

1. *What is the Threat to Drinking Water?*

This paper provides background information on the transportation of specified substances along corridors. It should be noted that this threat has been added as a local drinking water threat for the Thames Sydenham Source Protection Region and approved by the Director of the Source Protection Programs Branch of the Ministry of the Environment.

Transportation corridors include provincial highways, county and local roads, railways, ferries, navigation channels and other water bodies. The request to the Ministry is to include which substances (e.g. certain types of fuels, pesticides, dense non-aqueous phase liquids (DNAPL), and organic solvents) are linked to this threat.

In addition to the approved local drinking water threat, section 26.6 of Ontario Regulation 287/07 – General, specifies that a source protection plan may set out policies specifying the actions to be taken by persons or bodies to update spill prevention and spill contingency plans or emergency response plans for the purpose of protecting existing drinking water sources with respect to spills that occur within a wellhead protection area (WHPA) or surface water intake protection zone (IPZ) along highways, as defined in subsection 1(1) of the Highway Traffic Act, railway lines or shipping lanes (Government of Ontario, 2007).

The Highway Traffic Act defines “highway” as a common and public highway, street, avenue, parkway, driveway, square, place, bridge, viaduct or trestle, any part of which is intended for or used by the general public for the passage of vehicles and includes the area between the lateral property lines thereof (i.e. the road allowance). A ferry is considered to be part of a highway.

The transportation of material (oil and natural gas) through pipelines may also be included as a local threat.

All of the wellhead protection areas (WHPA) and intake protection zones (IPZ) in the Thames Sydenham Source Protection Region contain highways. Railway lines, including spur lines to industrial facilities are also adjacent to vulnerable areas in the region. The Lake Huron shipping lane runs through the delineated LAWSS IPZ-3 as well as the St Clair River channel has been identified as impacting Walleceburg IPZ-3.

Spill response is the recommended mechanism to deal with risk management for this drinking water threat.

NOTE TO THE READER

*This document is one of a series of threat policy discussion papers for the Thames- Sydenham and Region in support of Source Protection Plan development. Each discussion paper looks at the nature of one or more types of drinking water threat, describes the local occurrence of those threats, assesses existing policies/programs, and introduces related ‘policy concepts’ for source protection planning. **While every effort has been made to ensure the accuracy of the information in this document, it should not be construed as legal advice or relied on as a substitute for the legislation.***

*This version is considered to be a **working draft** because it will be revised as the policy development process progresses. This discussion paper represents the best information available to the SPC upon which they will base their policy decisions.*

Contents

- What is the Threat to Drinking Water?
- What causes the activity to be a drinking water threat?
- What is the local scale of the drinking water threat?
- Applicable legislation, policies and programs
- Gaps in existing legislation, policies and programs
- Policy considerations
- Proposed policy ideas
- References
- Tables
- Policy examples

2. *What causes this activity to be a drinking water threat?*

The Thames Sydenham Source Protection Region made application to the Director to add local drinking water threats under Technical Rule 119, in vulnerable areas of the St. Clair Region Source Protection Area (SCRSPA). These local threats were identified as follows:

- Transportation of fuel and fertilizer along provincial highways, county and local roads, railways and waterways along corridors passing through the various vulnerable in the SCRSPA; and
- Transportation of liquid petroleum products through pipelines that cross the St. Clair Region Source Protection Area and spill into the St. Clair River

The classification of these activities as either a significant, moderate or low drinking water threat is dependent on the location of the corridor as defined by the event based modelling exercise, the type of substance, and the volume or mass of the substance resulting from a spill.

3. *What is the local scale of the drinking water threat?*

The transportation of the above substances in specific quantities or circumstances along corridors in the SCRSPA can be a drinking water threat in the delineated IPZ-3 regions of the Sarnia (LAWSS), Petrolia and Wallaceburg intakes. This activity is not rated as a threat for the highly vulnerable aquifers and significant groundwater recharge areas.

With the exception of local deliveries, it is anticipated that some or all of these substances would be transported along provincial highways and major arterial roads, railway lines, shipping lanes and pipelines. As part of the identification of local threats as outlined in the Directors letter, The Thames Sydenham Source Protection region took an Event Based Approach to the identification of significant threats based on Rule 68 and Rule 130 of the Clean Water Act as follows:

Rule 68:

IPZ-3 shall be delineated if modeling demonstrates that contaminants released during an extreme event may be transported to the intake.

Rule 130:

An activity may be listed as a significant threat if modeling demonstrates that a spill could result in deterioration of the water supply.

Director's approval was given to accept the Event Based modelling based on reverse particle tracking, with the intent to model realistic spills knowing the location and type of activity and the estimated volume or mass of spill based on realistic activities. An IPZ-3 for various intakes was then delineated based on the modelling results to ensure potential threats are identified within an Intake Protection Zone. This modelling approach was applied to surface intakes in the St. Clair Source Protection Region.

Methodology

As part of the Event Based Modelling process the following parameters were considered to determine the impact of a spill on a surface water intake.

Extreme Event was defined as:

- a period of heavy precipitation or up to a 100 year storm event (wind)
- definition a combined 100 year event through a joint probability analysis (JPA)
- Petrolia and LAWSS – Sarnia wind speed and tributary flow
- Wallaceburg - Lake Huron water level and Sydenham River flow

Limitations:

- A limited number of events simulated. Concentrations at the intakes would be different for different events.
- A simple analytical approach was used to calculate longitudinal dispersion in the tributaries based on MOE (2009).
- MISED model was calibrated with ADCP data but with limited spill data on St. Clair River only.
- Decay due to physical and chemical processes not considered.
- It was assumed that tanker trucks, rail tankers and ships either contain or transport fuel along the corridors used in modeling.
- Hydrodynamics in Wallaceburg area are complex. Additional data collection and calibration is recommended to further delineate the area of influence as a result of a spill.
- Due to the limited number of spills simulated, results were extrapolated.
- Recognize that modeling is a tool that can be used to improve our understanding of the vulnerability of intakes. It is not precise.

Threat:

- All activities modeled with exception of Bear Creek spills can be designated as significant threat under Rule 130
- Modeled results could be extrapolated to include transportation of similar quantities/chemicals
- Could include fixed storage of similar quantities/chemicals
- Threat locations are within the areas delineated
- Locations outlet directly to the areas delineated

The following table outlines the series of eight scenarios defined by location, mode of transport and quantity of hazardous material that was spilled. Events which release chemicals in sufficient concentrations to impact the quality of drinking water at the intakes were then used to delineate the IPZ-3 areas around each of the surface intakes in the St. Clair Source Protection region.

Table 1. Modelled Spill Scenarios and ODWS Concentration based on type of spill

Scenario No.	Spill Scenario	Water Body	Spill	Contaminant	Release Volume	Release Concentration	ODWS (mg/L)
1	Validation Scenario	St. Clair River	Benzene	Benzene	45 L	100% Benzene	0.005
2	Tupperville Bridge Fertilizer Spill	Sydenham River	Urea	Nitrogen	30,000 kg	46% Nitrogen	10 for NO ₃ -N 1 for NO ₂ -N
3	Sombra Ferry Crossing Fertilizer Spill	St. Clair River	Urea	Nitrogen	34,000 kg	46% Nitrogen	10 for NO ₃ -N 1 for NO ₂ -N
4a and b	St. Clair River Pipeline Rupture	St. Clair River	Gasoline	Benzene	275,000 L	2% Benzene	0.005
5a and b	Tanker Truck Spill at 402 and Perch Creek	Perch Creek	Gasoline	Benzene	34,000 L	2% Benzene	0.005
6	Tanker Truck Spill at 402 and Cow Creek	Cow Creek	Gasoline	Benzene	33,000 L	2% Benzene	0.005

7a	Rail Tank Spill at Bear Creek (114 km from confluence)	Bear Creek	Gasoline	Benzene	66,000 L	2% Benzene	0.005
7b	Tanker Truck Spill at Bear Creek (20 km from confluence)	Bear Creek	Gasoline	Benzene	33,000 L	2% Benzene	0.005
8	Shipping Spill in Lake Huron	Lake Huron	Gasoline	Benzene	1,000,000 L	2% Benzene	0.005

The outcomes as a result of the spill scenario (Table 2) were calculated and used to determine the delineation of IPZ-3 through the reverse particle tracking process. Any events similar to those modeled occurring within this zone would have a similar impact and be considered a significant threat to the intake.

Table 2. Exceedances at intake based on spill event

Spill Scenario	Tributary	Spill Location (m upstream of mouth)	Flow (m ³ /s)	Flow Return Period	Contaminant	Peak Conc. (mg/L)	Duration (hrs)
2	Sydenham River	11,745	920	100-year	Nitrogen	36.3	0.23
5a,b	Perch Creek	5,800	4.5	<1-year	Benzene	51.3	1.5
6	Cow Creek	8,917	4.5	<1-year	Benzene	7.2	10.3
7a	Bear Creek ¹	114,000	157	10-year	Benzene	0.03	114
7b	Bear Creek ¹	19,850	157	10-year	Benzene	0.03	57

Note: Values in red indicate exceedance of ODWS (listed in Table 4.1).

¹ Results for Bear Creek represent concentrations at the confluence with the Sydenham River.

4. *Applicable Legislation, Policies and Programs*

There is an extensive safety net surrounding the transportation of substances along corridors that involves all three levels of government in Canada (federal, provincial and municipal), the United States and New York State, and private transportation companies. We note that in all situations, the “polluters pay principle” is applied, meaning that the party responsible for the spill will take full responsibility, both operationally and financially, for the response to an environmental emergency. Also, the appropriate level of government will oversee the Responsible Party’s response and if the response is inadequate in protecting human health, property and the environment, government authorities can take over management of the response operations in accordance with applicable legislation.

a) Federal

The following federal legislation, policies and national programs are summarized as:

Marine-based Transportation Corridors:

- Canada-United States Joint Marine Pollution Contingency Plans
- Canadian Coast Guard Marine Spills Contingency Plan
- Transport Canada’s National Marine Oil Spill Preparedness and Response Regime
- St. Lawrence Seaway Management Corporation

1. Joint Inland Pollution Contingency Plan

The Canada–United States Joint Inland Pollution Contingency Plan and the Joint Marine Pollution Contingency Plan provide for co-operative measures for dealing with accidental and unauthorized releases of pollutants that cause or may cause damage to the environment along the shared inland boundary and waters, and that may constitute a threat to the public health and property.

Environment Canada and the United States EPA are responsible for implementing the Joint Inland Pollution Contingency Plan, while the Canadian Coast Guard and United States Coast Guard are responsible for the Joint Marine Pollution Contingency Plan. These documents outline geographic annexes which specify the process that will be used, on either side of the border, to facilitate an effective joint response to spills.

The processes are also based on the Principle of Escalation. On land, the initial government response to an environmental emergency will almost always be led by the impacted local/municipal government. As the incident grows in significance (be it by the sheer size of the incident, associated impacts, complexity of the response, or cost) state/provincial and federal agencies may become involved on their own accord. If the environmental emergency exceeds the capacity of the local responders, a formal request will be made to the state/provincial or federal agencies responsible for the impacted parties (i.e. MOE, Environment Canada, Canadian Coast Guard).

For incidents in the water, the lead agency in the United States is either the United States Coast Guard (spills from coastal zone) or the EPA (spills from inland zone). In Canada, the lead agency is either the Canadian Coast Guard (spills from ships or undetermined source), Environment Canada (federal facilities), or the MOE (spills from land based, non-federal facilities).

2. Canadian Coast Guard Marine Spills Contingency Plan (Canadian Coast Guard, 1998)

The Canadian Coast Guard (CCG) is responsible for marine spill preparedness response in Canadian waters. Specifically, it is the lead response agency for spills from: vessels, ship to shore fuel transfer operations, mystery spills, and spills that impact or that threaten transboundary waters.

The National Chapter of the Canadian Coast Guard Marine Spills Contingency Plan defines the scope and framework within which the CCG operates to ensure appropriate response to marine pollution incidents (oil spills) as either the lead agency or supporting agency. It also sets the stage for regional and area response plans.

3. Transport Canada Marine Chemical Emergency Response Regime

A Marine Chemical Emergency Response Regime is being developed by Transport Canada to outline the roles and responsibilities of government and the private sector to address hazardous material incidents (currently the CCG is equipped to respond to petroleum spills only). CA staff has requested additional information about this proposed Regime from Transport Canada.

The Central and Arctic Region includes Ontario and has specific responsibilities associated with the Great Lakes and St. Lawrence River. The Central and Arctic Regional Response Plan of the Canadian Coast Guard National Response Strategy (Canadian Coast Guard, 2008) suggests that contingency planning officers are continually working with industry and environmental groups, response organizations, and other governments, including that of the United States, to develop, update, test and exercise contingency plans to be ready in the event of a spill. The Coast Guard has expressed an interest in the findings of some Assessment Reports and in working with the SPAs to develop their source protection plan.

According to the Regional Response Plan (Canadian Coast Guard, 2008), the area plans incorporate detailed response information for specific manageable geographic areas or response communities. The plans cover the following topics:

- Risk analysis – to determine which communities or areas are most likely to be endangered by a potential oil spill and why, their associated environmental sensitivities, plus the typical type of spill that

could be expected. Environment Canada's Environmental Sensitivities Atlases are used for the initial assessment.

- Priority Identification/Verification – through the Regional Environmental Emergencies Team (REET) at planning meetings, or through community consultation. REETs are discussed in more detail below.
- Strategy and Tactics Development – Response Management System objectives are determined by the CCG for the priorities identified through the above step. Strategies to meet the objectives (through specific activities) and details for implementation are then developed.
- Updating – plans are reviewed and updated annually.

The MOE Spills Action Centre is contacted by Coast Guard in the event of a spill so that MOE can activate its response procedures, which includes notifying downstream users such as drinking water treatment plants.

4. National Marine Oil Spill Preparedness and Response Regime (Transportation Canada, 2010)

Transport Canada is responsible for administering the National Marine Oil Spill Preparedness and Response Regime. The level of preparedness required for ships depends on the gross registered tonnes of the ship.

Operators of facilities that transfer oil to or from oil tankers of 150 tonnes gross tonnage, as well as the oil tankers themselves, and all other vessels of 400 tonnes gross tonnage, that travel through Canadian waters are required to have a shipboard oil pollution emergency plan, as well as an arrangement with a certified response organization that would respond to a spill on the polluter's behalf (Transport Canada, 2010).

As part of the oil pollution emergency plan, ships must have on-board resources to contain a spill of oil equal to the facility's rated capability within one hour, and begin recovery/cleanup operations of oil equal to the facility's rated capability within 6 hours.

Any ship that has a gross registered tonnage less than 400 tonnes and oil tankers less than 150 tonnes are not required to have a shipboard oil pollution emergency plan or an arrangement with a response organization. However, it must still report the potential or actual pollution incident to a Pollution Response Officer (Canadian Coast Guard, 2008).

Response organizations are certified every three years by Transport Canada. The network of private sector oil spill response organizations was created in 1995 as a result of amendments to the Canada Shipping Act, and are funded and operated by the private sector (Canadian Coast Guard, 2009). The response organizations would respond to a spill that is beyond the rated capabilities of the ship to a maximum of 10,000 tonnes.

The certified response organization for the major petroleum companies is the Eastern Canada Response Corporation (ECRC), which has response centres near Sarnia, Ontario (at Corunna), and Montreal, Quebec (at Verchères). The boundary between the two response centres is Butternut Bay (where Highway 401 and the Thousand Islands Parkway meet in Elizabethtown-Kitley). ECRC has two boats moored in Kingston (marine response contracted to a local company) and a response trailer stationed in Prescott (response contracted to a company in Ottawa, but first response comes from Napanee) (S. Johnson, ECRC, personal communication). ECRC also arranges response for land-based oil spills through the Ottawa-based contractor.

Depending on the arrangement with individual companies, the ECRC role is to provide complete management of spill response services or just equipment and operators. ECRC does not provide response services for chemical spills, although it will provide logistical support or equipment. Chemical spills require response from hazardous material (HAZMAT) teams.

The ECRC is divided into geographic areas of response for which there are area plans similar to those of the Canadian Coast Guard. The plans include pre-established response strategies, pre-identified logistical resources, and they are updated every three years (ECRC presentation to REET, 2006).

5. St. Lawrence Seaway Management Corporation

The St. Lawrence Seaway Management Corporation (Canada) and the Saint Lawrence Seaway Development Corporation (United States) produce a Seaway Handbook (2010) that covers a variety of topics related to the

Canadian Seaway Practices and Procedures and the United States Seaway Regulations, including reporting requirements for dangerous and hazardous cargo, and accidents.

The Canadian Coast Guard and the St. Lawrence Seaway Management Corporation intend to prepare a letter of understanding to confirm that the Corporation would respond to spills within the lock walls and the Coast Guard would respond to spills outside the lock walls (J. Munroe, CCG, personal communication).

Land-based Transportation Corridors:

- Canada-United States Joint Inland Pollution Contingency Plans
- National Environmental Emergencies Contingency Plan
- Railway Safety Act
- Transportation of Dangerous Goods Act and Regulations
- Responsible Care Program and TransCAER (Transportation Community Awareness and Emergency Response) Program
- Chemistry Industry Association of Canada's Transportation Emergency Response Program
- Canadian National Railway Emergency Response Plan
- Canadian Regional Environmental Emergencies Teams

1. Canada-United States Joint Inland Pollution Contingency Plans

This legislation is consistent with both marine and land based activities (see marine based corridors above)

2. National Environmental Emergencies Contingency Plan

Environment Canada has a National Environmental Emergencies Contingency Plan (1999) that covers those environmental emergencies and natural hazards which arise as sudden, unexpected events. It defines the scope and framework within which Environment Canada operates to ensure appropriate response to any environmental hazard or emergency. It describes the emergency reporting network and provides procedural guidelines for environmental emergencies staff. Each region may have its own regional contingency plan that specifies operational procedures.

According to the Plan, an environmental emergency is defined as a sudden or unexpected incident involving a release of a hazardous substance (or the likelihood of such a release into the natural environment) which may result in an immediate or long-term harmful effect on the environment, or constitute a danger to human life or health.

Environment Canada can be the lead agency or supporting agency for environmental emergencies that relate to transportation, federal facilities/lands, spills of unknown origin, and Canada/United States transboundary spills, depending on the situation.

3. Federal Railway Safety Act (Government of Canada, 1985)

The federal Railway Safety Act applies to inter-provincial and Canada-United States operations such as Canadian National Railway (CN) and VIA Rail. The Transportation of Dangerous Goods Act and Transportation Accident Investigation and Safety Board Act are also relevant to railway safety.

Railway companies that only operate in Ontario are regulated by the Ontario Shortline Railways Act. This legislation is based on the federal regime and automatically adopts changes to the applicable federal rules and regulations. Transport Canada provides inspection services for these railways, however, the province is responsible to carry out enforcement. There do not appear to be any Ontario-only or local railway companies operating in the (name) Source Protection Area.

The principle of the Railway Safety Act is that railway companies must be responsible and accountable for the safety of their own operations, while the regulator must retain the power to protect people, property and the environment by ensuring that the railways operate safely within a national framework (Railway Safety Act Review Secretariat, 2007). While there is government regulation and rules there are also approved industry-developed operating rules and engineering standards (through the Railway Association of Canada).

In keeping with the “polluters pay principle”, the railway company is responsible for emergency preparedness and incident management that includes: Initial hazard assessment to determine the scope and nature of the response, Operation supervision in the field, integrated response assurance, and disseminating information to stakeholders. In general, Environment Canada has jurisdiction over spills on railway rights-of-way that are federally regulated and the provinces have jurisdiction over materials that end up on provincial lands. The federal Transportation of Dangerous Goods Act, which is administered by Transport Canada, applies throughout Canada. Ontario has its own Transportation of Dangerous Goods Act but relies on the federal regulations. The MOE is generally the lead agency to respond, coordinate and monitor spills involving dangerous goods, while Environment Canada acts as a supporting agency. Environment Canada has the final say on when the clean-up has been completed at a site on federal land.

4. Transportation of Dangerous Goods Act and Regulations (Transportation Canada, 2010)

There are two important features of interest that fall under the Transportation of Dangerous Goods Act: the Canadian Transport Emergency Centre (CANUTEC) and emergency response assistance plans (ERAP). Federal regulations require that CANUTEC be contacted in the event of a dangerous goods accident or incident in areas under federal jurisdiction. CANUTEC is operated by Transport Canada to assist emergency response personnel in handling dangerous goods emergencies related to all modes of transportation (Transport Canada, 2009). It has a scientific database on chemicals that are manufactured, stored and transported in Canada, and is staffed by emergency response specialists. It also has access to directories of emergency response groups and lists of specialized equipment suppliers. The Transportation of Dangerous Goods Regulations requires shipping documents for dangerous goods to display a 24 hour emergency telephone number to ensure that technical assistance is immediately available to first response emergency personnel. These companies may register with CANUTEC to use its number, or use a private company such as Drain-All. Emergency response assistance plans (ERAPs) are required for the transportation of numerous dangerous goods that are listed in the Transportation of Dangerous Goods Regulations. For example, ERAPs are required for the transportation of methylene chloride and vinyl chloride at specified concentrations. ERAPs must be registered, inspected and approved by Transport Canada. The right to ship dangerous goods can be withdrawn at any time if the ERAP is found to be inadequate. The intent of an ERAP is to provide on-site assistance to local emergency responders through the provision of emergency response advice by telephone, the provision of emergency response advice first by telephone, then by a knowledgeable person attending the accident site, and the supply of specialized equipment and a response team to mitigate the effect of the dangerous goods at the accident site. There are 162 active ERAPs in Ontario filed with Transport Canada (Transport Canada, 2010).

5. Responsible Care Program and TransCAER Program

The Responsible Care program is a global voluntary initiative of the chemical industry that is implemented in Canada by the Canadian Chemical Producers’ Association. The intent of the program is to continuously improve the health, safety and environmental performance of companies, and to communicate with stakeholders about chemical products and processes (Responsible Care, 2010). It involves information sharing and support networks, and a rigorous system of checklists, performance indicators and verification procedures. Partners undergo independent audits for performance under the program.

6. Transportation Emergency Response Program

The Chemistry Industry Association of Canada (2009) produced the Transportation Emergency Response Program (TEAP III), which establishes minimum criteria for effective road and rail transportation emergency planning, preparedness and response to incidents. It was developed in association with interested stakeholders including CN Rail.

This association also has a Safety Training Tank Car CCPX 911 which is a virtual classroom on wheels that is used to train member-company employees and first-responder personnel, and is used to promote the importance of the safe transportation of chemical products at public events. It is a key component of the TransCaer Program. TransCaer is a national outreach program focused on assisting communities to prepare

for and respond to incidents involving dangerous goods. The focus of the program is on first-response emergency measures to take in the event of an incident, and includes accident simulation sessions.

7. Canadian National Railway Emergency Preparedness (Canadian National Railway Company, 2010)

The Canadian National Railway (CN) is a Responsible Care Partner which means that it has made a commitment to safe rail handling and transportation principles. CN is involved in the implementation of the TransCaer Program.

CN has an Emergency Response Plan (March 2010) and Environmental Incident Reporting and Communications Procedure (documented in the plan) in place to deal with environmental incidents in an immediate and coordinated manner. The plan and procedure includes information to assist CN employees in responding to a broad range of environmental emergencies and outlines the company's responsibilities for spill response, clean-up and reporting. CA staff may request additional information regarding if there are any site-specific supplements to the Emergency Response Plan for their Source Protection Area.

The company has its own team of environmental specialists who have access to a network of materials and specialized equipment suppliers and contractors to assist with a response. In some situations, the team has access to CN freight containers that are filled with emergency response equipment including pumps, generators and containment booms. It also contracts response to a company in Ottawa, but the first response comes from Napanee.

The MOE Spills Action Centre and local emergency responders are contacted in the event of a spill or imminent spill so that they can activate their response procedures.

According to the CN website, the company developed the Responder Education Assistance and Certification (REACT) program which provides rural responders with quality emergency training to respond to incidents involving dangerous goods, as well as Standard Operating Guidelines to enhance dangerous goods emergency response. The REACT program was a pilot project in British Columbia.

8. Canadian Regional Environmental Emergencies Teams (see Appendix C for weblink)

A Regional Environmental Emergencies Team (REET) is a multi-agency, multi-disciplinary group that specializes in environmental emergencies. REET members represent federal, provincial and municipal government departments, aboriginal communities, industries, and academic institutions. In Ontario, the REET can be co-chaired by Environment Canada and MOE.

The function of a REET covers a variety of environmental emergency prevention, preparedness and response activities on behalf of the Responsible Party, On Scene Commander or Lead Agency, including: identification of environmentally sensitive resources

determining pollutant behavior, fate and effects identifying containment, recovery, treatment and disposal strategies identification of environmental protection and rehabilitation priorities assessment and monitoring of environmental impacts (damage assessment) production of sensitive resource, impact and response progress mapping evaluation of clean-up activities participation in spill response exercises guidance on contingency planning provision of training (Environment Canada, 2001)

At the Ottawa REET meeting in 2007 an Environment Canada employee indicated that Environment Canada and MOE are more likely to use direction or orders to ensure that the responsible party maintains control of an incident than to take control over the response to an incident. This is also stated in a number of government publications.

b) Provincial

This section outlines provincial requirements for hazardous waste transportation, spill reporting and clean-up as well as a framework provincial emergency response.

1. Environmental Protection Act: Regulation 347 General – Waste Management (Government of Ontario, 1990)

In general, waste storage facilities must comply with the Environmental Protection Act and Regulation 347 General – Waste Management. Under the Regulation, spent chemicals are considered to be hazardous wastes that must be managed throughout their life cycles: collection, storage, transportation, treatment, recovery and disposal. This special handling is necessary to reduce adverse effects to human health and to the environment.

Waste generators are responsible for making sure their hazardous wastes are transported in compliance with Regulation 347. Generators, transporters and disposal facilities must be registered with MOE and maintain appropriate licences and Certificates of Approval under the Environmental Protection Act. Most hazardous wastes that are shipped off-site are accompanied by a manifest that is used to track the waste throughout its life-cycle, including transportation.

2. Environmental Protection Act (Government of Ontario, 1990)

Part X of the Environmental Protection Act outlines the required reporting and clean up of spills. The discharger is required to contact the MOE Spills Action Centre and the municipality in which the spill occurs. He or she is also required to contain and clean up the pollutant as quickly as possible under the circumstances, or arrange for these actions to be carried out, and to restore the spill site to pre-spill conditions (Environment Canada and United States EPA, 2001). Details on spills reporting are outlined in Spills Reporting - A Guide to Reporting Spills and Discharges As required by the (Ontario) Environmental Protection Act (s.92 and s.15) and Ontario

3. Regulation 675/98 Classification and Exemption of Spills and Reporting of Discharges (Ontario Ministry of the Environment, 2007).

The responsibility for locating an appropriate municipal contact point in the event of a spill rests with the person who spills or causes or permits the spill, or the person who had control of the pollutant immediately prior to the spill (Ontario Ministry of the Environment, 2007).

4. Spills Action Centre

The Ontario Ministry of the Environment (MOE) is the lead provincial agency for environmental emergencies. MOE's factsheet "Responding to Spill and Emergencies" Guideline G-2 Ontario Spills Action Centre Operations (Ontario Ministry of the Environment, 1994/2007) indicates that MOE operates the Spills Action Centre (SAC) which was established under the Environmental Protection Act to: maintain a province-wide, toll-free service for receiving, evaluating and initiating responses to notifications of spills and other urgent environmental matters that require immediate reporting to MOE on a 24-hour basis; serve as a provincial focal point for activities dealing with spills and related emergencies; liaise with other agencies on spills and related emergencies; maintain a provincial spill database for the Ministry; and, provide contingency planning functions and related spill response training.

In addition to receiving reports of spills, SAC is responsible for determining the adequacy of reported spills response activities, facilitating or triggering a response where it appears the response is inadequate, and activating an Ministry field response (on-site assessment), as required (Ontario Ministry of the Environment, 2007). MOE is expected to notify other agencies in a timely manner, and assists in warning "downstream" users or potentially affected parties. SAC Operating Procedure Cards, which are routinely updated, contain decision process guidelines for co-ordinating responses and for notifying other agencies, as required.

There are three levels of MOE field response to a spill (Environment Canada and United States EPA, 2001; Ontario Ministry of the Environment, 2007). The Level I District Response involves an initial site assessment and an analysis of the data available to determine what further actions or assistance are required (up to 2 hours after hours). The Level II Regional Response involves providing additional support staff, equipment and expertise, providing air or water monitoring, modeling, and analysis, and continuing to provide direct advice on appropriate response and cleanup techniques (up to 4 hours after hours). The Level III Head Office Response is to deploy a Trace Atmospheric Gas Analyzer (TAGA) Unit to conduct highly sophisticated air quality surveys

for the environmental emergency. In rare cases, the MOE may have to exercise the statutory options available to the MOE for pre-empting an inadequate response.

5. Emergency Management Ontario (see link to website in Appendix C)

All municipalities and provincial ministries are required to have emergency management programs by the Emergency Management and Civil Protection Act. Emergency Management Ontario (EMO) provides the municipalities and provincial ministries with support to implement their programs, through tools such as guidelines and training.

The Provincial Emergency Response Plan (Emergency Management Ontario, 2008) establishes a framework for a systematic, coordinated and effective emergency response by the Government of Ontario. The plan provides a means by which the province can be made aware of a threat or emergency, can coordinate and direct provincial resources, and can declare an emergency. EMO is responsible for monitoring emergencies and response activities through the Provincial Emergency Operations Centre.

The Ministry of Environment also established an emergency response plan for spill and drinking water emergencies (Ministry of the Environment, 2007). This document provides a framework for responses to these emergencies.

c) Municipal

1. Municipal By-laws

Municipalities have the ability to pass by-laws about the economic, social and environmental well-being of the municipality, and about the health, safety and well-being of people, under the Municipal Act.

A number of municipalities in the (name) Source Protection Area have by-laws controlling heavy truck traffic through traffic regulating by-laws. These by-laws prohibit and/or place seasonal restrictions on the operation of heavy vehicles on designated "highways". They may also designate heavy truck routes. In terms of prohibition, these highways are generally located in residential areas or community safety zones. Seasonal restrictions are generally placed on rural roads during the spring thaw to protect against road damage. There is the potential to use these by-laws to prohibit the transportation of specific substances through IPZs.

2. Emergency Plans

As mentioned above, municipalities are required to have emergency management programs. Municipal emergency plans are overarching procedures that allow municipalities to react to emergencies. Emergency Response Local emergency responders are normally first on the scene of railway accidents to assess, respond or control access to the site. However, they may have limited resources and training on how to respond to environmental emergencies. For example, the majority municipal emergency responders (fire departments) in the (name) Source Protection Area may have Hazmat awareness training, which means they can recognize hazardous materials, however, there are no Hazmat teams to deal with the chemicals. Local municipalities may have mutual aid agreements with other municipal fire departments that have Hazmat teams to respond to emergencies involving Hazmats. The closest emergency spill response Hazmat teams are located in the City of (names). Hazmat team response time would generally be a minimum of four to six hours.

5. *Gaps in existing legislation, policies and programs*

Gaps in existing legislation, policies and programs The existing federal and provincial legislation, policies and programs are extensive, however, additional protection could be provided to municipal sources of drinking water by providing key agencies with detailed information about the IPZs.

There are deficiencies in the ability of local emergency responders to respond to chemical spills, and the closest municipal Hazmat teams are more than two hours away. A Ship-Source Hazardous and Noxious Substances Incident Preparedness and Response Regime is being developed by Transport Canada to outline the roles and responsibilities of government and/or the private sector to address hazardous and noxious substance incidents (currently the CCG is equipped to respond to petroleum spills only). Transport Canada is

currently working to (a) determine what chemicals are being transported (in bulk and packaged) in Canadian waters, and (b) research the fate of chemicals in the Canadian marine environment (A. Laflamme, Transport Canada, personal communication). Country-wide consultation is anticipated to begin in 2011; the regime would not be completed until 2013 at the earliest.

6. Policy Considerations

Policy considerations A consideration for reducing or eliminating drinking water threats related to transportation of chemicals along corridors is to make sure that spill prevention and spill contingency plans, and/or emergency response plans are in place and that there are adequate resources to implement the plans when needed to make sure the pollutants do not enter surface water and/or groundwater.

It should be noted that this threat is defined by the event based modelling approach and policies should reflect the mitigation of risk within the defined IPZ-3 area.

7. Proposed policy ideas

Threat: Local Threat -Transportation Corridors (as defined by Directors Letter)

- Fuels: modeled quantities - 34,000 litres by road or railway, 275,000 litres in pipelines, 1 million litres by ship
 - Petroleum hydrocarbons F1 to F4 BTEX (benzene, toluene, ethylbenzene, and xylene)
- Fertilizers: modelled quantities 34,000 kg
 - Nitrogen (Nitrate), Phosphorus

Policy Tool	Policy ideas
Education and Outreach	<ul style="list-style-type: none"> • Raise awareness among shippers of dangerous goods about importance of proper transportation and handling within IPZs and the need for timely and adequate spill response • Provide railroads and marine agencies and operators with information about d IPZs and encourage upgrades to emergency response plan/operations (e.g. input IPZ locations into GPS and/or mapping so that operator knows when entering and exiting these vulnerable areas)
Incentive Programs	<ul style="list-style-type: none"> • N/A
Land Use Planning	<ul style="list-style-type: none"> • N/A
Prescribed Instruments	<ul style="list-style-type: none"> • N/A
S. 57 Prohibition	<ul style="list-style-type: none"> • N/A
S. 59 Risk Management Plan	<ul style="list-style-type: none"> • N/A
S.59 Restricted Land Uses	<ul style="list-style-type: none"> • N/A
S. 26 p.1Other-Specify Action	<ul style="list-style-type: none"> • Consider in decision making process rerouting, where possible, new highways or arterial roads around vulnerable areas (IPZs)

Policy Tool	Policy ideas
	<ul style="list-style-type: none"> • Consider developing municipal traffic regulating bylaws to prohibit transportation of specific substances/volume of substances through IPZs • Consider placing road signs at the entrance to IPZs for emergency responders • Consider boosting emergency response programs to be able to contain chemical spills (e.g. training, equipment). • Consider upgrading/reviewing their water treatment response time and equipment. • Update spill prevention and spill contingency plans, emergency response plans to identify all IPZs • Consideration to be given by MOE Spills Action Centre to review and update procedures to include source protection mapping and communicate spill information to municipal contacts based on IPZ delineations in a timely way • Share IPZ-3 flow data with MOE Spills Action Centre • Encourage Ministry of Transportation to conduct regional and province-wide review of Emergency Detour Routes considering IPZs

8. Reference List

Canadian Coast Guard and United States Coast Guard. 1999. Annex 1, CANUSLAK: Great Lakes Operational Supplement to the Joint Marine Contingency Plan. www.epa.gov/oem/docs/chem/canuscent.pdf

Canadian Coast Guard. 1998. National Chapter of the Canadian Coast Guard Marine Spills Contingency Plan. www.ccg-gcc.gc.ca/eng/Ccg/er_National_Response_Plan

Canadian Coast Guard. 2008. Central and Arctic Regional Response Plan of the Canadian Coast Guard National Response Strategy.

Canadian Coast Guard. 2009 Environmental Response. www.ccg-gcc.gc.ca/eng/CCG/Environmental_Response

Canadian National Railway Company. 2010. Emergency Response Plan (March 31, 2010). www.cn.ca/en/corporate-citizenship-safety-emergency-response.htm

Chemistry Industry Association of Canada. 2009. Transportation Emergency Response Program. www.canadianchemistry.ca.

Eastern Canada Response Corporation presentation to REET in Thunder Bay, 2006.

Emergency Management Ontario. 2008. Provincial Emergency Response Plan. Ministry of Community Safety and Correctional Services, Toronto, ON. www.emergencymanagementontario.ca/stellent/idcplg/webdav/Contribution%20Folders/emo/documents/PERP%20Final%20March%202008.pdf

Environment Canada. 1999. National Environmental Emergencies Contingency Plan. www.ec.gc.ca/ee-ue/default.asp?lang=en&n=8771D011

Environment Canada. 2001. Regional Environmental Emergencies Team. www.on.ec.gc.ca/emergency/reed/reed-e.html

Environment Canada and United States Environmental Protection Agency. 2009. Canada–United States Joint Inland Pollution Contingency Plan. www.ec.gc.ca/ee-ue/default.asp?lang=en&n=deb16a21

Environment Canada and United States EPA. 2003. Canada–United States Joint Marine Pollution Contingency Plan. www.ccg-gcc.gc.ca/folios/00025/docs/canadaus_pub-eng.pdf

Environment Canada and United States EPA. 2001. Canada-United States Joint Inland Pollution Contingency Plan, Annex III CANUSCENT. www.epa.gov/oem/docs/chem/canuscent.pdf

January 2011 Version 2 Transportation Corridors

Background Document Page 23 of 26

Government of Canada. 1985. Railway Safety Act. <http://laws.justice.gc.ca/en/r-4.2/>

Government of Ontario. 1990. Highway Traffic Act (as amended 2009). www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_90h08_e.htm

Government of Ontario. 1990. Environmental Protection Act (as amended 2009).

Government of Ontario. 1990. Environmental Protection Act. Ontario Regulation 347- General Waste Management www.e-laws.gov.on.ca/html/regs/english/elaws_regs_900347_e.htm#BK0

Government of Ontario. 2007. Clean Water Act. Ontario Regulation 287/07 – General. www.e-laws.gov.on.ca/html/regs/english/elaws_regs_070287_e.htm

Johnson, S., Eastern Canada Response Corporation, personal communication, November 15, 2010.

Munroe, J., Canadian Coast Guard, personal communication, November 16, 2010.

Railway Safety Act Review Secretariat. 2007. Stronger Ties: A Shared Commitment to Railway Safety. www.tc.gc.ca/eng/tcss/rsa_review/chapter1-370.htm

Responsible Care. 2010. Responsible Care. www.responsiblecare.org

Ontario Ministry of the Environment. 2007. Responding to Spills and Emergencies. www.ene.gov.on.ca/environment/en/about/emergency_planning/STDPROD_080741

Ontario Ministry of the Environment. 2007. Spills Reporting - A Guide to Reporting Spills and Discharges As required by the (Ontario) Environmental Protection Act (s.92 and s.15) and Ontario Regulation 675/98 Classification and Exemption of Spills and Reporting of Discharges. www.ene.gov.on.ca/environment/en/resources/STD01_076608.html

Ontario Ministry of the Environment. 2007. Responding to Spills and Emergencies www.ene.gov.on.ca/environment/en/resources/STD01_076611.html

Raisin-South Nation Source Protection Region. 2008. Spill Response Project: Final Report October 2008. Raisin Region Conservation Authority, Cornwall, ON.

St. Lawrence Seaway Management Corporation. 2010. The Seaway Handbook 2010 Edition. St. Lawrence Seaway Management Corporation. www.greatlakes-seaway.com/en/pdf/handbook.pdf

Transport Canada. 2010. National Marine Oil Spill Preparedness and Response Regime, website. www.tc.gc.ca/eng/marinesafety/oep-ers-regime-menu-1780.htm

January 2011 Version 2 Transportation Corridors

Background Document Page 24 of 26

Transport Canada. 2009. CANUTEC. www.tc.gc.ca/eng/canutec/menu.htm

Transport Canada. 2010. Transportation of Dangerous Goods. www.tc.gc.ca/eng/tdg/safety-menu.htm

Transport Canada. 2010 Emergency Response Assistance Plans. www.tc.gc.ca/eng/tdg/erap-menu-72.htm

January 2011 Version 2 Transportation Corridors

Background Document Page 25 of 26

Appendix A – tables

Appendix B-Policy Examples

Appendix B will be added when the SPC gets to the appropriate stage in the policy discussions. The draft policies presented in appendix B are placeholder policies based on the policy ideas noted above. They are presented in this document to facilitate policy discussion at the upcoming SPC meeting. And subsequent review and comment by the Municipal Source Protection Policy Advisory committee.

Policy Number	LT-1
Sub- Threat(s)	N/A
Circumstance	N/A
Vulnerable Area	IPZ (1,2,3)
Risk	N/A
Body Responsible for Implementing	Municipal Watershed Partnership with Conservation Authority to lead. The implementation of this policy in this manner builds on the strengths and efficiencies of the Conservation Authorities as a partnership of the municipalities in the watershed.
Threat Status	Existing and Future
Land Use	All
Legal Effect	Strategic
Policy Tool	Education and Outreach
Policy Idea	<p>Enhance existing education and outreach programs, or if they do not exist, develop new programs to promote Best Management Practices to protect drinking water sources associated with the transportation of fuel and fertilizer along provincial highways and the transportation of liquid petroleum through pipelines including:</p> <ul style="list-style-type: none"> • Raising awareness among fuel distributors (heating oil, private fuel) about the importance of proper transportation and handling within IPZs and the need for timely and adequate spill response • Providing railway operators (i.e. CN, CP, American) with information about IPZs and encourage these operators to upgrade emergency response plan/operations (e.g. input IPZ into GPS so that train operator knows when entering and exiting IPZ) • The implementation of this policy through the existing municipal partnership of the Conservation Authority will allow these programs to be built on existing watershed education and outreach in an efficient manner. The municipalities can be involved in the program development and delivery depending on their individual needs; however the program (s) would be developed in a consistent manner across the region.
Implementation schedule	Within 2 years of the approval of the Source Protection Plan
Monitoring Policy	The implementing body shall be encouraged to report to the SPA the number of educational packages offered as well as a description of the actions/measures they have taken to implement the education/outreach in the previous year. Measures of the uptake of these programs by the target audience will also be included in this report.

Appendix B – policy examples

Policy Number	LT-2a
Sub- Threat(s)	N/A
Circumstance	N/A
Vulnerable Area	IPZ (1,2,3)
Risk	N/A
Body Responsible for Implementing	Municipality
Threat Status	Existing and Future
Land Use	All
Legal Effect	Strategic
Policy Tool	S.26 p.1 Other-Specify Action
Policy Idea	<p>Municipalities shall consider developing municipal traffic regulating bylaws to prohibit transportation of fertilizers and fuel through IPZs.</p> <p>Municipalities shall consider in their decision processes rerouting, where possible, highways and arterial roads around more vulnerable areas.</p> <p>Municipalities shall consider placing road signs at the entrance to IPZs for emergency responders.</p> <p>Municipalities shall consider boosting their emergency response programs to be able to contain chemical spills (e.g. training, equipment).</p> <p>Municipalities shall consider upgrading/reviewing their water treatment response time and equipment.</p> <ul style="list-style-type: none"> • Update spill prevention and spill contingency plans, emergency response plans to identify all IPZs
Implementation schedule	This policy shall be implemented immediately once the Source Protection Plan has been approved.
Monitoring Policy	The municipality shall report annually to the CA the actions taken to reduce spills in vulnerable areas. This report would include if any decisions to reroute highways or arterial roads, the development of traffic regulating bylaws (if any) and if any road signs had been placed within the region.

Appendix B – policy examples

Policy Number	LT-2b
Sub- Threat(s)	N/A
Circumstance	N/A
Vulnerable Area	IPZ (1,2,3)
Risk	N/A
Body Responsible for Implementing	Municipality
Threat Status	Existing and Future
Land Use	All
Legal Effect	Strategic
Policy Tool	S.26 p.1 Other-Specify Action
Policy Idea	<p>Municipalities shall consider boosting their emergency response programs to be able to contain chemical spills (e.g. training, equipment).</p> <p>Municipalities shall consider upgrading/reviewing their water treatment response time and equipment.</p>
Implementation schedule	This policy shall be implemented immediately once the Source Protection Plan has been approved.
Monitoring Policy	Municipalities shall report to the CA the actions that have been taken to reduce spills in terms of emergency response and water treatment response.

Appendix B – policy examples

Policy Number	LT-2c
Sub- Threat(s)	N/A
Circumstance	N/A
Vulnerable Area	IPZ (1,2,3)
Risk	N/A
Body Responsible for Implementing	Municipality
Threat Status	Existing and Future
Land Use	All
Legal Effect	Strategic
Policy Tool	S.26 p. Other-Specify Action
Policy Idea	<ul style="list-style-type: none"> • MOE Spills action centre to review and update procedure cards, municipal contacts based on IPZ delineations • Municipalities shall be encouraged to share the IPZ-3 flow data with the MOE Spills Action Centre.
Implementation schedule	This policy shall be implemented immediately once the Source Protection Plan has been approved.
Monitoring Policy	Municipalities shall submit an annual report to the CA if they have submitted IPZ-3 flow data to the MOE Spills Action Centre.

Appendix B – policy examples

Policy Number	LT-2d
Sub- Threat(s)	N/A
Circumstance	N/A
Vulnerable Area	IPZ (1,2,3)
Risk	N/A
Body Responsible for Implementing	MTO
Threat Status	Existing and Future
Land Use	All
Legal Effect	Strategic
Policy Tool	S.26 p.1 other-specify action
Policy Idea	The province, through the Ministry of Transportation, shall be encouraged to conduct a regional and province-wide review of Emergency Detour Routes. This review would take into consideration the location of these routes through IPZs.
Implementation schedule	This policy shall be implemented immediately once the Source Protection Plan has been approved.
Monitoring Policy	MTO shall submit a report to the CA that would detail the findings of the regional and provincial review of Emergency Detour Routes. The province shall report even if this review has not been completed.