National Energy Board Hearing into Trans Mountain Expansion Project

Direct Written Evidence of Karen MacWilliam

Prepared for the City of Vancouver

May 15, 2015

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INTRODUCTION AND SUMMARY OF QUALIFICATIONS

Q.1 Please state your name, occupation and business address.

A.1 My name is Karen MacWilliam and I am a consultant, specializing in risk management and insurance analysis. I have worked in the insurance and risk management fields since 1985. I have operated a consultancy since 1998, with a focus on: local government, transportation, resources, property management, and maritime matters.

In addition to my consulting practice, I have lectured in risk management and advanced insurance curriculum at Simon Fraser University (1992 to 2014), Dalhousie University (2008 to the present) and University of Northern B.C. (2003 to 2010).

My address is 6 Seaview Avenue, Wolfville, Nova Scotia, B4P 2G2.

Q.2 What is your academic background?

A.2 I have a Bachelor's Degree in Economics from the University of B.C. I completed my CIP, and FCIP designations with the Insurance Institute of Canada in 1988, and 1992, respectively. I earned my Canadian Risk Management (CRM) certificate from the Global Risk Management Institute in 1991.

Q.3 Please outline your principal areas of experience.

A.3 My employment has included positions as Commercial Underwriter for Wellington Insurance Company, Risk Manager for Vancouver Port Authority, and Assistant Director, Risk Management & Corporate Security for the City of Edmonton. I have also provided consulting services to a number of local governments as well as provision and Federal crown corporations, including Vancouver Port Authority, Prince Rupert Port Authority and British Columbia Oil and Gas Commission.

From 2000 to 2008, I managed the insurance operations of BC Rail Group, a provincial crown corporation, specializing in multi-modal transportation and marine terminal operations. This assignment included acting as the Chief Operating Officer for BCR Captive Insurance Co. Ltd., a British Columbia based captive insurer. At the time of its dissolution, the company had assets in excess of $38 million.

Q.4 What is the purpose of your evidence in this proceeding?

A.4 Trans Mountain Pipeline ULC ("Trans Mountain") has applied to the National Energy Board (the "NEB") pursuant to section 52 of the *National Energy Board Act* for a certificate of public convenience and necessity in respect of the proposed Trans Mountain Expansion Project (the "TMEP"). The City of Vancouver is an Intervenor in the hearing of the TMEP application and has retained me to assess the possible risk transfer mechanisms that could be purchased by Trans Mountain to provide compensation for those economic impacts of a marine-based oil spill that would not be otherwise covered under the compensation regime identified in the Trans Mountain application due either to the nature of those impacts or the dollar amount of those impacts.

My report to the City of Vancouver entitled "*Alternate Risk Financing Mechanisms – Trans Mountain Pipeline Application*" sets out the details of my analysis and conclusions and is attached as **Appendix A**.

SUMMARY OF CONCLUSIONS

Q.5 Please summarize your conclusions.

A.5 A qualitative selection matrix which utilizes the City's required attributes, defined above, plus the likelihood of initial placement success, overall complexity, and ease of administration and management was utilized. The merits of each option were analyzed, yielding the following results:

Mechanism	Score
Contingent Capital	23

Catastrophe Bond/Insurance Securitization	27
Finite Risk	23
BC Based Captive Insurer	22

The most suitable option to be utilized is a catastrophe bond/insurance securitization similar in structure to a catastrophe bond. This would provide immediate risk financing to respond to the City of Vancouver's defined needs.

The cost will vary with the scope of insurance available to the pipeline proponent and stakeholders, however, the cost range will be 3.5%- 14% of the limit of coverage required, for an initial bond issue with a maturity of 1-5 years. For example, a $500,000,000 bond could have an initial cost of ranging from $17,500,000 - $70,000,000 (including brokers' commission).

Administrative costs will depend on whether a triggering event occurs; one time administrative costs could be as much as $350,000 and ongoing costs up to $400,000 annually if there are claims from a triggering event.

The likelihood of successfully issuing and subscribing a catastrophe bond will vary inversely with the bond amount. For a bond of $1 billion CDN, the likelihood of placement success is estimated at less than 20%. The chances of success will vary with the quality of parametric modelling information regarding a marine based oil spill that is provided to potentially interested investors, the ability of stakeholders to demonstrate compliance with risk control protocols required by investors, and the ability to attract a high quality "lead" investor.

Q.6. Do you submit the contents of this document and the Appendices as your written evidence?

A.6 Yes, this is my written evidence.

APPENDIX A TO THE WRITTEN EVIDENCE OF KAREN MacWILLIAM

Report of Karen MacWilliam
"Alternate Risk Financing Mechanisms - Trans Mountain Pipeline Application"

REPORT TO CITY OF VANCOUVER

ALTERNATE RISK FINANCING MECHANISMS

TRANS MOUNTAIN PIPELINE APPLICATION

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CITY OF VANCOUVER

ALTERNATE RISK FINANCING MECHANISMS – TRANS MOUNTAIN PIPELINE APPLICATION

EXECUTIVE SUMMARY

The City of Vancouver has requested an opinion regarding a risk financing mechanism related to the application of Trans Mountain to operate a pipeline, which terminates at Burrard Inlet. I am a consultant, specializing in risk management and insurance analysis. My detailed CV is appended to the report.

Specifically, the scope of services is:

- Conduct a review and analysis of the possible risk transfer mechanisms that could be purchased by Trans Mountain to provide compensation for those economic impacts of a marine-based oil spill with specified volumetric and probability parameters that would not be otherwise covered under the compensation regime identified in the Trans Mountain application due either to the nature of those impacts or the dollar amount of those impacts.
- Provide a recommendation with respect to the suitability of the identified risk transfer mechanisms for meeting the needs of the City of Vancouver, its residents and businesses along with an approximate cost.
- Conduct a review and analysis of the potential structure of such a risk transfer mechanism, including:

  (i) Fund governance and administration, renewal of the transfer mechanism, necessary support staff in the event of an oil spill, etc.
  (ii) How would claims against the fund be administered?
  (iii) What ongoing costs would maintaining such a mechanism impose?

I have also been asked to assume that such a mechanism possess the following attributes:

- Fixed price and capacity for 3-5 years
- Low volatility
- Dedicated funds readily available to indemnify impacted parties
- Structural features that provide adequate limits for foreseeable events
- Triggers that align with actual losses incurred by the City and third party stakeholders as defined by the City of Vancouver
- Coverage to be available for a minimum of 50 years

Four different alternative risk financing options listed below were evaluated and the operation, advantages, disadvantages, likelihood of successful initial implementation and costs are contained in the body of the full report. It is believed that each of these could be utilized to provide capacity up to $1 billion. Beyond this limit, a combination of approaches may be required to secure additional capacity or losses above that amount retained or transferred differently.

Option A - Contingent capital – Standby credit facility

A financial institution such as an insurance company, reinsurance company, or investment bank agrees to provide capital to the arranging organization upon the happening of a specific event, combination of concurrent events, or series of events. The event can be an insurable risk, or can encompass elements that go beyond traditional insurance coverage.

Advantages

- The cost of contingent capital is cheaper than insurance if there are no claims or minimal claims.
- Contingent capital arrangements provide risk financing capacity when needed at fixed cost.
- Contingent capital funds are made available immediately following a loss, and the arranging organization can handle the claims management process
- Because credit is arranged in advance, a triggering event which may impair the arranging organization's creditworthiness is not an issue, so low cost capital can be provided, even following a catastrophic event.
- The arranging organization controls whether or not to utilize the option.

Disadvantages

- Funds received from standby credit facilities are loans, and must be paid back to the financial institution with interest,
- With the catastrophe equity put option, ownership in the arranging organization is diluted. The total number of shares outstanding increases with the exercise of the option, thereby reducing each shareholder's relative share of ownership.

Option B - Catastrophe bond/insurance securitization

Catastrophe bonds are risk-linked securities that transfer a specified set of risks from a sponsor (typically an insurance company) to investors. A bond issue would provide an advantageous interest rate in the event that the triggering event (an oil spill into Burrard Inlet) did not occur. If the event did occur, the bond sponsor uses the capital provided by the investors to pay for losses resulting from the triggering event.

Advantages

- Insurance securitization, specifically catastrophe bonds, provides additional risk transfer capacity and an alternative to traditional insurance, insulated from traditional market cycles
- The issuance of a catastrophe bond lowers credit risk because the obligations to pay losses are fully collateralized
- A catastrophe bond with a parametric trigger does not require losses to be finalized in order for the sponsoring organization to receive payment, so losses in this case can be adjusted expeditiously.

Disadvantages

- Insurance securitization and specifically, catastrophe bonds, may expose the arranging organization to volatility because of the relationship between the return demanded by investors and premiums for insurance and reinsurance.
- The arranging organization will face significant opportunity costs for the assets used as **collateral**.
- The arranging organization and its business partners will incur significant time and costs associated with risk modelling and other costs associated with the transaction.
- Insurance securitization and the issuance of a catastrophe bond will be subject to basis risk. This means that the amount received by the bond sponsor will not be equivalent to the actual losses incurred.

Option C - Finite risk arrangement

A finite risk plan is a risk financing mechanism that transfers a finite amount of risk to an insurer or reinsurer and the risks not transferred are funded from the organization's own accounts.

Funds not used to pay for losses are returned to the insured organization as an incentive for positive loss control. Losses which are not adequately controlled which exceed a threshold amount are transferred to an insurer.

Advantages

- Finite risk plans smooth costs out over time.
- Finite risk plans incorporate features of retention and transfer.
- A finite risk plan provides higher coverage limits than could be obtained through the conventional insurance marketplace.
- A finite risk plan may meet contractual and regulatory requirements.
- A finite risk plan could be underwritten for multiple years, possibly for the duration of the operating life of the pipeline. This significantly reduces administrative time and expense.
- A finite risk plan improves budgeting and stabilizes cash flows because although a significant portion of risk is retained by the arranging organization, premium payments are constant for the duration of the finite risk contract period.

Disadvantages

- Finite risk arrangements command significant amounts of capital from the arranging organization that cannot be used for other purposes.
- Finite risk arrangements have one limit that applies to multiple years.
- Annual premiums paid would attract provincial insurance premium tax, which in British Columbia is currently a rate of 4.4%, which could be several million dollars annually
- If a finite risk transaction was entered into, and the arranger subsequently wished to return to more traditional risk financing methods, there may be challenges in re-entering the conventional marketplace.
- Finite risk transactions may be subject to extensive scrutiny from regulators, auditors, tax authorities and others.

- The arranger of a finite risk plan must convince regulators and tax authorities that the accounting treatment they are utilizing appropriately characterizes the basis of the finite risk transaction being used.
- The finite risk plan may require the establishment of a captive insurance company to enable access to the excess insurance and reinsurance markets.
- If the finite risk mechanism provided coverage for a large number of non-traditional risks, the costs and/or availability of excess insurance/reinsurance would be impacted.

Option D - BC - Based captive insurance company

A captive insurer is a specific purpose insurer formed to insure the losses of its owner(s) or parent and affiliates. The primary purpose of a captive insurer is to reduce the overall cost of risk financing for the captive company's owner(s). A captive insurance company operates like other insurance companies, by collecting premiums, issuing policies, and paying for covered losses.

A captive insurance company incorporated and based in BC could be formed in this case, which would provide coverage for a spill event. Premiums could be collected from stakeholders for basic coverage, and excess insurance could be purchased for larger catastrophic events.

Advantages

- Reducing the cost of risk
- Having direct access to reinsurers
- Improved cash flow control
- Profits in the captive build up value to the captive owners and the accumulation of surplus increases the ability of the captive to retain risk in the future.
- Capturing investment income
- Obtaining insurance not otherwise available
- Centralizing loss retention
- Immediate benefits from positive risk control

Disadvantages

- Capital requirements and start-up costs – the initial capitalization of a BC based captive to pay for foreseeable losses would be the subject of significant and protracted negotiation among participants.
- Inability to withdraw capital from the mechanism, a regulated insurance company
- Sensitivity to losses
- Pressure/lack of understanding from stakeholders
- There would need to be a process for appointing managers and a Board of Directors.
- Premium taxes and residual market loadings

Evaluating the Options

A qualitative selection matrix which utilizes the City's required attributes, defined above, plus the likelihood of initial placement success, overall complexity, and ease of administration and management was utilized. Rating parameters of "poor", "fair" "good" and "excellent" and relative scores of 1, 2, 3, and 4 respectively were assigned for each rating. The merits of each option were analyzed, yielding the following results:

Selection Matrix

Excellent – 4 Points

Fair – 2 Points

Good – 3 Points

Poor – 1 Point

Feature	Analysis of Risk Financing Mechanism			
	Contingent Capital	Catastrophe Bond	Finite Risk	BC Based Captive Insurer
Fixed price and capacity for 3-5 years	Good	Fair	Good	Fair
Low volatility	Poor	Poor	Good	Fair
Dedicated fund readily available to compensate impacted parties	Good	Excellent	Good	Good
Structural features that provide adequate limits of foreseeable events	Excellent	Excellent	Good	Fair
Triggers that align with actual losses incurred by the City and third party stakeholders as defined by the City of Vancouver	Good	Excellent	Good	Fair
Coverage to be available for 50 years	Poor	Poor	Fair	Fair
Likelihood of Initial Placement Success	Fair	Fair	Poor	Fair
Complexity	Fair	Good	Poor	Fair
Ease of Administration and management	Good	Excellent	Fair	Fair
Cost if triggering event occurs	Poor	Fair	Fair	Good
Score	**23**	**27**	**23**	**22**

The most suitable option to be utilized is a catastrophe bond/insurance securitization similar in structure to a catastrophe bond. This would provide immediate risk financing to respond to the City of Vancouver's defined needs.

The cost will vary with the scope of insurance available to the pipeline proponent and stakeholders, however, the cost range will be 3.5%- 14% of the limit of coverage required, for an initial bond issue with a maturity of 1-5 years. For example, a $500,000,000 bond could have an initial cost of ranging from $17,500,000 - $70,000,000 (including brokers' commission).

Administrative costs will depend on whether a triggering event occurs; one time administrative costs could be as much as $450,000 and ongoing costs up to $400,000 annually if there are claims from a triggering event.

As the amount of the bond issuance increases, the he likelihood of successfully issuing and subscribing this mechanism decreases. The likelihood of subscribing the bond for an amount that is sufficient to pay for losses from a triggering event is estimated at less than 20%.

The chance of success will vary with the quality of parametric modelling information regarding a marine based oil spill that is provided to potentially interested investors, the ability of stakeholders to demonstrate compliance with risk control protocols required by investors, and the ability to attract a high quality "lead" investor.

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1.0 Introduction and Scope of Report

The City of Vancouver has requested an opinion regarding a risk financing mechanism related to the application of Trans Mountain to operate a pipeline, which terminates at Burrard Inlet.

Specifically, the scope of services is:

- Conduct a review and analysis of the possible risk **transfer** mechanisms that could be purchased by Trans Mountain to provide compensation for those economic impacts of a marine-based oil spill with specified volumetric and probability parameters that would not be otherwise covered under the compensation regime identified in the Trans Mountain application due either to the nature of those impacts or the dollar amount of those impacts.

- Provide a recommendation with respect to the suitability of the identified risk **transfer** mechanisms for meeting the needs of the City of Vancouver, its residents and businesses along with an approximate cost.

- Conduct a review and analysis of the potential structure of such a risk **transfer** mechanism, including:

  (i) Fund governance and administration, renewal of the **transfer** mechanism, necessary support staff in the event of an oil spill, etc.

  (ii) How would claims against the fund be administered?

  (iii) What ongoing costs would maintaining such a mechanism impose?

I have also been asked to assume that such a mechanism possess the following attributes:

- Fixed price and capacity for 3-5 years;
- Low volatility;
- Dedicated funds readily available to compensate impacted parties;
- Structural features that provide adequate limits for foreseeable events;
- Triggers that align with actual losses incurred by the City and third party stakeholders as defined by the City of Vancouver;
- Coverage to be available for a minimum of 50 years.

To facilitate ease of reading, technical terms are shown in bold type, and definitions are provided in Appendix "A".

2.0 Assumptions and Constraints

Because of the existence of multiple stakeholders, each of which has financial and other interests that are not exactly aligned, it is assumed that the City of Vancouver wishes to control, but not fund, a risk financing mechanism which may be used to compensate third parties who may sustain losses as a result of a spill event. The options discussed in this report assume that the City of Vancouver will be the arranging and controlling organization and that the pipeline proponent and possible other stakeholders, will fund the cost of the risk financing mechanisms as a condition of approval being granted by the National Energy Board.

As the author of this report, I do not have the experience or the expertise to draw definitive conclusions about restrictions or permissions pursuant to the *Vancouver Charter* and accordingly, no such investigation has been carried out. It is my opinion that legal advice should be sought in this regard if **alternate risk financing** mechanisms to fund a marine-based oil spill are arranged.

The exact nature of the type of losses that could be covered by the theoretical risk financing mechanisms discussed in this report is not known. Because each is operated and regulated slightly differently, each of the theoretical mechanisms would not cover exactly the same losses. The scope of coverage of each mechanism would need to be specifically understood and negotiated with all of the parties participating in the mechanism.

Any risk financing product must be arranged in a marketplace that is dynamic and subject to constant change as to availability, pricing, and applicable terms and conditions. The purpose of this report is to outline the operation of risk financing mechanisms that could theoretically achieve the City's goals and to provide basic information about the range of costs and likelihood of achieving such alternatives.

Because of the nature of the risk financing marketplace, it is not appropriate to assume that the information contained herein will remain valid for any significant duration.

3.0 Qualifications

I am a consultant, specializing in risk management and insurance analysis. I have operated a consultancy since 1998, with a focus on: local government, transportation, resources, property management, and maritime matters.

I have a Bachelor's Degree in Economics from the University of B.C. I completed my CIP, and FCIP designations with the Insurance Institute of Canada in 1988, and 1992, respectively. I earned my Canadian Risk Management (CRM) certificate from the Global Risk Management Institute in 1991. I undertook M.B.A. studies at the University of Alberta in 1994-1995.

My employment has included positions as:

- Commercial Underwriter, Wellington Insurance Company
- Risk Manager, Weldwood of Canada Limited
- Senior Broker/Advisor, Sedgwick
- Assistant Director, Risk Management & Corporate Security, City of Edmonton
- Risk Manager, Vancouver Port Authority

With respect to related consulting matters, current and previous clients include:

- City of Edmonton
- City of Surrey
- City of Victoria
- City of Pitt Meadows
- City of Castlegar
- City of Nelson
- City of Trail
- Vancouver Port Authority
- Prince Rupert Port Authority
- Commissionaires Nova Scotia
- BC Oil and Gas Commission
- BC Rail
- BC Gas/Transmountain Pipeline

In addition to my consulting practice, I have lectured in risk management and advanced insurance curriculum at:

- Simon Fraser University – 1992 – Present
- Dalhousie University – 2008 – Present
- University of Northern B.C., - 2003 – 2010

I have authored four reference books:

The Risk Management and Insurance Guidebook for Industry © 2001 Scarecrow Press, Rockwood MD
Assessing Risk – A Canadian Perspective © Karen MacWilliam, 2008
Controlling Risk – A Canadian Perspective © Karen MacWilliam, 2009
Financing Risk – A Canadian Perspective © Karen MacWilliam, 2008

I have a bi-monthly column in *Alberta Broker* magazine on the subject of commercial insurance and I have been interviewed by numerous media outlets in respect of risk management and insurance issues, including:

- *Business Insurance*
- *Canadian Insurance*
- *Canadian Underwriter*
- *National Underwriter*
- *CBC Radio – "Ideas"*

I have been qualified as an expert witness in the areas of risk management and insurance analysis in the courts of British Columbia and Nova Scotia.

I have spoken locally, nationally, and internationally, on a wide variety of risk management and insurance related topics. Specifically, I have spoken on the topic of "Alternative Risk Transfer Techniques" to:

- RIMS Canada
- The Insurance Brokers' Association of BC
- The Insurance Brokers' Association of Alberta
- The Supply Chain Management Professionals Association
- The Insurance Institute of Southern Alberta
- The Insurance Institute of Nova Scotia

From 2000 – 2008, I managed the insurance operations of BC Rail Group, a provincial crown corporation, specializing in multi-modal transportation and marine terminal operations. This assignment included acting as the Chief Operating Officer for BCR Captive Insurance Co. Ltd., a British Columbia based captive insurer. At the time of its dissolution, the company had assets in excess of $38 million.

A detailed CV is appended as Appendix "B" of this report.

4.0 Risk Financing Options

Alternate risk financing mechanisms are sources of loss and risk funding which do not take the form of conventional insurance. Broadly speaking, **alternate risk financing** may involve retaining losses by the subject organization(s), transfer of losses beyond the resources of the subject organization(s), or hybrid mechanisms, which combine retention with transfer.

Risk financing options were analyzed and based on the City's defined criteria, four possible approaches are analyzed in detail in this report. They are:

- **Contingent capital** (standby credit facility)
- **Catastrophe bond**/insurance securitization
- **Finite risk**
- **BC based captive insurance company**

It is believed that each of these could be utilized to provide **capacity** up to $1 billion. Beyond this limit, a combination of approaches may be required to secure additional **capacity** or losses above that amount retained or transferred differently.

Each of these mechanisms could be arranged by the City of Vancouver or by the pipeline proponent, and each of them would require appropriate contractual mechanisms to guarantee that the pipeline proponent paid all associated costs of the mechanism, so that the City was not exposed to the risk of such costs. Separate legal advice would be required in this regard.

It should also be noted that each mechanism may vary in the scope of coverage that can be obtained and provided.

A list of definitions of terminology used in this report is appended as "Appendix A".

4.A Contingent Capital Arrangements

A **contingent capital arrangement** is an agreement arranged prior to a loss that establishes the terms for an organization to raise funds following a loss event.

A financial institution such as an insurance company, reinsurance company, or investment bank agrees to provide capital to the **arranging organization** upon the happening of a specific event, combination of concurrent events, or series of events. The event can be an insurable risk, or can encompass elements that go beyond **traditional insurance** coverage.

The financial institution receives a **commitment fee** in exchange for its promise to provide the counter-party with funds upon the happening of a defined triggering event at pre-agreed interest rates. The **arranging organization** receives funds immediately following the loss, uses those funds to pay losses, and then re-pays the financial institution as per the contingent capital agreement. Because all of the funds are repaid, this mechanism is a retention mechanism.

Because the terms of the arrangement are negotiated prior to a loss, the rates are more favourable than if the borrowing arrangements were made after the happening of the loss.

The contingent capital can be debt (a loan) or equity (shares) which will be used to pay for losses.

The financial institution assesses the effect that the triggering event would have upon the **arranging organization** and applicable interest rates are derived after this risk assessment.

The financial institution investing in the **contingent capital arrangement** becomes a creditor of, or equity investor in, the **arranging organization**. The **contingent capital arrangement** is most often structured as an option, so that the arranger has the option, but not the obligation, to utilize the contingent capital if the triggering event occurs.

There are two types of **contingent capital arrangements** which could theoretically be used:

- Standby credit facilities
- Catastrophe equity put options

A **standby credit facility** is an arrangement in which the financial institution agrees to provide a loan to the **arranging organization** in the event of a loss. The applicable interest rate and repayment terms are established at the commencement of the arrangement.

In exchange for credit being available, the organization pays a **commitment fee**, and typically pays an annual **standby fee**, for the privilege of having the capital available whenever a triggering event has occurred.

The funds are typically available in **tranches,** or layers, and there is typically a minimum draw required.

The funds are paid back to the financial institution in accordance with a re-payment schedule, allowing the organization to amortize the loss over a longer period than if it had simply paid losses from its operating funds. It is important to note that for this reason, the **standby credit facility** is not a **transfer** option – all of the losses are funded by the **arranging organization**. The primary benefit is that the losses are amortized over the medium term and capital needed to compensate affected parties is provided immediately.

The catastrophe equity **put option** is the right to sell equity (stock) at a pre-determined price in the event of a catastrophic loss. The buyer of the catastrophe equity **put option** pays a **commitment fee** to the seller, who agrees to purchase the equity at a pre-arranged price in the event of a triggering catastrophic event.

The cash injection is used to fund losses.

For the purpose of this analysis, the catastrophe equity **put option** has been immediately discounted, since it is virtually impossible that the City of Vancouver could convince and/or control the selling of the pipeline proponent's stock at pre-agreed prices. Current stock markets conditions and commodity price fluctuations make this option highly volatile.

4.A.1 Advantages of Contingent Capital Arrangements

- The cost of contingent capital is cheaper than insurance if there are no claims or minimal claims. The **commitment fee** and **standby fee** are typically a fraction of what an annual insurance premium might be. If the **arranging organization** does not experience a triggering event, there will be a cost saving, when compared with **traditional insurance**.

- **Contingent capital arrangements** provide risk financing **capacity** when needed at fixed cost. When compared with **traditional insurance**, excess insurance or reinsurance, the opportunity cost of contingent capital is much lower.

- Contingent capital funds are made available immediately following a loss, and the **arranging organization** can handle the claims management process, whereas insurance settlements may take considerable time and be subject to the insurer's interpretation as to the scope of coverage and amount of payment.

- Because credit is arranged in advance, a triggering event which may impair the **arranging organization**'s creditworthiness is not an issue, so low cost capital can be provided, even following a catastrophic event. With respect to the catastrophe equity put option, the option to purchase stock is arranged at pre-agreed prices, so even if the catastrophe caused a significant drop in the **arranging organization's** share price, adequate capital can still be raised and/or regained.

- The mechanism does not require activation following a covered loss, if the **arranging organization** does not need or wish to activate it following a loss. The **arranging organization** controls whether or not to utilize the option.

4.A.2 Disadvantages of Contingent Capital Arrangements

- Funds received from standby credit facilities are loans, and must be paid back to the financial institution with interest, making this the most expensive risk financing option if a triggering event is experienced. With traditional insurance, once the premium is paid, other than deductibles, there is no further cost.

- With the catastrophe equity put option, ownership in the arranging organization is diluted. The total number of shares outstanding increases with the exercise of the option, thereby reducing each shareholder's relative share of ownership.

4.A.3 Specific Issues in this Case

If the City of Vancouver is the arranging organization, then approval for authorization to borrow up to the amount of the contingent line of credit would have to be sought pursuant to the *Vancouver Charter*, and would likely require the assent of the electorate. Depending on the proposed amortization of the contingent borrowing, further investigations into the *Vancouver Charter* and the applicable legislation would be required.

This would involve significant risk for the City. It is possible that the Province of BC could be the **arranging organization**.

A captive insurer could be established to be the arranging (and borrowing) organization; however, it would require collateral and/or a financial guarantee from the pipeline proponent, the City of Vancouver, and potentially other stakeholders.

If the pipeline proponent or some other party is the **arranging organization**, then the City of Vancouver may potentially lose control over the use of the borrowed funds. It may be necessary to place the funds into a regulated mechanism (such as a **captive insurance company**) to ensure that the funds are used for the purpose intended.

If another party is the **arranging organization**, the creditworthiness of the organization is outside of the control of the City of Vancouver. The transaction will involve dramatic changes to the organization's balance sheet, and thus, will require approval of the pipeline proponent's executive, board of directors, and/or shareholders, all of which interject unknown and ongoing risk to the use of the mechanism.

4.A.4 Resources Required & Costs

A contingent capital option would require a placing broker or investment banker to oversee the placement. Customary compensation would typically be a fee or commission based on the cost/premium of the placement. The counterparty would receive a **commitment fee**, and **standby fee**.

Other resources required:

- Legal opinion regarding applicable legislation such as the *Vancouver Charter* as to the permissibility of a borrowing mechanism or agreement that the Province of BC would be the borrower
- Accounting expertise to review accounting and tax treatment of the mechanism proposed
- Legal fees to draft borrowing agreement
- Experts' fees to establish an applicable policy wording and insurer contract.
- Formation of a **captive insurance company** or other mechanism in the event that the option is triggered, or for the purposes of securing excess insurance or reinsurance.
- Establishing a claims management protocol, including, but not limited to: a Board of Directors or Executive Committee to oversee the payment of claims, claims adjusters/investigators to liaise with claimants and adjudicate indemnity payments to affected parties
- Advertising and public relations costs to disseminate information regarding the program
- External audit
- Financial management and reporting to regulators as required

If the pipeline proponent or other party is the arranging organization, additional expenses for audit and oversight would be required. Collateral may be required

If the pipeline proponent or other party is the arranging organization, a **financial guarantee** from the City of Vancouver may be required.

Anticipated costs:

- Commitment fee - $200,000 - $500,000 (Depending on amount of capital arranged)
- Standby fee – 0.1% - 0.5% of total standby credit available
- Legal and administrative expenses (one time) - $200,000 - $400,000

If a spill event occurs

- Costs to repay the loan plus interest – Up to amount borrowed plus interest
- Costs of establishing a captive insurer - ~ $100,000
- Claims adjustment – 2 full time adjusters/adjudicators (if a spill event occurs) - $200,000 annually
- Ongoing oversight of claims management process - ~ $100,00 annually

4.A.5 Likelihood of a successful placement

The likelihood of an initial placement for a **standby credit facility** is less than 20%. Since the weakening of global financial markets in 2007-2008, the likelihood has been reduced. If a placement could be successfully completed, it is likely that the pipeline proponent as the arranging organization would need collateral, and possibly, a **financial guarantee** from another party.

The City of Vancouver, if the arranging party, would likely require the assent of its electorate to consent to the borrowing arrangement.

If the Province of BC were the arranging party, cabinet approval would be required.

The likelihood of an initial placement of a catastrophe equity put option is less than 10%, given the volatility of crude oil prices and the pipeline proponent's share price.

4.B Catastrophe bond/Insurance Securitization

Catastrophe bonds are risk-linked securities that transfer a specified set of risks from a sponsor (typically an insurance company) to investors.

These instruments were initially developed in the early 1990's following large scale U.S. disasters such as Hurricane Andrew and the Northridge earthquake in California to provide additional risk financing **capacity** to insurance and reinsurance companies following natural disasters.

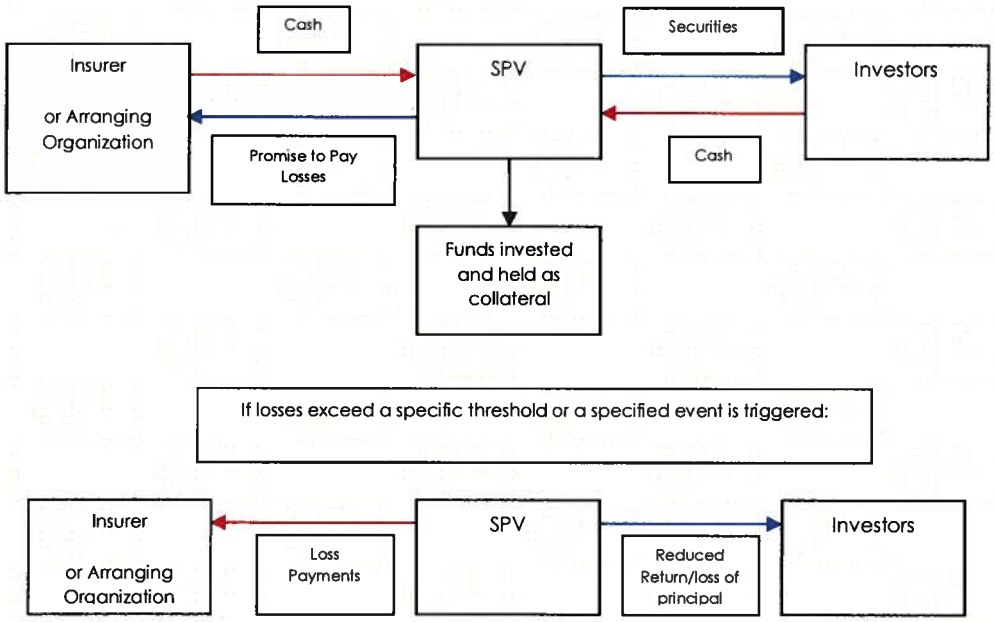
Catastrophe bonds are a specific example of insurance linked securities which are created through **insurance securitization**. **Insurance securitization** is the process of creating marketable insurance linked securities based on the cash flows that arise from the transfer of insurance risks.

Insurance securitization differs from most other types of securitization in that instead of selling income-producing assets to a **Special Purpose Vehicle** (SPV) and receiving cash, the sponsoring organization pays cash to the SPV, who sells insurance linked securities to investors on the capital market.

4.B.1 Insurance Securitization Model

The diagram below illustrates the concept of insurance securitization.

The **special purpose vehicle** (SPV) is a specialized facility that acts as an insurer or **reinsurer**.



In this generic model, the arrangement is as follows:

1) The organization arranging risk financing pays cash to a special purpose vehicle (SPV) equivalent to the anticipated interest payout to investors if the bond is not triggered.

2) The SPV sells the insurance linked securities (in this case, it issues a **catastrophe bond**) to investors in the capital market. The bond is usually arranged through an investment bank.

3) The SPV retains the principal from the bond issuance until the loss trigger specified in the contract is met, or the bond maturity date is reached.

4) If the loss trigger occurs, the SPV reimburses the sponsoring organization for the losses, using the principal received for purchase of the bond up to the specified limit.

5) If a triggering event has occurred, the SPV may withhold from investors the principal, the interest, or both, depending on the terms of the contract.

6) If the loss trigger does not occur and the bond matures, the SPV returns the principal to the investors along with investment earnings.

4.B.2 Investment Income and Securities Ratings

Catastrophe bonds are often floating rate bonds linked to a market index such as LIBOR.

LIBOR (Intercontinental Exchange London Interbank Offered Rate) is a benchmark interest rate that leading banks charge each other for short-term loans. **LIBOR** serves as the first step to calculating interest rates on various loans throughout the world. The rate is based on five currencies: U.S. dollar, Euro, pound sterling, Japanese yen and Swiss franc. **LIBOR** serves seven different maturity time horizons: overnight, one week, and one, two, three, six and twelve months. There are a total of thirty-five different **LIBOR** rates each business day. The most commonly quoted rate is the three-month U.S. dollar rate.

The **catastrophe bond** is issued with a coupon of LIBOR plus a spread, typically between 300 and 2000 **basis points** (3% - 20%). The bonds are inherently risky, so they may not be highly rated like typical government or corporate bonds. Preliminary discussions with service providers indicate that market conditions currently would need to generate a return of between 3% and 12%.

The investors purchasing the bond receive a higher than typical return, and are "gambling" against the likelihood of the triggering event occurring. These bonds may be attractive to large institutional investors, hedge funds, catastrophe oriented funds, and asset managers since the returns are not correlated to stock market events or typical business cycles. Life insurers, reinsurers, banks, pension funds, and other investors have also participated in historical offerings of **catastrophe bonds.**

Catastrophe bonds are often rated by a bond rating agency such as **Moody's** or **Standard and Poor's**.

Typically, a corporate bond is rated based on the probability of default (bankruptcy) of the bond's sponsor. A **catastrophe bond** is rated based on its probability of default due to a triggering event which causes investors to lose principal.

Most **catastrophe bonds** are rated below **investment grade** (below BBB-/Baa-) and a bond which was triggered by only one event is not likely to receive **investment grade** status. If multiple concurrent or sequential events were necessary to occur in order to trigger the bond, then **investment grade** status may be theoretically achievable, since the likelihood of a **triggering event** would be reduced.

4.B.3 Trigger Mechanisms

There are a number of theoretical trigger mechanisms used with insurance securitization, which contain **basis risk. Basis risk** is the risk that the amount received in indemnity is greater than or less than actual losses.

The four basic types of triggers are:

Indemnity – this is triggered by the sponsor's actual losses, so the sponsor is indemnified as though an actual insurance mechanism had been in place. For example, if the trigger and limit was $200 million in excess of $600 million of losses, then the bond is triggered when total actual losses reach $600 million. This method requires all losses to be adjusted in advance of the mechanism being triggered.

Modelled loss – this mechanism does not deal with actual losses, but instead an exposure portfolio is constructed using modeling software. When there is a large event, event parameters are run against the exposure database. If modelled losses are above a specified threshold, the bond is triggered. This is usually used in an insurance context.

Indexed to industry loss – Instead of adding up all claims, the bond is triggered when insurance industry losses from a certain peril or event reach a certain threshold. The bond will specify how industry losses are determined. This is used almost solely in an insurance context.

Parametric – Instead of the bond being triggered by claims (actual, modelled, or industry) the trigger is related to the happening of a specific event, the probability of occurrence of which can be estimated. It could be an earthquake over a certain magnitude, a hurricane of a certain force, or accumulations of precipitation exceeding a specified amount in a specified time.

There is also a variant of the parametric trigger, referred to as a **parametric index**. Because the bond may be triggered by an event which meets the triggering event criteria, however, the sponsoring organization does not sustain losses of a magnitude equivalent to the payout of funds held in the SPV, there is little correlation between the amount paid and the actual losses sustained. The **parametric index** triggered bond may have the bond pay out based on observations from numerous geographic points, such as hurricane wind speed measured by multiple weather stations.

Because it is likely that the consequences of a marine based oil spill upon third party stakeholders would take a long time horizon to quantify and settle, a **parametric trigger** would be the most appropriate trigger for the City of Vancouver to utilize in this situation.

4.B.4 Conditions necessary for successful insurance securitization

Successful insurance securitizations share some characteristics:

1) There needs to be a potentially large exposure to make the security issuance viable because of the time and transaction costs required. Normally the starting point would be a value above $50 million.

2) SPV's with high credit ratings or substantial assets that issue securities receive better pricing and subscription at issuance.

3) There needs to be loss exposures with independent, accurate loss history data available to enable the predicting of future losses, which facilitates **underwriting** and pricing by investors.

It would appear that in this case, these conditions can be met, or partially met by the City of Vancouver and/or the pipeline proponent.

4.B.5 Advantages of Insurance Securitization

- Insurance securitization, specifically catastrophe bonds, provides additional risk transfer **capacity** and an alternative to traditional insurance. Insurance and reinsurance availability will be dynamic and change with insurance market cycles, however, a bond issuance can provide risk financing which provides non-traditional coverage and pre-arranged **capacity.**

- The issuance of a catastrophe bond lowers credit risk because the obligations to pay losses are fully collateralized with the investments held by the SPV, which can be readily converted into cash. Because traditional insurers and reinsurers are not required by regulators to maintain capital equal to exposed policy limits, this option may be more reliable than traditional alternatives

- A catastrophe bond with a **parametric trigger** does not require losses to be finalized in order for the sponsoring organization to receive payment, so losses in this case can be adjusted expeditiously.

4.B.6 Disadvantages of Insurance Securitization

- Insurance securitization and specifically, catastrophe bonds, may expose the arranging organization to volatility because of the relationship between the return demanded by investors and premiums for insurance and reinsurance. Bond yields and insurance market conditions will fluctuate, making the catastrophe bond a less attractive option when insurance is relatively inexpensive and available.

- The arranging organization will face significant opportunity costs for the assets used in the SPV as **collateral**. These will need to be highly liquid and as a result, will earn a relatively low rate of return. In the case where the SPV is a BC captive insurer, the investment policy will need to be regulated by and acceptable to the Financial Institutions Commission of BC, the regulator of BC registered insurance companies. If the SPV is not a regulated entity, the opportunity cost would be lower, since insurance regulations do not need to be followed, but the risk would be higher.

- The arranging organization and its business partners will incur significant time and costs associated with risk modelling and other costs associated with the transaction. Much of this will be done for other reasons associated with the National Energy Board review process and will not need to be duplicated; however there is a risk that additional data will be required by investors at significant extra cost.

- Insurance securitization and the issuance of a catastrophe bond will be subject to basis risk. This means that the amount received by the bond sponsor will not be equivalent to the actual losses incurred. If, for example, actual losses exceed the funds generated by the catastrophe bond, there will be an issue surrounding whether and how to disperse excess funds, or whether they will be kept to guard against a future adverse event and the cost of a subsequent bond issue.

  Unlike insurance, which does not allow a policyholder to receive more than the **actual loss sustained**, the bond issuance could theoretically result in a situation where there are excess funds that have not been specifically allocated toward the payment of claims. Determining how and when to disperse these funds may not be an easy decision to make in advance of any losses.

4.B.7 Example for City of Vancouver

1) The City of Vancouver receives payment from pipeline proponent (discounted net present value of amount needed to pay investors in the event the triggering event does not occur)

2) Funds are placed in the SPV – for the purposes of this discussion, the SPV could be a BC based **captive insurance company**, or some other regulated or non-regulated vehicle.

3) The broker arranging the placement issues a catastrophe bond with a **parametric trigger** of a marine-based oil spill of a defined magnitude. The bond issue is fully subscribed. The bond has a coupon equal to LIBOR + x **basis points**. The bond has a term of y years. (x and y to be negotiated)

4) If the oil spill happens, the SPV pays the funds to the City, which the City uses to compensate stakeholders in accordance with pre-determined claims payment protocols and procedures. Residual funds remaining in the SPV would be dispersed in accordance with pre-agreed terms between the City, the pipeline proponent, and stakeholders.

5) If the bond matures without the occurrence of a triggering event, the SPV returns the **principal** and agreed interest to the investors. If necessary, a renewal term bond is negotiated, using the same process.

4.B.8 Specific Issues in this Case

Most catastrophe bonds are placed to respond to a natural event, over which the bond sponsor has little or no control. In this case, we have the pipeline proponent and other stakeholders, which have direct control over the handling of the oil, the pipeline, the vessels transporting oil, and the marine terminal operations. It is likely that investors would need to see a risk control plan and would require ongoing audits to ensure that stakeholders are rigourously complying with risk control protocols defined at the time of the bond issuance.

An additional difficulty is that the pipeline proponent will be relinquishing control of the oil at the point of loading at the pipeline's terminus. Risk control protocols would have to be defined, enforced, and agreed to by vessels entering the port and transporting the oil.

The City would have to be assured that appropriate contractual arrangements were in place to compel the pipeline proponent and others to comply with risk control protocols demanded by investors. The contractual obligations required would have to form part of the operating authority granted to the pipeline proponent and would have to be vigourously enforced to ensure that a source of risk financing was continuously available.

Investors supplying capital for this arrangement will be concerned with **moral hazard**, or the degree to which an organization can influence the triggering event and outcome. Traditionally, these mechanisms require objective triggers, a parameter that is not within the control of the arranging organization. Because of the active involvement of stakeholders in the handling of the oil, this arrangement would not have a fully objective trigger.

In this case, the pipeline proponent will be paying for the costs of the bond issuance, however, the City of Vancouver will be the bond sponsor and recipient of funds in the event that a triggering event occurs. This may be perceived as a conflict of interest as the City would have no compelling reason not to pay claims, since their reputation would be enhanced by doing so. An actual insurance policy applicable to the triggering parameters would not be attractive to investors, so a contract between the pipeline proponent and all stakeholders would have to be arranged to determine, in advance, those losses that would be and would not be indemnified by the bond mechanism.

Assuming that the funds are placed in a regulated mechanism, (such as a BC-based captive insurer), there would need to be a Board of Directors or Executive Committee to ensure that there was consistency in the claims management process and that regular claims audits occurred.

The tax treatment of the fees, investment income, and impact of a triggering event are not known. If the pipeline proponent is deemed to have received the proceeds of the SPV after a triggering event, this

could be deemed to be a windfall, and the tax implications could be significant. Given that this mechanism ultimately protects the pipeline proponent and other stakeholders, they will likely argue that, if possible, their costs should be eligible for income tax deduction.

Along the same lines, if there are residual funds in the SPV following a triggering event, or significant investment income while claims are being managed, the "owner" of the SPV may be subject to an unknown tax liability that may be substantive.

The market for catastrophe bonds is highly dynamic and annual subscription may be most desirable by potential investors. This approach increases the uncertainty in subscribing the bond issue, and increases the volatility of the price.

If the City of Vancouver is the arranging organization, a legal opinion would be required as to the applicability of the *Vancouver Charter* in respect of the issuance of the bond, the ownership or partial ownership of a **captive insurance company**, as well as the use and disbursement of funds if the bond is triggered.

4.B.9 Likelihood of a Successful Bond Issuance and Subscription

The City of Vancouver's insurance broker's capital markets division has estimated a less than 20% likelihood of success in placing the mechanism. Subscription success would be impacted by:

- The amount of **capacity** required (success is inversely proportional to the amount of the bond)
- Participation of a "big name" lead investor
- Confidence in the parametric modelling information
- Ability of the bond sponsor to compel compliance with risk control protocols
- Ability to exclude certain events such as a terrorist attack
- Ability to precisely define the triggering event and its location (i.e. Vancouver Harbour or a wider geographical area)

4.B.10 Resources Required & Costs

The **catastrophe bond** will require a placing broker to oversee the bond subscription. Customary compensation would be a commission based on the cost of the bond.

Other resources required:

- Drafting/reviewing contracts for risk control protocols
- Legal opinion regarding applicable legislation such as the *Vancouver Charter* as to the permissibility of the mechanism pursuant to legislation
- Establishing a Special Purpose Vehicle/BC **Captive insurance company**
- A Board of Directors or Executive Committee to oversee the payment of claims
- Claims adjusters/investigators to liaise with claimants and adjudicate indemnity payments to affected parties

- Advertising and public relations costs to disseminate information regarding the program whether the bond is triggered or not
- External audit
- Financial management and reporting to regulators as required

Anticipated costs:

- Cost of bond – 3-12% of **bond face value**
- Brokerage commission/fees – 15% of bond premium (i.e. 0.45% - 1.8% of **bond face value**)
- Legal and administrative expenses (one time) - $200,000 - $350,000
- Cost of establishing the captive ($100,000)

If a spill event occurs

- Ongoing management of captive/SPV - $100,000 - $200,000 annually (includes directors' fees, audit fees, and regulatory filings)
- Claims adjustment – 2 full time adjusters/adjudicators (if a spill event occurs) - $200,000 annually

4.C Finite Risk

A **finite risk plan** is a risk financing mechanism that transfers a finite amount of risk to an insurer or **reinsurer**. A large share of the premium held in the plan is used to fund the arranging organization's own losses, so that portion is **retention**. The plans are characterized as a hybrid mechanism because they combine self-insurance and risk transfer.

Finite risk transactions typically include a profit-sharing arrangement, where excess funds are returned to the insured organization as an incentive for positive loss control. Losses which are not adequately controlled which exceed a threshold amount are transferred to an insurer.

Finite risk plans have a number of features typical to them:

1) Coverage is manuscripted for the particular needs of the arranging organization. The coverage is typically broader than what could be arranged in conventional insurance markets.

2) Coverage is for multiple years. Finite risk financing contracts typically provide coverage for a 3 year or 5 year term. With some contracts, particularly those that apply to environmental coverages, the term may be as long as 10 – 35 years.

3) **Aggregate limits** of risk financing apply to finite risk arrangements.

The limits of coverage provided under finite risk arrangements are typically in the aggregate for the total coverage term (3-5 years) and may also apply on an annual aggregate basis for certain types of events such as flood, earthquake, windstorm, or product liability. For example, a contract may provide a term limit of $125 million, but with an annual aggregate limit of $25 million. This controls the insurer's exposure.

4) Finite risk contracts are non-cancelable. Because of the complexity of the transaction, finite risk transactions are normally non-cancelable by either party, except for breaches of contract, such as non-payment of premium.

5) The premium for a finite risk contract is typically a large portion of the limit of risk transfer being provided by the policy. With finite risk transactions the premium is generally a substantial percentage of the policy limit. For example, a $25 million finite risk limit may have an $18 million premium. This is because aggregate losses tend to be large, and the arranger's own funds tend to be used to pay for expected losses.

6) Finite risk contracts typically provide for profit sharing between the insurer and the arranging organization. This is not a benefit available in traditional insurance relationships.

7) Finite risk contracts typically provide for a **commutation** option. A **commutation** agreement is an agreement to eliminate all liabilities between the parties to an insurance or reinsurance contract. This

enables the finite risk insurer and arranging organization to extinguish their relationship quickly, and eliminate financial effects of long tail losses for the insurer. This is a cost saving mechanism.

8) Finite risk arrangements may receive accounting treatment as insurance. U.S. and Canadian accounting rules generally allow finite risk transactions to be accounted for as insurance, provided that there is actual transfer of risk. This would be more likely if the **finite risk plan** was operated by a regulated **captive insurance company.** One of the often quoted rules of thumb is that there must be a 10% or greater likelihood of a loss in excess of 10%.

9) Finite risk arrangements can be underwritten and arranged as either insurance or reinsurance. Finite risk transactions can be underwritten as primary insurance or reinsurance and may utilize conventional insurers/reinsurers or captive insurance companies.

A sample finite risk arrangement is shown below:

4.C.1 Finite Risk – An example

Finite Risk Plan

Example

Coverage: Environmental contamination – first party and third party

Premium - $48,000,000

Payable in bi-monthly installments of $8,000,000

Underwriter's Margin: $5,000,000

Limit: $ 500 million term **aggregate limit**; $200,000,000 per occurrence, annual **aggregate limit**

Attachment point: $5,000,000 self-insured retention

Expected losses ("loss pick") - $50,000,000

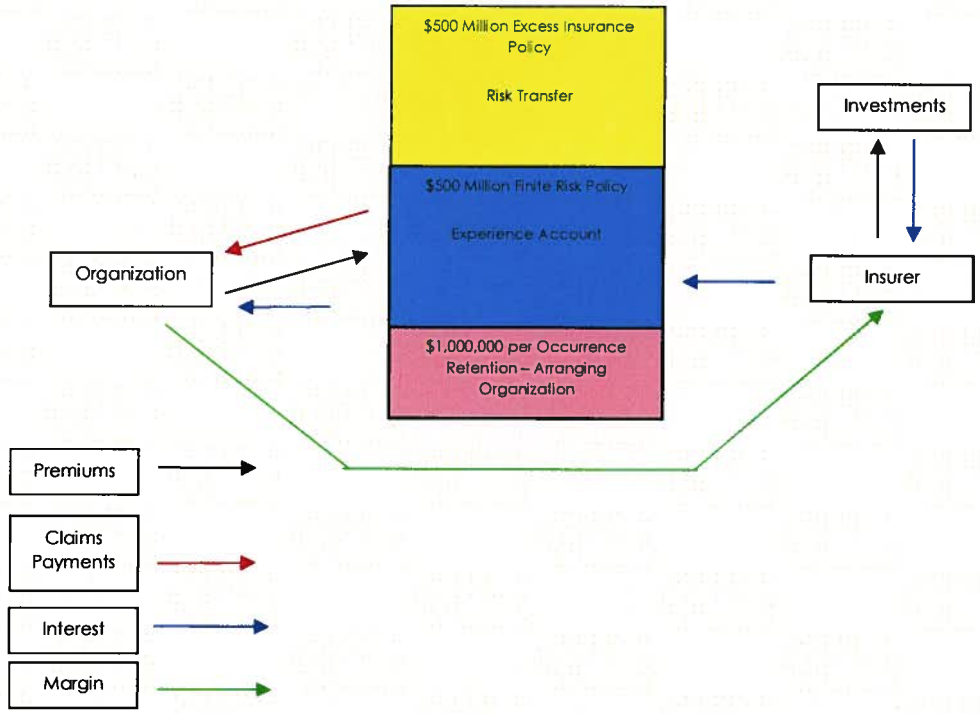
Term: 5 years, non-cancellable

Investment Income: 90 day Canadian T-Bill rate

Commutation: At the end of 5 years, arranger may commute the agreement, all funds held in **experience account** are returned to the arranger.

In this example, the arranging organization deposits $8 million bi-monthly into the **experience account**. Claims are paid back to the arranging organization and the funds held on deposit earn interest at the 90 day Canadian T-Bill rate. Losses in excess of $5 million are transferred to the insurer. Losses which exceed the capital to be contributed during the policy year are initially paid by the insurer, and repaid by the arranger on the pre-agreed premium payment schedule.

4.C.2 Sample Finite Risk Plan – Illustration



In this scenario, $240 million would be paid into the **experience account**. Assuming constant interest rates of 0.9% and daily compounding, approximately $295.6 million would be in the **experience account** at the end of 5 years, if there were no claims, and this could be returned to the arranging organization. Losses exceeding the accumulated balance of the **experience account** and less than $500 million would be paid by the insurer, and the arranger would continue to pay $8 million bi-monthly. Losses in excess of $500 million could be paid by excess insurance, if placed, to the amount required.

4.C.3 Advantages of Finite Risk Plans

- Finite risk plans smooth costs out over time. While the illustration is for a 5 year time horizon, this same model could be used over a 50 year time frame, assuming a willing **counter party**. The arranger continues to pay a constant premium at regular intervals, yet funds are available immediately to pay losses.

- Finite risk plans incorporate features of retention and transfer. A portion of losses are absorbed by the arranger, and amounts which exceed the ultimate limits to be contributed are transferred to the insurer.

- A finite risk plan provides higher coverage limits than could be obtained through the conventional insurance marketplace. In this example, a large self-insured retention and significant premiums reduce the risk to be transferred to the insurer, and as a result, more **capacity** is available to the arranging organization. Because it is unlikely that there will be multiple large losses, an **aggregate limit** of **capacity** is arranged, rather than annual limits, which are more expensive, and corresponding costs are more volatile
- A finite risk plan may meet contractual and regulatory requirements. The arrangement depicted would be an insurance policy with a $1 billion limit; this would be relatively easy and transparent to understand.

- A finite risk plan could be underwritten for multiple years, possibly for the duration of the operating life of the pipeline. This significantly reduces administrative time and expense.

- A finite risk plan improves budgeting and stabilizes cash flows because although a significant portion of risk is retained by the arranging organization, premium payments are constant for the duration of the finite risk contract period.

4.C.4 Disadvantages of Finite Risk Plans

- Finite risk arrangements command significant amounts of capital from the arranging organization that cannot be used for other purposes, and may often be held on deposit and in the custody of others. This may be unattractive.

- Finite risk arrangements have one limit that applies to multiple years. If there was a triggering spill event early in the life of the finite risk contract, the arranger would continue to pay premium, but would have exhausted the limit of insurance and would need to make alternate arrangements for risk financing **capacity.**

- If this mechanism is an insurance contract, the annual premiums paid would attract provincial insurance premium tax, which in British Columbia is currently a rate of 4.4%, which could be several million dollars annually. This is a significant cost and is not recoverable upon commutation of the contract.

- If a finite risk transaction was entered into, and the arranger subsequently wished to return to more traditional risk financing methods, there may be challenges in re-entering the conventional marketplace. Because this would be a specific purpose contract, these obstacles are perceived as minimal.

- Finite risk transactions may be subject to extensive scrutiny from regulators, auditors, tax authorities and others. Specialists to advise on accounting treatment may be necessary to avoid ongoing scrutiny.

- The arranger of a finite risk plan must convince regulators and tax authorities that the accounting treatment they are utilizing appropriately characterizes the basis of the finite risk transaction being used. If, upon questioning or audit, the program does not receive the desired tax and accounting treatment, there may be unexpected financial costs.

- The finite risk plan may require the establishment of a **captive insurance company** to enable access to the excess insurance and reinsurance markets. This would result in higher complexity and potentially higher costs.

- If the finite risk mechanism provided coverage for a large number of non-traditional risks, the costs and/or availability of excess insurance/reinsurance would be impacted.

4.C.5 Specific Issues in this Case

If the City of Vancouver is the arranging organization or the finite risk mechanism is entered into by a **captive insurance company**, the finite risk transaction will likely be perceived as insurance.

If the City was the arranger, the **experience account** balance would be shown as an asset on the City's financial statements, however, the premiums will be paid by the pipeline proponent or others. Because the assets would be depicted on the City's financial statements, and the liabilities on the pipeline proponent's, a mismatch would exist.

For this reason, it is likely that a regulated arm's length mechanism would need to be structured, with its own financial statements (such as a **captive insurance company**). This would allow the pipeline proponent to receive tax deductibility for the premium payments. Ultimate return of the **experience account** balance would be treated as a windfall for accounting purposes when received.

If **supplementary premiums** were required in the case of a triggering event, or if **collateral** was required by the counterparty providing the finite risk product, there would have to be a contractual mechanism with both the counterparty and the City to compel the pipeline proponent to provide the required funds.

If another party is the arranging organization, the creditworthiness of that organization is outside of the control of the City of Vancouver. Deteriorating finances may result in **collateral** or higher amounts of **collateral** being required by counterparties. Because part of a finite risk mechanism is transfer, ongoing availability of excess insurance/reinsurance cannot be predicted or guaranteed.

4.C.6 Resources Required & Costs

A finite risk option would require a placing broker to oversee the placement. Customary compensation would be a fee or commission based on the price of the placement.

Other resources required:

- Accounting expertise to review accounting and tax treatment of the **experience account** and deposits held with the counterparty
- Experts' fees to establish an applicable policy wording and insurer contract.
- Costs of establishing an arm's length mechanism to manage program and access excess insurance/reinsurance market (i.e. a BC based captive)

- Legal fees to prepare a contract between the City and the pipeline proponent with respect to premium payments, supplementary premium payments, furnishing of collateral, and other payments required by the mechanism.
- Establishing a claims management protocol, including, but not limited to a Board of Directors or Executive Committee to oversee the payment of claims, claims adjusters/investigators to liaise with claimants and adjudicate indemnity payments to affected parties
- Advertising and public relations costs to disseminate information regarding the program
- Internal/external audit
- Financial management and reporting to regulators as required

Anticipated costs:

- Underwriters' margin (5 year term) - $5,000,000 - $10,000,000
- Cost of excess insurance (5 year term) depending on limits required/available - ~$1,000,000 - $2,000,000
- Legal, accounting, and administrative expenses (one time) - $250,000 - $500,000
- Costs of setting up captive insurer if required (one time) - $150,000 - $250,000
- Annual management costs - $250,000 (includes staff/contractors)

4.C.7 Likelihood of successful initial placement

The likelihood of a successful initial placement is estimated at less than 10%. The existence of willing counter-parties since 2003 has significantly diminished since then New York State Governor Elliot Spitzer investigated finite risk transactions at that time. Because this mechanism would also utilize excess insurance and reinsurance, the ultimate success of the excess coverage would depend on the ability to negotiate a finite risk transaction and prevailing insurance market conditions.

If coverage provided by the finite risk transaction was not highly traditional, the likelihood of securing excess insurance or reinsurance would be reduced.

In addition, finite risk transactions tend to lend themselves best to accurate loss forecasting. The quality of triggering event modelling would carry considerable weight in considering the ultimate success of a finite risk placement.

4.D BC – Based Captive Insurer

A captive insurer is a specific purpose insurer formed to insure the losses of its owner(s) or parent and affiliates. The primary purpose of a captive insurer is to reduce the overall cost of risk financing for the captive company's owner(s). A **captive insurance company** operates like other insurance companies, by collecting premiums, issuing policies, and paying for covered losses.

Many captive insurers purchase reinsurance. This may be to transfer some level of loss to outside organizations. In some cases, captive insurers are formed to allow the captive insurer's owners to access reinsurance markets directly, rather than paying overhead costs associated with the retail insurance market.

A **captive insurance company** could be formed in this case, which would provide coverage for a spill event. Premiums could be collected from stakeholders for basic coverage, and excess insurance could be purchased for larger catastrophic events. For this reason, the mechanism is classified as a **hybrid**.

There are numerous locations or **domiciles** globally that permit the operation of captive insurance companies. A presumption has been made that it would be inappropriate for the City of Vancouver to establish, participate in, or operate a **captive insurance company** located outside of Canada, so **domiciles** other than British Columbia have not been investigated or discussed. The following discussion is generally true of all captive insurance companies, irrespective of **domicile**

4.D.1 British Columbia Captives – Overview

In 1987, British Columbia became the first Canadian province to enact legislation for the creation of domestic captive insurance companies. *The Insurance (Captive Company) Act* is a relatively brief and extremely flexible statute incorporating, by reference, sections from other British Columbia statutes, including the *Company Act*, the *Insurance Act* and the *Financial Institutions Act*. Three types of captives are permitted:

The Pure Captive - pure captives, or the single parent captive, may insure the risks of its parent, its parent's affiliated corporations (majority owned) and their officers, directors, employees, agents or independent contractors.

The Association Captive - may insure the risks of the members of an association (that has been in existence for over one year), their affiliates, and their officers, directors, members, agents or independent contractors.

The Sophisticated Insured Captive is intended to cover a group of insureds who may be unrelated except for their participation in the captive. Where groups of companies do not qualify for a Pure Captive, not being majority owned, the Sophisticated Insured Captive can be utilized. Each member of the group must spend a minimum of CDN $500,000 in annual premiums and must have "expertise" in insurance matters. The Sophisticated Insured Captive may insure the risks of the group, their affiliated corporations, and their officers, directors, employees, agents or independent contractors.

B.C. captives may write any line of insurance business within the meaning of the Insurance Act except: Surety insurance, other than reinsurance of surety insurance, and insurance of motor vehicles, other than fleet insurance by a corporation. The intent of the legislation is that B.C. captives only insure the risks of their owners and not the risks of the general public.

4.D.2 Regulatory Environment

B.C. captives operate within a provincially regulated climate, with minimal government intervention. Licensing is a relatively simple, speedy process with annual renewals. The regulators review standard indicators of solvency and performance; however, there are no statutory solvency or performance measures that must be met. This approach evaluates each captive on its merits and allows flexibility.

Captive insurance companies formed under the Insurance (Captive Company) Act are given latitude in the scope of allowable investments. There are no set limits, and the regulators examine the portfolio of each captive for prudence in its own unique circumstances.

The minimum level of capitalization for B.C. captives is CDN $200,000. The amount of capital required is dependent on the insurance program being written, and larger programs will require a larger amount of capital. In addition, the minimum level of reserves to be maintained after initial registration is CDN $100,000.

Example:

The pipeline proponent and stakeholders could form and incorporate a BC based captive insurance company. Premiums could be collected by the captive insurance company to fund foreseeable losses and excess insurance or reinsurance could be purchased for losses that exceed the capacity provided by the captive.

A partner such as OIL (Oil Insurance Limited) could be used.

The company was formed in 1972 by 16 energy companies in response to two large-scale industry accidents that occurred in the late 1960s. The company is based in Bermuda, a major international insurance, reinsurance and financial services centre.

OIL has more than 50 members and insured assets are valued at over $2 trillion. Shareholders' equity is over $4 billion and total assets currently exceed $7 billion. It is rated A- by Standard & Poor's and A2 by Moody's. [1]

4.D.3 Advantages of a BC-based Captive

Captive insurers can reduce risk financing costs in the following ways:

- Reducing the cost of risk – When compared with other more traditional mechanisms, captive insurance companies will tend to reduce the organization's cost of risk over the medium to long term (10 years plus). This is because it involves retaining significant amounts of loss; it eliminates the acquisition cost of obtaining insurance, it reduces underwriting expenses, eliminates a conventional insurer's overhead and profit, and allows for investment income.

- Having direct access to reinsurers - A captive insurer allows the arranging organization to purchase reinsurance directly from the source, and the reinsurer may be more flexible and cost effective than a retail insurer. If ceding commissions are payable by the reinsurer, the captive insurance company can utilize these for its own account.

- Improved cash flow control - Using a captive to provide risk transfer capacity means that any underwriting profit is retained by the captive and its owners, not a commercial insurer. When losses are reduced, each dollar saved through the effects of positive loss control is returned to the owners of the captive.

- Profits in the captive build up value to the captive owners and the accumulation of surplus increases the ability of the captive to retain risk in the future. This helps to reduce uncertainty about future cash flows and to smooth costs over time.

- Capturing investment income - A captive will retain 100% of investment income on loss reserves held on its books. This is investment income that would be earned by a commercial insurer. While a captive's investment policy will typically be conservative, most captives are not subject to the same restrictions as commercial insurers and can select investments that may ultimately pay higher returns, subject to regulatory approval and the investment guidelines of the captive and its parent.

- Obtaining insurance not otherwise available - The captive's owners may be able to receive insurance coverage that may not be commercially available. In this context, terrorism, third party claims beyond pure legal liability, and other environmental coverages not insurable can be insured by a captive. It is significant to note that the scope of reinsurance available may be impacted if the exposures insured by the captive are unusual.

- Centralizing loss retention – the captive owners can centralize the payment of losses emanating from this particular project. Instead of each stakeholder group funding its own losses, the captive could organization centralizes these expenses, and pool them. The captive insurance company can charge the participants based on their actual loss experience, without relying on the data from external and non-related pool sources.

- Immediate benefits from positive risk control - Every loss not paid by a captive insurer returns those funds not paid in claims to the parent organization. The captive insurer provides an immediate "reward" for successful risk control initiatives, typically not provided by commercial insurers.

4.D.4 Disadvantages of a BC-based Captive

In comparison to more traditional risk financing plans, captives can pose the following disadvantages to organizations:

- Capital requirements and start-up costs – the initial capitalization of a BC based captive to pay for foreseeable losses would be the subject of significant and protracted negotiation among participants. How to allocate costs, and how to manage claims would protract the discussions further.

- Because a BC-based captive insurance company is a regulated insurance company, the only ways in which funds can be removed are:
    - Payment of claims
    - Refund of premiums
    - Payment of dividend to owners

- Sensitivity to losses – a loss of the type anticipated by the pipeline proponent's operations would quickly drain the accumulated capital from the captive, leaving it vulnerable if there were further losses.

- Pressure/lack of understanding from stakeholders – a BC based captive insurance company would not be easily understood by taxpayers and the general public. How to depict the capital held in the captive and understanding the ownership and tax status of the company would be challenging. Forming a captive involves making a decision to enter the insurance business, and since neither the pipeline proponent nor the City have previously done so, the resistance likely to be encountered would be significant.

- There would need to be a process for appointing managers and a Board of Directors. While each stakeholder organization may want board representation, sound governance practices suggest that outside directors would be appropriate and necessary.

- Premium taxes and residual market loadings – in B.C., premium tax must be added to the premiums charged for the insurance. Further, the premium must accurately reflect the risk being insured by the captive. For example, one could not issue a $1 billion insurance policy and charge the arranging organization $1,000 per year. Premium taxes for environmental liability insurance would be an additional 4% of the total premium charged to participants.

4.D.5 Specific Issues in this Case

Forming a captive insurance company is a decision to enter the insurance business. If the City of Vancouver is the arranging organization, it will likely end up playing a significant an ongoing role in the management of the captive insurance company.

The willingness of an excess insurer and/or reinsurer to participate will be based on the reputation of the participants, their experiences, and their financial health.

Because of the challenges of removing capital from a regulated insurer, the pipeline proponent is unlikely to find the opportunity cost of the premiums held in this mechanism tolerable.

Depending on the ownership of the captive, the tax and accounting issues could become problematic. If the City of Vancouver is the owner, the earnings of the captive would not be subject to income tax, however, if the City is the owner, the pipeline proponent would likely object. If the pipeline proponent is the owner, the earnings of the captive will attract income tax. In addition, the City may object if it does not directly manage the captive.

If the captive is owned by a consortium of stakeholders, complexities in taxation and management are created. Would the captive pay its own corporate income tax? How would assets be reported on each stakeholder's balance sheet? How would surpluses (if any) be distributed, and when?

A thorough analysis of management issues and a business plan would be required in advance of forming this mechanism, and the organizational structure thoroughly analyzed in advance.

4.D.6 Resources Required & Costs

A contingent capital option would require a placing broker to oversee the placement. Customary compensation would be a fee or commission based on the cost of the placement.

Other resources required:

- Legal opinion regarding permissibility and proposed ownership of Captive
- Accounting expertise to review accounting and tax treatment of the proposed structure
- Experts' fees to establish an applicable policy wording and insurer contract.
- Costs of establishing an arm's length mechanism to manage program
- Preparation of business plan, investment policy, policies and procedures
- Appointment of board of directors, managers, and other resources to operate company
- External audit
- Financial management and reporting to regulators as required

Anticipated costs:

- Legal, accounting and administrative expenses (one time) – $300,000 - $500,000
- Annual management expenses - $200,000 - $400,000 – depending on claims

4.D.7 Likelihood of a successful initial placement

The likelihood of a successful initial placement depends on the limits of coverage provided, the scope of coverage provided, and the amount of risk intended to be funded in advance by the captive insurer. The

likelihood of success will also depend on the quality of data with respect to the projection and quantification of foreseeable losses.

The higher the amount of pre-funding, the higher the likelihood of success in attracting excess insurers/reinsurers to provide additional capacity.

5.0 Long Term Viability of All Options Proposed

All of the proposed options rely somewhat upon insurance, reinsurance, or capital markets. Long term fixed pricing beyond a five year time horizon is not feasible. Renewal of multi-year mechanisms cannot be assumed over the medium to long term. Essentially, a renewal of an option is likely to be treated as an entirely new transaction.

In the event of a significant catastrophe (most notably a large seismic event in Metro Vancouver), it is likely that the capacity of all risk transfer counterparties will be significantly impaired over the short to medium term, and possibly beyond.

In the event of one triggering event, the ongoing ability to maintain risk transfer capacity may be jeopardized, and/or the conditions imposed upon the issuance of products may be changed.

Capacity beyond $1.5 billion for one event is challenging to obtain. Providers of risk financing options may require parametric modelling each time that options are renewed.

The pipeline proponent does not appear to have examined the possibility of multiple moderate to severe triggering events. For example, with a catastrophe bond, a triggering event which occurred early in the tenure of the arrangement would activate the bond, and there would be no alternative risk transfer capacity available moving forward. The likelihood of renewing or arranging additional capacity would be effectively non-existent.

All of the proposed mechanisms rely to a large extent on the creditworthiness and reputation of the pipeline proponent, and to a lesser extent, the City of Vancouver. In the event of non-related deleterious financial events experienced by either party, market support for any alternative risk transfer mechanism will be dramatically reduced, if not eliminated. For the pipeline proponent, variables such as oil prices, environmental events from their other operations, environmental events experienced by competitors, share price, changes in management, changes in legislation, and commitment to other capital projects could all impact the ability to secure risk transfer capacity.

For the City of Vancouver, changes in elected officials, an impaired credit rating, loss of senior government transfers, legislative change, other high profile events, a large natural disaster, and other situations could impact the perceptions of risk transfer counterparties.

6.0 Recommendation

The most suitable option to be utilized is an **insurance securitization** similar in structure to a catastrophe bond. This would provide immediate risk financing to respond to the City of Vancouver's defined needs.

The requirement for the pipeline proponent to maintain operations and conditions to enable the catastrophe bond to be continuously available would need to be imposed as part of the operating authority granted to the proponent by the National Energy Board.

The cost will vary with the scope of insurance available to the pipeline proponent and stakeholders, however, the cost range will be 3.5%- 14% of the limit of coverage required, for an initial bond issuance of with a maturity of 1-5 years. For example, a $500,000,000 bond could have an initial cost of ranging from $17,500,000 - $70,000,000 (including brokers' commission).

Administrative costs will depend on whether a triggering event occurs; one time administrative costs could be as much as $450,000 and ongoing costs up to $400,000 annually if there are claims from a triggering event.

It is my opinion that this mechanism would provide the best fit based on the City of Vancouver's defined needs:

- Fixed price and capacity for 3-5 years
- Low volatility
- Dedicated funds readily available to compensate impacted parties
- Structural features that provide adequate limits for foreseeable events
- Triggers that align with actual losses incurred by the City and third party stakeholders as defined by the City of Vancouver
- Coverage to be available for a minimum of 50 years

In addition, included are selection parameters for the likelihood of initial placement success, overall complexity, as well as ease of administration and management

A selection matrix is shown on the following page, which assigns rating parameters of "poor", "fair" "good" and "excellent" and relative scores of 1, 2, 3, and 4 respectively for each rating. The 10 parameters have been equally weighted. Total scores, (out of a maximum possible of 40 points) based on this evaluation suggest that the catastrophe bond is the best option.

The likelihood of successfully issuing and subscribing a catastrophe bond will vary inversely with the bond amount. For a bond of $1 billion CDN, the likelihood of placement success is estimated at less than 20%. The chances of success will vary with the quality of parametric modelling information regarding a marine based oil spill that is provided to potentially interested investors, the ability of stakeholders to demonstrate compliance with risk control protocols required by investors, and the ability to attract a high quality "lead" investor.

6.1 Selection Matrix for Alternate Risk Financing

Excellent – 4 Points

Fair – 2 Points

Good – 3 Points

Poor – 1 Point

Feature	Analysis of Risk Financing Mechanism			
	Contingent Capital	Catastrophe Bond	Finite Risk	BC Based Captive Insurer
Fixed price and capacity for 3-5 years	Good	Fair	Good	Fair
Low volatility	Poor	Poor	Good	Fair
Dedicated fund readily available to compensate impacted parties	Good	Excellent	Good	Good
Structural features that provide adequate limits of foreseeable events	Excellent	Excellent	Good	Fair
Triggers that align with actual losses incurred by the City and third party stakeholders as defined by the City of Vancouver	Good	Excellent	Good	Fair
Coverage to be available for 50 years	Poor	Poor	Fair	Fair
Likelihood of Initial Placement Success	Fair	Fair	Poor	Fair
Complexity	Fair	Good	Poor	Fair
Ease of Administration and management	Good	Excellent	Fair	Fair
Cost if triggering event occurs	Poor	Fair	Fair	Good
Score	**23**	**27**	**23**	**22**

APPENDIX "A"

Glossary of Terms Used in this Report

Actual loss sustained – The total amount claimed by affected parties as a result of a triggering event

Aggregate limit – The total amount of insurance available for the cumulative value of all losses occurring in a defined time period or from a defined event

Alternate Risk Financing – sources of financing the payment of losses which do not take the form of traditional insurance

Arranging organization – the organization arranging and managing the alternate risk financing described in this report.

Basis point – 1 one hundredth of a percentage point, i.e. .01%. There are one hundred basis points in each one percent of a quoted interest rate. i.e. if the applicable rate is "the prime lending rate plus 25 basis points" and the prime rate is 3.00%, then the applicable rate is 3.25%

Basis risk – the risk that the amount the organization receives to offset its losses may be less than or greater than its actual losses sustained.

Bond face value – the amount shown on the bond. i.e. a $1,000 Canada Savings Bond has a face value of one thousand dollars CDN.

Capacity – the total amount of insurance or risk transfer limit available.

Captive insurance company – a specific purpose insurance company formed to insure the loss exposures of its parent company and affiliates.

Catastrophe bond - risk-linked securities that transfer a specified set of risks from a sponsor (typically an insurance company) to investors.

Catastrophe equity put option – a right to sell equity (stock) at a predetermined price in the event of a catastrophic loss.

Claims adjuster/adjudicator – a licensed representative who evaluates and settles claims on behalf of an insurer, or organization retaining its own losses

Collateral - is a borrower's pledge of specific assets to a lender, to secure repayment of a loan

Commitment fee – A fee paid to lenders upon the arrangement of a **standby credit facility**

Commutation – The extinguishing of liabilities between an insurer and policyholder under a finite risk transaction

Contingent Capital Arrangement - An agreement, entered into before any losses occur, that enables an organization to raise cash by selling stock or issuing debt at pre-arranged terms after the loss occurs, that exceeds a certain threshold or is triggered by certain defined events.

Counter-party – the contracting party providing securities, insurance, or other financial instruments to the arranging party.

Deductible- the amount of loss absorbed by the policyholder, above which an insurance company pays covered losses.

Domicile – The location where a captive insurance company is established, operated, and regulated.

Experience account – the account into which deposits are placed in a finite risk arrangement

Financial guarantee - a promise to take responsibility for another company's financial obligation if that company cannot meet its obligation. The entity assuming this responsibility is called the guarantor.

Finite risk plan- a risk financing mechanism that transfers a limited amount of risk to an insurer or reinsurer, and a significant part of risk is financed by the arranging organization.

Hybrid – A risk financing mechanism which combines elements of transfer and elements of retention.

Insurance securitization - the process of creating marketable insurance linked securities based on the cash flows that arise from the transfer of insurance risks.

Interest rate spread – A defined interest rate, inflated by a stated number of basis points. For example, "prime plus 2 %" has an interest rate spread of 200 basis points above the prime lending rate.

Investment grade - A security is considered investment grade if the issuer ratings are all ratings above BBB- or Baa- included. Investment grade issues are considered from 'extremely strong capacity to meet financial commitments' (AAA or Aaa) down to 'adequate capacity to meet financial commitments but more subject to adverse economic conditions' (BBB or Baa).

LIBOR - LIBOR (Intercontinental Exchange London Interbank Offered Rate) is a benchmark interest rate that leading banks charge each other for short-term loans.

Moody's – A bond rating agency

Moral hazard – the possibility that an organization or individual will be less prudent than they customarily would be because of the presence of insurance or risk financing.

Parametric index – A parametric event, measured from a number of different measuring perspectives, and calibrated using an index. i.e. sustained windspeeds in excess of 200 km/h, averaged through readings at six different measuring points

Parametric trigger – a specified event which activates a risk financing mechanism, the probability of occurrence of which can be estimated. i.e. sustained windspeeds in excess of 200 km/h at one specified location.

Pipeline proponent – Trans Mountain

Principal – the total amount to be borrowed.

Provincial premium tax - a tax levied by the provincial government which applies to the sale of property and casualty insurance.

Put option- provides the option holder the option to sell an asset (stock) at a pre-arranged price

Reciprocal – A regulated risk financing mechanism which pools the risk of its participants and acts like a mutual insurance company, owned by its policyholders.

Reinsurer – An insurance company providing insurance to insurance companies

Retention – losses paid from the organization's own financial resources

Special purpose vehicle (SPV) – a facility established for the purpose of purchasing income producing assets from an organization, holding title to them, and then using those assets to collateralize securities that will be sold to investors.

Standard and Poor's- A bond rating agency

Standby credit facility – An arrangement in which a bank or other financial institution agrees to provide a loan to an organization in the event the organization suffers a covered loss.

Standby fee - A fee charged by lenders for the privilege of having a line of credit available.

Supplementary premiums – premiums charged in a risk transfer arrangement beyond fixed premiums charged at the outset of the arrangement.

T-Bill rate – the interest rate payable on specified Treasury Bills issued by a national government's central bank.

Traditional insurance – fixed price annual insurance provided by a licensed regulated insurance company, offering coverage through traditional retail markets.

Tranche - In structured finance, a tranche (slice, section, series, portion) is one of a number of related securities offered as part of the same transaction. Each tranche is a different slice of the deal's risk.

Transfer – shifting the financial payment for losses from one party (the transferor) to another (the transferee). Placing insurance is an example of risk transfer.

Triggering event – a marine based oil spill with volumes as defined by the City of Vancouver

Underwriter's margin – the non-refundable fixed price charged by the insurer (or reinsurer) at the outset of a finite risk transaction.

Underwriting – the process of evaluating the suitability and costs of insurance for a particular applicant.

Sources: *Risk Financing, 6th Edition, © 2012, American Institute for Chartered Property Casualty Underwriters*
Financing Risk – A Canadian Perspective 2nd Edition, © 2014, Karen MacWilliam
Wikipedia
Investopedia

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APPENDIX "B" - CV - Karen MacWilliam

Karen MacWilliam is a self-employed consultant specializing in insurance analysis and risk management. She has worked in the insurance and risk management fields since 1985, and has operated a successful consultancy since 1997, with operations in Western and Atlantic Canada. Karen is a proud 5th generation Vancouverite.

Education

Graduation, Eric Hamber Secondary, Vancouver, B.C., 1982 - Alden Hamber Scholarship Winner
B.A. in Economics, University of British Columbia, 1986
CIP, FCIP designations, Insurance Institute of Canada, 1988 and 1992 respectively
Canadian Risk Management diploma (CRM), Global Risk Management Institute, 1991
MBA Studies, University of Alberta in 1994 -1995

Experience

Karen began her career in 1986 as an underwriter for the Wellington Insurance Company. In 1988, she switched to risk management, and has held risk management positions with employers including Weldwood, the City of Edmonton, the Vancouver Port Authority, and Sedgwick.

She has been on staff at Simon Fraser University at Harbour Centre in Vancouver since 1992, where she teaches advanced risk management and insurance curriculum. She has also been a lecturer at the University of Northern British Columbia in Prince George 2003 - 2010, and Dalhousie University in Halifax since 2008, where she instructs in the Canadian Risk Management designation program. Karen teaches insurance broker licensing courses through the Insurance Brokers' Association of BC.

Current and former clients include:

- Agricore United
- B.C. Buildings Corporation
- B.C. Ferries
- B.C. Fishing and Resort Outfitters Association
- B.C. Gas (now Terasen)
- B.C. Non-Profit Housing Association
- B.C. Rail Group
- BFL Canada Insurance Services
- Boston Pizza International
- Burchell Hayman Parish
- Cameco Corporation
- Cities of Castlegar, Nelson & Trail
- City of Chilliwack
- City of North Vancouver
- City of Pitt Meadows
- City of Surrey
- City of Victoria
- Clark Wilson LLP
- Clayoquot Sound Biosphere Trust Society
- CMW Insurance Brokers Ltd.
- Council of Tourism Associations of B.C.
- Cox and Palmer
- Credit Union Dep. Gtee Corp (Saskatchewan)
- Credit Union Central of Nova Scotia
- Devon Properties Ltd.
- Finning International Inc.
- Formation Capital Corporation
- Gov't of British Columbia (Ministry of Agriculture)
- Gov't of Canada (Fisheries & Oceans Canada)
- Imperial Parking Corporation
- Insurance Brokers' Association of Alberta
- Insurance Brokers' Association of B.C
- Insurance Institute of Nova Scotia
- Insurance Institute of Southern Alberta
- InTransit BC Ltd. (P3 Construction Project)
- Interfor
- Jardine Lloyd Thompson Canada
- The Kings' Mutual Insurance Company
- Kemaghan Adjusters Ltd.
- Lindsay Kenney LLP
- Lotte and John Hecht Memorial Foundation
- Marsh Canada
- McInnes Cooper LLP
- Northwest Territories Power Corporation
- Nova Scotia College of Chiropractors
- Nova Scotia Schools Insurance Program
- Prince Rupert Port Authority
- Province of Nova Scotia
- Purchasing Management Assoc. of Canada
- Rapid Transit Project 2000 Ltd. (SkyTrain)
- Rogers Insurance
- SEB Management Corp.
- Stabilization Central Credit Union of B.C.
- Swiss Reinsurance Company
- Teck Cominco
- TimberWest
- Transportation Investment Corporation
- Willis Canada
- WorkSafe BC
- Yukon Energy Corporation

Karen started her career as a personal lines and later commercial lines underwriter. At Weldwood of Canada, she managed the day to day risk management and insurance operations of a large integrated forest products company. At Sedgwick, she specialized on internal audit function and drafting manuscript commercial policy wordings.

With the City of Edmonton, Karen oversaw risk and insurance issues related to day-to-day operations. With the Vancouver Port Authority, Karen implemented the first formal risk management function for Canada's largest passenger and cargo port.

In 1998, she was the consulting risk manager for the expansion of Vancouver's LRT line, a $1.2 billion project. This included insurance procurement, contract review, and day to day management of risk management matters.

She spent 8 years managing the insurance and risk management function at BC Rail, a Class I railway and intermodal transportation operation. Karen was the Chief Operating Officer of BCR Captive Insurance Co. Ltd., a large single-parent captive insurance company from 2004-2008.

In 2005, she was retained as the risk and insurance advisor to InTransit BC, the Concessionaire for the Canada Line Project, an expansion of the Lower Mainland's LRT system, which had a capital cost of $2.1 billion. More recently, she has carried out a risk assessment of the new Port Mann Bridge on behalf of the Transportation Investment Corporation, a project > $2.5 billion.

Karen regularly advises executives and Boards in respect of risk and insurance matters. She has worked and consulted at all levels of government and has served on a number of volunteer boards and industry groups. She is a regular instructor for the Insurance Brokers' Association of Alberta, the Insurance Brokers' Association of B.C., and the Insurance Institutes of Northern Alberta, Southern Alberta, and Nova Scotia, for which she designs and delivers professional continuing education on the topics related to risk management and insurance analysis. In addition, she provides in-house training for private clients, and has spoken on a variety of risk management and insurance related topics locally, nationally, and internationally.

With respect to municipal government, maritime, and environmental matters, she has worked with:

- City of Edmonton
- City of Surrey
- City of Victoria
- City of Pitt Meadows
- City of Castlegar
- City of Nelson
- City of Trail
- Vancouver Port Authority
- Prince Rupert Port Authority
- Commissionaires Nova Scotia
- BC Oil and Gas Commission
- BC Rail

Karen has acted as an expert witness on matters related to insurance and risk management in the courts of BC and Nova Scotia.

Karen has been the subject of articles and interviews in the following media:

- *Business Insurance*
- *Canadian Insurance*
- *Canadian Underwriter*
- *National Underwriter*
- *CBC Radio – "Ideas"*

In 2008, Karen authored *"Assessing Risk – A Canadian Perspective"*, *"Controlling Risk – A Canadian Perspective"*, and *"Financing Risk – a Canadian Perspective"*, course texts for the Canadian Risk Management designation program in Canada.

In 2001, Karen authored a 200 page risk management and insurance reference book titled *"The Risk Management and Insurance Guidebook for Industry"*, © ABS/Government Institutes of Rockville, MD. This book is also the basis for "Introduction to Risk Management" – an online study course provided by ABS Inc. and is used as a textbook at several universities in Western Europe.

Karen has a regular column entitled "Commercial Break" in *Alberta Broker Magazine* and feature columns have appeared in *BC Broker* and *Saskatchewan Broker.*

Karen is a former Director and Past President of the British Columbia Society of Fellows of the Insurance Institute of Canada, a former Director of BC Risk & Insurance Management Association, and member of the Canadian Captive Insurance Association. She is a former member of a variety of industry specific risk management groups and insurance industry organizations, including the Canadian Municipal Risk Management Committee and the Pulp and Paper Association Risk Management Committee.

Karen is currently a Director of Habitat for Humanity Nova Scotia.

APPENDIX B TO THE WRITTEN EVIDENCE OF KAREN MacWILLIAM

Certificate of Expert's Duty

Appendix "B": Certificate of Expert's Duty

I, Karen MacWilliam, of Wolfville, Nova Scotia have been engaged on behalf of the City of Vancouver to provide evidence in relation to Trans Mountain Pipeline ULC's Trans Mountain Expansion Project application currently before the National Energy Board.

In providing evidence in relation to the above-noted proceeding, I acknowledge that it is my duty to provide evidence as follows:

1. to provide evidence that is fair, objective, and non-partisan;

2. to provide evidence that is related only to matters within my area of expertise; and

3. to provide such additional assistance as the tribunal may reasonably require to determine a matter in issue.

I acknowledge that my duty is to assist the tribunal, not act as an advocate for any particular party. This duty to the tribunal prevails over any obligation I may owe any other party, including the party on whose behalf I am engaged.

Date: MAY 15, 2015 Signature: Karen MacWilliam