

## Strategic Environmental Assessment on Shale Gas

### Submission to

### Bureau d'audiences publiques sur l'environnement

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In the synthesis report, *Strategic Environmental Assessment on Shale Gas: Knowledge Gained and Principal Findings*, the Bureau d'audiences publiques sur l'environnement (BAPE) identifies the principles applying to environmental, social, economic, and governance issues, and knowledge obtained with respect to those principles during the SEA process. These are sound principles that are supportive of responsible decision making with respect to resource development. The following remarks and comments focus mainly on technical and environmental matters, with comments on many of the social, economic, and governance issues left for others with expertise in those areas.

Overall, the report suggests that shale development and extraction can be undertaken safely within an appropriate regulatory framework, and with the application of responsible development and best practices to address technical concerns and mitigate potential impacts. The Canadian Society for Unconventional Resources supports these conclusions. Shale gas development is in its infancy in Quebec, and much will be learned about the resource and the most appropriate technological approaches to development and production as wells are drilled, tested, and evaluated. This knowledge will enable continuous improvement in operations and mitigation measures, as has been the case throughout western Canada.

As a general comment, shale gas development is an industrial activity, and as with any industrial development it can have local impacts. For shale gas development most of the disturbance at any specific location is temporary, or transient, as drilling and hydraulic fracturing operations are underway. For residents in the vicinity of a drilling or hydraulic fracturing operation the disturbance can be significant while it is underway. Typically operators will work with local residents to minimize the impacts as much as possible, and to locate well sites where benefits of natural mitigation can be obtained (for example distance from residences, topography, treed areas). Local communities can experience longer term impacts, both intrusive and beneficial, and constructive relationships with communities work in favor of both the community and the operator.

The SEA identified a spectrum of water related issues as areas of primary concern. Quebec is not alone in this regard. The use, transportation, storage and disposal of water are aspects of development that receive a great deal of attention from producers and industry service companies, as well as from regulators and governments in western Canada.

As an undertaking to address those concerns, the members of the Canadian Association of Petroleum Producers subscribe to a set of Guiding Principles for Hydraulic Fracturing and six Operating Practices directed specifically at establishing a responsible approach to water management. By making water management a priority producers are identifying a commitment to transparency, water protection and continuous improvement in operations. The six practices address:

- Fracturing fluid additive disclosure – in Alberta and British Columbia FracFocus is used by regulators for disclosure purposes, and in other jurisdictions CAPP members have indicated they will make additive information publicly available.
- Fracturing fluid risk assessment and management – well specific risk management plans for hydraulic fracturing fluid additives will be made publicly available.
- Baseline groundwater testing – producers will undertake domestic water well testing programs and work with governments and stakeholders to understand and address regional groundwater concerns
- Wellbore construction and quality assurance – companies will design and construct wellbores in a manner to ensure integrity, and prepare remedial plans in the unlikely event that the wellbore integrity is compromised. Wellbore construction and assurance practices will be publicly available.
- Water sourcing, measurement and reuse – water sources will be monitored as required to demonstrate sustainability, and water measurement, sourcing and reuse practices will be made publicly available.
- Fluid transport, handling, storage and disposal – identification, evaluation, and mitigation of risks will be undertaken as will planning to ensure quick response to accidental spills. These practices will be made publicly available.

Through their membership in the Petroleum Services Association of Canada (PSAC) the companies that provide hydraulic fracturing services to producers have also recognized public concerns and made addressing those concerns a priority. Those service companies have endorsed a Hydraulic Fracturing Code of Conduct which addresses water and the environment, fracturing fluid disclosure, technology development, health, safety and training, and community engagement. The service companies have made a commitment to advance opportunities to reduce water consumption, maximize protection of all water sources, ensure transparency, and invest in research and development to minimize the environmental impact of operations.

Governments and regulators in Alberta and British Columbia are also taking steps to address concerns related to water and other environmental and community issues. In recent years in both Alberta and British Columbia additional requirements and regulations have been put in place to identify and mitigate impacts on water, the environment and communities. The intent is to ensure long term integrated land use planning to address the needs of multiple users of land and water resources – an approach that the SEA has identified as essential for responsible development. Both the Alberta Energy Regulator and British Columbia Oil and Gas Commission routinely review the implications of changing technologies, knowledge of reservoir characteristics, and the appropriateness of regulations for resource development approaches.

As technologies and practices for shale gas development have evolved the following trends are becoming clear:

- Widespread use of multi-well pads, often with twelve or more wells on each pad, and longer horizontal wells is enabling:
  - o Increased reuse of both fracturing fluid flowback and produced water, and a corresponding reduction in water disposal requirements
  - o Production from larger subsurface reservoir areas from a single surface location with a corresponding reduction in the number of physical locations of disturbance on surface
  - o Reduced traffic, community disturbance, and fragmentation of both agricultural and forested lands
- Consultation with communities and municipalities to identify appropriate materials transportation and general traffic corridors for operations, reducing the day to day disruption and conflict
- Centralized treatment and permanent buried water distribution and produced water collection systems (facilitated by multi-well pads) with a corresponding reduction in truck traffic
- Conversion of equipment fleets to natural gas to reduce emissions and mitigate traffic and risks associated with transporting and storage of diesel fuel
- Where appropriate, some operators are choosing to use natural gas incinerators or similar technology as an alternate to flaring during production testing to minimize what might otherwise be significant visual disturbance, particularly at night

It must be understood that there is a significant capital cost associated with the implementation and application of some of these development approaches, and some of them become viable only after commercial development decisions have been made. Nevertheless, when applied during long term development they result in significant reductions in the impact of operations on the environment and communities, and the application of these practices and

development approaches will mitigate many of the concerns identified by the SEA. In Alberta and British Columbia both technologies and development practices are evolving rapidly, and continuous improvement is expected.

The synthesis report correctly identifies well design and construction as an area of particular concern in order to ensure mitigation of potential risks associated with gas migration. We agree with the conclusion that the use of good quality oilfield cements and proper design, construction and closure practices serve to minimize this risk. As is the case with other technologies, cement mixtures and technology are evolving and research related to early detection of integrity problems and remediation practices is continuing.

The SEA identifies a concern with the estimation of the risk of contamination of shallow freshwater aquifers which could result from surface leaks of fluids or fuels. Concerns about contamination of shallow aquifers are not unique to shale gas development – in fact they apply to most industrial operations and installations, including everything from retail fuel storage facilities to mining and effluent storage. A comprehensive report released by Gradient Corporation in May 2013 (*National Human Health Risk Evaluation for Hydraulic Fracturing Fluid Additives*) addresses the shallow aquifer contamination concern (among others), and the BAPE may find it useful to consider Gradient's assessment (and methodology) to further its understanding in this area. Gradient used historical spill data, a broad spectrum of conditions, conservative (health protective) assumptions (including an assumption that no containment, spill recovery or mitigation measures were in place), established risk management guidelines and probabilistic methodologies and concluded that the human health risk was negligible.

With respect to governance and economic benefits, others with more expertise can provide specific comments. However, it is worth noting that the economic benefits arising from oil and gas development in Saskatchewan, Alberta and British Columbia during the past 50 years are difficult to dismiss. Quebec has the opportunity to gain leverage from that history to develop a sustainable path forward that balances shale gas development, environmental protection, community interests, regulation and public benefit.