



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

This category of drinking water threat includes: i) the handling of liquid fuel in relation to its storage; and ii) the storage of liquid fuel. The types of storage facilities to be considered are defined in Ontario Regulation 213/01 (Fuel Oil) or Ontario Regulation 217/01 (Liquid Fuels). Both of these regulations are made under the *Technical Standards and Safety Act, 2000*. Although not part of the TSSA Regulations, facilities where fuel is manufactured or refined are also to be considered. The types of fuel storage facilities include:

- bulk plants or facilities where it is manufactured or refined;
- permanent or mobile retail outlets;
- marinas;
- cardlocks/keylocks;
- private outlets (e.g. public works yard, contractor yard);
- farms; and
- furnace oil tanks for home and business heating purposes.

The types of fuels considered include diesel, used oil when used as a fuel, kerosene and hydrocarbon fuel (e.g. gasoline)

The main consideration to reduce or eliminate drinking water threats related the handling and storage of fuel is to prevent fuel spills that could enter surface water or groundwater. A primary objective is to eliminate or manage significant drinking water threats such that they cease to be significant.

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

The Ontario Ministry of the Environment (MOE) has produced the Tables of Drinking Water Threats, herein referred to as the Threats Tables. The Threats Tables identify BTEX compounds and petroleum hydrocarbons (F1 to F4) as contaminants that could make their way into surface water or groundwater from spills associated with the handling of fuel (circumstances 112 to 191 in the Threats Tables) and the storage of fuel (circumstances 1289 to 1408 in the Threats Tables – Ontario Ministry of the Environment, 2009).

BTEX is an acronym for four compounds contained in fuels: benzene, toluene, ethylbenzene and xylene. The BTEX compounds have strong odours and tastes, which generally discourages accidental intake through drinking water. Benzene is a known carcinogen. Some research has also suggested that ethylbenzene may be carcinogenic and could produce birth defects. BTEX are highly water-soluble and can travel long distances

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.*

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in groundwater and surface water environments. Petroleum hydrocarbons (PHC) can cause an array of negative health effects to the reproductive, respiratory, immune and nervous systems and can also harm the kidneys, liver, skin, eyes, and blood. PHC's may also affect the odour, taste, and appearance of water.

Ontario Drinking Water Standards and Objectives (Ontario Ministry of the Environment, 2006)

All the BTEX compounds have Ontario Drinking Water Standards or Objectives. The maximum acceptable concentration in drinking water for benzene is 0.005 mg/L. The aesthetic objectives for ethylbenzene, xylene and toluene are 0.0024 mg/L, 0.3 mg/L and 0.024 mg/L respectively. While there are no Ontario standards, objectives or guidelines specifically for PHCs, the four BTEX compounds noted above are typical components of petroleum hydrocarbons..

The circumstances within the Threats Tables are divided into categories based on the handling of liquid fuel in relation to the type of storage and the volume of fuel stored. The list below summarizes the circumstances related to the potential for fuel spills where BTEX or PHCs could enter groundwater or surface water.

- Above or below grade handling
- Above, partially below or below grade storage
- Storage at a bulk plant or a facility that manufactures or refines fuel
- Storage where fuel is dispensed or used

Volume ranges include:

- Less than 25 litres;
- At least 25 litres, but not more than 250 litres;
- At least 250 litres, but not more than 2500 litres
- More than 2500 litres.

Significant Drinking Water Threats

Significant drinking water threats associated with the handling or storage of fuel are only possible in wellhead protection areas or intake protection zones with vulnerability scores of 10. Many of the circumstances involving more than 2500 litres of fuel are significant. This large volume of fuel is something that is generally associated with a gas station, bulk plant, refinery or manufacturer. Volumes of more than 2500 litres may also occur on farms, works yards or other properties where one or more tanks are used for refueling vehicles or equipment. As well, volumes between 250 and 2500 litres which are stored below or partially below grade can be significant drinking water threats. Home heating oil tanks are typically 900 litres; therefore any which are below grade or partially below grade (within basements) and in an area with a vulnerability score of 10 may be significant drinking water threats. See table 1 in Appendix A for locations of significant threats in the Thames-Sydenham Region.

Moderate Drinking Water Threats

Moderate drinking water threats are possible in: wellhead protection areas A, B and C with a vulnerability score of 8 or greater; and intake protection zones with a vulnerability score of 7 or higher. For surface water in the Thames-Sydenham Region, moderate threats can occur in the IPZ 1 of LAWSS, Town of Petrolia, Wallaceburg, Wheatley Emergency, West Elgin Emergency and the IPZ 2 of Wallaceburg.

The Sarnia Yacht Club is located in the IPZ -1 of LAWSS and as a marina is considered a moderate threat.

Low Drinking Water Threats

Low drinking water threats are possible in: wellhead protection area zones with a vulnerability score of 6 or higher; highly vulnerable aquifers and significant groundwater recharge areas with a vulnerability score of 6; and all intake protection zones with a vulnerability score of 4.8 or greater.

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

Activities related to fuel handling and storage can generally be thought of as those activities where fuel is: stored and used at that location; refined or manufactured; or stored and dispensed.

In the Thames-Sydenham Region, residential fuel tanks and fuel storage for back-up generators at wellheads make up the majority of the significant threats for fuel storage and handling. Significant threats in the region also include retail gas stations, maintenance garages and fuel storage at aggregate sites.

4. *How is the Risk Currently Managed?*

The following section illustrates examples of how these threats are dealt with municipally, provincially, federally or in other jurisdictions.

Federal

Canadian Environmental Protection Act, 1999 (CEPA) gives the federal government the authority to protect the environment and public health from risks associated with pollution and dangerous substances.

The Canadian Environmental Protection Act (CEPA) does not designate fuels as toxic substances unless the “fuel contains toxic substances that are dangerous goods within the meaning of section 2 of the Transportation of Dangerous Goods Act, 1992 and that

- a. are neither normal components of the fuel nor additives designed to improve the characteristics or the performance of the fuel; or
- b. are normal components of the fuel or additives designed to improve the characteristics or performance of the fuels, but are present in quantities or concentrations greater than those generally accepted by industry standards.”

As such, there are no special federal regulations, guidelines or codes of practice to be considered for this category of drinking water threat.

Provincial

There are three pieces of provincial legislation that deal specifically with the storage and handling of fuel. Two are regulations under the *Technical Standards and Safety Act, 2000* and one is the Ontario Fire Code Ontario Regulation 213/07. It must be noted that the Ontario Fire Code is superseded by the TSSA regulations where there is overlap.

The Technical Standards and Safety Authority (TSSA) is an independent, non-government, non-profit organization that has provincial jurisdiction over safe and responsible handling of petroleum products used as motor or appliance fuel (i.e. gasoline, diesel/fuel oil, natural gas and propane). The TSSA is responsible for enforcement of the *Technical Standards and Safety Act, 2000* and the related regulations. The specific areas of jurisdiction are retail outlets (gas station, marina, cardlock/keylock), private outlets (farm, business, residence), bulk plants (not refineries) and tank vehicles (trucks, not railcars).

A Code of Adoption Document and associated Director's Orders have been produced for both O.Reg 213/01 (Fuel Oil) and O.Reg. 217/01 (Liquid Fuels). Neither of these regulations addresses waste oil not used as fuel or facilities that manufacture or refine fuel.

The Codes are an extension of the respective regulations and generally include information about:

- Aboveground and underground storage tank installation requirements
- Acceptable equipment storage
- Environmental responsibilities
- Licensing requirements
- Maintenance requirements and inspections

(TSSA presentation to Source Water Protection Managers and Chairs, September 2010)

Ontario Regulation 213/01: Fuel Oil (Government of Ontario, 2001)

Section 2(1): “This Regulation applies to the installation, testing, maintenance, repair, removal, replacement, inspection and use of appliances, equipment, components and accessories where fuel oil is to be used as a fuel, but it does not apply to equipment referred to in Ontario Regulation 217/01 (Liquid Fuels) or to the transmission of fuel under Ontario Regulation 210/01 (Oil and Gas Pipeline Systems).”

(2) This Regulation applies to the maintenance, modification and specified upgrading of existing equipment and to all new equipment.

It applies specifically to:

- a. Appliances, equipment, components, and accessories where oil is used for fuel purposes such as
 - i. Forced-air furnaces;
 - ii. Boilers;
 - iii. Process furnaces;
 - iv. Water heaters;
 - v. Vehicle heaters; and
 - vi. Power supplies for buildings
- b. All stationary and portable oil-burning equipment, including fuel supply equipment and piping; and
- c. Aboveground and underground tanks.

- It requires licensing or certification for anyone who undertakes any of the activities noted above as well as for fuel delivery where fuel oil is used in an appliance for fuel.
- Fuel oil cannot be delivered unless the situation complies with the Regulation, it has been inspected at least once in the last ten years and the tank has been registered, if it is underground.
- No new appliances or equipment can be put into use until a satisfactory inspection is conducted by the distributor.
- Depending on the severity of an unacceptable condition related to an appliance or tank system fuel, delivery will be refused and the fuel oil supply may be shut off.

The Code that goes along with O.Reg 213/01, Ontario installation code for oil-burning equipment, 2006, provides more detailed requirements and recommendations including items of interest for drinking water protection. The following list presents items of interest for drinking water protection.

- Inspections are required once every ten years (i.e. some fuel distributors do not have a policy to require annual inspections).
- Underground storage tanks cannot be located closer than 15 m to drilled wells and 30 m to dug wells or waterways
- Above ground storage tanks greater than 5000 L require secondary containment
- Above ground and underground storage tanks are allowed in flood prone areas if equipped to prevent uplift.
- The six inch gap between the drop tube and the bottom of underground storage tanks means that this fuel cannot be pumped out in instances where there is tank disuse or a leak.

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- The minimum detection limits for underground storage leak detection are not zero and some do not include automated alarms; therefore, a month could pass before a leak is detected.
- Single –walled tanks are permitted (double walled tanks will be required 2011)
- Registration of underground storage tanks was not required until 2001 so any that have not been filled since that time are unknown and could be impacting drinking water sources.

Ontario Regulation 217/01: Liquid Fuels (Government of Ontario, 2001)

Section 2(1): “This Regulation applies to facilities where gasoline or an associated product is handled, loaded or dispensed to be used as a fuel in motor vehicles or as a fuel oil.”

This includes facilities where gasoline or an associated product is handled, loaded or dispensed to be used as a fuel in motor vehicles or as a fuel oil. This includes a permanent or mobile retail outlet, bulk plant, marina, cardlock/keylock, private outlet or farm where gasoline or an associated product is handled other than in portable containers.

The Regulation requires:

- Annual licenses for facilities and registration for contractors
- reporting for an occurrence, spill or accident
- depending on the severity of an unacceptable condition the supply of gasoline may be stopped and orders given to fix the situation
- locations of wells must be included in applications for a license

The Code that goes along with Ontario Regulation 217/01, Liquid Fuels Handling Code, 2007, provides more detailed requirements and recommendations including items of interest for drinking water protection. The following list presents items of interest for drinking water protection.

- All tanks must be double-walled
- Underground storage tanks cannot be located closer than 15 m to drilled wells and 30 m to dug wells or waterways
- Above ground and underground storage tanks are allowed in flood prone areas.
- Storage tanks at marinas must be located no closer than 5 m horizontally from the normal annual high-water mark
- It is the responsibility of the facility owner to report spills and leaks
- The six inch gap between the drop tube and the bottom of underground storage tanks means that this fuel cannot be pumped out in instances where there is tank disuse or a leak.
- Under Ontario Regulation 217/01 a license is not required if gasoline is used to ballast an underground storage tank

Environmental Management Protocol (EMP) for Fuel Handling Sites in Ontario

The “Environmental Management Protocol (EMP) for Fuel Handling Sites in Ontario” (Technical Standards and Safety Association, 2007) includes requirements under Ontario Regulation 153/04, Records of Site Condition, made pursuant to the Ontario Environmental Protection Act. It includes reporting, investigation and cleanup management for leaks, spills and discoveries (i.e. historical contaminants) at operating sites.

Enforcement of fuel release requirements (i.e. reporting and cleanup) is shared by TSSA and MOE. A memorandum of understanding between the two organizations was established in 1997 for all operational sites (i.e. fuel equipment is on site) as defined in the Liquid Fuels and Fuel Oil Regulations. TSSA is the lead except

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where a drinking water supply is affected or off-site migration is likely to occur, other than to municipally owned properties (e.g. roadways).

Once the fuel handling equipment (i.e. tanks, dispensers, lines) is removed and the environmental requirements from the Codes are implemented, the site is considered permanently closed and any outstanding environmental matters are MOE's responsibility. In cases where tanks are abandoned, TSSA tries to find the owner and order removal of the equipment, but TSSA can not take care of any environmental issues, such as removing fuel from the tanks.

The following is a summary of information contained in the Environmental Management Protocol that is relevant to source water protection.

Spill reporting: Spills that must be reported include more than 100 litres of product where there is no public access (i.e. bulk plants, private outlets and residences) and more than 25 litres where there is public access. All leaks must be reported since this is a result of equipment failure. Sites where there are spills less than the minimums must be reported if it could: create a public health or safety hazard; contaminate a fresh water source or a waterway; interfere with the rights of any person; or enter into a sewer system, underground stream or drainage system.

Discovery within property boundary: Reporting and actions are required if a separate phase product or vapour is found in a monitoring well, excavation or vapour is found in an enclosed space.

Soil Condition Standards (SCS): Determining the applicable SCS depends on a number of considerations including: groundwater potability; land use classification; soil texture; depth of overburden; soil pH; and whether a full depth or stratified remediation will be completed. Non-potable criteria are applied if the drinking water supply to the site and the surrounding area is not groundwater and also where groundwater is considered potable, but where a risk assessment has been accepted by the MOE to use the non-potable criteria. The acceptable levels of contaminants in potable water are the same as the Ontario Drinking Water Standards noted above in Section 2 and also include concentrations for some hydrocarbon fractions. The acceptable levels for non-potable water are much higher and would apply to areas within IPZ1.

Applying the SCS: No reporting or action is required as long as the SCS are met at the property boundary. If the SCS are exceeded, the area that exceeds must be delineated and mitigated through remediation.

Contaminant Management Plan (CMP): A CMP allows SCS to be exceeded on site with regular reporting to TSSA and agreement from any affected property owners to implement the CMP if off-site impact has occurred. A CMP cannot be applied if immediate corrective action is required (i.e. there is presence of a separate phase product, explosive levels of vapour are accumulating, there is a potential for off-site migration or there is any other situation that is unsafe for continued use).

Permanent Closures: Closures require compliance with the Liquid Fuel Handling Code (permanent tank closure and environmental restoration).

Qualifications: All reports (site investigations, site assessments, site remediation and CMPs) must be completed by a qualified person.

Property Owner Responsibilities: Property owners are responsible for investigation and mitigation of petroleum impacts as follows:

- Spills: investigate the extent and remediate as required
- Leaks: fix the leak, investigate the extent and remediate or manage via a Contaminant Management Plan
- Discovery: determine that it is not a result of an active leak, investigate the extent and remediate or manage as per CMP

Ontario Regulation 213/07: Fire Code (Government of Ontario, 2007)

Part 4 of the Fire Code made under the Fire Protection and Prevention Act, 1997 deals with flammable and combustible liquids; however, it is superceded by the TSSA regulations, except where fire prevention, fire protection and spill containment are concerned.

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

Under the Ontario Environmental Protection Act, fuel cannot be released to the environment where it could cause an adverse effect. As well, spills must be reported.

Section 14 of the Ontario Environmental Protection Act prohibits the discharge of a contaminant into the natural environment if the discharge causes or may cause an adverse effect. This term is defined by Ontario Regulation 339.

“Adverse effect means one or more of:

- (a) impairment of the quality of the natural environment for any use that can be made of it,
- (b) injury or damage to property or to plant or animal life,
- (c) harm or material discomfort to any person,
- (d) an adverse effect on the health of any person,
- (e) impairment of the safety of any person,
- (f) rendering any property or plant or animal life unfit for human use,
- (g) loss of enjoyment of normal use of property, and
- (h) interference with the normal conduct of business”.

Section 92(1) of the EPA requires any person with control of a pollutant that is spilled or who notices a spill to notify the Ministry, the applicable municipality, the owner of the pollutant and the person with control of the pollutant of the spill.

There is a [Spills Action Centre](#) run by the Ontario Ministry of the Environment where people can call to report a spill so that a response can be coordinated.

Clean Marine Program

The Ontario Marine Operators Association and its partners have a voluntary program for environmental best management practices. Every marina that is a Clean Marine member must pass an environmental audit by a third party firm licensed by Environment Canada. The end result is a comprehensive review and an “Eco-rating”. Over 200 environmental practices including fueling are considered. The rating ranges from 1 to 5 anchors and now an additional 12 criteria may bring them to gold, diamond or platinum status. There are more than 600 marinas, marine dealers, yacht clubs and associated companies that belong to the Ontario Marine Association of Ontario and currently there are 100 marinas with five anchors (Ontario Marine Association of Ontario, Nov 2010).

One of the perks of the program is that insurance discounts are possible and generally in proportion to the eco-rating since it is recognized that the level of risk is reduced via program participation.

The Clean Marine Practices Handbook, 1997 as amended, notes legislation and best management practices that apply to fuel handling and storage. In general, the handbook indicates that any handling of fuel near water must be done with extreme caution. It offers specific measures that either must or could be implemented to prevent fuel from entering the water including spill prevention, reporting and storage tank management.

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Municipal

Through development agreements under the *Planning Act* municipalities may be able to require that any new residential development only be permitted if a source of heat other than oil is implemented or that all tanks for any type of use be above ground and double walled. A municipality may also review whether its authorities under the *Municipal Act* (s. 10-11) support a by-law enacted to protect public health, safety and the environment by restricting the type and structural requirements of fuel storage.

Gaps in existing legislation, policies and programs

- Bio-fuels
- Pipelines that cross waterways
- Waste oil not used as a fuel is not considered in the Tables of Drinking Water Threats
- Replacement of piping systems is not required after a certain time frame and they are often the points of product loss.
- Contamination at gas stations is common. It is generally contained within 100 m from the point of release unless an extensive fracture network is encountered.
- Fuel oil tank inspections are only required every ten years by the TSSA Regulation. However, fuel distributors often require annual inspections for insurance purposes.
- Single-walled tanks for fuel oil are permitted in some circumstances
- Underground storage tanks for fuel oil are not prohibited; however, increased installation, monitoring and insurance costs discourage their use.
- No certification is required for people delivering fuel
- Storage tanks are allowed in areas subject to flooding if certain measures are followed.
- TSSA inspects public outlets every three years, but they do not inspect private outlets unless they are invited by the owner/operator. This is because they are not licensed as the other facilities are.
- Records for TSSA 10 year inspections reside with the fuel provider.
- Tank design generally prevents the bottom six inches of fuel from being pumped from unused storage tanks.

5. Policy Considerations

- REMINDER: The main consideration for reducing or eliminating drinking water threats related to fuel handling and storage is to prevent spills or have appropriate spill response.
- There is widespread storage and handling of fuels in the Thames-Sydenham Source Protection Area.
- All policy tools other than prescribed instruments are available to address this drinking water threat with the caveat that risk management plans, prohibition and the related restricted land use options only apply to significant drinking water threats.
- Larger volumes of fuel storage and underground storage tanks are greater drinking water threats. However, the MOE threat volumes are based on tank sizes and not on frequency of refills. Greater frequency of filling tanks increases the volume of fuel handled over a given time period and increases the risk of a spill or leak.
- The CWA uses the terms above, below or partially below grade, whereas the TSSA uses the terms below or above ground. The difference in the use of terms is intentional as the nature of the two sets

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of terms is different. Under the CWA the terms help understand the impact a leak or spill from a tank would have on either groundwater or surface water sources in the absence of protective measures. Therefore, the location of the tank compared to grade is the key indicator of potential for contamination of either groundwater (below or partially below grade tanks) or surface water (above grade tanks). Using the TSSA code, the terms are used to set out the different design specifications of a system to prevent a spill. Therefore, the physical location of the tank relative to the ground surface is the determining factor. If the two sets of terms were aligned, we could not be able to adequately characterize the circumstances under which a fuel tank in a basement poses a risk to groundwater quality. When looking at how to manage a threat, MOE expects the measures considered would line up with the above and below ground definitions in the TSSA codes. This is where it is appropriate for the TSSA definitions to apply as then we are dealing with prevention of spills and leaks. (MOE correspondence)

- The source protection plan will need to include a high-level policy approach (“a catch-all policy”) to address those “would be” drinking water threats that are unlikely to occur in a given vulnerable area so that they would be eliminated (e.g. oil refineries).
- It should be noted that the fuels industry is well regulated with many checks and balances.
- Fuel oil tank inspections are only required every ten years by the TSSA Regulation. However, fuel distributors often require annual inspections for insurance purposes.
- Single-walled tanks for fuel are permitted on farms only
- Underground storage tanks for fuel oil are not prohibited; however, increased installation, monitoring and insurance costs discourage their use. Double-walled tanks are mandatory for below ground.
- TSSA inspects public outlets every three years, but they do not inspect private outlets unless they are invited by the owner/operator. This is because they are not licensed as the other facilities are. (e.g. TSSA is not actively involved in Aggregate Sites but their codes apply)
- Records for TSSA 10 year inspections reside with the fuel provider.
- There are limited Prescribed Instruments available. The Aggregate Resources Act only speaks to the location of fuel tanks. The OWRA can address fuel storage in Water Works Permits.
- The Fire Code is revised every 5 years which includes propane and liquid fuel considerations. Fire Departments undergo new training.
- Outdoor tanks are inspected every time they are filled. Internal tanks can only be inspected every 10 years as there is no access to the tanks upon filling.
- Leaks inside homes should be easy to detect as they start slowly (e.g. a drip and hour) and should be detectable by smell and drips on floor quickly. Response from TSSA, insurance and distributor is very quick. Problem with cottages and other seasonal occupancy and elderly.
- Insurance companies are asking for tanks to be installed outside.
- Most tanks are safe (99%), however, there remain a few that undergo pre-mature corrosion. TSSA does analysis on this risk group. Manufacturers certify tanks.
- Most problems with home heating oil are due to human error.
- Gas stations generally have alarm systems to catch any spills. Card keylocks will have timeouts on the keylock. While unmanned, keylocks are supervised via computer from elsewhere.
- Currently it is not within TSSA or MOE’s jurisdiction to address abandoned fuel sites. The SPC has no directive to indicate an implementer for policies addressing abandoned sites/ brownfields. No records exist of fuel tanks prior to 1997. Any tank must be removed within 2 years of disuse. However, abandoned tanks are those that have been left.
- Storage of waste oil and underground tanks at service centres are not regulated by TSSA. Waste oil is considered as a waste threat.

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- TSSA conducts inspections on a cost-recovery basis. Once TSSA is on-site for an inspection they are invested in the inspection and would have the authority to shut someone down.
- Reporting exemptions exist for fuel spills less than 100 L if immediately remediated and it does not affect water. Clean-up is still required.
- There are very few private underground storage tanks remaining as they have been part of TSSA scheduled removing of old tanks.
- Small towns like St.Marys and Dorchester may not be in favour of complete prohibition of future fuel related activities in significant areas in fear of discouraging industry.

6. *Proposed policy ideas*

For discussion purposes, this section of the report provides examples of policy ideas that could be applicable to the subject threat in the Thames-Sydenham and Region. It is not an exhaustive list. Each policy tool is discussed separately in the table below.

Threat:	The Handling and Storage of Fuel
Circumstances	<ul style="list-style-type: none"> • Above and below grade storage of greater than 2500 litres • Below grade or partially below grade of volumes 250-2500 litres • Below grade handling greater than 2500 litres • Storage at Bulk Plant or facility that manufactures or refines fuels

Policy Tool	Policy ideas	
Education and Outreach	<ul style="list-style-type: none"> • Put stickers on home heating oil tanks with a spill response number and an indication that the tank is located within a specific vulnerable area. • Inform fuel distributors about spill cleanup, vulnerable areas, and encourage annual inspections where companies are not already doing so • Support/encourage participation in the Clean Marine Program in Sarnia • Provide information to gas companies and franchise owners informing about the vulnerable areas and promoting BMPs and training of staff • Education program targeted for private outlets to meet TSSA standards • Inform fuel distributors about source water protection and vulnerable areas. Incorporate drinking water vulnerability as part of fuel distributor check-list for installing new tanks. • Extra signage about drinking water protection and spills reporting at card keylocks 	<ul style="list-style-type: none"> •

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	<ul style="list-style-type: none"> Educate fire departments especially in the 401 corridor, as to proper spills response Educate private residence to report any spill in a WHPA-A or B with a vulnerability score of 10 to the municipality. Encourage/Require use of Emergency Management Plans <p>Encourage all spills in vulnerable areas to be reported in some way to Water Operators (where exempt from MOE and municipal reporting)</p>	
Incentive Programs	<ul style="list-style-type: none"> Incentives to replace underground storage tanks with above ground storage tanks for heating oil and private fuel outlets Provide incentives for double-walled tanks Address underground storage tanks at abandoned gas stations 	•
Land Use Planning	<ul style="list-style-type: none"> No new gas stations, permanent or mobile retail outlets, marinas, cardlocks/keylocks, bulk plants or facilities that manufacture or refine fuels, in areas where the threat would be significant. Include a requirement for spill containment in site plan control agreements for new gas stations Municipalities can require expanding gas stations to require an oil/water separator for surface spills Avoid locating new marinas in IPZ-1 within limits of site-specific considerations. 	•
Prescribed Instruments	<ul style="list-style-type: none"> Through the Aggregate Resources Act, permits can speak to the handling procedures of fuel and the location of fuel tanks such as keeping them out of the specific quarry or pit area. Through Water Works Permits, a Certificate of Approval which addresses back-up generators can require double-walled tanks or secondary containment, with proper inspection. Through Sewage Works Permits, Certificate of approval applications which address back-up generators can require double-walled tanks or secondary containment, and proper inspection. 	•
Municipal Operations/ Infrastructure	<ul style="list-style-type: none"> Include fuel appliance and equipment reviews in annual infrastructure inspections (employ a certified technician for this aspect) Ensure proper staff training for fuel pumps Encourage fire prevention officers or RMO to in part educate residents and business owners about spill containment 	•

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	<ul style="list-style-type: none"> • Have municipalities identify and record abandoned site locations in their course of business. 	
Risk Management Plans	<ul style="list-style-type: none"> • Require design standards for spill containment at all existing and expanding gas stations, fuel distributors etc. • Require all farms and other private sites where fuels are stored and are a significant drinking water threat to have a double-walled tank. • Require RMP for all fuel storages associated with back-up generators • Activities (private outlets) not regulated under TSSA shall be required to do a RMP that meets TSSA standards as a minimum. • RMO and individuals/ business owners will need access to expertise • Recommend private outlets be part of inspection an program 	•
Prohibition	<ul style="list-style-type: none"> • Preference to use land use planning to restrict future expansion and development. • Prohibit new refineries, manufacturers, gas stations, bulk plants, fuel distributors from establishing in WHPA A and B • Prohibit expanding gas stations, fuel distributors etc. from expanding within WHPA A-B 	•
Restricted Land Uses	<ul style="list-style-type: none"> • Flag all types of land use that could be connected to fuel storage and handling activities. 	•
Monitoring without Action	<ul style="list-style-type: none"> • TSSA to monitor the effectiveness of their program. • Prioritize abandoned/decommissioned gas stations for monitoring (e.g. any located in WHPAs) 	•
Other/ Specify Action	<ul style="list-style-type: none"> • Encourage MOE to decrease the minimum volume spill reporting requirements in areas where fuel threats are significant • Have all spills within vulnerable areas fall under MOE jurisdiction because of threat to drinking water rather than TSSA for on-site spills. • Recommend private outlets be part of inspection program • The province of Ontario should consider funding and/or setting up a program to prioritize the monitoring and proper decommissioning of abandoned fuel sites. 	•

7. *Reference List*

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The Handling and Storage of Fuel

Table 1: Number of enumerated locations of potential significant threats

The Handling and Storage of Fuels

System	Type	Number of Locations	Vulnerable Area	Vulnerability Score	Circumstance description
Birr	Chemical	12	WHPA-A	10	back-up generator at well field, residential fuel tanks
Dorchester	Chemical	56	WHPA-A,B	10, 6	back-up generators, communication tower fuel oil tanks at farms
Kilworth-Komoka	Chemical	2	WHPA-A	10	back-up generator at wellhead, aggregate potential,... fuel oil spill occurred at back-up generator (condition)
City of London-Fanshawe	Chemical	6	WHPA-A,B	10	fuel storage at aggregate, backup generator at well-field, residential properties
City of London-Hyde Park	Chemical	1	WHPA-A	10	well field back-up generator
Melrose	Chemical	24	WHPA-A,B	10	residential fuel tanks, back-up generator at well-head, maintenance garage
Embros	Chemical	1	WHPA-A	10	
Ingersoll	Chemical	4	WHPA-A, B	10, 8, 6	
Mount Elgin	Chemical	13	WHPA-A	10	
Tavistock	Chemical	2	WHPA-A	10	
Woodstock-urban	Chemical	3	WHPA-A	10	
Woodstock-rural	Chemical	12	WHPA-A, B	6, 10	
Mitchell	Chemical	3	WHPA-A,B	10,6	
St.Marys	Chemical	6	WHPA-A,B	8, 10	6 handling, 6 storage
Ridgetown	Chemical	25	WHPA-A	10	residential fuel tanks, tanks for back-up generators at well heads
Highgate	Chemical	24	WHPA-A	10	gas station, residential fuel tank
Total Number of Locations		194			

* There are no fuel storage and handling significant threats identified in the WHPAs of Sebringville, St.Pauls or Shakespeare

Draft Policies

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	15-1
Sub- Threat(s)	Handling and Storage of Fuel
Circumstance	Fuel Storage and Handling over 2500L
Vulnerable Area	WHPA A and B.
Risk	Significant
Body Responsible for Implementing	CA to lead in cooperation with other agencies
Threat Status	Existing, Future
Land Use	Commercial, Industrial
Legal Effect	Conform
Policy Tool	Education/Outreach
Policy	<p>a. Area wide education campaign on fuel as drinking water threat and spills handling and response</p> <p>b. An outreach program which targets all fuel stations in vulnerable areas to inform owners of drinking water threat. Provide package to educate and train employees and users (especially for cardlock).</p> <p>c. Spills and leaks education for home oil heating</p> <p>d. Include source water protection messaging through TSSA</p>
Implementation schedule	Initiate upon approval of SPP
Monitoring Policy	

Policy Number	15-2
Sub- Threat(s)	Handling and Storage of Fuel
Circumstance	Fuel Storage and Handling over 2500L
Vulnerable Area	WHPA A and B.
Risk	Significant
Body Responsible for Implementing	Municipality
Threat Status	Future
Land Use	Commercial, Industrial
Legal Effect	Conform
Policy Tool	Prohibition, Restricted Land Use
Policy	No new bulk plants or refineries shall be located in a vulnerable area with a score of 10. Bulk plants and refineries should be discouraged in WHPAs with a vulnerability score of 6 or higher and in IPZs with a vulnerability score of 4.8 or greater.
Implementation schedule	Shall be initiated within 6 months of approval of SPP, and updated in all Official Plans within 2 years; bylaws within 3 years of the Source Protection Plan approval date.
Monitoring Policy	Municipality to report annually to SPC on any applications submitted and decisions associated with those applications.

Policy Number	15-3
Sub- Threat(s)	Handling and Storage of Fuel
Circumstance	Fuel Storage and Handling over 2500L
Vulnerable Area	WHPA A and B.
Risk	Significant
Body Responsible for Implementing	Municipality
Threat Status	Future
Land Use	Commercial/ Industrial
Legal Effect	Conform
Policy Tool	Land Use Planning, Restricted Land Use
Policy	Future permanent or mobile retail fuel outlets and cardlocks/ keylocks shall be prohibited from locating in vulnerable areas with a score of 10.
Implementation schedule	To be updated in all Official Plans within 2 years of the Source Protection Plan approval date and bylaws within 3 years of the Source Protection Plan approval date.
Monitoring Policy	Municipality to report annually to SPC on any applications submitted and decisions associated with those applications.

Policy Number	15-4
Sub- Threat(s)	Handling and Storage of Fuel
Circumstance	Fuel Storage and Handling over 2500L
Vulnerable Area	WHPA A and B
Risk	Significant
Body Responsible for Implementing	Municipality
Threat Status	Existing, expanding
Land Use	Commercial/ Industrial
Legal Effect	Conform
Policy Tool	Risk Management Plan
Policy	Existing or expanding permanent or mobile retail fuel outlets and cardlocks/ keylocks located in a vulnerable area with a score of 10, must require a Risk Management Plan. The RMP must meet standards as outlined for spill containment and protocol.
Implementation schedule	Shall be initiated within 6 months of approval of SPP, and updated in all Official Plans within 2 years; bylaws within 3 years of the Source Protection Plan approval date.
Monitoring Policy	Municipality to report annually to SPC on any applications submitted and decisions associated with those applications.

Policy Number	15-5
Sub- Threat(s)	The handling and storage of fuel
Circumstance	Fuel storage and handling over 2500L.
Vulnerable Area	WHPA-A and B with a vulnerability score of 10
Risk	Significant
Body Responsible for Implementing	Municipality
Threat Status	Future
Land Use	All
Legal Effect	Conform
Policy Tool	Restricted Land Uses
Policy	Flag all types of land use that could store fuel.
Implementation schedule	Shall be initiated within 6 months of approval of SPP, and updated in all Official Plans within 2 years; bylaws within 3 years of the Source Protection Plan approval date.
Monitoring Policy	Report annually to SPA on number of applications flagged, type of use, and decision on how application proceeded.

Policy Number	15-6
Sub- Threat(s)	Handling and Storage of Fuel
Circumstance	Fuel Storage and Handling, over 2500 L
Vulnerable Area	WHPA A and B
Risk	Significant
Body Responsible for Implementing	Municipality
Threat Status	Significant
Land Use	Municipal
Legal Effect	Conform
Policy Tool	Specify Action
Policy	Back-up generator fuel at well heads shall follow safety protocol and training to ensure the threat is no longer significant.
Implementation schedule	Within 6 months of approval of SPP
Monitoring Policy	Report back to SPC on implementation and details of protocol and training.

Policy Number	15-7
Sub- Threat(s)	
Circumstance	Fuel Storage and Handling, over 2500L Fuel Storage below grade or partially below grade 250-2500 L
Vulnerable Area	All vulnerable areas
Risk	Significant, Moderate, Low
Body Responsible for Implementing	MOE, TSSA
Threat Status	existing
Land Use	Commercial/Industrial
Legal Effect	Strategic action
Policy Tool	Specify Action: Spills notification
Policy	That MOE be the lead on all spills occurring within vulnerable areas.
Implementation schedule	Upon approval of SPP
Monitoring Policy	

Policy Number	15-8
Sub- Threat(s)	
Circumstance	Fuel Storage and Handling, over 2500L
Vulnerable Area	WHPA A and B with a vulnerability score of 10
Risk	Significant
Body Responsible for Implementing	MOE
Threat Status	existing
Land Use	Commercial/Industrial
Legal Effect	Strategic action
Policy Tool	Specify Action
Policy	Priority shall be given to remove unused storage tanks at abandoned gas stations within vulnerable areas with a score of 10.
Implementation schedule	Upon approval of SPP
Monitoring Policy	

Policy Number	15-9
Sub- Threat(s)	
Circumstance	Storage of Fuel between 250 – 2500 L, below grade or partially below grade
Vulnerable Area	WHPA A and B with a vulnerability score of 10
Risk	Significant
Body Responsible for Implementing	
Threat Status	Existing, Future
Land Use	Residential
Legal Effect	
Policy Tool	Specify Action
Policy	
Implementation schedule	
Monitoring Policy	

Appendix B – draft policies

Policy Number	15-10
Sub- Threat(s)	
Circumstance	
Vulnerable Area	WHPA A and B with a vulnerability score of 10
Risk	Significant
Body Responsible for Implementing	
Threat Status	
Land Use	All
Legal Effect	
Policy Tool	Incentives
Policy	
Implementation schedule	
Monitoring Policy	