

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

The focus of this discussion paper is on waste disposal sites, which is a subthreat of prescribed drinking water threat 1-the establishment, operation or maintenance of a waste disposal site within the meaning of Part V of the Environmental Protection Act (EPA). The main consideration for reducing or eliminating drinking water threats related to waste disposal sites is to make sure that any discharge from the sites does not result in a significant risk to drinking water through appropriate measures to mitigate the threat.

Waste disposal sites may be active, inactive (i.e., are no longer used, but did not follow a closure plan) or closed and are defined as any land, building, or structure in connection with the depositing, disposal, handling, storage, transfer, treatment or processing of waste. Operational activities associated with these sites are also included in the definition. Waste includes: ashes, garbage, refuse, domestic waste, industrial waste, or municipal refuse and such other materials as are designated in the regulations under the Act.

The following types of waste disposal sites are indicated in the MOE Tables of Drinking Water Threats (2008, as amended in 2009):

- Land farming of petroleum refining waste- Landfarming is defined by O. Reg. 347 as the biodegradation of petroleum refining wastes by naturally occurring soil bacteria by means of controlled application of the wastes to land followed by periodic tilling.;
- Landfilling of hazardous waste- Landfilling is the process of the disposal of waste by deposit, under controlled conditions, on land or on land covered by water, and includes compaction of the waste into a cell and covering the waste with cover materials at regular intervals. Hazardous waste includes the following: hazardous industrial waste, acute hazardous waste chemical (includes commercial waste chemical), hazardous waste chemical, ignitable waste; corrosive waste; reactive waste (except radioisotope as per the Canadian Nuclear Safety Commission); pathological waste; leachate toxic waste or PCB waste;
- Landfilling of municipal waste- Municipal Waste is any waste, whether or not it is owned, controlled or managed by a municipality (except hazardous waste, liquid industrial waste or gaseous waste) and solid fuel that is derived in whole or in part from waste.;
- Landfilling of solid, non-hazardous industrial or commercial waste- Non-Hazardous Industrial waste means industrial waste that is not liquid industrial, hazardous or asbestos waste. Commercial waste includes asbestos waste;
- Liquid industrial waste injection into a well- Liquid Industrial waste as defined by O. Reg. 347 is both liquid waste and industrial waste that has a slump of more than 150 millimeters using the Test Methods for the Determination of Liquid Waste (slump test) set out in Schedule 9 of the regulation.;
- PCB (Polychlorinated biphenyl) waste storage- PCB (monochlorinated or polychlorinated biphenyl) waste is defined by O. Reg 362 as means of PCB equipment, PCB liquid or PCB material excluding the outlined as exemptions.;

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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- Storage of hazardous waste at disposal sites- Storage of Hazardous Waste at disposal sites is defined in the Drinking Water threat tables as hazardous waste or liquid industrial waste stored at or below grade that has the potential to discharge waste into surface and groundwater.; and,
- Storage of certain hazardous wastes- Clauses (p), (q), (r), (s), (t), or (u) include small quantities of hazardous waste, the storage of empty hazardous waste containers, and the storage of residues or contaminated materials from the cleanup of a small spill, meaning they are also considered drinking water threats..

Waste disposal sites do not apply to the storage or disposal on a private property, unless the situation becomes a nuisance (Director's decision), or where the activity would fall under the Ontario Water Resources Act (e.g. sewage disposal, water quality impacts). Future waste disposal sites must be located in an area which will not create a significant drinking water threat.

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

There are thirty-five (35) chemicals (circumstances 1533 to 1943) listed in the MOE Tables of Drinking Water Threats and shown in Table 1 below (Ontario Ministry of the Environment, 2009). These chemicals have the potential to be introduced into surface and groundwater as a result of the storage and land disposal of a prescribed waste.

Table 1: Chemical Threats Associated with the Storage and Land Disposal of a Prescribed Waste

Threat Grouping	Chemical Parameter
Land Disposal of Municipal Waste (O. Reg. 347 s. 1 land disposal definition clauses (a) & (b))	Arsenic, Barium, BTEX, Cadmium, Dichlorobenzene-1,4, Lead, Mercury, Nitrogen, Selenium, Trichloroethylene (DNAPL), Uranium, Vinyl chloride (DNAPL)
Land Disposal of Industrial Waste or Commercial Waste (O. Reg. 347 s. 1 land disposal definition clause (c))	
Land Disposal of Municipal Waste (O. Reg. 347 s. 1 land disposal definition clauses (a) & (b))	Arsenic, Barium, BTEX, Cadmium, Dichlorobenzene-1,4, Lead, Mercury, Nitrogen, Selenium, Trichloroethylene (DNAPL), Uranium, Vinyl chloride (DNAPL)
Land Disposal of Petroleum Refining Waste (O. Reg. 347 s. 1 land disposal definition clause (d))	BTEX, PAHs, Petroleum Hydrocarbons (F1-F4)
Land Disposal of Hazardous Waste, Liquid Industrial Waste or Processed Liquid Industrial Waste (O. Reg. 347 s. 1 land disposal definition clauses (a) & (b))	Arsenic, Barium, Cadmium, Chromium VI, D-2,4, Lead, Mercury, PCBs, Selenium, Silver, 2,4,5-T, Uranium
A Site that is Not Approved to Accept, but Does Accept a Hazardous or Industrial Waste (O. Reg. 347 waste description clauses (p), (q), (r), (s), (t) or (u); hazardous waste definition clause (d))	Arsenic, Barium, Cadmium, Chromium VI, D-2,4, Lead, Mercury, Selenium, Silver, 2,4,5-T
Storage of Hazardous Waste at Disposal Sites (as defined in O. Reg. 347 (General – Waste Management), R.R.O. 1990)	
PCB Waste Storage at Disposal Sites (as described in O. Reg. 362 s.3 or in accordance with clause 8(a))	PCBs
Liquid Industrial Waste Injection into a Well (as defined in O. Reg. 347 (General – Waste Management), R.R.O. 1990)	Arsenic, Atrazine, Barium, Bis(2-ethylhexyl) phthalate, BTEX, Cadmium, Carbofuran, Chlorobenzene, Copper, Cyanide (CN-), Dichlorobenzene-1,2 (ortho),

Threat Grouping	Chemical Parameter
	Dichlorobenzene 1,4 (para), Hexachlorobenzene, Hexachlorocyclopentadiene, Lead, Mercury, PCBs, Oxamyl, 1,2,4-T, Trichloroethane-1,1,1, Trichloroethylene (DNAPL), Vinyl Chloride (DNAPL), Zinc

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

Existing and historic waste disposal sites may be identified within intake protection zones (IPZ) and wellhead protection areas (WHPA). A number of sites are more likely to be present within the highly vulnerable aquifers (HVAs) and significant groundwater recharge areas (SGRAs) as they generally cover a greater geographical area. It is unlikely that future waste disposal sites will be permitted in an IPZ or WHPA, although there is currently no legislation preventing their establishment.

Significant Threat

In most instances, any waste disposal site (particularly medium to large operations) located within a WHPA A or B or IPZ-1 could constitute a significant threat. Acceptance of hazardous waste or industrial waste in small quantities, if stored above, or partially above grade increases the potential for even small municipal operations to be identified as a significant drinking water threat.

Moderate/Low Threat

In WHPA C and D, there is considerable variability, although a waste disposal site will likely be classified as a moderate or low threat. The land disposal or storage of waste (at a waste disposal site) is generally classified as a low threat within Highly Vulnerable Aquifers (HVAs) and Significant Groundwater Recharge Areas (SGRAs) where the vulnerability score is 6. The presence of vinyl chloride, a DNAPL, could result in a moderate drinking water threat for large waste disposal sites. This activity cannot be or become a significant threat in these areas.

4. *Applicable Legislation, Policies and Programs*

The following section provides a summary of the applicable legislation, policies and programs (provincial, municipal and other) that address waste disposal.

Table 2: Applicable Legislation, Policies and Programs

Level of Government	Applicable Legislation/Policy/Program
Federal	Canadian Environmental Protection Act (Government of Canada, 1999)
Provincial	Environmental Protection Act (Part V Waste Management) (Government of Ontario, 1990) <ul style="list-style-type: none"> • O. Reg. 347 General Waste Management • O. Reg.232/98 Landfilling Sites • O. Reg 102/94 Waste Audits and Waste Reduction Work Plan • O. Reg.103/94 Industrial, Commercial and Institutional (IC&I) Source Separation Programs
	Environmental Assessment Act (Government of Ontario, 1990)
	Waste Diversion Act 2002 (Government of Ontario,

Level of Government	Applicable Legislation/Policy/Program
	2002)
	Ministry of Environment Guidelines and Procedures <ul style="list-style-type: none"> • B-7 reasonable use (MOE, 1994) • B-7-1 determination of contaminant limits and attenuation zone (MOE, 2008) • D-4 land use on or near landfills and dumps (MOE, 1994) • Procedure C-13-1 engineered facilities (MOE, 2008) • Guidelines for environmental protection measures at chemical and waste storage facilities (MOE, 2007)
	Landfill Inventory Management Ontario
Municipal	Land Use Planning
	Waste Management Practices
	Sewer Use Bylaw
Other	Ontario Tire Stewardship Used Tire Program
	Stewardship Ontario Orange Drop Program

a) **Federal**

Canadian Environmental Assessment Act (Government of Canada, 1999)

Under the Canadian Environmental Protection Act, there are regulations which establish a prohibition on the release, manufacture, processing, use, import, export, offer for sale and sale of PCBs and products that contain certain concentrations of PCBs. The regulations also provide exceptions to these prohibitions, set storage requirements for PCBs and products containing PCBs across Canada and labeling and reporting requirements (Lake Erie Source Protection Committee, 2011).

b) **Provincial**

Environmental Protection Act (Part V Waste Management) (Government of Ontario, 1990)

Other than where an exemption applies, prior to using, operating, establishing, altering, enlarging or extending a waste management system or a waste disposal site, a Certificate of Approval is required from the Ministry of the Environment under Part V of the Environmental Protection Act (s. 27). The Certificate of Approval (C of A) is a prescribed instrument under the Clean Water Act, and therefore may be used to implement policies in a Source Protection Plan. The term “waste disposal site” is broad, and includes facilities where waste is only temporarily handled, stored or processed as well as sites where waste is permanently deposited. Waste disposal site C of A are required for all of these types of activities. Private waste disposal sites may accept a variety of municipal, industrial and commercial waste but only in accordance with their Certificate of Approval. Some examples of the types of terms and conditions that may be associated with a C of A include:

- Restrictions on the type and/or quantity of waste that can be accepted at the site.
- Restrictions of the type and/or quantity of waste that can be transported (for waste haulers) or processed (for waste processors).
- Restrictions on where/how the waste can be stored/processed/disposed.
- Requirement for the posting of Financial Assurance (typically only required for privately owned waste facilities).
- Operational requirements
- Monitoring and reporting requirements

There are many exemptions to this approval requirement are set out in the EPA and a number of its associated regulations.

MOE field staff (i.e., “Environmental Officers”) from the ministry’s local District Offices typically undertake annual inspections at a subset of waste facilities located within their geographic area of responsibility. These inspections may include municipal and/or private disposal sites, waste processing sites, storage/transfer sites as well as waste haulers. MOE field staff may also carry out site visits/inspections of waste facilities in response to complaints or reports of noncompliance, spills or other environmental concerns. Where issues of non-compliance with regulatory requirements are identified, Environmental Officers have the authority to require the facility owner/operator to take action to bring the facility into compliance.

O. Reg. 347 General Waste Management

Section 11 of Ontario Regulation 347, made under the EPA, specifies the generic standards for waste disposal sites, definitions of waste, and designates, classifies and exempts waste sites. The standards that are relevant to drinking water source protection include: restricting access to authorized persons; treatment of runoff; separation distances; collection and treatment of leachate; mitigation measures and environmental monitoring; and inspection and maintenance of final and daily cover material over fill area.

O. Reg.232/98 Landfilling Sites

Ontario Regulation 232/98 applies to new or expanded landfill sites (as of August 1, 1998) that receive municipal waste (i.e. non-hazardous) and have a final capacity greater than 40,000 cubic metres. It details the requirements for design, operation, closure, post-closure care and financial assurance of new municipal landfill sites and the preparation of certificates of approval. Parts III and V outline specific design and construction specifications such as requiring a minimum 30 m buffer around a landfill, as well as operational standards for landfilling sites.

O. Reg 102/94 Waste Audits and Waste Reduction Work Plan and O. Reg.103/94 Industrial, Commercial and Institutional (IC&I) Source Separation Programs

Ontario Regulation 102/94 requires that industrial, commercial and institutional entities conduct waste audits and prepare, post and update waste reduction workplans. Ontario Regulation 103/94 requires that source separation programs are in place and sets out the types of waste to be separated from the waste stream for specified sectors.

Environmental Assessment Act (Government of Ontario, 1990)

Many landfill proposals, particularly larger sites, may require approval under the Environmental Assessment Act (EAA). Under the EAA, a broader view of the environment is taken and issues beyond the effects on the natural environment must be addressed. An Environmental Assessment is triggered by the proposed capacity of the landfill.

Waste Diversion Act 2002 (Government of Ontario, 2002)

The Waste Diversion Act was introduced in 2002 to promote the reduction, reuse and recycling of waste and to provide for the development, implementation and operation of waste diversion programs. Under this Act the Ministry of Environment designates waste materials for programs such as blue box waste, used tires, waste electrical and electronic equipment and municipal hazardous and special waste. Waste Diversion Ontario, a non-crown agency was established to develop, implement and operate waste diversion programs (CIELAP, 2008).

Ministry of Environment Guidelines and Procedures

Guidelines and procedures do not have the same legal status as requirements set out in acts and regulations. The only instance where they become legally binding is when they are imposed through reference in a certificate of approval.

Guideline B-7 reasonable use (MOE, 1994)

The overall objective of these guidelines is to ensure a waste disposal facility's impact on local groundwater is "reasonable" and will not result in unacceptable impairment to the groundwater quality of neighbouring properties. Guideline B-7 outlines situations and locations where the MOE may not support waste disposal facilities and Guideline B-7-1 sets out an approach to determine impact limits for the groundwater at the down gradient property boundary in an area referred to as a "contaminant attenuation zone".

Guideline B-7-1 determination of contaminant limits and attenuation zone (MOE, 2008)

Guideline B-7-1 sets out an approach to determine impact limits for the groundwater at the down gradient property boundary in an area referred to as a "contaminant attenuation zone". It essentially allows limited impairment of use of off-site properties. The level of impairment depends on the current use of groundwater. For example, where groundwater is used for drinking and the quality of the water is better than the Ontario Drinking Water Standards it is permitted to allow off-site migration of contaminants that would result in a reduction of water quality as follows:

- Up to 50% of the difference between background conditions and the ODWO for non-health-related parameters; and
- Up to 25% of the difference between background conditions and the ODWO for health-related parameters.

Guideline D-4 land use on or near landfills and dumps (MOE, 1994)

There are a number of guidelines identifying setback distances for the establishment of new waste disposal sites, including keeping these sites away from settlement areas. The Ontario Ministry of the Environment Guideline D-4: Land Use On or Near Landfills and Dumps provides guidelines on land uses (either existing or proposed) that are sensitive to landfills, such as permanent structures used in animal husbandry (i.e. a barn), agricultural land used for pasturing livestock, or residences. This guideline makes reference to 500 m setbacks to identify the study area in the evaluation of a new site to sensitive land uses but it is not a legal requirement.

Guidelines for environmental protection measures at chemical and waste storage facilities (MOE, 2007)

These guidelines identifies environmental protection measures for chemical and waste storage areas and protection measures for human health and is identified as a resource during the planning of upgrades to existing storage areas and for the design and operation of new facilities. MOE abatement staff, owners, operators and designers of chemical and waste storage facilities may utilize this document, which indicates best practices, and spill containment provisions.

Procedure C-13-1 engineered facilities (MOE, 2008)

In this procedure the MOE indicates that there are limitations for engineered waste disposal sites and that any site should be located in an area with a high degree of natural protection and where groundwater is not and would not be used.

Landfill Inventory Management Ontario

The MOE created Landfill Inventory Management Ontario (LIMO) to store key information on Ontario's largest landfills and the LIMO dataset was created to make landfill information available to the public. For larger landfills, information is available on landfill capacity, fill rates, estimated remaining capacity, engineering designs and reporting and monitoring details. For the smaller landfills, information is available on open/closed status, site owner, site location and Certificate of Approval number. Many landfills produce Annual Reports each year that outline how the landfill has been operating (Lake Erie Source Protection Committee, 2011).

c) Municipal

Land Use Planning

Many municipalities have policies regarding waste disposal sites in their official plans. In general, these policies recognize existing sites and indicate the need for an official plan and/or zoning bylaw amendment in order to establish a new site. Many official plans recognize that new sites may not be possible within their boundaries based on legislative requirements. Municipalities that have waste disposal site policies may also explicitly prohibit the storage or disposal of nuclear and toxic (hazardous) waste.

Waste Management Practices

The Government of Ontario gave waste managers in Ontario the goal of diverting 60% of waste from disposal by the end of 2008. This goal indirectly supports the drinking water source protection initiative through the implementation of policies and programs that increase the lifespan of the site (i.e. fewer new waste disposal sites are required), and keeping certain materials out of landfills, thereby improving the quality of runoff from the site that enters surface water and groundwater. Many municipalities have or are implementing programs and projects to reduce the amount of waste that requires disposal, such as recycling programs, green bin programs, and household hazardous waste collection days. Recently introduced programs under Stewardship Ontario offer municipalities a way to significantly recover costs.

Sewer Use Bylaw

For a landfill discharging to a sewer, the quality and quantity of the discharge is controlled by local sewer use bylaws, and the requirements or limitations of the receiving wastewater treatment plant.

d) Other

Ontario Tire Stewardship Used Tire Program

Ontario Tire Stewardship (OTS) is an industry funded organization that implements and operates the used tire program. This program was launched in 2009 as a province-wide initiative to divert scrap tires away from burning and landfill (Ontario Tire Stewardship, 2011). The OTS provides financial incentives for registered organizations that collect, transport or process used tires or manufacture recycled products. The program is projected within 5 years to divert 90% of scrap on road tires and collect and recycle 50% of all scrap off road tires within 5 years (Ontario Tire Stewardship, 2011).

Stewardship Ontario Orange Drop Program

Stewardship Ontario, a private not-for-profit organization, has been developed to administer government-mandated stewardship such as the Orange Drop Program. The Orange Drop Program is a recycling program aimed at keeping household hazardous waste out of landfills (Ontario Stewardship, 2011). This program is free to residents being fully funded by manufacturers and importers of household hazardous or special waste material. In 2010 this program diverted 26 482 tonnes of waste (Ontario Stewardship, 2011).

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

The following table provides the gaps that exist in the legislation, policies and programs that are currently associated with waste disposal sites.

Table 3: Gaps in Existing Legislation, Policies and Programs

Level of Government	Applicable Legislation/Policies/Programs	Gaps
Provincial	Environmental Protection Act (Government of Ontario, 1990) and Certificates of Approval for Waste Disposal	<ul style="list-style-type: none"> Many waste disposal sites are exempted from the C of A process under section 39 of the EPA. There is inconsistency in the regulations due to the many exemptions. Since older C of As for waste disposal do not have an expiry date there are still some very old, inadequate C of As. There is a lack of resources at the Ministry level to monitor and enforce EPA regulations and C of A requirements. Certificates of approval are not generally required for PCB waste disposal sites
	Ontario Regulation 232/98 Landfilling Sites	<ul style="list-style-type: none"> Landfills approved prior to August 1, 1998 did not require the same level of consideration for design and construction specifications or operational standards (i.e. Parts III and V of Ontario Regulation 232/98).
	Ontario Regulation 102/94: Waste Audits and Waste Reduction Work Plans (O.Reg. 102/94) and Ontario Regulation 103/94: Industrial, Commercial and Institutional (IC&I) Source Separation Programs	<ul style="list-style-type: none"> These regulations require Institutional/Commercial/Industrial (ICI) sectors to do waste reduction plans and waste audits; however there is no enforcement to ensure these plans have been created or followed.
	Guideline D-4: Land Use On or Near Landfills and Dumps (Ontario Ministry of the Environment, 1994)	<ul style="list-style-type: none"> It can be difficult to enforce these guidelines unless the property is municipally owned. Developers may try to work around the guidelines or get the allowable land use changed.
	MOE Guidelines and Procedures (Guidelines B-7, B-7-1, D-4 and guidelines for environmental protection measures at chemical and waste storage facilities, Procedure C-13-1)	<ul style="list-style-type: none"> Guidelines and procedures note specific considerations for water quality protection, they are not legally binding unless included in Certificate of Approval
Municipal	Land Use Planning	<ul style="list-style-type: none"> Waste disposal sites are not explicitly prohibited within vulnerable areas in municipal official plans and zoning by-laws.
Other Regulatory Gaps		<ul style="list-style-type: none"> There is very limited regulation for old, historic waste disposal sites and a lack of responsibility being taken for these sites. Historic landfill locations are not necessarily recorded and monitored

Level of Government	Applicable Legislation/Policies/Programs	Gaps
		<ul style="list-style-type: none"> • The frequency of household hazardous waste collection opportunities (e.g. collection days) is not sufficient to accommodate the needs of the community; therefore, household hazardous wastes may still be illegally disposed with household garbage. • Exemptions in the definitions of “waste” and “waste disposal” may have an impact on authority of policies or applicability of prescribed instruments

6. Policy Considerations

- REMINDER: The main consideration for reducing or eliminating drinking water threats related to waste disposal sites is to make sure that any discharge from the sites does not result in a significant risk to drinking water through appropriate measures to mitigate the threat, such that discharge from the sites do not threaten the quality of surface or groundwater sources, or are adequately mitigated. This could be accomplished by:
 - Complete or improved diversion of household hazardous waste, electronics, compost and recyclables for current and future use will reduce contamination from harmful waste and the overall footprint/area of impact
 - Capture and treatment of surface water runoff and prevention of run-off by using proper operating techniques and enforcement of C of A conditions.
 - Capture and treatment of leachate (to reduce impacts on groundwater). Prevention of leachate from entering groundwater/surface water by using proper design and/or rehabilitation
- Clean Water Act Part IV tools interim risk management plans, risk management plans, prohibition, and restricted land uses cannot be used for waste disposal sites.
- Prescribed Instruments may be used to address concerns for waste disposal sites, but identified risk management measures are only mandatory for significant drinking water threats. However, this does not prevent their voluntary incorporation.
- The source protection plan will need to address all “would be” situations related to waste disposal sites, even those instances where we believe they are unlikely to occur. Those situations can be covered by a high-level policy approach (“a catch-all policy”).

7. 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 establishment, operation or maintenance of a waste disposal site within the meaning of Part V of the *Environmental Protection Act*.

- Sub- Threat**
- Land farming of petroleum refining waste
 - Landfilling of hazardous waste
 - Landfilling of municipal waste

Circumstances

- Landfilling of solid, non-hazardous industrial or commercial waste
- Liquid industrial waste injection into a well
- PCB (Polychlorinated biphenyl) waste storage
- Storage of hazardous waste at disposal sites
- Storage of certain hazardous wastes
- Land farming of petroleum refining waste
 - Application area >10 ha
- Landfilling of hazardous waste, municipal waste, solid, non-hazardous industrial or commercial waste
 - <1 ha
 - 1-10 ha
 - >10 ha
- Liquid industrial waste injection into a well
 - 380 to 3800 m³
 - 3800 to 38000 m³
 - 38000 to 380 000 m³
 - 380 000 to 3 800 000 m³
 - 3 800 000 to 38 000 000 m³
 - >38 000 000 m³
- PCB (Polychlorinated biphenyl) waste storage
 - Stored in an underground pit or engineered cell
 - Stored in tanks completely below grade
 - Stored in tanks partially below grade
 - Stored in uncontained piles
- Storage of hazardous waste at disposal sites, certain hazardous waste
 - At or above grade
 - Completely below grade
 - Partially below grade

Policy Tool	Policy ideas
Education and Outreach	<ul style="list-style-type: none"> • Provide education materials and information sessions about proper disposal of waste materials prescribed under the Clean Water Act and what can be done to reduce the volume of waste • Encourage waste diversion approaches to complement household special waste (HSW) and SP goals and mandates • Promote backyard composters. • Ensure HSW is included in garbage schedule (calendar)
Incentive Programs	<ul style="list-style-type: none"> • Provincial funding for municipalities to increase household hazardous waste collection opportunities. • Province may waive MOE application fees for existing C of A amendments to include SWP generated policies • Coordinate cross municipal HSW programs to increase accessibility (amend C of

	A's as needed)
Land Use Planning	<ul style="list-style-type: none"> Prohibit new waste disposal sites in areas where they would be a significant drinking water threat.
Prescribed Instruments	<ul style="list-style-type: none"> Do not issue waste site C of A's where the site activity is a significant threat unless term and conditions adequately manage the threat. Require MOE to review and amend current C of A's in locations where the site activity is a significant threat to ensure that term and conditions adequately manage the threat.
S.26 p.1 Other-Specify Action (Municipal Operations/ Infrastructure)	<ul style="list-style-type: none"> Encourage municipalities to develop complimentary programs that would achieve waste reduction goals to minimize liquid and hazardous waste materials from entering landfill as follows: <ul style="list-style-type: none"> "Pay as you throw" program to encourage waste diversion (fee per bag of garbage, bag limits, bi-weekly pickup), along with other waste diversion strategies. Require the use of clear garbage bags to help identify household hazardous waste or other materials that should be diverted from a landfill. Random garbage bag audits. This can help target future diversion initiatives, including household hazardous waste and electronics. Electronics recycling collection – Stewardship Ontario has initiated programs to assist municipalities and business to divert electronics from the waste stream. Ontario Tire Stewardship – Although tires are banned from landfills, they have been historically been illegally dumped/stored. Programs have been put into place to reduce this behaviour.

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Appendix A-Local Scale of Drinking Water Threat

Appendix A – Significant Threat Tables

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	1.3-1
Sub- Threat(s)	<ul style="list-style-type: none"> • Land farming of petroleum refining waste • Landfilling of hazardous waste • Landfilling of municipal waste • Landfilling of solid, non-hazardous industrial or commercial waste • Liquid industrial waste injection into a well • PCB (Polychlorinated biphenyl) waste storage • Storage of hazardous waste at disposal sites • Storage of certain hazardous wastes
Circumstance	<ul style="list-style-type: none"> • Land farming of petroleum refining waste <ul style="list-style-type: none"> ○ Application area >10 ha • Landfilling of hazardous waste, municipal waste, solid, non-hazardous industrial or commercial waste <ul style="list-style-type: none"> ○ <1 ha ○ 1-10 ha ○ >10 ha • Liquid industrial waste injection into a well <ul style="list-style-type: none"> ○ 380 to 3800 m³ ○ 3800 to 38000 m³ ○ 38000 to 380 000 m³ ○ 380 000 to 3 800 000 m³ ○ 3 800 000 to 38 000 000 m³ ○ >38 000 000 m³ • PCB (Polychlorinated biphenyl) waste storage <ul style="list-style-type: none"> ○ Stored in an underground pit or engineered cell ○ Stored in tanks completely below grade ○ Stored in tanks partially below grade ○ Stored in uncontained piles • Storage of hazardous waste at disposal sites, certain hazardous waste <ul style="list-style-type: none"> ○ At or above grade ○ Completely below grade ○ Partially below grade
Vulnerable Area	<ul style="list-style-type: none"> • WHPA-A,B with vulnerability score of 10 • IPZ-1
Risk	Significant, Moderate and Low
Body Responsible for	Municipal Watershed partnership with Conservation Authority as lead. The

Appendix B – draft policies

Implementing	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 land use which could be associated with waste disposal.
Legal Effect	Conform (significant), strategic (moderate and low)
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 from the chemical risks associated with the disposal of waste including:</p> <ul style="list-style-type: none"> • Providing education materials and information sessions about proper disposal of CWA prescribed waste materials and what can be done to reduce the volume of waste • Encouraging waste diversion approaches to complement household hazardous waste programs • Promoting the use of backyard composters in order to reduce municipal waste • Providing material within the waste schedule calendar that promotes awareness of household hazardous waste • 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 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 tracking the uptake by the target audience will also be included in this report.

Policy Number	1.3-2
Sub- Threat(s)	<ul style="list-style-type: none"> • Land farming of petroleum refining waste • Landfilling of hazardous waste • Landfilling of municipal waste • Landfilling of solid, non-hazardous industrial or commercial waste • Liquid industrial waste injection into a well • PCB (Polychlorinated biphenyl) waste storage • Storage of hazardous waste at disposal sites • Storage of certain hazardous wastes
Circumstance	<ul style="list-style-type: none"> • Land farming of petroleum refining waste <ul style="list-style-type: none"> ○ Application area >10 ha • Landfilling of hazardous waste, municipal waste, solid, non-hazardous industrial or commercial waste <ul style="list-style-type: none"> ○ <1 ha ○ 1-10 ha ○ >10 ha • Liquid industrial waste injection into a well <ul style="list-style-type: none"> ○ 380 to 3800 m³ ○ 3800 to 38000 m³ ○ 38000 to 380 000 m³ ○ 380 000 to 3 800 000 m³ ○ 3 800 000 to 38 000 000 m³ ○ >38 000 000 m³ • PCB (Polychlorinated biphenyl) waste storage <ul style="list-style-type: none"> ○ Stored in an underground pit or engineered cell ○ Stored in tanks completely below grade ○ Stored in tanks partially below grade ○ Stored in uncontained piles • Storage of hazardous waste at disposal sites, certain hazardous waste <ul style="list-style-type: none"> ○ At or above grade ○ Completely below grade ○ Partially below grade
Vulnerable Area	<ul style="list-style-type: none"> • WHPA-A,B with vulnerability score of 10 • IPZ-1
Risk	Significant

Appendix B – draft policies

Body Responsible for Implementing	MOE
Threat Status	Existing and Future
Land Use	All land use which could be associated with waste disposal.
Legal Effect	Strategic (MOE)
Policy Tool	Incentive Programs
Policy Idea	<p>The province shall be encouraged to develop and implement new incentive programs to assist with the costs of risk mitigation practices. These programs could provide funding for municipalities that would allow opportunities such as increasing household hazardous waste collection to occur.</p> <p>The province shall be encouraged to waive application fees where C of As would need to be amended based on source water protection policies.</p>
Implementation schedule	This policy shall be implemented within 1 year of the effective date of the first approved source protection plan.
Monitoring Policy	The implementing bodies shall report to the CA annually on the implementation of this policy. The report shall include the funding available, the uptake of the incentives, the areas where the incentives were used and a description of the efforts to promote the incentives. The report shall report on each type of incentive separately.

Policy Number	1.3-3
Sub- Threat(s)	<ul style="list-style-type: none"> • Land farming of petroleum refining waste • Landfilling of hazardous waste • Landfilling of municipal waste • Landfilling of solid, non-hazardous industrial or commercial waste • Liquid industrial waste injection into a well • PCB (Polychlorinated biphenyl) waste storage • Storage of hazardous waste at disposal sites • Storage of certain hazardous wastes
Circumstance	<ul style="list-style-type: none"> • Land farming of petroleum refining waste <ul style="list-style-type: none"> ○ Application area >10 ha • Landfilling of hazardous waste, municipal waste, solid, non-hazardous industrial or commercial waste <ul style="list-style-type: none"> ○ <1 ha ○ 1-10 ha ○ >10 ha • Liquid industrial waste injection into a well <ul style="list-style-type: none"> ○ 380 to 3800 m³ ○ 3800 to 38000 m³ ○ 38000 to 380 000 m³ ○ 380 000 to 3 800 000 m³ ○ 3 800 000 to 38 000 000 m³ ○ >38 000 000 m³ • PCB (Polychlorinated biphenyl) waste storage <ul style="list-style-type: none"> ○ Stored in an underground pit or engineered cell ○ Stored in tanks completely below grade ○ Stored in tanks partially below grade ○ Stored in uncontained piles • Storage of hazardous waste at disposal sites, certain hazardous waste <ul style="list-style-type: none"> ○ At or above grade ○ Completely below grade ○ Partially below grade
Vulnerable Area	<ul style="list-style-type: none"> • WHPA-A,B with vulnerability score of 10 • IPZ-1
Risk	Significant

Appendix B – draft policies

Body Responsible for Implementing	Municipality
Threat Status	Future
Land Use	All land use which could be associated with waste disposal.
Legal Effect	Conform
Policy Tool	Land Use Planning
Policy Idea	Municipalities shall prohibit new waste disposal sites in areas where they would be a significant drinking water threat.
Implementation schedule	From the date of the Source Protection Plan approval, all planning decisions shall be in conformity. Updates shall be initiated in all Official Plan within 6 months of the Source Protection Plan approval with the goal to be completed within 2 years of the SPP approval date. Zoning by-laws shall be updated with the goal to be completed within 3 years of the SPP approval date.
Monitoring Policy	Municipalities shall report to the CA on new policies incorporated in Official Plans and any new by-laws relevant to source water protection. All municipalities must report even if it is to indicate that no changes were required. Where no changes were required, the report is to describe how the existing OP and bylaws meet the requirements of this policy.

Policy Number	1.3-4
Sub- Threat(s)	<ul style="list-style-type: none"> • Land farming of petroleum refining waste • Landfilling of hazardous waste • Landfilling of municipal waste • Landfilling of solid, non-hazardous industrial or commercial waste • Liquid industrial waste injection into a well • PCB (Polychlorinated biphenyl) waste storage • Storage of hazardous waste at disposal sites • Storage of certain hazardous wastes
Circumstance	<ul style="list-style-type: none"> • Land farming of petroleum refining waste <ul style="list-style-type: none"> ○ Application area >10 ha • Landfilling of hazardous waste, municipal waste, solid, non-hazardous industrial or commercial waste <ul style="list-style-type: none"> ○ <1 ha ○ 1-10 ha ○ >10 ha • Liquid industrial waste injection into a well <ul style="list-style-type: none"> ○ 380 to 3800 m³ ○ 3800 to 38000 m³ ○ 38000 to 380 000 m³ ○ 380 000 to 3 800 000 m³ ○ 3 800 000 to 38 000 000 m³ ○ >38 000 000 m³ • PCB (Polychlorinated biphenyl) waste storage <ul style="list-style-type: none"> ○ Stored in an underground pit or engineered cell ○ Stored in tanks completely below grade ○ Stored in tanks partially below grade ○ Stored in uncontained piles • Storage of hazardous waste at disposal sites, certain hazardous waste <ul style="list-style-type: none"> ○ At or above grade ○ Completely below grade ○ Partially below grade
Vulnerable Area	<ul style="list-style-type: none"> • WHPA-A,B with vulnerability score of 10 • IPZ-1
Risk	Significant

Appendix B – draft policies

Body Responsible for Implementing	MOE
Threat Status	Existing and Future
Land Use	All land use which could be associated with waste disposal.
Legal Effect	Conform
Policy Tool	Prescribed Instrument-Environmental Protection Act
Policy Idea	<p>MOE shall prohibit the issuance of future waste site C of A where the site activity is a significant threat unless terms and conditions identified within the C of A adequately manage the threat.</p> <p>MOE shall review and amend current C of A where the site activity is a significant threat to ensure that terms and conditions adequately manage the threat.</p>
Implementation schedule	For existing C of A, the implementation of this policy shall be within 1 year of the approval of the SPP. For future C of As, this policy shall be implemented immediately following the approval of the SPP.
Monitoring Policy	MOE shall report to the CA the number of C of A applications that have been reviewed and amended including the instrument number as well as the number of C of A applications that have been prohibited within vulnerable areas where the threat is considered significant.

Policy Number	1.3-5
Sub- Threat(s)	<ul style="list-style-type: none"> • Land farming of petroleum refining waste • Landfilling of hazardous waste • Landfilling of municipal waste • Landfilling of solid, non-hazardous industrial or commercial waste • Liquid industrial waste injection into a well • PCB (Polychlorinated biphenyl) waste storage • Storage of hazardous waste at disposal sites • Storage of certain hazardous wastes
Circumstance	<ul style="list-style-type: none"> • Land farming of petroleum refining waste <ul style="list-style-type: none"> ○ Application area >10 ha • Landfilling of hazardous waste, municipal waste, solid, non-hazardous industrial or commercial waste <ul style="list-style-type: none"> ○ <1 ha ○ 1-10 ha ○ >10 ha • Liquid industrial waste injection into a well <ul style="list-style-type: none"> ○ 380 to 3800 m³ ○ 3800 to 38000 m³ ○ 38000 to 380 000 m³ ○ 380 000 to 3 800 000 m³ ○ 3 800 000 to 38 000 000 m³ ○ >38 000 000 m³ • PCB (Polychlorinated biphenyl) waste storage <ul style="list-style-type: none"> ○ Stored in an underground pit or engineered cell ○ Stored in tanks completely below grade ○ Stored in tanks partially below grade ○ Stored in uncontained piles • Storage of hazardous waste at disposal sites, certain hazardous waste <ul style="list-style-type: none"> ○ At or above grade ○ Completely below grade ○ Partially below grade
Vulnerable Area	<ul style="list-style-type: none"> • WHPA-A,B with vulnerability score of 10 • IPZ-1
Risk	Significant

Appendix B – draft policies

Body Responsible for Implementing	Municipality
Threat Status	Existing and Future
Land Use	All land use which could be associated with waste disposal.
Legal Effect	Conform
Policy Tool	S.26 Other-Establish Stewardship
Policy Idea	<p>Municipalities shall be encouraged to develop and implement complementary stewardship programs that would minimize liquid and hazardous waste materials from entering landfills where the threat would be significant. These programs would encourage a change in behaviour and could include:</p> <ul style="list-style-type: none"> ○ “pay as you throw” program to encourage waste diversion (fee per bag of garbage, bag limits, bi-weekly pickup) along with other waste diversion strategies ○ Require the use of clear garbage bags to help identify household hazardous waste or other materials that should be diverted from a landfill ○ Random garbage bag audits. This can help target future diversion initiative, including household hazardous waste and electronics ○ Electronics recycling collection-stewardship Ontario has initiated programs to assist municipalities and business to divert electronics from waste stream ○ Ontario tire stewardship-although tires are banned from landfills, they have been historically illegally dumped/stored.
Implementation schedule	The development of stewardship programs shall be initiated immediately following the approval of the source protection plan.
Monitoring Policy	Municipalities shall report annually to the CA the number of stewardship programs developed as well as a description of the actions/measures they have taken to implement these programs.

Policy Number	1.3-6
Sub- Threat(s)	<ul style="list-style-type: none"> • Land farming of petroleum refining waste • Landfilling of hazardous waste • Landfilling of municipal waste • Landfilling of solid, non-hazardous industrial or commercial waste • Liquid industrial waste injection into a well • PCB (Polychlorinated biphenyl) waste storage • Storage of hazardous waste at disposal sites • Storage of certain hazardous wastes
Circumstance	<ul style="list-style-type: none"> • Land farming of petroleum refining waste <ul style="list-style-type: none"> ○ Application area >10 ha • Landfilling of hazardous waste, municipal waste, solid, non-hazardous industrial or commercial waste <ul style="list-style-type: none"> ○ <1 ha ○ 1-10 ha ○ >10 ha • Liquid industrial waste injection into a well <ul style="list-style-type: none"> ○ 380 to 3800 m³ ○ 3800 to 38000 m³ ○ 38000 to 380 000 m³ ○ 380 000 to 3 800 000 m³ ○ 3 800 000 to 38 000 000 m³ ○ >38 000 000 m³ • PCB (Polychlorinated biphenyl) waste storage <ul style="list-style-type: none"> ○ Stored in an underground pit or engineered cell ○ Stored in tanks completely below grade ○ Stored in tanks partially below grade ○ Stored in uncontained piles • Storage of hazardous waste at disposal sites, certain hazardous waste <ul style="list-style-type: none"> ○ At or above grade ○ Completely below grade ○ Partially below grade
Vulnerable Area	<ul style="list-style-type: none"> • WHPA-A,B with vulnerability score of 10 • IPZ-1
Risk	Significant

Appendix B – draft policies

Body Responsible for Implementing	Municipality
Threat Status	Existing and Future
Land Use	All land use which could be associated with waste disposal.
Legal Effect	Conform
Policy Tool	S.26 Other-Specify Action
Policy Idea	Municipalities shall consider collaborating with each other to increase accessibility to cross municipal household hazardous waste programs in order to cease the threat from being significant.
Implementation schedule	Within 1 year of the effective date of the Source Protection Plan.
Monitoring Policy	Municipalities shall submit a report to the CA which would detail if cross municipal partnerships have occurred.

Appendix C-Definitions

Drinking Water Threat: An activity or condition that adversely affects or has the potential to adversely affect the quality or quantity of any water that is or may be used as a source of drinking water and includes an activity or condition that is prescribed by the regulation as a drinking water threat (Clean Water Act, 2006₁).

Intake Protection Zone (IPZ): Refers to a surface water intake protection zone, which is an area related to a surface water intake and within which it is desirable to regulate or monitor drinking water threats (General Regulation 287/07₂). Intake Protection Zones are further delineated as:

- Intake Protection Zone 1 (IPZ-1), which is the immediate zone of 1 kilometer radius for a Great Lakes intake, drawn around the intake, until it touches the shore where it extends to a certain setback into the land;
- Intake Protection Zone 2 (IPZ-2), is delineated based on a 2 hour travel time to the intake under tributaries and creeks that drain into the lake within a 2 hour time of travel to the intake.

Moderate and Low Drinking Water Threats: Generally refer to prescribed activities deemed moderate or low drinking water threats based on the risk score.

Significant Threat: A significant drinking water threat means a drinking water threat that according to a risk assessment, poses or has the potential to pose a significant risk (Clean Water Act, 2006₁)

Threat: Refers to an activity (land use) that poses a threat to drinking water quality or quantity.

Vulnerability Score: A score assigned to a vulnerable area with a higher score indicating a higher vulnerability.

Wellhead Protection Area (WHPA): Refers to an area that is related to a wellhead and within which it is desirable to regulate or monitor drinking water threats (General Regulation 297/07₂). Wellhead Protection Zones can be further delineated into:

- WHPA-A: 100 m fixed radius around each well;
- WHPA-B: 2 year time of travel to the well, excluding the area of WHPA-A
- WHPA-C: 2 to 5 year time of travel to the well;
- WHPA-D: 5 to 25 year time of travel to the well;
- WHPA-E: delineated if it is shown that a surface water system influence effectively bypass the aquifer's protection; and,
- WHPA-F: delineated if the well is subject to issues, which originate from outside the other parts of the Wellhead Protection Area.

¹Clean Water Act, 2006 (http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_06c22_e.htm)

²Clean Water Act Ontario Regulation 287/07-General (http://www.e-laws.gov.on.ca/html/regs/english/elaws_regs_070287_e.htm)