

6.0 Summary and Conclusions

This SEA has compiled and consolidated a large amount of information relevant to oil and gas activities that may occur off the south coast of Newfoundland. The key points are summarized in this section.

6.1 Potential Issues

Potential issues that are generally applicable to East Coast oil and gas activities, including the Southern Newfoundland SEA Area, include:

- Effects of accidental spills on marine flora and fauna;
- Effects of industrial sound on commercial and non-commercial invertebrates and fish, marine mammals, and SAR;
- Disturbance of commercial fishery activities (vessel traffic and gear conflicts);
- Disturbance of sensitive benthic communities, particularly deep-sea coral areas; and
- Attraction of seabirds, particularly petrels, to rigs and supply vessels.

Potential issues specific to the SEA Area include:

- Sensitivity of shallow subtidal and intertidal areas to an accidental spill, particularly with respect to coastal seabirds, coastal waterfowl and shorebirds, and their respective habitats;
- Potential sensitivity of redfish and cod spawning areas in the northwest SEA Area;
- Potential sensitivity of CAD-NAFO Coral Protection Area on Grand Banks southwest slope;
- Potential sensitivity of areas identified by DFO (e.g., EBSAs), Parks Canada (e.g. NMCA) and CPAWS (i.e., SMAs);
- Potential sensitivity of estuarine areas at mouths of Atlantic salmon rivers;
- Intensive commercial fisheries in much of the SEA Area; and
- Effects on aesthetics associated with the presence of oil and gas infrastructure nearshore.

6.2 Planning Implications

There are a number of aspects of the SEA Area that have planning implications for any exploration and production activities in the area. The most important ones are identified below.

6.2.1 Identified Potentially Sensitive Areas

Five categories of sensitive areas have been identified in the SEA. They are as follows:

1. DFO EBSAs;
2. CAD-NAFO Coral Protection Zone;
3. Special Marine Areas identified by CPAWS;
4. Potential Parks Canada NMCA; and
5. Atlantic salmon rivers.

In addition, areas of unexploded ordnances can be considered sensitive areas, albeit for different reasons than the above list. Defining characteristics include key fish spawning/nursery areas, deep-sea coral areas containing relatively high abundance and diversity, areas of high productivity manifested by aggregations of biota representing different levels of the food chain, important coastal habitats, and important nesting areas for SAR bird species. All of these characteristics will have to be considered at some level when planning any exploration and production activities.

6.2.2 Shallow Subtidal/Intertidal Areas

Various shore types exist along the section of the south coast and some are more sensitive than others to potential effects from oil and gas activities. For example, some rare and sensitive shore type habitats (e.g., salt marsh, tidal flats, and sandy beaches) would retain spilled oil for a longer period than more exposed shore types if cleanup were left to natural processes. Therefore, spill prevention and response are very important issues in the SEA Area. Another issue that is complicated by shallow water and complex bottom substrates is underwater sound transmission. Sound propagation is complex in deepwater areas due to different water layers and other factors, but it is further complicated in shallow water. Acoustic modelling may be required to better predict the propagation of sound from sources such as seismic surveying.

6.2.3 Mitigations

Operators will be required by the C-NLOPB to comply with all applicable legislation and guidelines, including the C-NLOPB guidelines (e.g., *Geophysical, Geological, Environmental and Geotechnical Program Guidelines – C-NLOPB 2008*; *Offshore Waste Treatment Guidelines – NEB et al. 2002*; *Offshore Chemical Selection Guidelines – NEB et al. 2009*).

Mitigations have been discussed throughout the SEA. For geophysical surveys (including VSP), typical mitigations employed by operators include:

- Establish a safety zone which is a circle with a radius of at least 500 m as measured from the centre of the air source array;
- Minimize the proportion of the energy that propagates horizontally;
- Schedule seismic surveys to avoid gear conflicts and fish disruptions during DFO surveys;
- Ramp up ('soft start') airguns at the start of survey;
- Monitor marine mammals and sea turtles using qualified observers;
- Maintain good communications with the fishing industry;
- Use Notice to Mariners and fisheries broadcasts;
- Use fisheries guard vessels and observers (FLOs) to avoid conflicts with fishing vessels and gear;
- Support compensation for gear losses attributable to seismic survey activity;
- Design/select of equipment to optimize source levels;
- Avoid sensitive areas and/or times; and
- Shutdown if sensitive species of marine mammals and sea turtles (e.g., Schedule 1 *SARA* species) are within a pre-determined safety zone.

These mitigations are now more or less standard practice on the East Coast, including Newfoundland and Labrador waters. Mitigations for drilling activity may include:

- Adherence to *Offshore Waste Treatment Guidelines* limits on discharges;
- Screening and selection of chemicals used in drilling;
- Design and implementation of a Waste Management Plan to be approved by the C-NLOPB;
- Environmental criteria (to minimize emissions) in selection of new equipment to be installed;
- Use of WBMs whenever possible;
- Treatment and disposition of drill cuttings as per requirements of the *Offshore Waste Treatment Guidelines* (NEB et al. 2002);
- Recycling, reuse and ultimately disposal of SBMs on-shore;
- Well abandonment procedures to be approved by C-NLOPB (mechanical procedures are much preferred over explosives; if explosives are used, safety zones, marine mammal and sea turtle monitoring, and restrictions on timing, type, placement and shape of charges may be imposed);
- Selection of supply vessel and aircraft routing to avoid sensitive areas and/or times;

- Communication with fishing industry and other mariners in regard to vessel routing and safety zones, and other issues that may arise;
- Seabird observers (also to record marine mammals and sea turtles) on drilling rigs; and
- Implementation of fishing gear compensation program in event of gear damage by an operator.

Mitigations for accidental events include:

- Emphasis on prevention through education, procedures and policies;
- Design and implementation of an Oil Spill Response Plan to be approved by C-NLOPB;
- Spill response material (e.g., absorbents and booms) on the drill rig and/or attendant vessels;
- Reduced speeds (vessel collision reduction) in areas known to be frequented by marine mammals or areas of known marine mammal concentrations;
- Training and education of personnel to handle oil spills;
- Maintenance of oil spill response capabilities (trained personnel, absorbents, containment and cleanup systems) on the drill units and/or supply vessels that is appropriate;
- Exercising of oil spill response plans on a regular basis and preparation to implement shoreline protection measures and clean-up in event of an oil spill;
- Fishery compensation programs for damaged gear and lost markets in the event of damage attributable a major spill or blow out; and
- Construction of impermeable berm around the drill rig area of an onshore to offshore directional drilling operation.

Potential mitigations for the production phase of a project may include all of the above. Decommissioning of production facilities would be accomplished according to regulations in effect at the time but would include many of the above. In addition, the removal of all infrastructures may be required.

Existing and future research under ESRF, PRAC, PERD, and others will assist in refining mitigations by filling data gaps (e.g., acoustic environment) (see below).

6.3 Data Gaps

Important data gaps identified during this SEA include:

1. High quality data on specific locations of various fisheries, especially inshore [There is a considerable database on fishery landings in the SEA Area and it is clear that the entire SEA Area is very important to the fishery, particularly for invertebrate species such as American lobster, snow crab and whelk, but also for finfish species such as Atlantic cod, redfish and yellowtail flounder. While many of the offshore catches are georeferenced, most of the inshore catches are not.];
2. Distribution of VECs in time and space, specifically fish eggs and larvae, marine birds, marine mammals and sea turtles, particularly for *SARA*-listed species such as wolffish, leatherback sea turtles, and various whale species;
3. Locations of enhanced areas of production and/or concentrations of feeding seabirds, sea turtles and marine mammals [While many areas have been identified as ‘potentially sensitive areas’, supporting biological, physical and chemical data are lacking.];
4. Locations of important habitat where coastal waterfowl and shorebirds congregate;
5. Locations of spawning areas or other critical habitat for commercial invertebrates and fish;
6. Information on benthic communities, particularly in the deepwater (>500 m) areas. [Some deep-sea coral areas have been identified but many areas have not been surveyed.];
7. Ambient and anthropogenic underwater sound data, both modeled and measured;
8. Information of oil and gas physical and chemical properties for the SEA Area; and
9. The exact trajectory (where, when and how much will reach shore) from an oil spill in the SEA Area is unknown; and is a data gap for this SEA. However, spill trajectory modelling and fate and effect of spills is a requirement for site-specific drilling and production environmental assessments.

6.4 Addressing Data Gaps

Some of the data gaps can be addressed by the relevant government departments under their respective mandates, some by collaborative efforts between industry and government (e.g., PERD), some by general industry-funded programs (e.g., ESRF), some during monitoring programs during exploration, and some as part of project-specific EAs. Some examples are listed below.

1. Additional spatial and temporal distribution data on fish spawning aggregations would be valuable for managing the fisheries as well as for use in impact assessment. It is likely that the C-NLOPB in collaboration with DFO and others in industry will find means to continue gathering these types of data;
2. Additional distributional data on marine-associated birds and marine mammals will likely be collected by operators through seabird and marine mammal observation programs carried out in conjunction with exploration activities. These monitoring and observation programs have been undertaken for many of the exploration activities undertaken in the northeast Grand Banks, the Laurentian Sub-basin and the Orphan Basin;
3. Project-specific EAs may identify the need to collect baseline data or undertake modelling or monitoring programs. Depending upon timing of exploration activities, data collection may be undertaken opportunistically or there may be a requirement to collect data prior to commencement of activities;
4. Site-specific EAs typically provide reviews of all relevant data and in some cases also provide original data (e.g., benthic surveys); and
5. The C-NLOPB will promote research through the ESRF, PRAC, and Memorial University to address data constraints identified in this SEA.

6.5 Conclusions

The Southern Newfoundland Strategic Environmental Assessment (SEA) report provides a general overview of the physical and biological environment for the Southern NL SEA Area. Data constraints and gaps are highlighted for certain environmental descriptors within the SEA Area, including oceanographic, benthic invertebrates, marine mammals, marine birds, and commercial fisheries data.

Within the SEA Area there are a number of sensitive areas, some of which have been included on Figure 3.86. There is one potential candidate area for an National Marine Conservation Area, three Ecologically and Biologically Sensitive Areas that are potential candidate areas for a Marine Protected (NMCA) Area MPA associated with DFO Maritime Region, four (EBSAs) that are candidate areas for a MPA associated with the DFO NL Region, two Important Bird Areas, Special Marine Areas identified by the Canadian Parks and Wilderness Society, potential critical habitat designation for the leatherback turtle, a CAN-NAFO Coral Protection Zone, a provincial park, 15 scheduled Atlantic salmon rivers, and unexploded ordnance.

The SEA report discusses a number of data gaps. As the SEA Area is large and diverse, these data gaps are described for the entire SEA Area as well as for specific locations within the Area. The C-NLOPB will promote the undertaking of research within the Southern Newfoundland SEA Area through research organizations such as the Environmental Studies Research Funds, the Program of Energy Research and Development, Petroleum Research – Atlantic Canada, and researchers at Memorial University. In addition, operators may be required to collect data as part of their program operations either opportunistically during program operations or prior to the start of program activities. The requirement and nature of the data collection will be determined during the project-specific EA stage.

The identification of an area as “sensitive” in the SEA report does not, in itself, automatically imply that it will require the application of special or non-typical mitigations or restrictions. Within some sensitive areas, there may be a requirement for non-typical mitigations or restrictions on offshore oil and gas activities in order to prevent potential environmental effects. The timing, spatial extent, and nature of proposed oil and gas activities,

in addition to mitigations prescribed by legislation, will determine the level of restriction or mitigation that will be required. The timing of these restrictions and/or the application of special mitigation measures are either highlighted below or will be determined during the C-NLOPB's project-specific environmental assessment regulatory approval processes.

The SEA report identifies a number of sensitive areas within and immediately adjacent to the Southern NL SEA Study Area. For these areas, the following conclusions apply:

- The timing of seismic survey activities may be restricted to avoid peak fish spawning/nursery areas identified in the SEA Area.
- In areas with known coral community abundances, activities involving the direct physical disturbance of the seabed may be restricted. Enhanced mitigation measures to reduce or eliminate effects on corals from the disposal of offshore wastes may be required. A 14,040 km² CAD-NAFO Coral Protection Zone currently exists as a mandatory temporary closure to fishing (to 31 December 2012) on the slope of the Grand Bank in NAFO Division 3O.
- The possible location of a shipwreck, HMCS *Shawinigan* has been identified by DND. The location, while unknown, may be located near 47°34'N 59°11'W. Additional unexploded ordnance (UXO) may be "the presence of a Second World War torpedoed merchant ship (*Empire Sailor*)" within EL 1087R at a location of 43°53'N 55°12'W. An "explosives restricted area" is possibly located at 44.75°N 55°W, and an "explosives and chemical restricted area" is possibly located at 44°N; 55.25°W. A potential UXO site known as the "Sydney Disposal Area" may be located at the western edge of the SEA in position 46.08N, 058 W. Wellsite or geohazard surveys may be required prior to any authorization involving physical disturbance (e.g. seabed sampling, drilling programs) in these areas.
- Potential designation of critical habitat for the leatherback turtle. The federal Leatherback Turtle Working Group is considering updating the Leatherback Action Plan to include a critical habitat designation within the SEA Area. Spatial and temporal mitigations may be required to avoid critical life stages.
- Potential designation of a DFO MPA. Four EBSAs associated with the Placentia Bay-Grand Banks LOMA (Burge Bank; Laurentian Channel and Slope; St. Pierre Bank; and Southwest Shelf Edge and Slope) occur in the SEA Area. Three EBSAs proposed by DFO Maritime Region on the offshore Scotian Shelf occur either partially or entirely within the SEA Area. The decisions regarding the conduct of exploration activity will depend on the area designated by DFO and cannot be made until the area is designated as a MPA. Offshore oil and gas activities in or adjacent to the potential MPAs and future protected areas will be bound by the protection measures defined in the appropriate legislative framework for these areas. Additional mitigation, if required, will be determined at the project-specific environmental assessment stage.
- Parks Canada has identified the "South Coast Fjords Area" off southern Newfoundland as a potential NMCA within the SEA Area. With regard to the proposed NMCA, decisions regarding the conduct of exploration activity will depend on the area designated by Parks Canada. These decisions cannot be made until the area is designated by Parks Canada as a NMCA.

With the exception of the foregoing, the SEA indicates that petroleum exploration activities can be undertaken in the Southern NL area using the mitigations described in the document. A project-specific environmental assessment will determine the nature and extent of these restrictions or non-standard mitigations for each activity proposed in each area. If it is determined during an assessment process that baseline information is required in order to assess impact predictions, the operator may then be required to undertake data collection. It is likely that during the early exploration phase, such data collection can be conducted opportunistically as part of ongoing industry activity. In the event that petroleum resources with development potential are discovered, the C-NLOPB will consult with the appropriate operator, government agencies and interested parties in the public to determine the specifics of data collection effort that would be required to support a future development application.