

**MINISTRY OF ENVIRONMENT  
MEETING INFORMATION NOTE**

July 14, 2014

File:

CLIFF/tracking #: 208298

**PREPARED FOR:** Honourable Mary Polak, Minister of Environment

**DATE AND TIME OF MEETING:** July 18<sup>th</sup> 3pm in Vancouver (exact location TBC)

**ATTENDEES:** Representative(s) of the Canadian Geothermal Association

**ISSUE(S):** To discuss the benefits of Geothermal Energy for British Columbia –  
May 8, 2014 correspondence to Minister Polak.

**BACKGROUND:**

Geothermal energy is thermal energy generated and stored in the Earth, and has demonstrated value as a renewable source of heat and power for residential and commercial buildings. British Columbia (BC) is situated on the Pacific Ocean “Ring of Fire” volcanic network and has several volcanic regions with potential geothermal resources.

Although the up-front capital and exploratory costs are high, geothermal energy has low operational costs, leaves a relatively small ecological footprint, and can potentially provide firm energy (i.e., constant baseload) for an indefinite period of time.

The National Geothermal Energy Program (between 1976 and 1986) identified many potential geothermal sites in BC. At Meager Creek, several wells were drilled in the 1980s under this Program. Today, there are a total of five geothermal permits in the Province and one geothermal lease active in BC:

- Borealis GeoPower is involved as a permit holder in two geothermal prospects in BC:
  - In October 2013, Borealis renewed only one of three permits at Canoe Reach, south of Valemount; and
  - In January 2014, with Kitselas First Nation and Enbridge partners, Borealis was awarded a geothermal permit at Lakelse Lake, south of Terrace.
- There are three permits near Mount Meager, and a geothermal lease held by Ram Power at Mount Meager, as a result of the federal program in the 1980s (above).
- All of the above are still in the exploration stage.

The Ministry of Energy and Mines and the Oil and Gas Commission are currently working to streamline the regulatory framework for geothermal energy in BC.

The Minister is scheduled to meet with representative(s) of the Canadian Geothermal Association (CanGEA). CanGEA was founded in 2007. Its main activity is political advocacy. Alison Thompson, who corresponded with Minister Polak on May 8<sup>th</sup>, is the Chair of the Canadian Geothermal Association. Most recently, Borealis GeoPower, an

active corporate member of the Canadian Geothermal Energy Association out of Calgary, met with Honourable Shirley Bond in May 2014.

## **DISCUSSION:**

It is anticipated that CanGEA will speak to the key points they have made (geothermal opportunities and benefits in BC) in the correspondence sent to the Minister's Office on May 8, 2014:

1. Using geothermal to power prospective LNG terminals;
2. Supporting the BC Jobs Plan over and above traditional means of electricity generation;
3. Addressing existing deficiencies in the province's geothermal regulatory processes;
4. Supporting mineral sharing agreement negotiations with First Nations;
5. Helping to stabilize power rates; and
6. Providing firm but flexible power to existing transmission infrastructure.

CanGEA's position is that BC has significant geothermal potential that is not being realized, particularly considering the level of activity in other parts of the world, including the western states in the U.S. and Mexico.

CanGEA has recommended that geothermal companies be subject to corporate income taxes and that no royalties should be levied on geothermal energy (A royalty scheme for geothermal is not in place). CanGEA is completing a favourability study of geothermal energy in BC, with funding from GeoScienceBC. GeoScienceBC has received the report and is currently assessing the data.

Barriers to the exploration and development of geothermal energy in BC include the high up-front cost and risk of exploration, and the length of exploration and development timelines. However, geothermal plants, once a resource has been identified, can continuously deliver firm power with very low operating costs.

## **SUGGESTED RESPONSE:**

s.13

**Contact:***Tim Lesiuk**Climate Action Secretariat**250 387-9456***Alternate Contact:***Erik Kaye**Climate Policy Branch**250 387-1160***Prepared by:***Ted Sheldon**Climate Policy Branch**250 387-1359*

<b>Reviewed by</b>	<b>Initials</b>	<b>Date</b>
DM	-	-
DMO	VJ	July 16/14
A/Head, CAS	TL	July 14/14
Exec Dir	LL	July 14/14
A/Mgr.	EK	14.07.14
Author	TS	14.07.14

**MINISTRY OF ENVIRONMENT  
MEETING INFORMATION NOTE**

July 15, 2014  
File: 280-20  
32910-30  
CLIFF/tracking #: 207703

**PREPARED FOR:** Honourable Mary Polak, Minister of Environment

**DATE AND TIME OF MEETING:** July 24, 2014 at 9:00am

**ATTENDEES:** Minister Polak, Deputy Minister Wes Shoemaker, Assistant Deputy Minister Jim Standen, Executive Director Jim Hofweber, Environmental Emergencies Director Graham Knox, Project Lead Angie Poss and Senior Policy Analyst Ben Vander Steen. CEPA: Vice President Philippe Reicher and support staff.

**ISSUE(S):** The Canadian Energy Pipeline Association (CEPA) will brief Minister Polak and project team on their response to the Ministry's intentions paper on land based spill preparedness and response.

**BACKGROUND:**

CEPA is one of many stakeholder associations planning to submit comments to the Ministry's public consultation process on a proposed new spill preparedness and response regime for the land base. The consultation period closes July 25. Many associations, particularly those representing industry, plan to submit their comments at the end of the consultation period to maximize their time to consult with their members.

In March, CEPA presented the Ministry with a formal report (attached) outlining a voluntary alternative to the new regime being developed by the Ministry. This paper was a partnership with the Railway Association of Canada in consultation with Western Canada Marine Spill Response Services and Western Canada Spill Services.

**DISCUSSION:**

Over the past 18 months, CEPA has expressed concern about the necessity and elements of a world class spill response system in B.C.<sup>s.13</sup>  
s.13

s.13

CEPA is expected to raise the following points in their response to the intentions paper:

**ISSUE:** Voluntary measures vs. regulatory oversight

CEPA has consistently expressed a preference for voluntary spill response measures including an industry steering committee, in-house training and exercising of response plans and industry discretion in determining response actions, restoration activities and

end points once a spill has occurred. Several industry organizations and companies have expressed that voluntarily exceeding (existing) regulations contributes to their corporate branding and social license.

**RESPONSE:**<sup>s.13</sup>  
s.13

**ISSUE:** Funding and cost implications

1) CEPA and the Canadian Association of Petroleum Producers (CAPP) have both asserted that any costs associated with an improved provincial spill preparedness and response regime should be covered by the Province using revenue from industry taxes and royalties. CEPA and CAPP further assert that costs incurred by communities in preparing for and responding to spills should be borne using revenue from industry property taxes. 2) Incremental cost increases associated with an improved regime are also a concern for several industry sectors consulted in developing the intentions paper proposals. 3) Concerns about other jurisdictions following B.C.'s lead in strengthening their requirements, leading to cost increases for operations across North America.

**RESPONSE:**  
s.13,s.17

**ISSUE:** Perceived duplication

CEPA members are subject to regulation by the National Energy Board, BC Oil and Gas Commission, and potentially other federal regulators depending on the scope and scale of their operations. Recent proposed or pending legislative changes by the National Energy Board and Transport Canada have heightened sensitivity that B.C.'s world leading regime will duplicate existing regulations.

**RESPONSE:**

s.13,s.16,s.17

**ISSUE:** Perceived lack of gaps within current system

Both CEPA and CAPP have requested MoE perform a gap analysis.

**RESPONSE:**

s.13,s.17

**Attachments:** 1A: World Leading Land Based Spill Preparedness and Response in British Columbia: The Perspective of Large Liquid Hydrocarbon Transporters.

**Contact:**

*Jim Standen, ADM  
Environmental Protection  
Division*

*250 387-1288*

**Alternate Contact:**

*Jim Hofweber, ED,  
Environmental  
Emergencies and Land  
Remediation Branch*

*250 387-9971*

**Prepared by:**

*Angie Poss  
Environmental Emergencies and  
Land Remediation Branch*

*250 356-9833*

<b>Reviewed by</b>	<b>Initials</b>	<b>Date</b>
DM	-	-
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Author	AP	July 15/14



canadian  
energy  
pipeline  
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canadienne  
de pipelines  
d'énergie



Railway Association  
of Canada

# **World-Leading Land Based Spill Preparedness and Response in British Columbia**

## ***The Perspective of Large Liquid Hydrocarbon Transporters***

**Canadian Energy Pipeline Association  
Railway Association of Canada**

**In consultation with  
Western Canada Marine Response Corporation  
Western Canadian Spill Services Ltd.**

**March 17, 2014**





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# **World-Leading Land Based Spill Preparedness and Response in British Columbia**

## ***The Perspective of Large Liquid Hydrocarbon Transporters***

### **1. Executive Summary**

Companies and organizations that today provide the vast majority of liquid hydrocarbon transportation services and oil spill prevention, response and recovery systems in British Columbia support the initiative by the Ministry of Environment (MOE) for a world leading land based spill preparedness and response regime. Safety and integrity are top priorities for the pipeline and railway sectors. While existing preparedness is robust, we are committed to continuously identify new approaches and opportunities to enhance transportation safety in Canada.

This paper is focused on pipeline and railway transportation of liquid hydrocarbons.

As a starting point, we believe that the establishment of an Industry Steering Committee (ISC) would fully and most expeditiously meet the MOE Guiding Principles and Ministry Intentions. The ISC would provide a one-window approach for coordination and communications with regulators and stakeholders, and would ensure effective and sustainable land oil spill prevention, preparedness, response and recovery, while continuing to allow individual companies to address their specific risks. Next steps include drafting detailed mandate and Terms of Reference, liaising with the evolving policy discussions in the Federal Government, determining the optimum governance and funding model and considering undertaking a comprehensive land based oil spill needs assessment.

### **2. Purpose**

The purpose of this position paper is to articulate a vision for a world-leading, robust and continuously improving land based spill preparedness and response capacity in British Columbia while extracting maximum leverage and benefits from existing systems, organizations and capabilities, and ensuring seamless and effective implementation in concert with evolving policies and regulations of other provinces and of the Federal Government.

### **3. Background**

The Government of British Columbia established five necessary conditions for support of heavy oil projects. The third condition requires world-leading practices for land oil spill prevention, response and recovery systems to manage and mitigate the risks and costs of heavy oil pipelines. In December 2012, the British Columbia Ministry of Environment (MOE) published a policy intentions paper for consultation concerning Land Based Spill Preparedness and Response<sup>1</sup>,

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<sup>1</sup> British Columbia Ministry of Environment (2012), Land Based Spill Preparedness and Response in British Columbia, Policy Intentions Paper for Consultation

inviting feedback by February 2013 and hosting a well-attended symposium in March of the same year. Rounds of meetings of three working groups and of an advisory committee have now concluded and the MOE plans to publish a second intentions paper in early 2014.

In November 2013, Alberta Premier Alison Redford and British Columbia Premier Christy Clark announced a framework agreement between the two provinces on moving energy resources to new markets. The Deputy Ministers Working Group report of December 2013 includes principles and recommendations for a world class marine and terrestrial spill prevention, preparedness and response regime.<sup>2</sup>

#### **4. Contributing Organizations**

This document presents the perspective of a group formed through collaboration and composed of the Canadian Energy Pipeline Association (CEPA), the Railway Association of Canada (RAC), the Western Canada Marine Response Corporation (WCMRC) and Western Canadian Spill Services Ltd. (WCSS). The document also includes contributions from the following companies: Northern Gateway Pipelines, Kinder Morgan Canada, Pembina Pipeline Corporation, Canadian National Railway and Canadian Pacific Railway.

Throughout 2013, many of the contributing organizations actively participated in the MOE consultation process, attending the symposium and working group meetings, as well as submitting input in written form. These activities, as well as our operating knowledge, skills and track record, have informed the consensus view that we respectfully present in this paper.

Collectively, the contributing organizations provide the vast majority of liquid hydrocarbon transportation services and of oil spill prevention, response and recovery systems in British Columbia, and we offer deep expertise and recognized experience in ensuring the integrity and safety of the transportation of large volumes of heavy oil and other commodities.

#### **5. Ministry of Environment Policy Intentions**

The MOE policy intentions paper proposed Guiding Principles and a description of Ministry Intentions.

##### **Guiding Principles**

Through active participation, the contributing organizations have supported the MOE's initiative for a world leading land based spill preparedness and response regime. The sentiments behind the seven Guiding Principles are aligned with the visions, missions and mandates of our respective organizations and companies. Safety, systems integrity and protection of the environment are major priorities for the pipeline and railway sectors and we are committed to continuously identify new approaches and opportunities to enhance transportation safety in Canada. Indeed, today's regime for operational safety, emergency preparedness and

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<sup>2</sup> British Columbia/Alberta Deputy Ministers Working Group (2013). Report Prepared for Premier Christy Clark and Premier Alison Redford

environmental protection has been built on strong partnerships between industry, all levels of government and the communities in which we operate.

### **Ministry Intentions**

The MOE is seeking to strengthen spill preparedness and response in three specific areas:

- Establishing a world leading regime for land based spill preparedness and response;
- Developing effective and efficient rules for restoration of the environment following a spill;
- Ensuring effective government oversight and coordination of industry spill response.

### **World Leading Regime for Land Based Spill Preparedness and Response**

We support seeking a comprehensive and effective world leading regime for land based spill preparedness and response, built on a philosophy of continuous improvement. We believe that industry has and continues to demonstrate a strong track record of addressing the risks to the environment and to public safety through our policies, skills training and specialized capabilities that promote prevention, a culture of safety, emergency response capacity and a commitment to restoration following a spill. We continue to consider emergency response to be a shared responsibility.

Consistency, based on recognized standards and systems, is critical to strengthening performance across all jurisdictions nationwide. This will enable seamless alignment between provincial and federal jurisdictions, sharing of learning and best practices, and maximum leverage of resources such as similar training programs and interchangeable personnel and equipment. We would prioritize a coordinated regulatory framework to effectively minimize the risk and liability associated with moving dangerous goods in Canada.

In particular, we see significant value in an industry driven and self-sustaining Industry Steering Committee (ISC) to enhance coordination and communications between transporters, governments, host communities, and providers of land based oil spill prevention, response and recovery systems which include cooperatives such as the WCSS and the WCMRC. Cooperative organizations have proven to be an effective vehicle for prompt availability of response equipment, technical training, and the development and maintenance of contingency plans to complement the extensive expertise, equipment and financial support for prevention, emergency response and recovery that pipeline and railway companies maintain in-house. The ISC could be the starting point for a more formal organizational framework to be subsequently pursued.

We also support the MOE's intention to enhance local engagement through Geographic Response Plans that reflect input from local communities, First Nations and other stakeholders, and to collect, store and publish of spill data. Details of our suggestions and input are found in Appendix 1.

### Effective and Efficient Rules for Restoration of the Environment

The MOE's intention to clarify the parameters for remediation, restoration, and recovery activities would be a step forward in comparison to the current approach. We support effective and efficient rules for restoration of the environment following a spill as well as appropriate consultation and environmental monitoring in coordination with appropriate regulatory agencies and impacted stakeholders.

### Effective Government Oversight and Coordination

We do not believe that the establishment of a government-led, industry funded spill response organization is necessary or optimum as the implementation mechanism. Furthermore, our view is that additional collection of funds for the establishment of a provincial spill response fund is not required. Government engagement in the Industry Steering Committee as described below would fully and best meet the objectives of the Guiding Principles and Ministry Intentions.

## **6. Industry Steering Committee**

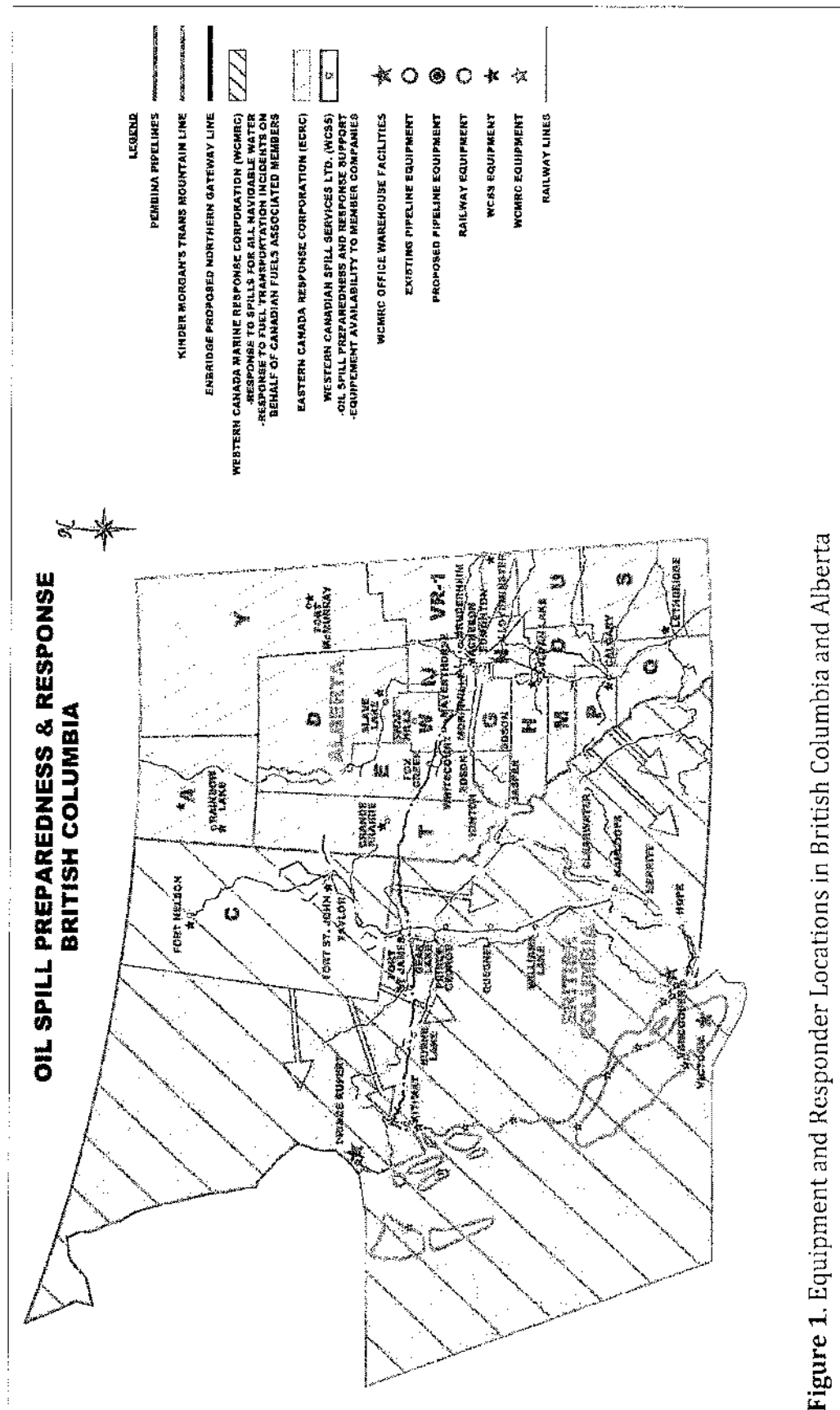
### Existing Situation

Transporters of large volumes of liquid hydrocarbons through British Columbia, such as pipeline and railway operators, follow best practices for prevention and have pre-invested in significant preparedness and response capabilities. In addition, equipment caches are maintained inland British Columbia by WCSS and along the Pacific coast by WCMRC. While WCSS and WCMRC have currently limited presence along some of the transportation corridors, strengthened presence could be contemplated as a consideration for ISC. Finally, companies contemplating expansion projects have also committed to commensurate additional capacity in equipment and staff. A map outlining current and proposed spill response team and equipment locations in British Columbia in relation to transportation corridors is shown in Figure 1. Additional details are provided in Appendix 2.

Preparedness goes further than equipment caches, as pipeline, railway operators, WCSS and WCMRC collaborate in skills training and share lessons learned.

With these capabilities, industry is demonstrating that significant amounts of equipment and personnel are available and ready to be deployed when needed.

Furthermore, the existing federal and provincial regulatory frameworks and the risk mitigation programs implemented by operators ensure that the risk associated with moving dangerous goods in British Columbia is minimal.



**Figure 1.** Equipment and Responder Locations in British Columbia and Alberta

### **Purpose and Role of the Industry Steering Committee**

The purpose of the ISC is the implementation of a world leading and continuously improving land based spill preparedness and response capacity in British Columbia while extracting maximum leverage and benefits from existing systems, organizations and capabilities, and ensuring seamless and effective implementation in concert with evolving policies and regulations of other provinces and of the Federal Government.

MOE Guiding Principles and Ministry Intentions would be best and most expeditiously achieved by harnessing and coordinating existing expertise, experience, capabilities and equipment through the ISC which would allow for a one-window approach for coordination and communications, and would ensure effective and sustainable land based spill preparedness, response and recovery, while continuing to allow individual companies to address their specific risks. A subscription and self-sustaining business model would be established that is commensurate to each operator's level of risk and to the risk mitigation programs and capabilities that they already have in place. Active regulator and stakeholder interaction would be available and encouraged through representation on the Steering Committee. The ISC would also look to form appropriate alliances with existing response organizations nationwide.

Incident response, including the management of resources to address incidents, should continue to remain firmly with the operator and not with the ISC or other entity.

Specific duties of the ISC are likely to include:

- Credible technical advice to government on response priorities, objectives and actions in concert with current regulations;
- Data management and quality assurance;
- Strategic management and coordination of resources;
- Continuous improvement and sustainability;
- Government engagement and participation;
- Aboriginal participation;
- Potential incremental capacity support:
  - Needs assessment
  - Enhanced capacity and gap closure plans
  - Area plans development
  - Joint exercises
  - Lessons learned.

With MOE support, the ISC would take the appropriate steps to reach out to stakeholders and proceed with drafting detailed terms of reference and examine appropriate governance structures in order to ensure effective and sustained implementation.

## **7. Conclusion and Next Steps**

The objective of a world leading land based spill preparedness and response regime in British Columbia is one that is shared by industry and government. Safety, integrity of operations and protection of the environment are major priorities of the pipeline and railway sectors in Canada, as evidenced by existing and planned investments in equipment and skills training for prevention, response and recovery systems. The shared objective of a world leading spill preparedness and response regime would be fully and most expeditiously met by the establishment of an Industry Steering Committee as the leadership vehicle for coordination and communications with transporters, spill response and recovery service providers, governments, regulators, First Nations, local communities and other stakeholders. The ISC would leverage the existing capabilities and expertise of transporters and of cooperative organizations (WCSS and WCMRC) and could be the starting point for a more formal organizational framework.

Next steps for the implementation and launching of the ISC include:

- Drafting of the mandate and terms of reference
- Liaising with the evolving policy discussions in the Federal Government
- Determining the optimum governance and funding model for ISC
- Considering undertaking a land based oil spill needs assessment.

With government support for this approach, the industry can move forward rapidly with the establishment of the ISC targeting having a fully functional system in place before the end of 2014.



## Appendix 1 – Specific Responses to MOE Objectives and Topics

### Working Groups 1 and 3

Working Group 1 Topic 3		
MOE Objective	Response	Proposed Initiatives
Housing spill data, spill reports, and information on spill responders and equipment	<p>Housing of spill data should continue to be an initiative through the MOEs programming.</p> <p>Information on spill responders and equipment is housed by individual companies as part of their emergency management programs and is available for viewing upon request.</p>	The proposed geographic plans will allow for more collaboration and openness regarding response resources allowing for a venue for availability of responder and equipment data.

#### Working Group 1 Topic 4

MOE Objective	Response	Proposed Initiatives
Development, housing and maintenance of geographic response plans will require meaningful local input.	The authors agree with this objective and offers that there are many elements of geographic plans developed or in development within an individual company's existing emergency plans.	The authors would be open to sharing existing internal geographical plans as part of a commitment to transparency and cooperation. This cooperation would be an excellent window for municipal, provincial and identified stakeholder involvement and communication in order to appropriately identify and catalogue receptors and response challenges within a given geographic plan.
Understanding the spill risks and response capacity that exists in BC	Risk Assessments have been completed by individual companies and are included in the Emergency Plans that are available for review.	The authors will seek to share risk assessments with regulators in active information exchange in order to better understand areas of receptor risk. Meetings through development communications for the geographic plans would be an opportunity for this information sharing.

### Working Group 1 Topic 5

MOE Objective	Response	Proposed Initiatives
Verify RO and/or individual companies' state of readiness; or – as stated above – serving as an RO.	<p>It is the opinion of the authors that a specific Ministry of Environment regulated Response Organization would be impractical because of the geographic realities in the province of BC and possible conflicts and redundancies with current regulations. Instead the efficiencies of current external response contractors and internal response teams should be leveraged in order to strengthen the province's wide response capabilities. Strategic planning should be used with specific emphasis on area plans to fulfil the objectives proposed in the symposium and working groups 1 - 3. Area plan development will allow for specific emphasis on geographic realities in the preparation, mitigation and response stages of spill response.</p> <p>Active regulator and stakeholder interactions have been encouraged to individual companies through their exercise regime and various existing industry committees. This involvement has been informal and varied based on initiatives and availability of individual companies and regulators.</p>	<p>Active regulator and stakeholder interactions are encouraged and would be available through formal liaison with and representation to the authors and allow for access to the foremost expertise throughout the continent through member companies.</p> <p>The authors would also look to form strategic alliances with existing response organizations and provide credible technical advice to the government on response priorities, objectives and actions coinciding with current regulations. The operations of the authors would be open for cooperation and transparency as they are seen to be the key elements of credibility. The authors will ensure public safety and net environmental benefits are openly addressed and communicated as the top response priorities.</p>

Coordinating and cataloguing community preparedness and ensuring appropriate resources are available at the local level.	The authors agree with this objective. It would be beneficial to the authors as an organization as well as the individual companies. Individual efforts are being made by companies to further the response training and capabilities through training outreach programs.	Based upon the results obtained by the MOE in their cataloging initiative, the authors may be able to leverage synergies and work together in order to address gaps in municipal emergency preparedness where appropriate and work with identified subcontractors in order to provide response assistance throughout the province.
Create certainty around industry/response organization state of readiness	The authors acknowledge that there is room for improvement regarding regulatory and stakeholder engagement in terms of preparedness communications. Individual companies will continue individually to engage regulators and stakeholders in their exercise development and conduct.	The authors will pursue public communication as well as stakeholder and regulatory engagement through assessment of current communication programs and identification of enhancements.

Working Group 1 Topic 6		
MOE Objective	Response	Proposed Initiatives
Ensuring adequate technical and special expertise is in place	Individual companies have technical expertise in house or on contract. These resources and their relevant 24/7/365 contact information is included in individual company's emergency response plans.	Sharing of technical resources may be possible through industry led initiatives. Increased cooperative planning may allow for gap identification and formalization of industry best practices in technical expertise and could lead to the development of industry best practices to respond to spills in various conditions.  The sharing of technical resources may take the form of a shared resource list of subject matter experts and other resources that that could be used to assist with a spill response.
Timely capacity / capability for technical or special expertise	Individual companies have equipment and personnel throughout the province commensurate to their risks (as shown in Figure 1 and Appendix 2).	Working together with regulators the authors may find gaps in response capabilities or specific receptor risks that will be addressed.

<b>Working Group 1 Topic 7</b>		
<b>MOE Objective</b>	<b>Response</b>	<b>Proposed Initiatives</b>
Coordinating spill prevention programs	Individual companies have active spill prevention programs that are mandated by federal and / or provincial legislations in addition to programs that are followed through commitments to industry best practices.	Continued sharing of learnings and best practices could be formalized through the industry led initiative. This formalization would allow for more transparency with regulatory and stakeholder involvement and may take the form of a program where lessons learned from spills and training exercises as well as best practices could be shared with all stakeholders.
The need for a coordinated, ongoing sustainable spill prevention program.	The authors agree with the need for ongoing sustainable spill prevention programs. Current prevention plans have been addressed above, and are considered to be sustainable.	Coordination of response planning through mutual aid and leveraging of current individual company capabilities would be the founding objective of an industry led initiative.

### Working Group 3 Topic 1

MOE Objective	Response	Proposed Initiatives
<p>British Columbians are confident that spill response is timely, appropriate, and effective; and, the Ministry of Environment has a tool for ensuring response is conducted according to established minimum levels. With the leading option of developing regulations or guidelines that establish response standards on response time guidelines, equipment and personnel levels and location requirements, and exercising and testing requirements.</p>	<p>The authors agree with the role of government as stated but argue that the accountability and responsibility for public safety, infrastructure, business and environmental protection is a shared responsibility between government, communities and the spiller.</p> <p>The authors also believe that industry can develop a sustainable effective spill preparedness and response program that meets regulatory and public expectations without the development of additional regulations.</p> <p>The authors submit that there are existing prescriptive regulations that govern the individual companies regarding training level requirements of employees as well as exercising and testing requirements. There are also existing outcome expectation regulations regarding response expectations that govern equipment and personnel levels for response as well as response time guidelines. Further, there are existing regulatory requirements for the auditing of emergency response plans specific to the transportation corridors that address the effectiveness of proposed</p>	<p>In future, the authors would seek to leverage current capabilities through mutual aid for response and sharing of emergency plans in order to ensure comprehensive and holistic risk assessment. Further, the group will seek to develop a recommended standard training matrix for internal and subcontracted emergency response personnel based upon their job functions in a spill response.</p> <p>Synergistic priorities in spill response would be greatly fostered by regulator and stakeholder involvement in the authors in the planning stages of spill response to allow for the best advisory communication of priorities in the creation of the area plans.</p> <p>Continued individual company efforts in municipal, regional and first responder training and outreach programs will continue with potential mutual efforts made through group cooperation to address gaps that may be found.</p>

	<p>response tactics and strategies. The authors observe that prescriptive rules in regulatory requirements are demonstrated to be sub-optimal in most jurisdictions where they are applied. Objective based priorities in preparedness accompanied by immediate guidance in the response phase would be significantly more effective.</p> <p>Working Group Paper 1 stated that “the primary role of government is to demonstrate and apply governance, that it is government, not the spiller that has the accountability and responsibility to determine priorities for the public, infrastructure, business and environmental protection and to establish and monitor response performance”.</p> <p>The authors agree with this statement and offers that only through clear communication on response capabilities as outlined in this paper, and demonstrated in exercises that are made open to regulators, including the MOE – may priorities and communication of those priorities be demonstrated before a spill incident will allow for world class spill response with synergistic objectives between the regulators and the spillers occur in the event of a spill.</p>	
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Consistent spill impact monitoring	Individual companies employ consultant subcontractors to initiate spill impact monitoring.	<p>Active regulator expectation communications are invited on this topic and may be communicated through interaction with industry as a whole and with specific meetings such as what will be possible with industry led initiatives.</p> <p>Sharing of technical resources may be possible through the authors. Increased cooperative planning may allow for gap identification and formalization of industry best practices in technical expertise.</p>
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Working Group 3 Topic 2		
MOE Objective	Response	Proposed Initiatives
<p>All parties involved in a response understand their roles and responsibilities and are able to support achievement of spill response standards.</p> <p>With the leading objective to establish regulatory requirements that ensure the incident command system is consistently applied above Tier II.</p>	<p>The authors are in full agreement and will continue to use ICS and IMS in their spill response operations as well as train internal staff and work with subcontracted responders, first responders and regulators within the ICS framework.</p>	<p>Where ICS training needs are identified the authors may enter into mutual aid outreach education programs.</p>

### Working Group 3 Topic 3

MOE Objective	Response	Proposed Initiatives
All responders have the appropriate levels of skills and competencies for the role they are assigned, supporting achievement of response standards and reducing health and safety risks. With a leading option of establishing regulatory requirements that ensure responders are trained to provide an effective response to a spill.	Individual companies are currently maintaining at least minimum training requirements for their internal and subcontracted staff. Training requirements are specific based upon individual company risk and are best assessed by the company though industry stakeholder communication and advisory are welcomed.	<p>Mutual training and exercise scheduling could be facilitated by the authors in order to increase the training and experience of internal and sub-contracted responders to capitalize on efficiencies through joint exercises.</p> <p>An industry best practice of a minimum training matrix or a training pathway may be developed by the group. This matrix would be created through the coordination of a training needs assessment program and establishing training objectives. Further work in this area could come in the form of coordinated program development where gaps or opportunities have been identified.</p> <p>Mutual aid arrangements may also be possible for training provision for volunteers and laborers in the event of an incident that exceeds the resources of the spill location.</p>

Working Group 3 Topic 4		
MOE Objective	Response	Proposed Initiatives
Persons or businesses that suffer a loss due to a spill are easily and quickly able to access information about the claims process; and, (2) response to injured wildlife is coordinated. Public enquiries and reports of injured wildlife are funneled through a single contact point, freeing responders to concentrate on other priorities.	Individual companies within the authors have active claims programs that are activated in the event of loss due to a spill. Wildlife response and communications planning is included in each company's emergency response plan.	Industry experts could be accessed through the member companies for an educational seminar for member companies, stakeholders and regulators in order to further understanding of wildlife response.  The authors could work together to coordinate an assessment of the current status of wildlife response capability and identify enhancements.

#### Working Group 3 Topic 4

MOE Objective	Response	Proposed Initiatives
The responsible party and province are both able to accurately and as quickly as possible start assessing the impact of a spill on the surrounding environment.	Individual companies within the group include consultants for spill impact and assessment in their emergency response plans. These subcontracted resources are engaged in an emergency response capacity and will respond to site when called upon for impact assessment of spills. Typically these resources are activated before ministry requests for activation are made.	Industry experts could be accessed through the member companies for an educational seminar for member companies, stakeholders and regulators.

## **Appendix 2 - Oil Spill Response Equipment**

### ***British Columbia and Alberta***

The following provides a general overview of oil spill response equipment in British Columbia and Alberta that is owned and maintained by pipeline and railway companies as well as emergency preparedness and response organizations. Alberta is included because the two bulk liquid hydrocarbon pipelines, the proposed new pipelines and two railway companies that operate in B.C. have equipment located in Alberta that can be dispatched to B.C. locations if required. In addition, equipment maintained by WCSS can also be utilized throughout the province on a case-by-case basis.

Figure 1 provides the approximate location of the equipment described in the section.

## **Pipeline Companies – Trans Mountain Pipeline (operated by Kinder Morgan Canada)**

Currently there are equipment caches in five locations in British Columbia:

- Burnaby
- Westridge
- Hope
- Kamloops
- Blue River

Kinder Morgan also maintains an extensive inventory of equipment in Alberta which is available for transport to other locations if required (i.e. Jasper, Gainford, and Edmonton).

The equipment is designed to contain and recover liquid hydrocarbon in surface water with an emphasis on rivers; in several locations the company has jet boats that would be used to deploy the equipment. The company has a corporate emergency response plan that includes control point information, resource lists of contractors and subject matter experts that could be involved in spill control. Kinder Morgan holds several emergency response exercises/drills annually where equipment is deployed in surface water and they also maintain their internal training programs.

Kinder Morgan also has a mutual aid agreement with other pipeline members of the Canadian Energy Pipeline Association (CEPA) including Pembina Pipeline and Enbridge, and is a shareholder of both WCMRC and WCSS.



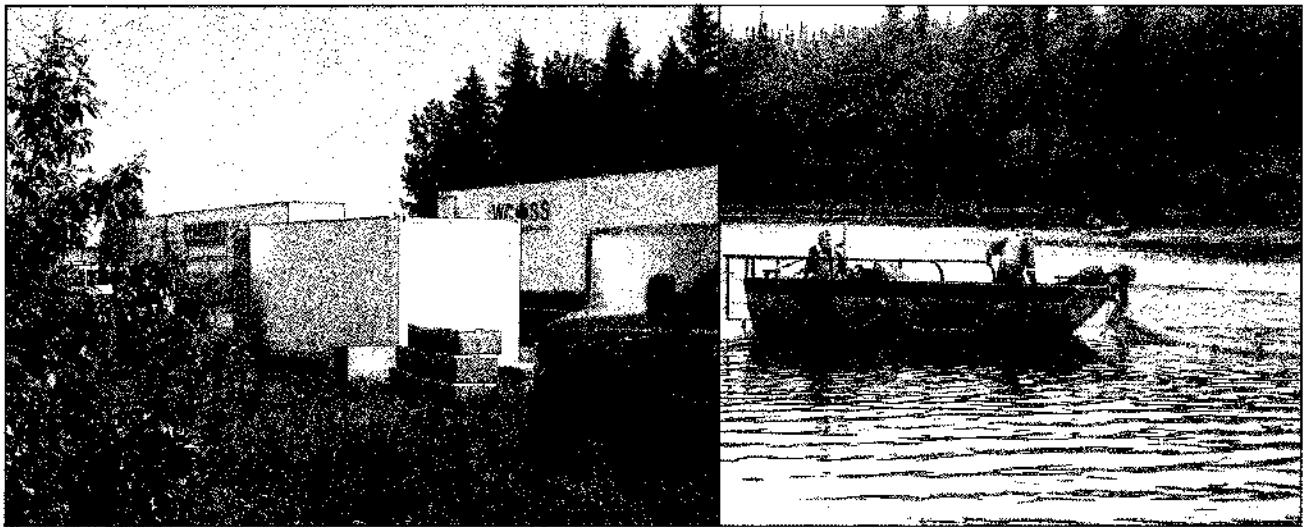
**Figure 2 - Picture of Typical Oil Spill Equipment Deployment Training Exercise**

### **Pipeline Companies – Pembina Pipeline**

Pembina Pipeline maintains oil spill response equipment in the following B.C. locations:

- Fort St John
- Willow Flats (Chetwyn)
- Prince George
- Kamloops

Pembina also has equipment caches in Alberta (i.e. Grande Prairie, Edmonton) that can be transported to any location as required. The response units are self-contained with all of the hardware required to deploy in a river or lake environment; Pembina equipment also includes boats.



**Figure 3 - Pembina Pipeline – Response Equipment**

As indicated Pembina has a mutual aid agreement with Kinder Morgan and Enbridge as well as other CEPA members and is affiliated with WCSS. Like the other pipeline companies they maintain corporate ER Plans, supplemental oil spill contingency manuals and hold annual ER drills and equipment deployment exercises.



### **Pipeline Companies – Northern Gateway Pipelines / Proposed Pipelines**

Northern Gateway Pipelines has regional equipment locations identified in their proposed pipeline plan that extends from Alberta to Kitimat, including:

- Whitecourt, AB
- Smokey River Pump Station, AB
- Tumbler Ridge, B.C.
- Prince George, B.C.
- Burns Lake, B.C.
- Kitimat, B.C.

In addition Northern Gateway Pipelines is also planning to locate initial spill response units at all of the pump stations including:

- Whitecourt , AB
- Smokey River, AB
- Tumbler Ridge, B.C.
- Bear Lake, B.C.
- Fort St James, B.C.
- Burns Lake, B.C.
- Houston, B.C.
- Clearwater, B.C.
- Kitimat, B.C.

In some cases the equipment caches will include boats and specialized equipment (i.e. communication trailers and wildlife response units).

## **Railway Companies – Canadian Pacific Railway (CP)**

CP maintains emergency response equipment in both B.C. and Alberta. Their equipment caches differ somewhat from the typical pipeline company response units, with some common features like oil spill sorbents and containment boom; they also maintain specialized equipment such as air foam units. Cache locations in B.C. include:

- Field
- Golden
- Cranbrook
- Creston
- Nelson
- Revelstoke
- Tappen
- Kamloops
- Hope
- Coquitlam

CP has access to contractor equipment and could access equipment from both WCMRC and WCSS in some cases. CP maintains an ER Plan and also holds annual training exercises.

### **Railway Companies – Canadian National Railway (CNR)**

CN maintains 11 equipment locations in Alberta and another 18 caches in British Columbia; all of the B.C. response caches include oil spill containment boom and sorbents. Caches are located in:

- Kamloops
- Thornton
- Prince George
- North Vancouver
- Hope
- Lytton
- Valemount
- Squamish
- Lillooet
- Williams Lake
- Fort St. James
- Burns Lake
- Smithers
- Terrace
- Mackenzie
- Chetwyn
- Fort St. John
- Quesnel

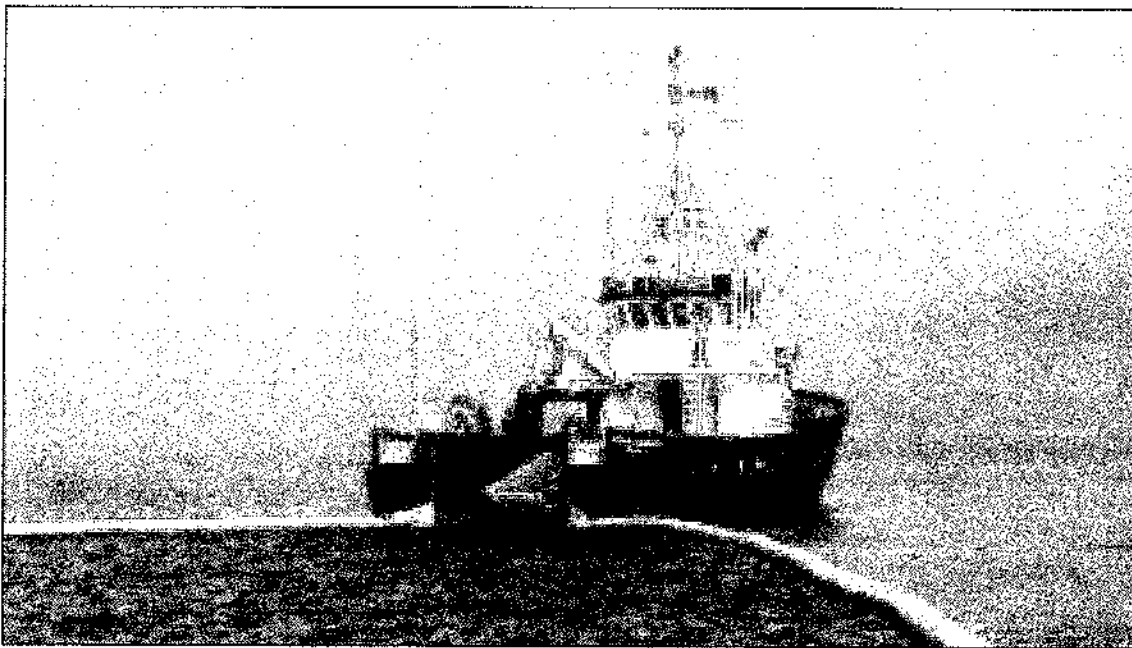
CN has access to contractor equipment and could access equipment from both WCMRC and WCSS in some cases. CN maintains an ER plan and also holds annual training exercises.

### **Western Canada Marine Response Corporation (WCMRC)**

WCMRC is a well-established, internationally recognized oil spill preparedness and response organization with a primary focus on the marine environment of British Columbia's west coast. WCMRC also coordinates the response to tank truck incidents on behalf of Canadian Fuel Association members, and has been involved with inland spill response in the province.

WCMRC offers training programs and has the capability to assist member companies directly with their spill response activities by providing in-house subject matter experts and access to trained contractors. WCMRC has extensive caches of equipment located in three geographic areas including:

- South Coast Operations – Warehouse of spill response equipment as well as vessels, specialized equipment and caches primarily located in Vancouver area and on the Sunshine Coast.
- Vancouver Island Operations – Extensive equipment in several areas.
- North Coast Operations – Extensive equipment in locations like Prince Rupert, Kitimat, Shearwater and Haida Gwaii.



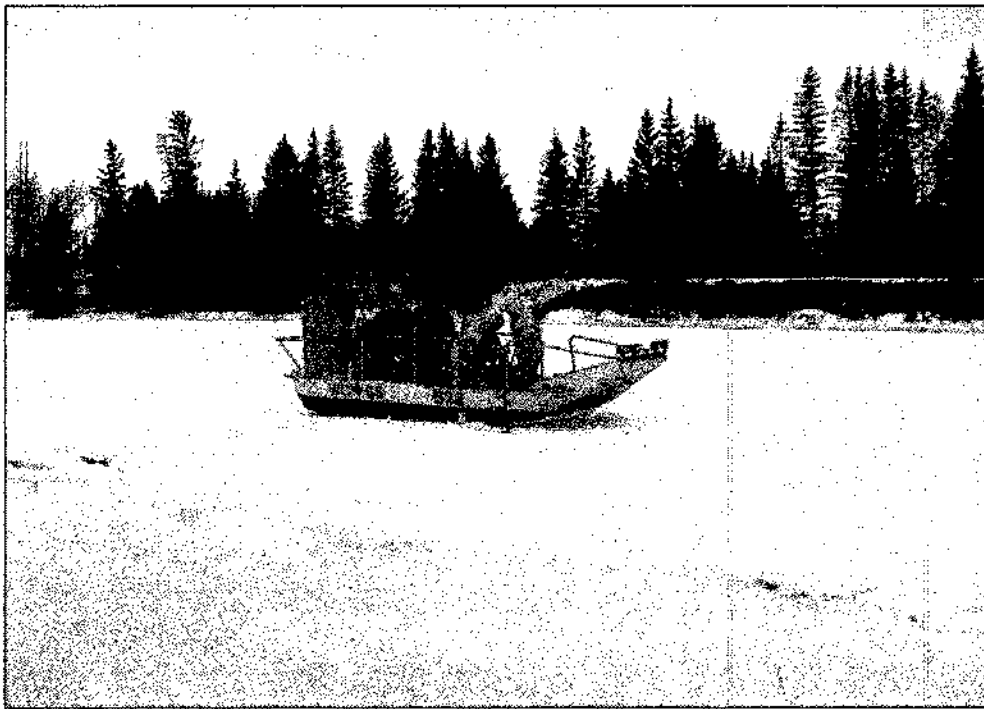
**Figure 4 - WCMRC Vessel**

## Western Canadian Spill Services (WCSS)

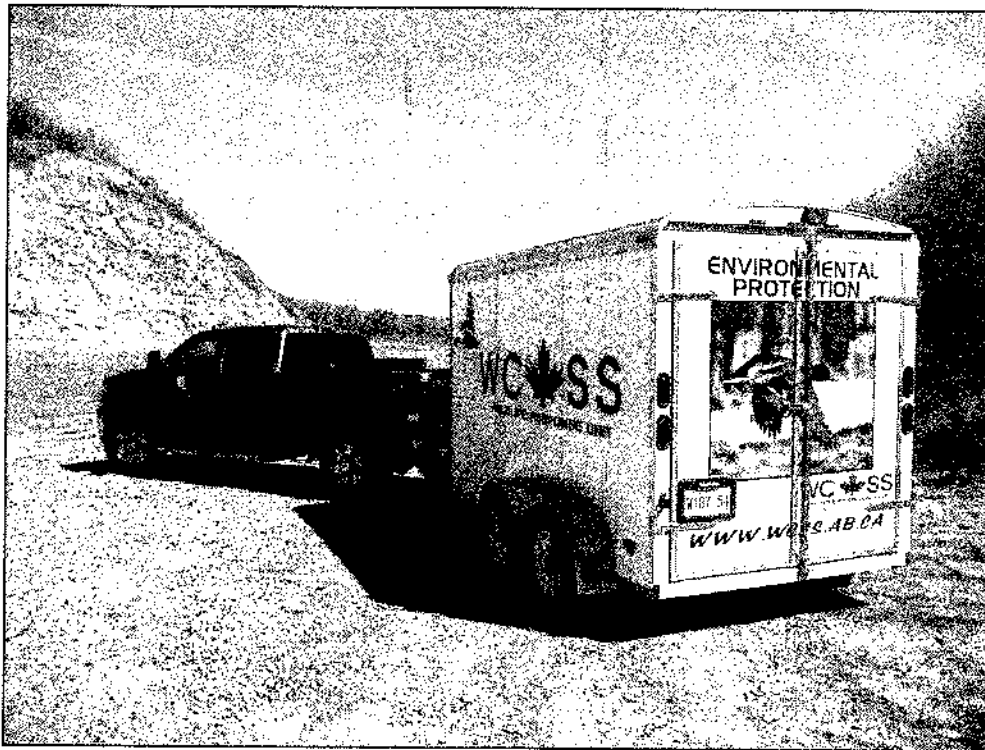
Established in 1972 as a non-profit volunteer-based organization, WCSS is currently comprised of 18 inland Oil Spill Cooperatives including Area C in N.E. B.C. Members of WCSS include licensees of oil wells, gas wells that produce more than 2 m<sup>3</sup> of hydrocarbon liquids per month and oil pipeline companies.

WCSS maintains area oil spill contingency plans, coordinates annual exercises in each area and offers both open registration and contract training. WCSS maintains initial spill response units, regional response units and specialized equipment, i.e. jet boats, wildlife units, winter units, air curtain incinerator, air boats, etc.

WCSS's equipment is primarily designed to contain and recover liquid hydrocarbon spills in lakes and rivers including those with an ice sheet present. There are over 600 WCSS member companies including Kinder Morgan, Enbridge and Pembina that have access to Alberta based equipment for use in B.C. if required. Although the railway companies are not WCSS members, they can access WCSS equipment on a case-by-case basis.



**Figure 5 - Drilling Bore Holes in an Ice Sheet**



**Figure 6 - WCSS Wildlife Response Unit**

### **Acknowledgement**

Prepared by: Al McFadyen, WCSS President and COO

On Behalf - British Columbia Industry Liquid Petroleum Transporters

2014/01

Note: This submission is a general overview of oil spill equipment locations in British Columbia and Alberta that is subject to change at any time. The document is not intended to be all encompassing and may exclude contractors' equipment, equipment maintained by regulatory agencies and other.

**MINISTRY OF ENVIRONMENT  
MEETING INFORMATION NOTE**

July 15, 2014  
File: 280-30  
CLIFF/tracking #: 208315

**PREPARED FOR:** Honourable Mary Polak, Minister of Environment

**DATE AND TIME OF MEETING:** July 24<sup>th</sup> at 10:45 am via Telepresence at PVO/Superior

**ATTENDEES:** Honourable Mary Polak, Minister of Environment  
Mining Association of BC staff:

- Karina Brino, President & CEO
- Angela Waterman, VP, Environment & Technical Affairs
- Bryan Cox, VP, Corporate Affairs

**ISSUE:** Meeting with the Mining Association of BC on their interests related to the Minister's 2014 Mandate Letter.

**BACKGROUND:**

The Mining Association of BC (MABC) focuses on actively representing the BC mining industry on several key issues of public policy including aboriginal and community relations, environment, competitiveness and the Towards Sustainable Mining initiative. In 2013, B.C.'s mining sector contributed \$8.5 billion to the provincial economy and as one of the highest paying trade industries, directly employed more than 10,000 British Columbians.

**DISCUSSION:**

MABC has indicated that they are interested in working with the Minister on the initiatives that were outlined in the Minister's 2014 mandate letter from the premier. Specific issues mentioned include: the implementation of the *Water Sustainability Act*; developing a provincially designated protected area in the Klappan; the provincial roundtable on improving environmental protection and economic development in British Columbia, and B.C.'s Caribou protection and recovery strategies.

Karina Brino, President and CEO of the Association requested the meeting with the Minister to discuss their interests in these initiatives (Attachment 1: Letter from MABC).

**SUGGESTED RESPONSE:**  
s.13,s.16

**Attachments:** Attachment 1: Letter from MABC

**Contact:**

*Mark Zacharias, ADM  
Environmental  
Sustainability and  
Strategic Policy Division  
250-356-0121*

**Alternate Contact:**

*Anthony Danks  
Strategic Policy Branch  
ESSPD  
250-387-8483*

**Prepared by:**

*Laura Feyrer  
Strategic Policy Branch  
ESSPD  
250-387-9796*



<b>Reviewed by</b>	<b>Initials</b>	<b>Date</b>
DM	-	-
DMO	VJ	July 17/14
ADM	MZ	July 16/14
Executive Dir.	AD	July 16/14
Director	LP	July 16, 2014
Author	LJF	July 16, 2014

# MABC

MINING ASSOCIATION OF BRITISH COLUMBIA

The Honourable Mary Polak  
Minister of Environment  
PO Box 9047  
STN PROV GOVT  
Victoria, BC V8W 9E2  
Sent via email: [ENV.Minister@gov.bc.ca](mailto:ENV.Minister@gov.bc.ca)

June 17, 2014

Re: 2014 Mandate Letter

Minister Polak,

On behalf of the Mining Association of B.C., I would like to congratulate you on a successful year in your capacity as Minister of Environment. We appreciate your continued efforts in support of responsible development and a strong and vibrant mining industry in B.C.

In 2013, B.C.'s mining sector contributed \$8.5 billion to the provincial economy and directly employed more than 10,000 British Columbians. The mining industry is one of the highest paying trade industries with an average salary of \$114,600, including benefits, providing family and community supporting jobs throughout B.C.

In your 2014 mandate letter, as issued by the Premier on June 10, 2014, a number of initiatives were set out for the year ahead. We look forward to working with you a number of those initiatives, including but not limited to:

- the implementation of the Water Sustainability Act;
- potentially developing a provincially designated protected area in the Klappan;
- the provincial roundtable on improving environmental protection and economic development in British Columbia, and;
- B.C.'s Caribou protection and recovery strategies.

I look forward to continuing to work with you to foster a growing and competitive industry and a prosperous British Columbia. At your convenience, I'd appreciate an opportunity to meet with you to discuss the above.

Sincerely,



Karina Briño  
President & CEO

**BC's Voice of Mining since 1901**  
900 – 808 West Hastings St., Vancouver, BC V6C 2X4  
Tel: (604) 681-4321 / Fax: (604) 681-5305 / Web: [www.mining.bc.ca](http://www.mining.bc.ca)

**MINISTRY OF ENVIRONMENT  
INFORMATION NOTE**

August 5, 2014  
File: 11678  
CLIFF/tracking #: 208625

**PREPARED FOR:** Premier's Office

**ISSUE:** Tailings Pond Breach at Mt. Polley Mine on August 4, 2014 and subsequent discharge of tailings supernatant into waterways

**BACKGROUND:**

Mt Polley is a copper-gold mine-mill complex located near Likely, British Columbia. They have had an effluent permit (#11678) with the Ministry of Environment since 1997. The mine temporarily closed in 2001 and reopened in 2005.

Mount Polley mill tailings and site runoff water are collected in the Tailings Storage Facility. The supernatant from the Tailings Storage Facility is re-cycled through the mill process (no discharge). Mount Polley mine operates with an annual water surplus, and currently had 6.5 Mm<sup>3</sup> (million cubic metres) of water stored in the Tailings Storage Facility.

The last significant amendment in 2009 authorized Mt Polley to discharge up to 1,400,000 m<sup>3</sup>/y of dam seepage effluent from the tailings storage facility to nearby Hazelton Creek (dam seepage is different than supernatant – it's supernatant that seeps through the dam, see Appendix A for map), limited to 35% of that creek's daily flowrate, with contaminant limits, and requiring an annual discharge plan. The Permit also requires a Communication Plan for sharing environmental data with the Soda Creek Indian Band (Xats'ull) and the Williams Lake Indian Band (T'exele).

Mt Polley submitted a permit amendment request in July 2014, to request authorization to discharge up to 3,000,000 m<sup>3</sup>/y of treated effluent (ditch water) to Polley Lake, which overflows to Hazelton Creek. The treatment technology will be finalized based on the results of the reverse osmosis pilot treatment plant that operated for a short period in December 2013.

Since 2012, Mt Polley has had five non-compliance incidents of mostly a minor nature. In response the Ministry issued three advisory letters and one warning letter. Only one of these incidents involved the tailings storage facility. This incident, on May 24, 2014, found the freeboard level in the tailings storage facility below permitted levels due to heavy rainfall.

Recent tailings impoundment supernatant data show that selenium levels exceed drinking water guideline, particularly in samples taken before May 2014. Sulphate did not exceed the drinking water guideline in May 2014, but there have been slight exceedences over the last few years.

Molybdenum levels are well below drinking water levels in the last two years, but concentrations had been approaching the guideline in earlier years; recent molybdenum concentrations in the supernatant exceeded livestock watering and irrigation guidelines.

Organic carbon concentrations exceed the 4mg/L guidelines for chlorination (water treated with chlorine that contains >4mg/L of organic carbon can result in toxic chlorination by-products).

Furthermore, the data for the tailings impoundment supernatant show that it was not extremely toxic.

#### **DISCUSSION:**

Ministry staff continue to work with partner agencies and the company to develop a safe and effective monitoring program in the short and long term and to determine the extent/degree of environmental impact.

#### **NEXT STEPS:**

Ministry of Environment staff were on Quesnel Lake and Quesnel River on Monday August 4 and Tuesday August 5 conducting monitoring. Staff will be providing information relative to water and health use restrictions to the Interior Health Authority as sampling results become available.

**Attachments:** Appendix A

**Contact:**

*Jennifer McGuire*  
*Environmental Protection*  
  
*250-361-5944*

**Alternate Contact:**

*Hubert Bunce*  
*Environmental*  
*Protection*  
  
*250-713-2711*

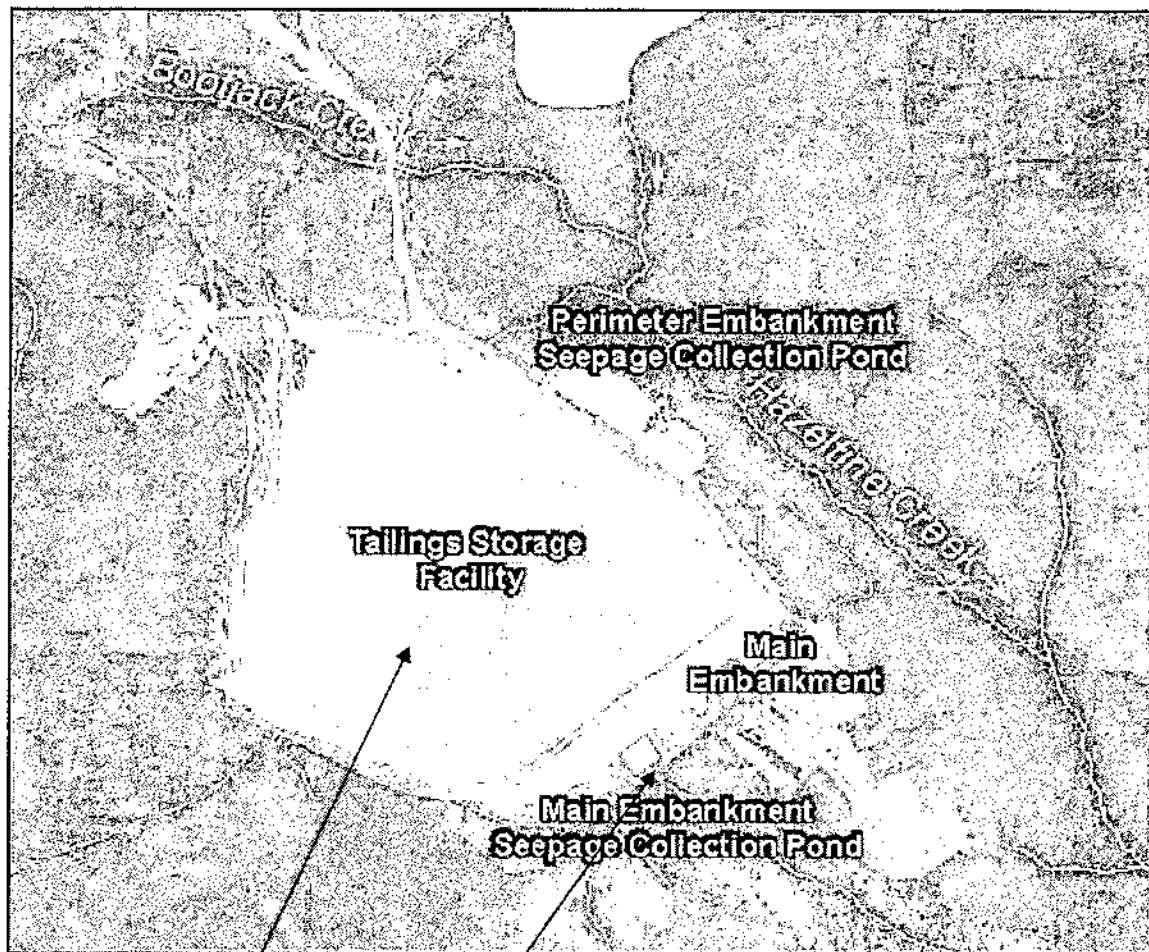
**Prepared by:**

*Shelley Metcalfe*  
*Environmental Protection*  
  
*604-817-9900*

[Insert additional rows if needed]

<b>Reviewed by</b>	<b>Initials</b>	<b>Date</b>
DM	LH for WS	Aug 14/14
DMO	VJ	Aug 14/14
ADM		
Dir./Mgr.	JMcGuire	Aug 5/14
Author		

Appendix A – Map of Mt Polley Tailings Storage Facility



Supernatant

Dam seepage (approx)

## MINISTRY OF ENVIRONMENT

### INFORMATION NOTE

August 14, 2014

File:

CLIFF/tracking #: 208469

#### **PREPARED FOR: Honourable Mary Polak, Minister of Environment**

**ISSUE:** A new report “Evaluation of BC Flood policy for Coastal Areas in a Changing Climate” will be made available to the public on the Ministry’s website. The report may generate media inquiries about provincial flood protection initiatives.

#### **BACKGROUND:**

Through funding support provided by the British Columbia (BC) Ministry of Environment’s Climate Action Secretariat (CAS) and Natural Resources Canada’s (NRCan) Climate Impacts and Adaptation Program, a report was commissioned from the Arlington Group, *Evaluation of B.C. flood policy for coastal areas in a changing climate* (Arlington report). The report examines whether existing flood policies and programs support or hinder adaptation to sea level rise and related climate impacts in coastal areas, and recommends measures that would facilitate adaptive actions.

CAS staff provided the terms of reference and management for this project. The BC Provincial Flood Hazard and Climate Change Working Group (WG) operated as the project’s advisory committee during the development of this report. The WG consists of staff from the Ministry of Community Sport and Cultural Development, Environment, Forests, Lands and Natural Resource Operations, Justice (LMBC), and Transportation and Infrastructure.

#### **DISCUSSION:**

Climate change impacts such as sea level rise, changing storm patterns and increasingly intense rainfall will change flood risks in the province in the coming century. BC’s flood policies and funding programs need to adapt to manage future flood risks.

Responsibility for flood hazard management is shared between the provincial and local governments. In general, implementation of flood-related policy rests, to a large extent, with local governments (i.e. land use and development control) and the BC Government provides the enabling legislation (i.e. dikes, emergency response). Sea level rise has amplified the importance of intergovernmental collaboration to address current and future coastal hazards, as well as the need for clear provincial direction on provincial flooding hazard issues.

This report complements previous research and outreach on sea level rise, and provides useful information to help inform future work on flood risks. The Arlington report indicates that the BC flood policy regime generally supports adaptation to sea level rise and associated impacts. However, in some cases, the implementation consequences may have significant financial and land development implications. The impacts of flooding

can be very costly. At the regional level, the costs to adapt flood protection in the lower mainland to meet sea level rise predictions of one metre were estimated around \$9.5 billion.<sup>1</sup> Floodplain maps are an essential tool for identifying areas that may be impacted by flooding and planning flood response. Public Safety Canada has estimated that it would cost \$48.2 million to update BC's floodplain maps.

The provincial Executive Summary in the Arlington report (Appendix 1) points to priority recommendations including: updated floodplain maps; clarification of minimum flood protection standards; revisions to the Compensation and Disaster Financial Assistance Regulation; ongoing public education; disclosure of flood risk during real estate transactions and notice on title; coordinated regional planning; the need for funding programs; Building Code amendments; and investigate options for overland flood insurance. Appendix 2 outlines report's priority recommendations and responses prepared by the internal government WG.

#### **NEXT STEPS:**

- The findings and release of the Arlington report provide useful information to help build an adaptive coastal policy regime in BC.
- The report will be posted online on the Climate Action Secretariat's website on August 28, 2014. As per the Contribution Agreement with NRCan, NRCan will be posting the report on their Impacts and Adaptation website, as well as on the Adaptation Library.
- The WG will continue to meet and follow-up on the recommendations of the report.
- MoE and FLNRO will continue to work together to amend the 2004 Flood Hazard Area Land Use Management Guidelines to include sea level rise considerations.
- EMBC will continue to engage with the federal government on floodplain mapping, and the new federal National Disaster Mitigation Strategy to explore opportunities for mapping and structural upgrades.

#### **Attachments:**

Appendix 1: *Arlington report recommendations and responses*

Appendix 2: Foreword and Executive Summary, *Evaluation of B.C. flood policy for Coastal Areas in a Changing Climate* (PDF)

Appendix 3: Full Report, *Evaluation of B.C. flood policy for Coastal Areas in a Changing Climate* (PDF)

#### **Contact:**

*Tim Lesiuk, A/Head*

*Climate Action Secretariat*

*250-356-6243*

#### **Alternate Contact:**

*Thomas White*

*Climate Action Secretariat*

*250-953-4883*

#### **Prepared by:**

*Jennifer Pouliotte*

*Climate Action Secretariat*

*250-387-4601*

<b>Reviewed by</b>	<b>Initials</b>	<b>Date</b>
DM	WS	25Aug2014
DMO	SN for VJ	22Aug2014
ADM	TL	18Aug2014
Dir./Mgr.	TW	14Aug2014

<sup>1</sup> FLNRO. Delcan. *Cost of Adaptation – Sea Dikes and Alternative Strategies*. October 2012.

## Appendix 1

Table 1 Arlington report recommendations and responses

Policy	Arlington Report Recommendations	Agency Leads and Responses
S. 15 and 30, Disaster Financial Assistance Regulation	Eliminate conflict and clarify conditions for DFA eligibility.	<p><b>EMBC</b></p> <p>As per these sections (s.15 refers to private sector; s.30 refers to local government bodies), no assistance can be provided for structures in a flood plain area unless the structures have been "properly flood protected". The Regulation does not define what properly flood protected means, but EMBC has established policy which states: "The phrase 'properly flood protected' as used in sections 15 and 30 of the Compensation and Disaster Financial Regulation means that the structure meets the Ministry of Forests Lands and Natural Resource Operations' Flood Hazard Area Land Use Management Guidelines that were in effect when the structure was built. Where there are restrictive covenants registered against the property at Land Titles (s.18) which set out minimum construction standards for flood protection, and the structure was in compliance with these restrictions, the structure will be considered to have been properly flood protected."</p> <p>These sections, taken in conjunction with s.16 and s.31 which allow DFA to be reduced or denied if the applicant did not take appropriate action before, during or after the disaster provide incentives for property owners to take all reasonable steps to flood proof their structures.</p>
S. 14 and 29, Disaster Financial Assistance Regulation	Revise Regulation to limit DFA funding for building	<p><b>EMBC</b></p> <p>Limiting the number of times DFA can be paid unless a structure has</p>



Policy	Advisory Report Recommendations	Agency Leads and Responses
	repairs to one time (not twice) unless flood proofing to current standards is provided and require money be spent on mitigation or relocation.	been properly flood protected would be a strong incentive to encourage property owners to take action to protect their property. Further exploration and stakeholder consultation of this option would be required.
2004 Provincial Guidelines	Update 2004 Provincial Guidelines to provide clarity concerning SLR and associated climate change hazards.	<i>MOE and FLNRO</i> MOE and FLNRO are proposing amendments to the guidelines and are currently in consultation with local governments through UBCM. Amending the 2004 <u>Flood Hazard Area Land Use Management Guidelines</u> to include recommendations from the 2011 <i>Climate Change Adaptation Guidelines for Sea Level Rise and Coastal Flood Hazard Land Use</i> report would provide clarity for local governments seeking to begin the process of planning for sea level rise.
Review and clarify minimum flood protection standard	Can be addressed in updated Provincial Guidelines; Province should determine minimum level of protection.	<i>MOE and FLNRO</i> Minimum flood protection standards will be addressed in proposed amendments to the guidelines.
Expanded disclosure statement under Real Estate Development Marketing Act	Can be implemented by Superintendent of Real Estate; will inform all purchasers of new subdivision in flood hazard areas; reliability will depend on updated flood plain mapping.	Expanding the disclosure statement to potentially indicate whether /if a development is in a floodplain and what hazard mitigation measure have taken place may provide further incentives to developers to address risk mitigation, and would inform purchasers. Further exploration and consultation of this option would be required.

Policy	Action Report Recommendations	Agency Leads and Responses
Expanded use of Notice on Title	Requires legislative change; will better align private interests with B.C. flood policy.	<i>MOE and CSCD</i> Expanding the use of Notice on Title could be a useful tool to inform the public of risks and actions taken on that property to mitigate risks. Further exploration and consultation of this option would be required.
Expanded education measures	Continue to support and expand education measures with local government, NGOs, academia, and general public to address sea level rise adaptation measures.	<i>MOE and CSCD</i> The B.C. Government will continue its ongoing work and collaborations on research, outreach and action on sea level rise and flooding in British Columbia.
Regional planning co-ordination	Can proceed at present as legislative change is not required for inclusion in Regional Strategy.	<i>MOE, CSCD, FLNRO, EMBC</i> B.C. Government will continue its collaborations with local government. The B.C. Government is involved in the Lower Mainland Regional Flood Management Strategy – a multi-year initiative led by the Fraser Basin Council with the participation of all orders of government and other public and private sector organizations. Through this initiative, these organizations are developing a regional flood management strategy for the Fraser River and coastal communities in the Lower Mainland.
Program to update flood plain mapping	Most existing mapping is over 25 or more years old; updated mapping will address SLR, improve accuracy, enable more informed decision making and be more user friendly.	<i>FLNRO</i> Many local governments do not have the funding resources or the technical expertise to prepare updated floodplain maps. Currently, Public Safety Canada is assessing the state of floodplain mapping in Canada and developing cost estimates to update floodplain maps on a national basis. It would be beneficial for the province to consider a new federal-provincial agreement similar to the joint Canada-BC Floodplain

Policy	Adaptation Report Recommendations	Agency Leads and Responses
	Investigate opportunity for regional scale mapping and coordination. Should not be undertaken without cost sharing by local and Federal governments. Should be ongoing program.	Mapping Program that expired in 1998.
Program funding for structural upgrading measures	Should fund planning studies. Should follow updated flood plain mapping, consideration of living shorelines, and benefit-cost analysis (for larger projects).	<i>FLNRO and EMBC</i> The current Flood Protection Program funds construction of structural systems, but does not provide money for floodplain planning. The new federal National Disaster Mitigation Strategy may provide an opportunity to support planning to identify a full range of options, in addition to structural protection.
Inclusion of land acquisition in provincial program funding, where applicable	Has limited application but can provide a cost-effective policy tool; will facilitate Managed Retreat where applicable.	Land acquisition (by province) may be an option that could be applied in very limited circumstances where there is a direct threat to health and safety. This would need to be carefully considered so as not be seen as an incentive or benefit for owning lands in high risk areas.
Amend B.C. Building Code to address building development in flood plains	Requires lengthy development process and consultation; has potential to significantly mitigate flood damages.	<i>MEM</i> The B.C. Building Code applies the core concepts of the National Building Code, combined with elements specific to B.C.'s unique needs. Updates to the National and B.C. building codes could be a useful tool to mitigate flood damage to individual buildings.
Overland flood insurance	Has potential to mitigate	A well designed insurance program could be an important component

Policy	Arlington Report Recommendations	Agency Leads and Responses
	risk and align private interests with B.C. flood policy but requires detailed investigation and consultation.	of an effective floodplain management program.

## Foreword

The Government of British Columbia has begun preparing for the impacts of a changing climate and in 2010, released *Preparing for Climate Change: British Columbia's Adaptation Strategy*. The Strategy commits to advancing adaptation by taking action within government and supporting adaptation in specific climate sensitive sectors.

In 2013, a series of policy analyses were commissioned to examine whether current policies and programs support or hinder adaptive decision making, and to suggest appropriate measures that would facilitate adaptive action. This report, *Evaluation of B.C. Flood Policy for Coastal Areas in a Changing Climate*, written by The Arlington Group Planning + Architecture Inc., is one of those assessments. This assessment takes an initial look at B.C. Government's coastal flooding-related policies, provides some conclusions and proposes some initial recommendations.

Flood hazard management is complex and must be considered in the context of the historical development of B.C. Historical land development and associated structural protection measures will constrain the approaches available for managing flood hazards. Sea level rise and associated hazards related to climate change are also relatively new considerations for provincial flood management, and current policies and programs were not designed with climate change in mind. Climate change impacts such as sea level rise, changing storm patterns and increasingly intense rainfall events, however, will change flood risk in coastal regions in the coming century. Given that the current flood regulatory regime was developed under the assumption of a static climate, it will be necessary to evolve the current suite of policies to respond to changing coastal flood hazards to ensure the policies continue to achieve the stated goals.

Currently in B.C., responsibility for flood hazard management is shared between the provincial government and local land use authorities (e.g. federal government on Indian Reserves, the provincial government on Crown lands and local governments). The Federal government has a role in sharing infrastructure and flood response/recovery costs. The B.C. Government provides enabling legislation and programming (e.g. funding programs). Local implementation of flood-related policy (e.g., land use planning and zoning, building flood protection structures) rests, to a large extent, with local governments. The challenges posed by sea level rise further increase the importance of intergovernmental collaboration to address current and future coastal hazards.

This report complements previous research and outreach on sea level rise. Previous work has included a series of technical studies to assist practitioners in incorporating sea level rise into coastal flood plain mapping, sea dike design and land use planning<sup>1</sup>. These reports are helping inform planning and management decisions in coastal areas. *Cost of Adaptation – Sea Dike and Alternative Strategies*<sup>2</sup>

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<sup>1</sup> Technical studies can be downloaded at: [http://www.env.gov.bc.ca/wsd/public\\_safety/flood/fhm-2012/draw\\_report.html](http://www.env.gov.bc.ca/wsd/public_safety/flood/fhm-2012/draw_report.html) and include: *Coastal Floodplain Mapping Guidelines and Specifications* (2011); *Climate Change Adaptation Guidelines for Sea Dike & Coastal Flood Hazard Land Use* (2011)..

<sup>2</sup> *Cost of Adaptation – Sea Dike and Alternative Strategies – Final Report* (2012) can be downloaded at: [http://www.env.gov.bc.ca/wsd/public\\_safety/flood/fhm-2012/draw\\_report.html](http://www.env.gov.bc.ca/wsd/public_safety/flood/fhm-2012/draw_report.html).

provides a high-level cost estimate for upgrading the Lower Mainland's flood protection infrastructure for sea levels projected in the year 2100. This study is a first step in quantifying the scale of investment needed in flood infrastructure over the coming decades. The Sea Level Rise Adaptation Primer<sup>3</sup> is a resource for local governments and land managers that provides information on a range of tools that can be used as part of a sea level rise adaptation strategy. The Primer was developed in response to requests from local governments for more information on adaptation approaches.

The B.C. Government, through its Climate Change Adaptation Strategy will continue its efforts to disseminate relevant regional science, provide a clear and enabling policy framework, coordinate across ministries, and collaborate with local and federal governments to complement and support local adaptation action in B.C. The findings from this assessment provide useful information to help inform future mainstreaming initiatives and represent an initial step to help build an adaptive coastal policy regime in B.C.

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<sup>3</sup> *Sea Level Rise Adaptation Primer. A Toolkit to Build Adaptive Capacity on Canada's South Coasts* (2013) can be downloaded at: <http://www.env.gov.bc.ca/cas/adaptation/pdf/SLR-Primer.pdf>.

## **Executive Summary**

The B.C. Ministry of Environment, Climate Action Secretariat commissioned The Arlington Group Planning + Architecture Inc., with Kerr Wood Leidal, Sustainability Solutions Group and Greenomics, to analyze B.C. provincial policies related to flood hazard management from a climate change adaptation perspective. The purpose of the analysis was to examine whether existing policies and programs support or hinder adaptation to sea level rise and related climate change impacts in coastal areas, and to recommend appropriate measures to facilitate adaptive action.

The policies analysed in this report, referred to here as “B.C. flood policy”, represent the legislative enactments, regulations, plans and programs available in B.C. to reduce the risks of flood hazards and respond to and recover from flood events. Although these policies were not designed with sea level rise in mind, given the current risks associated with climate change it is important to examine whether these policies support adaptive actions. The analysis focused on the provincial government’s roles and responsibilities with respect to flood management, which include administering funding programs, regulating dikes, managing flood emergencies and issuing land use planning and flood mitigation guidance.

### ***Methodology***

A process was developed by the consultants to assess the current flood policy regime in B.C. for its ability to support adaptation to sea level rise and related climate change impacts. The analysis did not assess the overall policy effectiveness or performance. A list of relevant B.C. flood policies were identified and reviewed in terms of their adaptability to sea level rise and related coastal hazards. The evaluation of policies provided an analysis of any conflicts between components of B.C.’s flood policy, and a preliminary identification of any aspects that enable or hinder adaptation to sea level rise and associated impacts. A literature review was also conducted to highlight examples of how flood policy has been designed and applied in other jurisdictions in Canada and internationally. These examples helped inform the recommendations for this report.

### ***Policy Analysis Engagement***

The assessment included engagement with provincial government staff with direct responsibilities relating to coastal flood risk, and local government staff with direct involvement and/or responsibility for flood management.

Five workshops with local government staff were held in Metro Vancouver, the Capital Regional District, and central Vancouver Island. The workshops were structured around four sea level rise adaptation scenarios (protect, accommodate, retreat and avoid). The engagement process with local government staff indicated a high awareness and interest in adapting to sea level rise and associated impacts. They stated that adaptation to sea level rise is a challenge that they are eager to address, but emphasized the importance of strong partnerships between local governments and the B.C. Government. Some of the main challenges expressed by local government participants are summarized below.

- As the risk profile changes due to climate change, some local government participants have expressed a concern about their ability to mitigate risk and a lack of clarity around responsibilities.
- Although the provincial government is moving forward in developing technical studies, such as through the proposed amendments to provincial flood management land use guidelines, there is a gap between the development of those studies and local government's ability to implement them in their communities.
- Existing funding may not support coastal protection measures. Local government participants felt a risk-based approach to distributing funding would improve resiliency. A concern was also expressed that funding criteria may require projects to be "shovel ready" and therefore could not be applied to planning and risk assessment activities required for adaptation decision making.
- A concern that today's decisions could lead to future liability, as well as concerns over compensation post-disaster for already existing communities that may not be able to meet flood protection standards.

Some of the priority recommendations highlighted by the engagement process included clarification on target setting (e.g. What is the appropriate increase in sea level rise to use for a new development?), updating critically important information (e.g. flood plain mapping, 2004 *Provincial Flood Hazard Land Use Guidelines* to reflect adaptation to sea level rise), and continued education and information sharing.

### ***Policy Evaluation***

With few exceptions, the assessment found that much of the B.C. flood policy regime is highly adaptable to sea level rise and associated impacts. Most of the existing legislation was found to be capable of being used in a wide range of circumstances, including for situations that were not anticipated when the legislation was enacted. Regulations pursuant to existing legislation have somewhat lower adaptability where the wording is less generic and the references are more specific to circumstances which may change over time. The assessment, however, found that there were few instances where regulations posed conflicts to adaptive actions.

Although it was found that the B.C. flood policy regime generally supports adaptation, in some cases the implementation consequences may be significant. For instance the *Dike Maintenance Act* enables changing standards to address climate change hazards; however, the financial implications of this change may be significant for local and provincial governments and available resources managed under different programs would have to be adjusted accordingly.

Some of the key findings from the policy evaluation include:

- B.C. flood policy is generally enabling of structural flood management, land use policy and planning options, and flood proofing. Building dikes, establishing flood construction levels, and the use of planning and zoning tools are useful options to manage sea level rise.



- Structural protection measures are the most explicitly addressed and supported by the current B.C. flood policy regime, and understanding and familiarity with soft armouring approaches is developing. Implementation barriers include the cost of structural upgrading (e.g. dike elevation and widening), soft armouring and land acquisition where applicable.
- Although structural flood management options (e.g. dikes) have historically been the focus of coastal protection measures, a combination of protect, accommodate, retreat and avoid strategies will likely be necessary to adequately manage the risk of coastal flooding in a changing climate.
- Funding for flood hazard mitigation has been almost exclusively for structural protection (e.g. dikes). Costs have been shared between federal, provincial and local governments. Currently, accommodate strategies have been the responsibility of property developers and with local governments through planning, zoning and development requirements.
- While structural protection measures are well established in the policy regime, this strategy alone may lead to higher vulnerability by potentially creating a false sense of security for people and property behind flood protection structures.
- The avoid strategy is well enabled within the current policy regime through the use of Official Community Plans, development permit areas, conservation trusts and covenants; however this strategy is not applicable in currently developed areas and it has limited applicability in other areas unless established as a strategic priority.
- Managed retreat, and to a lesser extent, avoid options have yet to be fully addressed in flood policy. Challenges to managed retreat include: the amount of existing development in the flood plain, high value of coastal properties, potential or perceived impacts to local government tax base, emotional and political significance of land ownership, determining future costs and benefits, and the complexity of implementation.

Overall, the analysis found that a more consistent, integrated approach to risk management will be required in a changing climate. This would include coordination among neighbouring regions and the provincial government for diking and other aspects of flood management.

### ***Recommendations***

The report outlines specific policy conflicts and gaps and proposes solutions and policy alternatives. Priority recommendations identified by the consultant included:

- Updating critically important information such as 2004 *Provincial Flood Hazard Land Use Guidelines* and provincial flood plain maps.
- Clear target getting through clarification of minimum flood protection standards which can be addressed through updated 2004 *Provincial Flood Hazard Land Use Guidelines*.
- Revise the Disaster Financial Assistance Regulation to reduce vulnerability and enhance compliance with BC flood policy.
- Continued education and information sharing to help enable decision makers and the public advance and support adaptive actions.

- Expand the disclosure statement under the *Real Estate Development Marketing Act* and use of Notice on Title to identify developments in flood hazard areas.
- Continued and strengthened regional planning co-ordination on flood hazard management.
- Funding programs to further support planning studies, alternatives to structural protection measures and possibly land acquisition.
- Explore amending the B.C. Building Code to address building in the flood plain.
- Detailed investigation and consultation of the use of insurance to cover overland flooding.

