the area are more intense during the winter months. As a result, mean wind speeds tend to peak during winter. Nearshore air temperatures are coldest in January and February, and warmest in August.

In Bull Arm, the following species of finfish are commonly found and commercially fished: cod (a COSEWIC-assessed at-risk species), capelin, herring and mackerel. Greenland halibut may be present in deeper water (200 to 300 m) outside Bull Arm. Other species include wolffish (a *Species at Risk Act* (SARA)-listed at-risk species), eelpout, lumpfish, skate and cunners. Great Mosquito Cove and “The Brood” in Bellevue are locally known as a spawning ground for herring. Shellfish that occur in the area include sea scallop, snow crab, lobster and squid. Capelin, mackerel, herring, crab and lobster have generated over 90 percent of all fishing income from species caught in Trinity Bay. Cod, sea urchin, squid and lumpfish make up most of the remaining portion of their annual earnings.

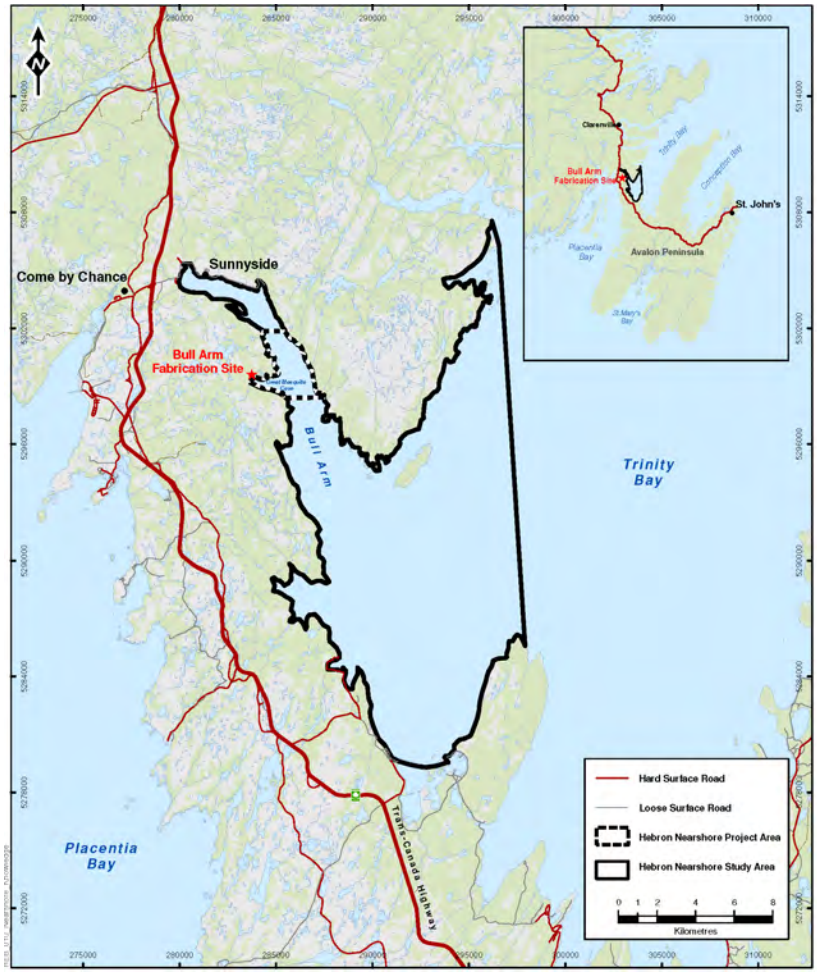


Figure 5 Nearshore Study Area

Habitat for shorebirds (Charadriiformes), such as shoreline deposits of fine sediments and tidal flats, is limited in the Nearshore Study Area. Bellevue Beach, located at the southern boundary of the Nearshore Study Area, is an important habitat for marine birds, including the Red Knot (a COSEWIC-assessed at-risk species). A strong tidal current flowing over a mud flat at the south end of Bellevue Beach creates a rich marine habitat. Gulls, terns, shorebirds and Ospreys are common here in season. There is a nesting colony of gulls and terns on Bellevue Island, 0.5 km from the tidal flats. Approximately 15 species of migrating shorebirds occur regularly on the Bellevue Beach tidal flats during south-bound migration.

A total of 21 marine mammals, including five baleen whales (mysticetes), 12 toothed whales (odontocetes), and four true seals (phocids), are known to occur in the Nearshore Study Area. Four species may be rare visitors in the Study Area: the beluga whale (a SARA-listed at-risk species); North Atlantic right whale (a SARA-listed at-risk species); ringed seal; and bearded seal. Seals occur year-round in waters off Newfoundland and Labrador, including populations of grey, harp and hooded seals.

There are potentially a number of at-risk species (either assessed by COSEWIC or listed on SARA) that may occur in the Nearshore Study Area. Wolffish species are the marine fish SAR most likely to occur in the Hebron Nearshore Study Area. Bird SAR that could occur in the Hebron Nearshore Project Area are the Red Knot (a shore bird)

and Ivory Gull (a marine bird). The marine mammal SAR that is likely to occur in the Hebron Nearshore Study Area is the fin whale; blue whale may occur in small numbers. The sea turtle species at-risk likely to occur in the Nearshore Study Area are the leatherback and loggerhead sea turtles. Sensitive or Special Areas include capelin beaches (*e.g.*, Bellevue Beach) and eelgrass beds (used by juvenile Atlantic cod, among others).

OFFSHORE STUDY AREA

The Hebron Platform will be situated within the Jeanne d'Arc Basin, one of the major sedimentary basins within the eastern Canadian offshore. The Grand Banks form a series of shallow outer banks separated from the Newfoundland coast by irregular inner shelf basins (Avalon and St. Pierre Channels). Water depth in the area ranges from 88 to 102 m. The Grand Banks has an overall area of 100,000 km^2. The Hebron Platform will be situated on the northeast margin of the Grand Banks, within approximately 98 m water depth. The Offshore Study Area is illustrated in Figure 6.

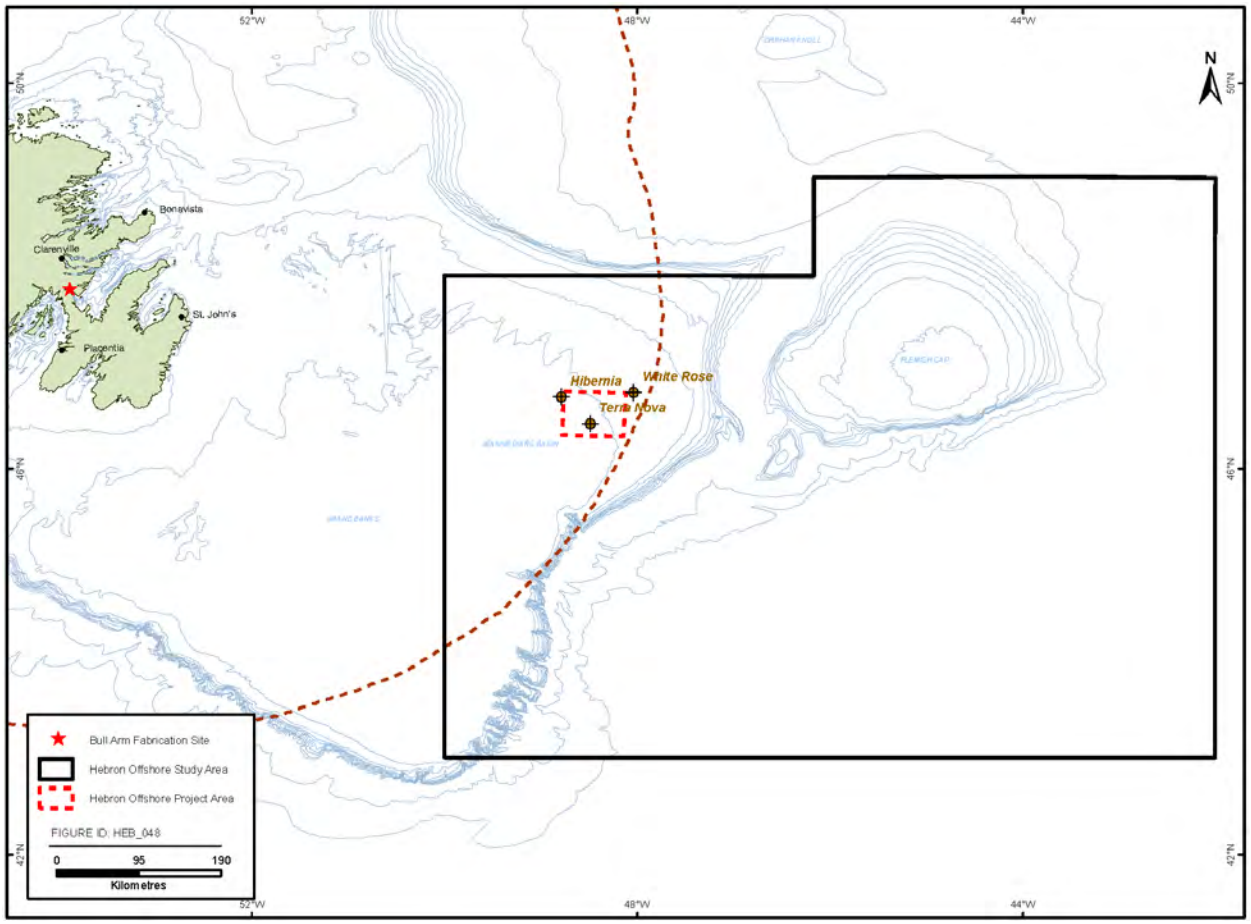


Figure 6 Offshore Study Area

The climate of the Grand Banks is dynamic and influenced by maritime, Arctic and tropical air masses. The area typically has cold and dry winters (with respect to humidity) and cool and moist summers. Weather systems are often intense, and include a wide range of precipitation types, particularly in fall and winter. In winter, spring and fall, the dominant winds in the area are westerly and in summer,

southwesterly. Air temperatures in the vicinity of the Hebron Platform are generally lower in summer and higher in winter compared to St. John's because of the oceanic environment. February is the coldest month and August is the warmest month both onshore and offshore.

The Grand Banks region is the wettest in eastern Canada, with over 1,000 mm of precipitation per year. The occurrence of precipitation is highest in January and lowest in July. Rainfall is most likely in autumn, with moderate to heavy rainfall occurring most frequently from September to January. Snow is most likely to occur in January through March. Moderate to heavy snowfall is most likely to occur in January and February. Fog frequently occurs in the vicinity of the Hebron Platform, with the foggiest period occurring between May and July. In July, the foggiest month, visibility is often reduced to less than 1 km. The highest waves occur from December to February.

Snow crab, shrimp and Iceland scallop occur on the Grand Banks in the vicinity of the Hebron Platform. Other species occurring in the area include sand lance, capelin, mailed sculpin, sea urchin, sand dollar, soft-shelled clams, toad crab and sea stars. Historically, the most abundant species in the vicinity of the Hebron Platform were American plaice (a COSEWIC-assessed at-risk species) and cod, but these species are also widely distributed throughout the Grand Banks. The dominant commercial fish in the vicinity of the Hebron Platform include snow crab, shrimp, American plaice and Iceland scallop.

The Grand Banks provides important habitat for millions of marine birds. Over 60 species have been reported. Approximately 19 of these species are pelagic and could occur in the Offshore Project Area. In the spring and summer, the most common species include the Northern Fulmar, Shearwaters, Storm-petrels, Jaegers, Black-legged Kittiwake, Gulls, Skuas and Dovekies.

Several species of whales may be found on the Grand Banks, including humpback, minke, sei, Atlantic pilot, sperm and northern bottlenose. Many species are mostly summer residents, transients, or both. There are only a few permanent residents, including the Atlantic pilot whale. There is one not-at-risk species of sea turtle known to occur near the Hebron Platform, the Kemp's ridley.

There are potentially a number of at-risk species (either assessed by COSEWIC or listed on SARA) that may occur in the Offshore Study Area. Schedule 1 SARA species known to occur in the Offshore Study Area include Atlantic wolffish, northern wolffish, spotted wolffish, Ivory Gull, blue whale, fin whale and leatherback sea turtle. The North Atlantic right whale, a Schedule 1 listed species, is not considered likely to occur in the Offshore Project Area. Some of the COSEWIC-assessed at-risk species include Atlantic cod, Atlantic plaice, redfish and loggerhead sea turtle.

Offshore Sensitive or Special Areas include those designated by the Northwest Atlantic Fisheries Organization, specifically the Southeast Shoal Vulnerable Marine Ecosystem and various canyon areas and seamount and knoll vulnerable marine ecosystems . In addition, the following Ecologically and Biologically Significant Areas, as identified by Fisheries and Oceans Canada (DFO), occur within the Offshore Study Area: Northeast Shelf and Slope; Virgin Rocks (immediately adjacent to the Offshore Study Area); Lily Canyon-Carson Canyon; and Southeast Shoal and Tail of the Banks.

KEY FINDINGS OF THE ASSESSMENT

AIR QUALITY

To assess potential effects on air quality in the nearshore and offshore environments, an emissions inventory and modelling were used. The emissions inventory was used to predict the annual emissions released and the dispersion modelling was used to estimate the maximum ground-level concentrations.

Typical air emissions from Project activities include carbon monoxide, nitrous oxides, total suspended particulate, volatile organic compounds and greenhouse gases (GHGs).

Nearshore

The air emissions associated with grinding, welding and concrete production include total suspended particulate. However, such emissions will be temporary in nature and are considered to be localized, such as welding, or relatively minor in quantity and environmental effect. Vessels will emit carbon monoxide, nitrous oxides, total suspended particulate, volatile organic compounds and GHGs. However, these emissions are small in quantity, temporary and localized. They can be mitigated by reducing the amount of time the vessels are in idle mode, connecting to electrical power whenever possible, and other mitigation measures.

Offshore

The air dispersion modelling shows that the emissions produced from the Hebron Project alone, as well as in conjunction with emissions from existing platforms, would generally meet air quality criteria (*i.e.*, the stipulated National Ambient Air Quality objectives) in the short-term, the long-term, and in near-field and far-field locations. Fugitive emissions from operational sources (*e.g.*, leaking valves, pump seals, compressor seals, flanges / connectors, and pressure relief valves) may occur during operation of the Platform and have been considered quantitatively in this assessment. Mitigation measures include maintenance and inspection programs to repair equipment and machinery.

Findings

By implementing appropriate mitigation measures, the environmental effects on Air Quality during the construction and operations phases of the Project, including accidental events and cumulative environmental effects, is determined to be not significant. With respect to GHG, the magnitude is ranked as medium for both the construction and operations phases; however, the predicted emissions are consistent with those currently being reported for other similar facilities in the Newfoundland offshore and are rated as not significant. In the unlikely event of a large-scale accident or malfunction, the Project's GHG emissions will be temporarily increased. The percent contribution of GHGs from the Hebron Project to the overall national total is small in magnitude.

FISH AND FISH HABITAT

Nearshore

In the Nearshore Project Area, changes in fish habitat will occur in Bull Arm during construction of the bund wall and drydock and if dredging and/or ocean disposal is required. In accordance with the DFO policy of no net loss of fish habitat, a habitat compensation program will be developed in conjunction with DFO to compensate for any loss of fish habitat. As its preferred option for HADD compensation, EMCP is proposing to enhance fish habitat in Bull Arm by re-locating bund wall material to featureless sedimentary areas of the sea floor, which currently have low commercial fish productivity.

Increased levels of suspended sediments and underwater noise can also be expected within the Nearshore Project Area. Mitigation measures will include the use of settlement basins and/or containment areas for concrete washwater. EMCP will also investigate the use of washed-rock for bund wall construction, as well as the use of silt and bubble curtains. While some fish egg and larval mortality may occur as a result of in-water blasting, any in-water blasting will adhere to DFO's *Guidelines for Use of Explosives in Canadian Fisheries Waters* to reduce the chance of injury to fish. Some mortality of benthic species is expected as a result of infilling for the bund wall, drydock construction, dredging, and spoils disposal (if required), but these benthic invertebrates are ubiquitous throughout the area and will re-colonize within a few years of construction.

Offshore

In the Offshore Project Area, access to the substrate in the footprint of the Hebron Platform and OLS and its flowlines may be lost to fish and shellfish. If excavated drill centres are constructed as part of the Hebron Project, fish habitat will be affected. For this associated affect on fish habitat, fish habitat compensation may be required. Seismic activities associated with the Project will adhere to the *Statement of Canadian Practice on Mitigation of Seismic Noise in the Marine Environment* as appended to the *Geophysical, Geological, Environmental and Geotechnical Program Guidelines* (C-NLOPB 2011).

Discharges from Project operations will be managed under an EPP and will adhere to the OWTG (NEB *et al.* 2010). During operations at the Hebron Platform, water-based cuttings will be discharged overboard from the Hebron Platform and synthetic-based cuttings will be reinjected into the formation. If a MODU is used, both water-based and synthetic-based cuttings would be discharged overboard in accordance with the OWTG (NEB *et al.* 2010). The discharge of drill cuttings released on the Grand Banks have been monitored through various EEM programs and scientific studies, confirming that no significant environmental effect on the marine environment from discharged mud or cuttings occurred for these projects.

The feasibility of produced water re-injection is being investigated. If re-injection is not feasible, produced water, meeting the requirements of the OWTG (NEB *et al.* 2010), will be discharged from the Hebron Platform along with cooling water. Any associated effects are expected to be undetectable at a distance greater than 500 m from the

Hebron Platform. Within 500 m, survival, growth and fertilization success of some species can be affected.

Findings

Based on the nature of the effects, planned mitigation, including fish habitat compensation, and knowledge gained from other offshore projects, no significant adverse residual environmental effects are predicted as a result of any of the Project phases. The cumulative environmental effects are also predicted to be not significant.

An accidental event is considered adverse but not significant and not likely to occur. Natural recruitment is expected to re-establish the population to its original level and avoidance of the area is expected to be temporary should an accidental event occur.

COMMERCIAL FISHERIES

Nearshore

Establishment of marine construction safety zones at the Bull Arm Facility will create a temporary loss of access to fishing grounds (Figure 7) and possibly interfere with vessel transit. EMCP will establish an overall Project agreement with commercial fishers using the Bull Arm area that addresses safe operations and compensation.

Marine traffic associated with Project construction will use designated routes. EMCP will consult with the area fish harvesters to discuss and agree on an appropriate Vessel Traffic Management Plan for the safe and efficient operation of Project marine traffic and fishing vessel operations in the Nearshore Project Area. Communications will be maintained directly at sea by Project vessels via marine radio to facilitate information exchange with fisheries participants. Relevant information about marine operations occurring outside the safety zones will also be publicized, when appropriate, using established communications mechanisms, such as the Notices to Shipping (Continuous Marine Broadcast and NavTex) and CBC Radio's (Newfoundland and Labrador) Fisheries Broadcast.

EMCP will also discuss the timing of in-water blasting operations if required and other activities that will create loud underwater noise. Activities will be planned to the extent possible to avoid finfish harvesting times.

EMCP will work with fishers active in the area and time period affected by platform tow-out from Bull Arm and through Trinity Bay to the offshore location to ensure safety and minimize disturbance.

Offshore

As part of the planning for offshore operations, EMCP will establish ongoing consultations and communications with relevant area fishers as well as with FFAW and One Ocean. EMCP will also have in place a fishing gear compensation program to cover loss of or damage to fishing gear associated with Project activities.

Any survey activity associated with the Project will follow guidance provided in the *Geophysical, Geological, Environmental and Geotechnical Program Guidelines* (C-NLOPB 2011) for minimizing effects on commercial fish harvesting.

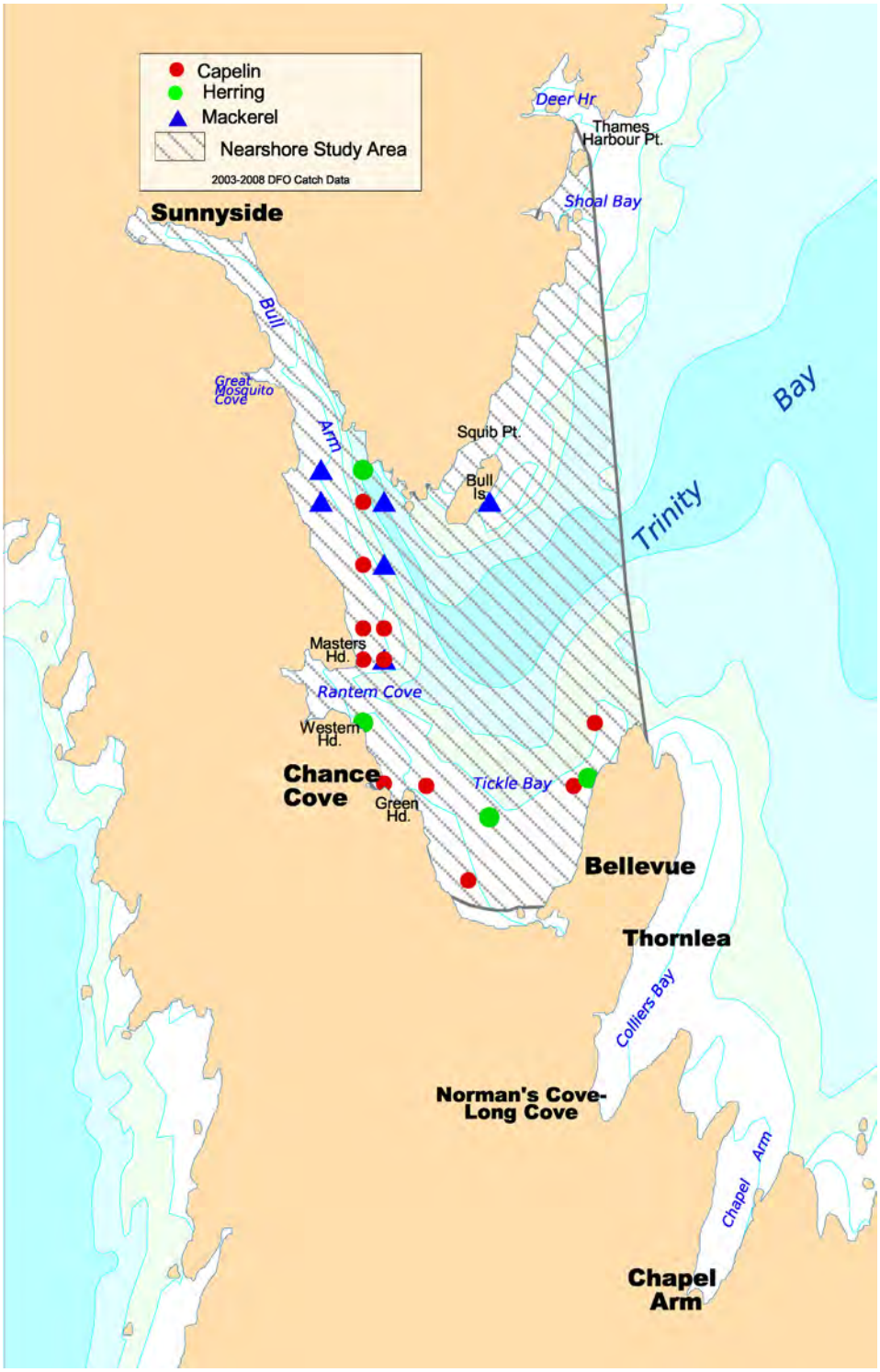
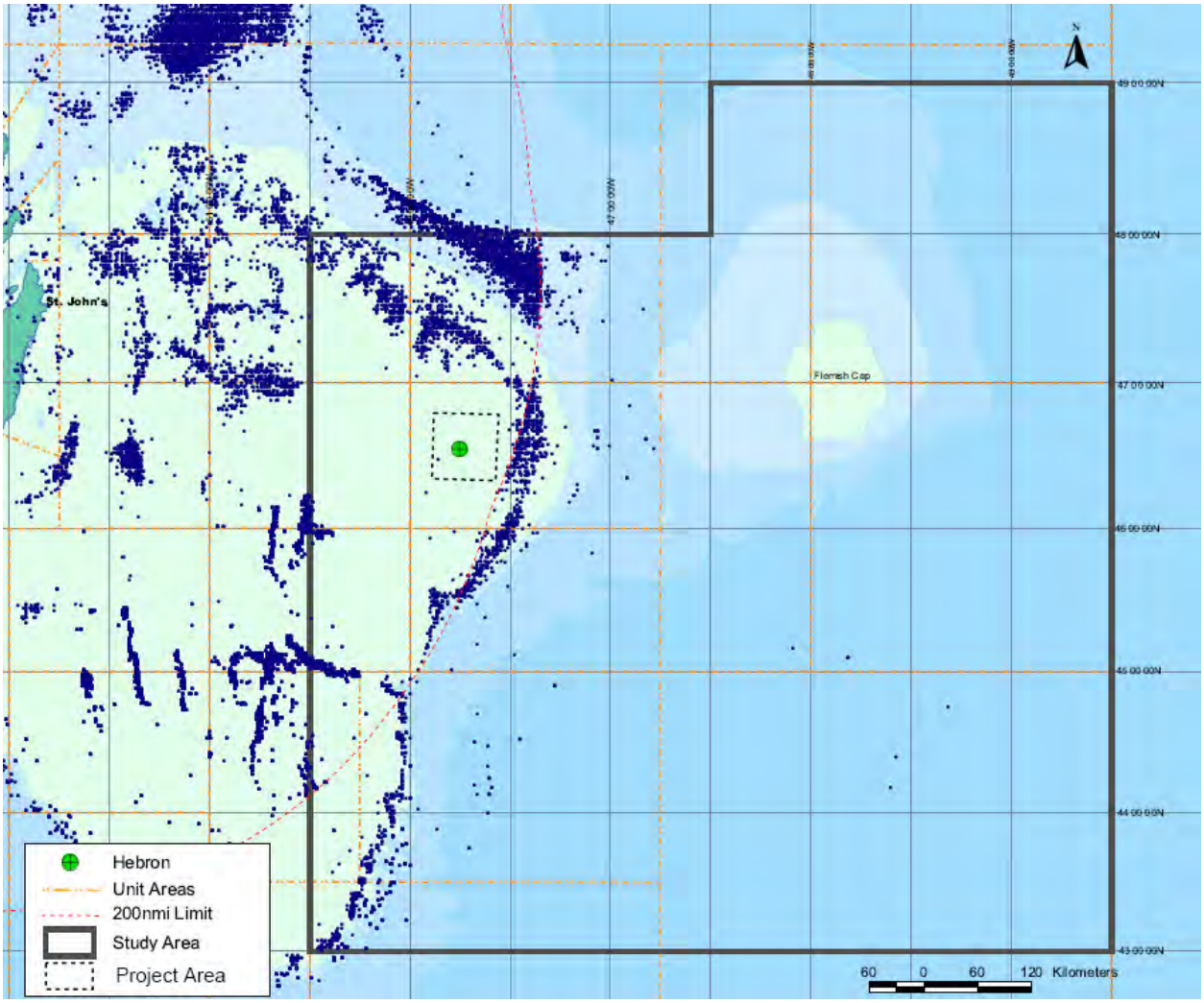


Figure 7 Nearshore Study Area Harvesting Locations for Key Pelagic Species, 2006 to 2008

Considering the relatively low level of fish harvesting in the Offshore Project Area (Figure 8), and the type of fisheries in recent decades, few gear conflicts or catchability effects are likely to occur during operations. EMCP will maintain effective liaison with the offshore fishing industry and will meet as necessary during the operation and maintenance phase to continue communications with relevant area fishers and to help mitigate all aspects of potential fisheries effects.



Note; initial data for 2009, received in 2010, indicate that fishing activities in 2009 (in terms of quantities and harvesting locations) were consistent with those in recent years (*i.e.*, 2004 to 2008).

Figure 8 Domestic Harvesting Locations, 2008

Findings

With the proposed mitigation measures in place, the adverse residual environmental effects from all Project phases are predicted to be not significant. An accidental spill could temporarily limit access to fishing grounds, cause damage to fishing gear or result in a negative effect on the marketability of fish products. A fishing gear compensation program and fisheries compensation plan will be developed.

With regard to offshore activities and potential interactions with commercial fishers, EMCP is committed to work with the One Ocean Working Group, relevant offshore fishers, FFAW representatives and other agencies to ensure good relations, cooperation and partnering between all offshore marine user groups.

MARINE BIRDS

Nearshore

There are no nesting or feeding concentrations of marine birds expected to occur in the Nearshore Project Area. If in-water blasting is required, an observer will monitor for diving marine birds occurring within a specified safety zone of the blast location and protocols will be developed to reduce potential effects on marine birds. Blasts will be delayed until birds move outside the designated safety zone. Disturbance to birds in the area will be short-term and bird behaviour will likely return to normal shortly after the completion of these activities (if disturbed at all).

Offshore

In offshore Newfoundland waters, marine birds, primarily Leach's Storm-Petrels, are often attracted to lights and may become disoriented or injured by flying directly into the source of light or associated infrastructure. Structures and vessels that remain lit overnight will be searched for stranded birds in the morning. Recovered birds will be handled with care and released according to established protocols.

Gas flaring at night may also attract birds; however, the heat and noise generated by the flare may deter marine birds from the immediate area under most nighttime conditions. While there is no known mitigation, flaring is expected to have minimal effect on marine bird populations over the duration of the Project. EMCP is committed to undertaking a research program that, when designed, would provide scientifically defensible information regarding seabird attraction to offshore facilities.

Shearwaters, Northern Fulmars and gulls are the species most likely to be attracted to the Hebron Pplatform and may rest on the water nearby. During Project operation and maintenance, produced water will be discharged below the thermocline whenever possible to minimize the occurrence of sheens that may be associated with this discharge.

During any seismic surveys, the approach of the seismic vessel would likely flush the birds from the area prior to being exposed to any airgun sounds or occurring in close proximity to operating airguns. For birds that do remain in the immediate area, seismic activity could result in hearing impairment to marine birds spending considerable amounts of time below the surface of the water and if in close proximity to airgun pulses; for example, alcids that secure food by diving and swimming under the water. Other offshore construction activities may cause temporary and localized disturbance of marine birds. These activities are not expected to occur near any known nesting colonies, so they should not affect that portion of marine bird life cycles. It is expected that bird behaviour would likely return to normal shortly after the completion of these activities (if disturbed at all).

Findings

With the planned mitigation in place, the potential adverse residual environmental effects for all phases of the Project are predicted to be not significant. Cumulative environmental effects are also predicted to be not significant.

Should an accidental oil spill occur, marine birds are the biota most at-risk. Reported environmental effects vary with species, type of oil, weather conditions, time of year and duration of the spill. Exposure to oil causes several physiological effects and/or thermal and buoyancy deficiencies that may lead to death. Although significant at the individual level, the adverse residual environmental effects are predicted to be reversible at the population level. Nevertheless, these adverse residual environmental effects are predicted to be significant, although unlikely to occur. Mitigation for accidental events will include an oil spill response plan. ExxonMobil's philosophy is focused on prevention using safety and risk management systems, management of change procedures, and global standards. There will be an emphasis on accident prevention at all phases of the Project. These procedures will minimize the potential mortality from such accidental events.

MARINE MAMMALS AND SEA TURTLES

Nearshore

During construction, in-water blasting without proper mitigation has the most potential to cause physical effects in marine mammals. If in-water blasting is required, a blast impact assessment will be undertaken to determine appropriate marine mammal and sea turtle exclusion zones. These zones will be monitored by a trained observer prior to and during in-water blasting operations in the marine environment, and in-water blasting operations will be temporarily suspended or halted if a marine mammal or sea turtle is sighted within or about to enter the zone. Activities will not resume until the animal(s) has left the zone or it has not been re-sighted for 30 minutes.

Offshore

In the offshore, the primary construction activity with potential to interact with marine mammals is seismic surveys. While there is uncertainty about the potential for survey sounds to cause either auditory impairment or other non-auditory physical effects in marine mammals or sea turtles, mitigation measures will follow those outlined in the *Geophysical, Geological, Environmental and Geotechnical Program Guidelines* (C-NLOPB 2011).

There is limited potential for direct mortality of marine mammals or sea turtles as a result of collisions with vessels associated with any of the Project phases. Project activities involving vessel traffic will avoid spatial and temporal concentrations of marine mammals and sea turtles whenever possible, and vessels will maintain a steady speed and course in order to avoid potentially fatal collisions. Speed will be minimized whenever possible and vessels will deviate from their course to avoid concentrations of marine mammals and sea turtles in their path.

Findings

Given that Project activities are localized, and with the application of mitigation measures, it is predicted that the adverse residual environmental effects on Marine Mammals and Sea Turtles are not significant.

In the unlikely case of an accidental event, marine mammals and sea turtles are not considered to be at high risk from the environmental effects of oil exposure. For marine

mammals and sea turtles, it is probable that only small proportions of populations are at risk at any one time (in either the nearshore or offshore).

Underwater sound associated with Project activities will likely have the greatest potential cumulative environmental effect on marine mammals and sea turtles, particularly cetaceans. Most species will be able to hear sounds, if they are close enough, and will be able to avoid them if they so choose. Mitigation measures associated with seismic surveys are designed to reduce potential effects to marine mammals or sea turtles. Individual mammals travelling near one or more of the offshore developments or in proximity to other offshore exploration activities may be subject to cumulative environmental effects. However, these environmental effects would most likely be limited to behavioural effects (*i.e.*, localized avoidance).

SPECIES AT RISK

For the purposes of this CSR, SAR refers to those species of marine fish, mammals, birds and reptiles listed federally under SARA, and/or assessed as at-risk by COSEWIC, which could potentially occur in either the Hebron Nearshore or Offshore Study Areas. The environmental assessment includes the associated habitats that these species rely upon, as protected under SARA.

Potential interactions between the Project and SAR are similar to those described above for non-listed species. The key differences between listed SAR and non-listed species are abundance and spatial and temporal presence. SAR are typically less abundant and are more widely dispersed in the marine environment, making it less likely that Project activities will interact with SAR and their respective habitats.

MARINE FISH SPECIES AT RISK

Nearshore

The marine fish SAR most likely to occur in the Hebron Nearshore Study Area are described above under the Fish and Fish Habitat setting. For these species, habitat in the Nearshore Project Area has not been identified as critical habitat. For marine fish SAR, the pelagic eggs and larvae of finfish may be more susceptible to Project activities than the adult stage. Fish SAR are not known to spawn within the Hebron Nearshore Project Area. The mitigation measures described above for all Project activities for Fish and Fish Habitat are considered applicable to marine fish SAR.

Offshore

The marine fish SAR likely to occur in the Hebron Offshore Study Area are described above under the Fish and Fish Habitat setting. The Hebron Offshore Project Area has not been identified as critical habitat for any of these species.

The potential environmental effects for SAR associated with Project activities, as well as mitigation measures and management strategies, are similar to those presented for non-listed marine fish species.

Findings

The adverse residual environmental effects on marine fish SAR for all Project phases, including cumulative environmental effects, are predicted to be not significant. Due to the reversibility and limited duration of an accidental event, potential environmental effects of a spill on marine fish SAR and fish habitat are also considered adverse but not significant and not likely to occur. Natural recruitment is expected to re-establish the population to its original level and avoidance of the area is expected to be temporary should an accidental event occur.

MARINE MAMMAL AND SEA TURTLE SPECIES AT RISK

Nearshore

The marine mammal and sea turtle SAR most likely to occur in the Hebron Nearshore Study Area are described above in the Marine Mammal and Sea Turtle setting. The issues of concern with respect to environmental effects for marine mammal and sea turtle SAR, as well as mitigation measures and management strategies, are similar to those presented for marine mammal and sea turtle species considered not at-risk. In-water blasting, if required, has the most potential to cause physical effects in marine mammals, and the mitigation described above for not at-risk species is considered appropriate for SAR species.

Offshore

The marine mammal and sea turtle SAR most likely to occur in the Hebron Offshore Study Area are described above in the Marine Mammal and Sea Turtle setting. The key Project activity with the potential to result in injury or mortality of marine mammal and sea turtle SAR is the operation of vessels. Project activities involving vessel traffic will avoid spatial and temporal concentrations of marine mammals and sea turtles, including SAR, whenever possible, and vessels will maintain a steady speed and course in order to avoid potentially fatal collisions with the VEC. Vessels will reduce speed whenever possible and deviate their course to avoid marine animals.

During seismic programs, mitigation measures outlined in the *Geophysical, Geological, Environmental and Geotechnical Program Guidelines* (C-NLOPB 2011) will be followed to reduce environmental effects on marine mammals and sea turtles, including SAR.

Findings

The adverse residual environmental effects for all Project phases including cumulative environmental effects and accidental events are predicted to be not significant.

BIRD SPECIES AT RISK

Nearshore

The bird SAR most likely to occur in the Hebron Nearshore Study Area are described above in the Marine Birds setting. Many of the issues of concern with respect to environmental effects for bird SAR, as well as mitigation measures and management

strategies, are similar to those presented for bird species considered not at risk. The most likely interaction with bird SAR is noise associated with Project activities.

Offshore

The only bird SAR likely to occur in the Offshore Project Area is the Ivory Gull. It has a circumpolar breeding distribution and is associated with pack ice throughout the year. As such, individuals may occasionally reach the northern part of the Offshore Study Area in late winter or early spring when sea ice reaches its maximum southern extremity. The potential environmental effects and Project mitigation measures would be as described for species considered not at risk.

Findings

The potential adverse residual environmental effects from all Project phases on marine bird SAR including cumulative environmental effects are predicted to be not significant. The potential effects associated with accidental events are similar to those described above for non-SAR Marine Birds.

SENSITIVE OR SPECIAL AREAS

Nearshore

In the Nearshore Study Area, Sensitive or Special Areas include capelin beaches (*e.g.*, Bellevue Beach) and eelgrass beds. There is considerable distance between the Bull Arm Site and the nearest areas of eelgrass and capelin spawning beach and this limits the potential interaction with routine Project activities. Therefore, the only potential interaction is associated with an accidental event.

Offshore

As with the Nearshore Study Area, the distance between the Project and the Sensitive or Special Areas limits the potential interaction with routine Project activities. Therefore, the only potential interaction is associated with an accidental event.

Findings

For all Sensitive or Special Areas, the physical distance of these areas from the Project Areas limits the potential for interaction with routine Project activities. Therefore, the assessment focused on accidental events.

In the Nearshore Study Area, in the unlikely event of an accidental event where hydrocarbons reached eelgrass beds, the ability for eelgrass beds to function as a nursery and feeding area for juvenile fish may be affected. With regard to capelin beaches, there is potential for hydrocarbons to sink into the beach sediments and become buried. In this unlikely scenario, hydrocarbon contamination can persist for years, continuing to affect sensitive life stages of eggs and larvae and, therefore, the productivity. Using a precautionary approach, it is concluded that there is potential for a significant adverse residual environmental effect to the Sensitive or Special Areas in the Nearshore Study Area. However, the likelihood of a significant adverse residual environmental effect occurring is considered low.

Offshore, the effects of a spill on the biota that may be using these areas were assessed in their respective VECs and determined to be not significant. Therefore, the adverse residual environmental effect of accidental event on the Sensitive or Special Areas identified in the Offshore Study Area was determined to be not significant.

EFFECTS OF THE ENVIRONMENT ON THE PROJECT

Hebron Project design and planning will benefit from the years of physical data collection in the general area of the offshore Project location, as well as the experience gained during comparable construction and fabrication activities at Bull Arm for the Hibernia GBS platform in the early 1990s.

Several aspects of the physical environment affect Project design, construction / fabrication activities and operations in the Nearshore and Offshore Study Areas, including: water depth and seabed profile (bathymetry); wind, waves and currents; tsunamis; tides, water levels and storm surge; temperature; sea ice and icebergs; geohazards; and climate change.

Mitigation measures to be applied to minimize the effects of the environment on the Project include (but are not limited to) the following:

- Engineering design will adhere to national standards and codes
- Site-specific weather and oceanographic data will be collected
- An ice management plan will be implemented

FOLLOW-UP AND MONITORING

EMCP will include EEM programs for the nearshore and offshore Project activities as a part of its overall Environmental Management System.

EMCP will implement a nearshore EEM program to verify impact predictions in the marine environment in Bull Arm. The details of the nearshore EEM program will be developed in consultation with regulatory agencies and key stakeholders. If in-water blasting is required, a monitoring and observation program will be implemented in the Nearshore Project Area.

In the Offshore Project Area, an EEM program for production operations will be developed and will build on the experience of the existing offshore oil and gas production EEM programs. Marine birds and mammal data will be collected opportunistically during drilling operations from MODUs and from supply vessels where space is available. Weather and sea ice conditions will be recorded as part of the oceanographic monitoring program.

EMCP is committed to a fish habitat compensation follow-up monitoring program for fish habitat compensation in the Nearshore and Offshore Project Areas.

SUMMARY AND CONCLUSIONS

The Hebron Project will benefit from the experience of the existing production projects offshore Newfoundland, with respect to many key items including reducing resource conflicts with commercial fishers, development of effective monitoring programs, and effective emergency response planning. Standard mitigation measures will reduce the potential for adverse environmental effects from most routine construction and operation

activities. EMCP will comply with legislative requirements and adhere to guidelines and/or codes of practice that have been specifically developed to address environmental protection practices in the Newfoundland and Labrador Offshore Area.

A summary of the residual environmental effects assessment for each of the identified VECs is provided in Table 1.

Table 1 Significant (S) and Not Significant (NS) Residual Environmental Effects on Valued Ecosystem Components

VEC	Significance of Residual Environmental Effect					
	Construction / Installation	Operation and Maintenance	Decommissioning and Abandonment	Accidents, Malfunctions and Unplanned Events	Project Overall	Cumulative Environmental Effects
Air Quality	NS	NS	NS	NS	NS	NS
Fish and Fish Habitat	NS	NS	NS	NS	NS	NS
Commercial Fisheries	NS	NS	NS	NS	NS	NS
Marine Birds	NS	NS	NS	S	NS	NS
Marine Mammals and Sea Turtles	NS	NS	NS	NS	NS	NS
SAR: Marine Fish	NS	NS	NS	NS	NS	NS
SAR: Marine Mammals and Sea Turtles	NS	NS	NS	NS	NS	NS
SAR: Birds	NS	NS	NS	S	NS	NS
Sensitive or Special Areas	NS	NS	NS	S	NS	NS

The only potential for significant adverse residual environmental effects as a result of the Hebron Project is in association with an accidental event. In such an unlikely event, significant adverse environmental effects have been predicted for Marine Birds, Bird SAR and nearshore Sensitive or Special Areas. Emphasis on both pollution prevention and effective response planning will further reduce the potential for these unlikely significant environmental effects to occur.

EMCP's commitment is to plan and execute the Hebron Project as an environmentally responsible development and one that successfully balances environmental and economic needs. The Hebron Project will be designed, built and operated within the ExxonMobil policy of environmental responsibility, summarized as *Protect Tomorrow. Today.*