

Environmental Protection and Offshore Petroleum Activities – A Regulator’s Perspective

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INTRODUCTION

The Canada-Nova Scotia Offshore Petroleum Board (Board or CNSOPB) regulates the oil and gas industry operating off the coast of Nova Scotia. Under the *Accord Acts*¹ one of the core responsibilities of the Board is the protection of the environment during all phases of offshore petroleum activities. Broadly this entails that activities are conducted in a manner in which environmental hazards are properly identified, and the associated risks assessed and then mitigated and managed.

Offshore petroleum activities range from geotechnical work, seismic surveys and exploratory drilling to development and production projects. All these produce environmental effects consisting of noise, air and liquid emissions to the marine and atmospheric environments. Some of them include operational discharges in the form of drilling fluid, cuttings and liquid wastes, and fugitive emissions. Although the probability of large petroleum spills is very low, they also must be assessed and planned for response.

Since there are a variety of tools to promote environmental protection which the Board utilizes, this paper will briefly touch upon some of the more significant aspects of its regulatory program: environmental assessment, environmental protection plans, environmental effects monitoring, compliance/enforcement, regulatory coordination, and stakeholder engagement.

ENVIRONMENTAL ASSESSMENT

One of most important tools in protecting the environment and the first step in the regulatory process is an environmental assessment (EA).² Offshore petroleum activities cannot proceed without Board authorization and as part of the authorization process, operators are required to conduct project EAs.³

While the EA generally must identify potential adverse environmental effects, propose measures to mitigate those effects and predict whether there will be significant adverse environmental effects after mitigation measures are implemented (including a follow-up program to verify the EAs accuracy and the effectiveness of the mitigation measures), a focus on assessing environmental impacts respecting valued components lies at the heart of the EA exercise.

Valued components (VCs) are notable features of the natural and human environment that have the potential to be impacted by the proposed activities. Within the temporal and spatial boundaries regarding the footprint of the proposed activity, the Board requires that the VCs evaluated include fish and fish habitat, marine mammals and sea turtles, marine benthos,

¹ *Canada-Nova Scotia Offshore Petroleum Resources Implementation Act*, S.C. 1988, c.28; *Canada-Nova Scotia Offshore Petroleum Resources Implementation (Nova Scotia) Act*, S.N.S. 1987, c.3. Citations will be to the federal version of the legislation. [Collectively, the *Accord Acts*.]

² The Board conducts or participates in three kinds of EAs: strategic environmental assessments for a regional area subject to a Call for Bids and the potential issuance of exploration licences; project-specific EAs under the *Accord Acts* for geophysical and geotechnical activities; and project-specific EAs under the *Canadian Environmental Assessment Act, 2012* (CEAA 2012) for exploratory drilling, development and decommissioning/abandonment activities.

³ Sections 140 and 142 of the *Accord Acts*.

migratory birds, species at risk and their critical habitat, special areas, and other ocean users such as commercial fisheries, Aboriginal fisheries and marine shipping.

Depending on the VC, the Board will require detailed information to ascertain how a given activity may result in residual environmental impacts after mitigation is taken into account. Seismic surveys, for example, must assess species of special status in a study area and the assessment of the potential for disturbance to/displacement of these species due to noise, vessel presence, and the possibility of ship strike.⁴ Included in the assessment is the means by which potential adverse effects are mitigated through operational procedures and how proposed strategies and action plans are demonstrated to be consistent with other laws such as the *Species at Risk Act* and the *Migratory Birds Convention Act, 1994*.⁵

In addition to identifying and assessing VCs, EAs must address other possible effects. The most significant of these often pertain to accidents and malfunctions that may occur in connection with the activity. As another example, for a drilling project this entails identifying worst-case accident scenarios from spills of fuel, drilling fluid/mud and spills from a blowout.⁶ In describing its spill probability analysis and other modelling, the proponent will outline its spill prevention and response safeguards and incorporate within an overall project plan and design mitigation measures to prevent or reduce adverse effects. These include standard mitigation measures, industry best management practices, and compliance with requirements under the *Accord Acts* legislation.⁷ To this end, the Board must be satisfied of the proponent's approach to risk management and that it will take all reasonable measures to minimize the probability of malfunctions and accidents, and if they occur then mitigate the impacts by implementing appropriate emergency response and contingency plans.

Another key EA component is assessing potential cumulative effects whereby the proponent's activity could result in environmental effects acting in combination with the residual effects of other projects and activities that have been or will be carried out. By looking at other ocean users and assessing any overlaps which impact applicable VCs, design and operational procedures can be implemented to mitigate or minimize adverse effects resulting from these cumulative effects.

ENVIRONMENTAL PROTECTION PLAN

An Environmental Protection Plan (EPP) can be considered the proponent/operator's primary document detailing its mitigation requirements. Whereas the EA presents a project conceptually, the EPP sets out in practice the who, what, when and how an operator will protect the environment while conducting its activity. By regulation, the EPP must set out the procedures,

⁴ For example, see the Board's *Scoping Document for Environmental Assessment BP Exploration (Canada) Ltd. Tangier 3D Seismic Survey Exploration Licences 2431, 2432, 2433 and 2434, August 2013*. Environmental assessment documents are available on the Board's website: <http://www.cnsopb.ns.ca/>

⁵ S.C. 2002, c. 29 and S.C. 1994, c 22.

⁶ Canadian Environmental Assessment Agency, *Shelburne Basin Venture Exploration Drilling Project – Environmental Assessment Report*, June 2015, Chapter 7.

⁷ Principally the provisions of the *Nova Scotia Offshore Drilling and Production Regulations* and the *Nova Scotia Offshore Installation Regulations*.

practices, resources and monitoring necessary to manage hazards and protect the environment.⁸ The operator's EPP must be submitted in support of its application for an authorization since the Board must be satisfied the operator's equipment and installations are fit for the purposes for which they are to be used, the operating procedures relating to them are appropriate for those uses, and the personnel who are employed in connection with them are qualified and competent.⁹

Another requirement of the EPP is that it must be a component of an operator's management system and is an operator's plan to effectively implement its environmental protection measures.¹⁰ The system must include coordinating arrangements between the operator and its contractors and set out the contractors' activities within the scope of the operator's EPP. The system should also be linked to the operator's environmental policy, which should form part of the core values of the system, and the policy should include a policy statement that establishes the basic environmental principles applicable to the planned activity. The statement sets the tone for environmental responsibility and performance.

Additionally, the EPP must refer to specific plans, procedures, work instructions, operating manuals and other documents intended to direct the work of personnel at the installation. These documents must be written to demonstrate how the activity is to be conducted in a manner that conforms to the environmental policy, that the EA environmental mitigation commitments are met, limits for discharges are not exceeded, and the operator's objectives and commitments are met.

As to in-depth planning, since each exploration, development and production work or activity is unique, the management system should enable an operator to determine environmental hazards associated with all aspects of the planned work or activity, to evaluate the risk potential of such hazards, and to identify and implement appropriate mitigation strategies. Consequently, the EPP will contain a summary of studies undertaken to identify hazards, evaluate risks, the results of those studies and a summary of the means to avoid, prevent, reduce or manage risks to the natural environment.

The EPP also must describe any planned discharges, the limit on these discharges, and, for waste discharges, the equipment and procedures for treatment, handling and disposal of waste materials. Since emissions and discharges associated with offshore drilling and production are well known, the Board has co-published guidance¹¹ that discusses the Board's expectations of the discharge limits for a variety of waste streams.

ENVIRONMENTAL EFFECTS MONITORING

Environmental Effects Monitoring (EEM) is a science-based performance measurement tool used to verify environmental effects predicted during an EA and to evaluate the efficacy of

⁸ Section 9 of the *Nova Scotia Offshore Drilling and Production Regulations*.

⁹ Section 143.1 of the *Accord Acts*.

¹⁰ For greater details, see the *Environmental Protection Plan Guidelines* issued March 2011 jointly by the CNSOPB, the Canada-Newfoundland and Labrador Offshore Petroleum Board and the National Energy Board.

¹¹ See *Offshore Waste Treatment Guidelines* and *Offshore Chemical Selection Guidelines for Drilling & Production Activities on Frontier Lands* respectively issued jointly by the CNSOPB, the Canada-Newfoundland and Labrador Offshore Petroleum Board and the National Energy Board.

mitigation measures. In the offshore context, it involves scientific monitoring of the effects of petroleum activities on specific components of the surrounding environment. Producing operators are required to conduct EEM programs throughout each year, and the program design may change yearly. EEM is required for all development projects, and at times for certain exploration activities depending on the commitments made in an EA.

In 2005 the Board, the Canadian Environmental Assessment Agency (CEA Agency), Fisheries and Oceans Canada, and Environment and Climate Change Canada developed an EEM process framework. The purpose of the framework was strengthening cooperation and coordination between government, regulators and industry when designing, implementing and reviewing EEM programs. As part of the framework, a periodic synopsis report is prepared by the Board as a public facing document that summarizes the EEM reports that have submitted to the Board over the years.¹²

The EEM reports have verified the predictions of environmental effects on a variety of VCs through experimentation, including:

- monitoring of produced water effects on marine life (taint, chemical body burden and fish health);
- water column monitoring through scraping shellfish (mussel) samples directly from platform legs or moored cages and in-lab testing;
- sediment/benthic habitat and chemistry monitoring, involving retrieving sediment samples. The same samples are used to determine possible toxicity in sediments;
- seabird monitoring consists of relatively continuous and opportunistic observations from platforms and project vessels using trained observers;
- oiled beached bird surveys on Sable Island; and
- marine mammal monitoring to gauge the extent of possible sound related effects.

Monitoring parameters may change from year to year as the EEM programs adapt to better understand findings from past surveys. Over a decade of monitoring results have shown:

- production platforms were predicted to contribute to benthic habitat quality by creating a 'reef effect'. Much more habitat was created than originally lost;
- programs to date have not found evidence of tainting effects in mussel samples;
- oiling of beached birds has not been attributed to the petroleum industry but rather to shipping and other vessel traffic;
- a predicted plume of drilling waste was only detected once and appeared lighter and shorter lived than modeled; and
- some species of marine mammals show no avoidance behavior related to underwater noise from seismic programs (dolphins in particular).

Success in some areas of effects monitoring may naturally lead to improving the methods and processes used to evaluate the relationship between offshore petroleum activities and the receiving environment. Once a knowledge base concerning a particular interaction is developed, the remaining unknowns become the new questions that guide and drive future monitoring

¹² The latest report was published in 2011, *A Synopsis of Nova Scotia's Offshore Oil and Gas Environmental Effects Monitoring Programs*: <http://0-nsleg-edeposit.gov.ns.ca.legcat.gov.ns.ca/deposit/b1064376x.pdf>

efforts. As each monitoring program has gone through a cycle of data collection, interpretation, analysis, and review, new information has been applied to improving program design and adapting monitoring parameters.

COMPLIANCE AND ENFORCEMENT

The Board has in place a regulatory compliance monitoring program to evaluate operator compliance with environmental regulatory requirements while conducting authorized petroleum activities. Operators are required to submit reports detailing the status of their work programs on an ongoing basis, along with other documentation to demonstrate compliance with regulatory requirements. Operational status reports are provided on a daily basis for drilling and production activities, and on a weekly basis for other activities. Reports filed with the Board are reviewed by staff to identify environmental compliance issues and such issues are addressed accordingly.

Board conservation officers regularly conduct environmental audits and inspections at offshore work sites and operator offices to verify compliance. Specifically, the officers have the authority to enter and inspect a place used for a work or activity. They have powers to do various things, including pose questions, conduct tests, take samples, remove anything for examination, take photographs or measurements, use a computer system, have a document be produced or prepared, use copying equipment, be accompanied by any individual, and meet in private with any individual with consent.¹³

For the purposes of conducting formal investigations, a justice of the peace may issue a warrant on *ex parte* application, that authorizes an officer to enter a place, and search for and seize anything, if there are reasonable grounds to believe the place contains evidence of the commission of an offence.¹⁴ In urgent circumstances, however, it is not necessary for the officer to first obtain a warrant.

The Board has an established compliance and enforcement policy to address situations of regulatory noncompliance where operator action is insufficient. Enforcement actions may include: facilitated or directed compliance; issuance of orders, directives or notices; suspension or revocation of approvals and authorizations; issuance of administrative monetary penalties; and prosecution in the court system.

REGULATORY COORDINATION

In February of 2013, the federal Auditor General's Commissioner of the Environment and Sustainable Development (CESD) tabled an audit report¹⁵ on the performance of the Board's environmental regulatory program. This report came after a rigorous review of the Board's management of environmental risks and impacts associated with offshore oil and gas activities. While the report concluded on balance the Board exercised due diligence when assessing and

¹³ Section 194 of the Accord Acts.

¹⁴ Section 197.1 of the Accord Acts.

¹⁵ Office of the Auditor General of Canada, *2012 Fall Report of the Commissioner of the Environment and Sustainable Development*.

approving projects and activities, it did identify areas for improvement. After the report was tabled, the Board released a statement outlining its response and action plan.¹⁶

One of the main findings of the CESD audit was that the Board should have in place up to date and effective agreements with other federal organizations that may be involved in, or support, the Board's regulatory mandate respecting spill preparedness, prevention and response.

Memoranda of Understanding

In response, memoranda of understanding (MOUs) have since been created or updated with a number of departments and bodies, including: Transport Canada Marine Safety and Security, the Canadian Coast Guard, Environment and Climate Change Canada (Environment Canada), Fisheries and Oceans Canada, the National Energy Board and the Canada-Newfoundland and Labrador Offshore Petroleum Board.

To summarize these recent MOUs:¹⁷

MOU between the CNSOPB and the Canadian Coast Guard

The CNSOPB signed a new MOU with the Canadian Coast Guard to coordinate activities related to safety and environment response (including spill response), to cooperate and share information to promote safety and environmental protection through effective spill preparedness and response, as well as training and exercises.

MOU between the CNSOPB and Transport Canada Marine Safety and Security

The CNSOPB updated its MOU with Transport Canada Marine Safety and Security to facilitate coordination of offshore oil and gas activities where possible and to avoid duplication of work in relation to marine safety, occupational safety and health, and environmental protection. In addition, the MOU provides clarification on the use of the National Aerial Surveillance Program in monitoring spill incidents.

MOU between the CNSOPB and the Canada-Newfoundland and Labrador Offshore Petroleum Board and the National Energy Board

The CNSOPB entered into this MOU with these respective Boards to enhance the cooperation and coordination of activities between the participants related to safety, security, the environment, and resource conservation, including activities respecting regulatory matters, the sharing of resources, and emergency management.

MOU between the CNSOPB and Environment Canada

The CNSOPB updated its MOU with Environment Canada to facilitate and promote protection of the environment, preparedness and response to oil spills and conservation of migratory birds

¹⁶ Link to the statement: http://www.cnsopb.ns.ca/sites/default/files/pdfs/cesd_news_statement_feb_5.pdf

¹⁷ Link to the MOUs: <http://www.cnsopb.ns.ca/environment/cesd-audit>

and species at risk during offshore oil and gas activities. Furthermore, this MOU details how the Integrated Satellite Tracking of Pollution program may be used to track oil and gas environmental incidents.

MOU between the CNSOPB and Fisheries and Oceans Canada

The CNSOPB updated its MOU with Fisheries and Oceans Canada (DFO) to facilitate and promote effective coordination between both organizations. This MOU details how the CNSOPB and DFO will collaborate on the development and implementation of integrated management plans for marine and coastal waters in respect of the offshore area, including associated actions pertaining to the management of Canada's commercial, recreational, and Aboriginal fisheries, at-risk aquatic species and their critical habitat. The Board is also involved in initiatives led by DFO related to marine protected areas and integrated management planning under the *Oceans Act*.¹⁸

With respect to the Board's relationship to DFO and Environment Canada, it is worth noting that the three agencies work closely, particularly on the review of EAs whether they are conducted under the *Accord Acts* or *CEAA 2012*. For *Accord Acts* EAs, the Board relies on DFO for scientific expert advice respecting fish, marine mammals and fisheries and relies on Environment Canada respecting species at risk, marine birds and spill response. Conversely, the Board, as a federal authority under *CEAA 2012*, provides advice on environmental impacts and mitigation from its perspective through in-house expertise (geologists, drilling engineers, facilities engineers and others) to the CEA Agency and other federal authorities.

STAKEHOLDER ENGAGEMENT

Complementing the above-noted tools, the Board maintains an open working relationship with various stakeholders with an interest in offshore petroleum activities. The following are three of the main approaches of how the Board works to ensure open and transparent relationships with stakeholders.

Minimizing Impacts to Fisheries

The Board requires operators to conduct offshore activities in a manner that minimizes the impact on fisheries, marine fish resources, and fish habitat. The presence of vessels associated with offshore petroleum exploration and development activities may require the use of space which may also be occupied by commercial fisheries.

Standard marine protocols to communicate and avoid collision with other vessels, including a Notice to Mariners, are required for all offshore activities under Board's jurisdiction. There is a requirement for a 500m safety zone¹⁹ around drilling and production installations, where non-project vessels are restricted from entering. Outside of this zone, petroleum operators are required to work with commercial fishing vessels to minimize interactions.

¹⁸ S.C. 1996, c. 31

¹⁹ Section 72 of the *Nova Scotia Offshore Drilling and Production Regulations*.

In addition to the above protocols, the Board requires a fisheries liaison officer to be present on all seismic vessels using air-gun arrays, to minimize navigational interactions with active fisheries present in the area. Knowledgeable fisheries liaison officers help ensure effective communication between petroleum operators and fishers. The Board also evaluates other offshore activities during the environmental assessment process to determine if there is a need for a fisheries liaison officer. As a secondary role, the fisheries liaison officer may also monitor and record marine mammal and seabird observations.

Fisheries Advisory Committee

The Board's Fisheries Advisory Committee (FAC) includes representatives from various fishing groups, DFO, the Nova Scotia Department of Agriculture and Fisheries, Natural Resources Canada, and the Nova Scotia Department of Energy. FAC members provide advice and suggestions to the Board for consideration in work authorization applications, regulations and guidelines. Meetings are held quarterly and briefings are sent out to inform and engage members in discussion of upcoming projects and other petroleum related activities. Committee members are provided with notice of all environmental assessments and are invited to submit comments to the Board for consideration during the review processes.

International Offshore Petroleum Environment Regulators

The Board is a founding member of the International Offshore Petroleum Environment Regulators (IOPER). The IOPER is a collaborative group of national regulators whose members are dedicated to raising environmental performance standards within the offshore petroleum exploration and production industry. This includes standards applicable to the industry's normal operations, as well as environmental emergency prevention, preparedness and response.

CONCLUSION

From the Board's perspective, decisions on environmental assessments must be based on sound science and the appropriate information about the natural environment and how proposed activities may impact it. While activities are underway, the application of practical plans and mitigation measures will ideally result in minimal residual effects. Monitoring and studying environmental effects to verify assessment predications and to evaluate mitigation leads to a greater understanding of what is happening to the natural environment. Regulatory coordination and information sharing provides a framework for government bodies, industry and other stakeholders to ensure environmental protection continues to evolve and improve for existing and future projects.