

STRATEGIC ENVIRONMENTAL ASSESSMENT ON HYDROCARBONS

■ Report specific
on Île d'Anticosti

May 2016

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We would first like to point out that the strategic environmental assessment (SEA) of the entire hydrocarbon option and the SEA specific to Île d'Anticosti were guided by the following goals:

- Conduct work in a rigorous and structured manner
- Acquire new knowledge based on science
- Conduct an objective, integrated analysis of the environmental, social, and economic issues
- Set stringent safety and security requirements and environmental standards based on best practices in order to modernize the legislative and regulatory framework
- Be attentive to citizens' concerns, inform them, and act responsibly and transparently

The work was overseen by a steering committee of government representatives and independent experts from the academic community. We would like to thank these experts for their commitment and for their critical input throughout the SEA process:

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- Lynda Roy, SEA Coordinator and Steering Committee Secretary
- Claude Leblanc and Charles Lamontagne, Society Focus Area Coordinators
- Georges Gangbazo, Environment Focus Area Coordinator



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- Ministère des Affaires municipales et de l'Occupation du territoire
- Secrétariat aux affaires autochtones
- Ministère des Forêts, de la Faune et des Parcs
- Ministère de la Santé et des Services sociaux

Thanks also to the interest groups and industry representatives that took part in the public consultation on SEAs and to Aboriginal nations for their contribution. The points of view expressed, the concerns and issues raised, and the proposals submitted helped significantly improve the reports that were produced.

Lastly, we would like to point out that this report on the SEA specific to Île d'Anticosti, as well as the knowledge assessments and studies conducted as part of the AKAP are meant to be an informative tool to help the Government of Québec in its decisions about oil and gas development on Île d'Anticosti.

Cochairs

Gilbert Charland
Deputy Minister of Energy
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PLEASE NOTE:

This document does not contain all the information provided in the consultation document. Anyone interested in reading all the results may consult the documents produced, including the report on the public consultation and the studies conducted as part of the strategic environmental assessments, which are available online at hydrocarbures.gouv.qc.ca.

LIST OF ACRONYMS

| | |
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| CVIEPA: | Centre de vigilance et d'information sur les enjeux pétroliers à Anticosti |
| SEA: | Strategic environmental assessment |
| GHG: | Greenhouse gas |
| EQA: | Environment Quality Act |
| MDDELCC: | Ministère du Développement durable, de l'Environnement et de la Lutte contre les changements climatiques |
| MEES: | Ministère de l'Éducation et de l'Enseignement supérieur |
| MERN: | Ministère de l'Énergie et des Ressources naturelles |
| MFFP: | Ministère des Forêts, de la Faune et des Parcs |
| RCM: | Regional county municipality |
| MSP: | Ministère de la Sécurité publique |
| MTMDET: | Ministère des Transports, de la Mobilité durable et de l'Électrification des transports |
| AKAP: | Additional Knowledge Acquisition Plan |
| WWPR: | Water Withdrawal and Protection Regulation |
| RPNGUR: | Regulation respecting petroleum, natural gas and underground reservoirs |
| SÉPAQ: | Société des établissements de plein air du Québec |
| ECRC: | Eastern Canada Response Corporation |
| SOPFEU: | Société de protection des forêts contre le feu |
| SPEDE: | Cap-and-trade system for greenhouse gas emission allowances |



OVERVIEW

A strategic environmental assessment (SEA) is an analytical and participatory process carried out before a strategic decision is made. The goal of an SEA is to incorporate environmental considerations into policies, plans, and programs and to assess their impacts on economic and social considerations to inform decision making.¹

The work completed as part of the SEA specific to Île d'Anticosti made it possible to:

- Assess current knowledge and the knowledge acquired through the Additional Knowledge Acquisition Plan
- Identify the potential environmental, social, and economic impacts
- Determine mitigation measures to develop resources responsibly while protecting people and property and respecting the environment
- Define the additional knowledge that the government or industry needs to acquire

The overview presents the main social, economic, and environmental considerations that the government should take into account in its decision on oil and gas development on Île d'Anticosti.

Social considerations

The qualitative survey of Île d'Anticosti residents conducted by Ministère des Ressources naturelles (MRN) in 2014 and the work carried out as part of the SEA specific to Île d'Anticosti made it possible to document the potential social impacts on the Île d'Anticosti community, as well as residents' concerns and expectations and their level of adaptability and resiliency with regard to the changes that oil and gas development could bring.

Moreover, a number of briefs submitted during the public consultation expressed social concerns about Anticosti related, among other things to the impact on the community, the increase in GHG emissions, the reconciliation of different forms of land use, and the preservation of the island's natural environment.

A remote and isolated island community

Anticosti residents live in a remote and isolated island environment where the high costs of transporting people and goods is a major issue. Anticosti's population is aging and in decline.

Although forestry was an important economic engine between 1926 and 1970, today the island's economy essentially relies on the recreation and tourism industry. Residents appreciate the diversity and quality of services available, but feel that some may be untenable. Strict enforcement of certain laws and regulations is also perceived as hindering their development possibilities.

¹ Canadian Environmental Assessment Agency, 2012, André et coll.

Concerns and expectations

The SEA helped identify the concerns and expectations of the Anticosti community, which:

- Wants to take its development in hand and curb the community's decline through a shared vision of development, the involvement of key, socially engaged stakeholders, and access to objective information
- Is concerned about the potential impacts of oil and gas development on the quality of the environment, the quality of life, the community, and on recreation and tourism activities, such as hunting and fishing, which are currently its main sources of income
- Wants to bolster the tourism sector to ensure the community's survival and growth and introduce permanent, affordable shore-to-shore transportation to relieve the feeling of isolation
- Has mixed feelings about potential oil and gas development, yet sees positive aspects from an economic perspective. The community wants to be involved in the project's development so long as it has capacity-building benefits for Anticosti residents, but is not convinced of the advantages it could bring them in its current form. Moreover, it wants land-use conflicts to be mitigated and constraint zones to be defined before signing off on any project.

Economic considerations

The knowledge obtained from available data and analogous situations was used to assess the potential financial profitability of oil and gas development on Île d'Anticosti based on a so-called "optimized" scenario. In this scenario it is estimated that 448 platforms could be built over a period of 50 years², for a total of some 4,155 wells. During the period of maximum development, production would be composed of 77.5% natural gas and 22.5% oil, or 246 Bcf of gas and 12.3 million barrels of oil. Oil and gas development on the island would likely be sufficient to meet up to 113% of Québec's annual natural gas consumption needs and up to 9% of its oil consumption needs. It could represent an influx of over \$2 billion a year into Québec's GDP.

Considering the lifespan of the project, which could extend over 75 years, operations on Île d'Anticosti could create and maintain an average of between 2,200 and 2,600 direct and indirect jobs a year, depending on the selected for transporting natural gas (factory vessels or a pipeline). The bulk of these jobs would derive from project operations.

It is premature to reach any conclusions as to project profitability until the presence of commercially producible oil and gas on Île d'Anticosti is confirmed. A number of exploratory wells drilled by means of hydraulic fracturing are required to assess the resources.

If the presence of resources is confirmed, economic feasibility studies will be conducted to assess the commercially producible resources and the project's potential profitability based on the prevailing economic, technical, and regulatory conditions at the time of the studies. Some of the main factors at play include resource price forecasts, which are currently low, anticipated production costs, and the cost of building facilities for extracting, transporting, and processing oil and gas.

² About 10 new platforms built a year on average.



Environmental and safety considerations

If the presence of resources is confirmed, their development is deemed viable, and the government authorizes the industry to proceed, the industry will be required to take all necessary steps to limit the potential impacts of the project. This includes implementing mitigation measures adapted to the project and the local environment in order to maintain water and air quality, manage waste materials and wastewater, control GHG emissions and spills, and protect biodiversity. Through its technological choices and operations management, industry must ensure the short-, medium-, and long-term safety and security of people and the environment and optimize the performance, safety, and integrity of operations.

The main issues associated with oil and gas development on Île d'Anticosti, including those concerning hydraulic fracturing, as well as the main conditions and obligations that should be imposed on the industry are described below.

Water supply

Since fracturing is generally a multi-step process, large amounts of water (sometimes up to 16,000 m³ per well) may be required. The main issues concern the availability of water and the impact of water withdrawals on natural environments. To address this, the following steps are recommended:

- Determine the source of water supplies in accordance with the WWPR
- Set up new hydrometric stations to gain a better understanding of the water regime of the watercourses where withdrawals could be made
- Consider using water from the Gulf of St. Lawrence (or other substances such as propane gel) since the amount of surface water available on Île d'Anticosti would not be sufficient to meet the needs of a possible future oil and gas development involving hydraulic fracturing
- Monitor the physicochemical quality of surface water and changes in benthic macroinvertebrate communities.

Groundwater contamination

Recommendation: Groundwater migration and contamination

Groundwater contamination from hydraulic fracturing may be the result of defective equipment, tanks, or wells; human error; or other causes such as climate conditions and vandalism.³ To address this, the following steps are recommended:

- Characterize the initial condition of groundwater
- Determine the risk of fluids migrating into aquifers via natural and induced fissures
- Use an impermeable membrane at the site to reduce the impact of leaks and soil contamination
- Store wastewater in enclosed tanks and handle it with care (particularly when transporting it), making sure not to contaminate the natural environment through runoff and water infiltration
- Install berms around drilling sites to reduce the impact of leaks and soil contamination
- Set up a centralized water treatment plant with ocean discharge (operation phase)
- Develop a waste management plan
- Implement a groundwater quality monitoring procedure in accordance with the WWPR.

Air quality and noise pollution

At the local level, air quality could be altered from between a few hundred meters to a kilometer away from exploration and production sites. To address this, the following steps are recommended:

- Install an air quality control and monitoring station

Operations associated with oil and gas exploration and production, notably road and well site construction and hydraulic fracturing operations, may create some noise disturbances for cottagers. To address this, the following steps are recommended:

- Limit noise disturbances by using obstacles to block noise or by using quieter equipment

³ Assessment of the Potential Impacts of Hydraulic Fracturing for Oil and Gas on Drinking Water Resources, Environmental Protection Agency (EPA), 2015, http://www.epa.gov/sites/production/files/2015-06/documents/hf_es_erd_jun2015.pdf



Induced seismicity

Hydraulic fracturing rarely causes earthquakes, but when it does, they are usually small to moderate in magnitude. The Geological Survey of Canada installed three new seismic measuring stations on Île d'Anticosti to monitor seismic activity. If the government decides to authorize this kind of development, the following steps are recommended:

- Determine the geological constraints and stability of the main faults on Île d'Anticosti to limit the risks of induced seismicity stemming from hydraulic fracturing
- Monitor seismic activity on Île d'Anticosti to measure natural seismicity
- Document the seismic events that may be triggered by hydraulic fracturing

GHG emissions

Under the first scenario, where gas recovery facilities would be in place at the start of gas production in 2020, annual GHG emissions would be in the range of 1.4 million tons of CO₂ equivalent during the peak well operation period.

To put this into perspective, these GHG emissions would represent about 2% of Québec's target of 67.6 million tons of CO₂-equivalent GHG emissions for 2020. This data is based on Québec's inventory of greenhouse gas emissions in 2012 and their evolution since 1990, which was the inventory available at the time the sectoral studies were done. Under the second and third scenarios, annual GHG emissions would likely be much higher at between 2 and 4 million tons of CO₂ equivalent, accounting respectively for between 3% and 6% of Québec's emissions based on the 2020 target.

Wildlife concerns

The industry's development strategy and the technological choices to be made must take into account the protection of Atlantic salmon and white-tailed deer. Specific mitigation measures and environmental monitoring of the anticipated impacts are needed. The restoration of abandoned sites must also be an integral part of the projects submitted.

Biodiversity

Most of the impacts of oil and gas exploration and development on biodiversity are attributed to the construction of roads and pipelines and the transportation of people and goods.

Oil and gas development must be carried out without compromising Île d'Anticosti's conservation interests, including the possibility of expanding protected areas or creating new ones. Other mitigation measures could also be required before authorization certificates are issued.

Technology and operations management

Best practices have been identified for risk mitigation and environmental protection in oil and gas exploration and development (GTEC02, GTEC03, and 04).

The new legislative and regulatory framework to be implemented must take into account best practices in terms of work planning, well design, and other related activities in order to limit the risks of incidents related to work and operations management. Best practices must also be followed to ensure a rapid response in the event that an anomaly is detected during work monitoring or control.

In addition, to properly regulate hydraulic fracturing work, the government should require developers to submit a detailed plan of the work that includes water management, the list of additives used, the measures taken to ensure well integrity, and the conditions in which fracking will be carried out. All of the items that should be included in the work plan are listed in Section 3.3.2 of the SEA of the entire hydrocarbon option.

Spill management

Given the lack of emergency response capabilities on Île d'Anticosti, all incident prevention, preparation, response, and compensation measures must be coordinated with municipal authorities and carried out by the licensed corporation. The company must therefore have an emergency response plan that is adapted to Île d'Anticosti's geographic situation and the risks associated with oil and gas exploration and development to ensure the safety and well-being of citizens and protect the environment.



OIL AND GAS EXPLORATION AND DEVELOPMENT RAISES A NUMBER OF CONCERNS AND CHALLENGES WITH REGARD TO SUSTAINABLE DEVELOPMENT FOR ALL STAKEHOLDERS (BUSINESSES, GOVERNMENTS, LOCAL COMMUNITIES, CIVIL SOCIETY, ETC.), PARTICULARLY GIVEN THE NON-RENEWABLE NATURE OF THESE RESOURCES.

The **government** must develop a strict legislative and regulatory framework to make it possible to:

- Develop resources responsibly in a manner that is respectful of the environment, protects people and property, and minimizes GHG emissions
- Maximize the benefits of oil and gas exploration and development for local communities, Aboriginal people, and all Quebecers and ensure they are compensated for any externalities these activities may generate
- Get local communities more involved in the decision making process

For its part, industry must take all the necessary measures to mitigate, or eliminate, the social and environmental impacts that oil and gas exploration and development can generate.

It must also take the necessary steps to foster the social acceptability of its project by meeting local community needs and expectations in terms of project monitoring, communication, quality of life, resource protection, and economic spinoffs.

The government must take the following factors into consideration in decisions about the next steps in the work on Île d'Anticosti:

- The Anticosti community does not have the capability to deal on its own with the changes likely to be spurred by the introduction of oil and gas development on the island. Regardless of the chosen development scenario—including the status quo—the community will need support.
- The Anticosti community wants to be consulted on the choices to be made concerning the development plans envisaged for the island.
- More exploration work is needed, including drilling with hydraulic fracturing, to confirm the presence of the resources and determine whether they are commercially producible.
- The project presents environmental risks that must be controlled and limited, especially in light of the island's specific geographic and socioeconomic characteristics.
- The project may generate GHG emissions that require other sectors in Québec to further limit their own emissions in order for reduction targets to be met.
- Additional knowledge about Île d'Anticosti is required at every step of the project's development.
- The project may yield major economic benefits if the economic climate, which is strongly linked to the price of resources, is favorable.

