2 Agricultural Threats

2.1 Application and Storage of Agricultural Source Material (ASM)

What is the Threat to Drinking Water

Nutrients are materials that can be applied to land for the purpose of improving the growth of agricultural crops and for soil conditioning. There are three sources of nutrients to be considered through the drinking water source protection initiative: agricultural source material, non-agricultural source material, and commercial fertilizer.

This paper provides background information for prescribed drinking water threat 3 – application of agricultural source material to land and prescribed drinking water threat 4 – the storage of agricultural source material.
According to Ontario Regulation 267/03 – General, under the Nutrient Management Act, agricultural source materials (ASM) include the following that may be produced on a farm:

- manure produced by farm animals, including bedding materials;
- runoff from farm-animal yards and manure storages;
- wash water that has not been mixed with human body waste (e.g. from the milking centre);
- organic materials produced by intermediate operations that process the above materials (e.g. mushroom compost);
- anaerobic digestion output that does not include sewage biosolids or human body waste (anaerobic digestion is a process used to decompose organic matter by bacteria in an oxygen-limited environment); and,
- regulated compost (which contains dead farm animals).

ASM is produced on farms with livestock. ASM can be stored in a permanent nutrient storage facility (usually a steel or concrete tank or earthen lagoon), or on a temporary field nutrient storage site (only for solid ASM). Permanent nutrient storage facilities are generally, but not always, located near barns and outdoor confinement areas. Temporary field nutrient storage facilities can be located near barns and outdoor confinement areas, as well as on fields where the ASM will be applied. The storage and application of ASMs occur in the highly vulnerable aquifers and significant groundwater recharge areas, and in parts of some intake protection zones and wellhead protection areas.

The primary consideration for reducing or eliminating drinking water threats related to the application and storage of ASM is to make sure nitrogen, phosphorus and pathogens do not enter surface water and/or groundwater.

What Causes the Activity to be a Drinking Water Threat

The Ontario Ministry of the Environment (MOE) Tables of Drinking Water Threats (Ontario Ministry of the Environment, 2009) identify nitrogen, total phosphorus and pathogens as contaminants that could make their way into surface and groundwater as a result of the application of ASM to land (circumstances 1 to 18 and 1944), and the storage of ASM (circumstances 1201 to 1224 and 1962 to 1964). The primary source of nitrogen, total phosphorus and pathogens in ASM is from animal waste and by-products.
The storage of ASMs is a chemical threat based on location of facility, type of facility, and associated volume or weight of ASM. Pathogens are a significant threat due to spill or runoff.

What is the Local Scale of the Drinking Water Threat

The classification of this activity as a significant, moderate or low drinking water threat is dependent on the vulnerability score of the specific area, as well as the combination of the managed land percentage and livestock density for the vulnerable area. As a reminder:

- Managed lands include cropland, fallow land, improved pasture, golf courses, sports fields and lawns to which ASM, non-agricultural source material, or commercial fertilizer could be applied. This value was calculated based on MOE Technical Rules and is included in the Assessment Report.

- Livestock density is the number of farm animals in a given area. Livestock density is standardized to nutrient units per acres since different types of animals produce different amounts of manure with different nutrient values. A nutrient unit is based on the manure equivalent of nutrients contained in 43 kg of nitrogen or 55 kg of phosphate. The livestock density value was calculated based on MOE Technical Rules and is included in the Assessment Report.

- Total phosphorus associated with agricultural source material can only be a drinking water threat in intake protection zones (IPZs) and in wellhead protection areas (WHPAs) where the groundwater is under the direct influence of surface water (WHPA-E).

  - Nitrogen associated with agricultural source material can be a drinking water threat in IPZs, WHPAs, Highly Vulnerable Areas (HVAs), and significant groundwater recharge areas (SGRAs).

  - Pathogens associated with agricultural source material can be a drinking water threat in IPZs, and WHPAs including WHPA-E.

The storage and application of ASMs can be considered a significant threat in a WHPA-A or B a vulnerability score of 10 for pathogens or nitrogen. Within a WHPA-E with vulnerability score of 9, the application of ASMs can be a chemical threat due to combination of managed land percentage and livestock density producing ASM and a pathogen threat for any quantity. Within a WHPA-E with vulnerability score of 8.1, the following can be considered a significant threat: all applications of ASM can be considered a threat; storage at or above grade in either temporary or permanent facility; pathogen threat only due to spill or runoff. The following table provides the local scale of the application and storage of ASM within the Thames-Sydenham and Region.

Table 2-1 Local Scale of the Application and Storage of ASM

System	Threat	Type	# locations	WHPA	V score
Dorchester	Storage ASM	Pathogen	1	A,B	10
Ingersoll	Storage ASM	Chemical, Pathogen	1	B	10
St.Marys	Storage ASM	Pathogen	7	A,B	10
Ridgetown	Storage ASM	NA	1	A	10
Birr	Application ASM	Pathogen	1	A	10
Dorchester	Application ASM	Pathogen	21	A,B	10
Melrose	Application ASM	Chemical	2	B	10
Thorndale	Application ASM	Pathogen	2	A	10
Embro	Application ASM	Pathogen	1	A	10
Hickson	Application ASM	Pathogen	1	A	10
Ingersoll	Application ASM	Chemical, Pathogen	7	A, B	10
Innerkip	Application ASM	Pathogen	2	A	10
Lakeside	Application ASM	Chemical, Pathogen	1	A	10

System	Threat	Type	# locations	WHPA	V score
Mount Elgin	Application ASM	Pathogen	3	A	10
Thamesford	Application ASM	Pathogen	4	A, B	10
Woodstock-rural	Application ASM	Chemical, Pathogen	18	A, B	10
Shakespeare	Application ASM	Chemical, Pathogen	1	A, B	10
St. Pauls	Application ASM	Chemical, Pathogen	1	A	10
St.Marys	Application ASM	Chemical*, Pathogen	4	B	10
Ridgetown	Application ASM	NA	5		
	TOTALS		**84**		

Applicable Legislation, Policies and Programs

The following section provides a summary of the applicable legislation, policies and programs (federal, provincial, municipal and other) that address the drinking water threats of the application and storage of ASM.

Table 2-2 Applicable Legislation, Policies and Programs

Level of Government	Applicable Legislation, Policies and Programs
Federal	Fisheries Act (Government of Canada,1985)
Provincial	Environmental Protection Act (Government of Ontario, 1990)
	Ontario Water Resources Act (Government of Ontario, 1990)
	Nutrient Management Act and Ontario Regulation 267/03 (Government of Ontario, 2002) • Nutrient Management Strategies • Nutrient Management Plans
	Nutrient Management Act and Ontario Regulation 106/09: Disposal of Dead Farm Animals (Government of Ontario, 2009)
Municipal	Municipal Act 2001
	Minimum Distance Separation Formulae
Other	Canada-Ontario Environmental Farm Plan (Ontario Soil and Crop Improvement Association, 2005)

Federal

Fisheries Act

Section 36(3) of the Fisheries Act states that "… no person shall deposit or permit the deposit of a deleterious substance of any type in water frequented by fish or in any place under any conditions where the deleterious substance or any other deleterious substance that results from the deposit of the deleterious substance may enter any such water" (Government of Canada, 1985). The deposition of any deleterious substance (contaminant) is in contravention of the legislation. In general, the Fisheries Act is enforced by Fisheries and Oceans Canada; however, the section that applies to contamination is under the authority of Environment Canada.

Provincial

Environmental Protection Act

The Environmental Protection Act (EPA), which is enforced by the MOE, prohibits the discharge of contaminants into the natural environment (Government of Ontario, 1990). Although the application of animal wastes to land

in accordance with normal farming practices and the regulations made under the Nutrient Management Act does not require approval under the EPA, farmers must ensure that ASM spills do not occur.

Ontario Water Resources Act

The Ontario Water Resources Act (OWRA) contains general prohibitions against discharging pollutants to surface or groundwater (Government of Ontario, 1990). Permits are required for vegetated filter strip systems and constructed wetlands, if these methods will be used to treat milking centre washwater.

Nutrient Management Act and Ontario Regulation 267/03 – General

The Nutrient Management Act passed on June 27, 2002. It addresses land-applied materials containing nutrients. This includes provisions for the development of strong new standards for all land-applied materials containing nutrients, a proposal to ban the land application of untreated septage over a five-year period, and proposed strong new requirements such as: the review and approval of nutrient management plans, certification of land applicators and a new registry system for all land applications (Government of Ontario, 2002).

The Act provides a comprehensive nutrient management framework for Ontario's agricultural industry, municipalities and other generators of materials containing nutrients, including clear environmental protection guidelines. It builds on the existing system by giving current best management practices the force of law, and creating comprehensive, enforceable, province-wide standards to regulate the management of all land- applied materials containing nutrients. The Act contains amendments to the Environmental Protection Act, the Highway Traffic Act, the Ontario Water Resources Act and the Pesticides Act, and consequential amendments to the Farming and Food Production Protection Act, 1998 to ensure consistency and give higher recognition to the standards.

Farms are regulated under the Nutrient Management Act if the farm generates greater than 300 nutrient units annually or generate between 5 and 300 NU annually and have applied for a building permit to construct a building used to hold farm animals or manure. Nutrient management strategies and plans are used by some farms to optimize the relationship between the land-based application of nutrients, farm management techniques and crop requirements; to maximize the efficient use of on-site nutrients; and to minimize adverse impacts to the environment.

Sections 10, 14 and 28 of Ontario Regulation 267/03 – General are prescribed instruments under the Clean Water Act. These sections relate to the approval of nutrient management strategies and nutrient management plans, and compliance (Government of Ontario, 2003).

The “Nutrient Management Protocol” (Ontario Ministry of Agriculture and Rural Affairs, 2009) provides technical standards and procedures related to O. Reg. 267/03 – General. According to the Protocol, a NMS must contain numerous components including information about the type and volume of prescribed materials (ASM) generated by the farm, the intended destination of the materials, and storage facilities. A NMP must contain numerous components including information about the nutrients that will be applied (type, content, application rate); the fields where the nutrients will be applied; and cropping practices, crop rotation and yields. The required contingency plan covers topics such as more nutrients than addressed in the ASM nutrient management strategy and/or plan, and unanticipated release of nutrients (e.g. spills).

Nutrient Management Strategies and Plans

Consultants who prepare approved nutrient management strategies and plans for ASM must be certified through the OMAFRA.

Nutrient Management Strategy (NMS)
Nutrient management strategies are required for:
1. farms that generate more than 300 nutrient units;
2. farms that generate greater than 5 nutrients units annually if:
   a) an earthen lagoon is constructed or;
   b) there is building permit application to construct or expand barns used for housing livestock or other structures for storage of manure ;
3. if there is a regulated mixed anaerobic digester on the farm.

Not all strategies are approved by the Ministry of Agriculture, Food and Rural Affairs (OMAFRA); some farms only register their operation and have the strategy kept at the farm.

A NMS sets out an environmentally acceptable method for managing all prescribed materials generated at an agricultural operation. Where prescribed materials are generated in the course of the operation, the operation shall ensure that the nutrients are managed in accordance with a NMS if the operation is phased in by the Regulation, Part II. The nutrient management strategy details the storage and destination of all the manure generated on the property. It does not deal with application of manure to the land.

Nutrient Management Plan (NMP)
A NMP details how nutrients are to be applied to a given land base. A NMP is based on both the components of the nutrients used and the characteristics of the field. The NMP optimizes the utilization of the nutrients by crops in the field and minimizes environmental impacts. A person who owns or controls an agricultural operation, which is phased in by the Regulation, Part II, must ensure that nutrients are managed in accordance with a NMP.
1. the farm generates more than 300 NU annually or;
2. the farm is located within 100 m of a municipal well.

These plans are filed on the farm and are reviewed by the MOE Agricultural Environmental Officer during compliance inspections. Under the Regulation, a farm that is not required to have a nutrient management strategy cannot be required to have a nutrient management plan, even if the farm is within 100 m of a municipal well.

The regulation contains land application standards that include timing restrictions for application, vegetated buffers zones adjacent to surface water, and setbacks from surface water and wells that are applicable to all farms that require a nutrient management plan. These standards are considered to be best management practices for non-regulated farms.

Requirements for the Storage of ASM
For farms phased in under O. Reg. 267/03, the minimum setback requirements for a permanent nutrient storage facility are listed in Table 2-3. Temporary field nutrient sites must also meet setback requirements if solid ASM is to be stored on the site for more than 24 hours (value in brackets if different). These requirements are generally considered to be best management practices for temporary storage less than 24 hours. The storage requirements are considered to be best management practices for non-regulated farms.

Table 2-3 Minimum setback requirements for the storage of ASM

Feature	Value
Minimum distance to municipal wells	100m
Minimum distance to drilled wells (>15m deep with 6m casing)	15m (45m)
Minimum distance to all other wells including dug wells	30m (90m)
Minimum distance to field drainage tiles or piped municipal drains	15m
Minimum flow path to surface water of tile inlet	50m

A site characteristic study that consists of a hydrogeological or geotechnical investigation performed by a qualified person is required to identify the soil types and presence of any aquifer or bedrock at the site of the

proposed permanent nutrient storage facility. The regulation includes design standards for the walls, floors, liners and capacity of a facility.

For farms phased in under O. Reg. 267/03, a permanent solid nutrient storage facility must have a runoff management system to handle all of the runoff generated by the facility (e.g. solid manure piled on a concrete base). The system must consist of at least one of the following:

- A roof used to prevent the entry of precipitation, assuming that any water upstream of the facility has been diverted away from the facility.
- Vegetated filter strip systems
- Properly sized runoff collection and storage systems
- A permanently vegetated area (PVA), if runoff from the facility is generated from an area less than 300 sq. m. The location requirements for a PVA are similar to those for the nutrient storage facility (see Table 2-3).
- A sewage works approved under the OWRA or a sewage system approved under the Ontario Building Code.

The part of the regulation that addresses the design, establishment and operation of vegetated filter strip systems (VFSS) applied to all farms regardless of whether or not they have a nutrient management strategy. The requirements for a VFSS are similar to those for the nutrient storage facility.

Requirements for the Application of ASM

For farms required to have a NMP there are additional restrictions on the application of ASM based on time of year, slope and application rate, application method, incorporation, crop residue (e.g. stalks and leaves), and distances from surface water. For example, liquid ASM cannot generally be applied to land when the soil is snow covered or frozen, while solid ASM can be applied under restrictions. These restrictions are considered to be best management practices for non-regulated farms. The minimum setback requirements for the application of ASM to land are listed in Table 2-4.

Table 2-4 Minimum setback requirements for the application of ASM to land

Feature	Value
Minimum distance to municipal wells	100m
Minimum distance to drilled wells (>15m deep with 6m casing)	15m
Minimum distance to all other wells including dug wells	30m
Minimum distance to top of bank including surface water	13m [1]
No application of liquid manure to an area whose maximum sustained slope is 25% or greater, within 150m from the top of the bank of the surface water [1] This distance may be reduced to as little as 3 m if the ASM is injected into soil, placed with seed, there is a specified amount of crop residue, or if it is applied to a living crop (such as in a pasture)	

A vegetated buffer zone is required between land where ASM is applied and surface water. The buffer zone must have a minimum width of 3 m and be maintained under continuous vegetated cover including perennial grasses, other herbaceous plants, or trees and perennial forage crops that can be harvested as hay or silage.

O. Reg. 267/03 restricts the use of high trajectory irrigation guns to land apply liquid manure on all farms regardless of whether or not they have a NMS or NMP. The regulation also contains rules for the land application of anaerobic digestion output on all farms regardless of whether or not they have a nutrient management plan. The minimum setback requirements listed in Table 3 apply to the application of anaerobic digestion output if;

i. the anaerobic digestion materials were treated in a mixed anaerobic digestion facility,
ii. at least 50 per cent, by volume, of the total amount of anaerobic digestion materials were on-farm anaerobic digestion materials, and
iii. the anaerobic digestion materials did not contain sewage biosolids or human body waste.

Custom manure application businesses must have a Prescribed Materials Business Owners License. Employees of the custom application business who apply nutrients to an agricultural operation that requires a NMP must have a Nutrient Application Technician License.

Compliance

Compliance and enforcement of the Nutrient Management Act is the responsibility of the MOE. According to "Complying with Environmental Legislation on Farms" (Ontario Ministry of the Environment, 2009), the MOE's on-farm compliance program uses a problem-solving approach to help farmers comply with the law and manage environmental issues through education and outreach. Minor violations can be addressed through voluntary abatement plans, authorizing document amendments (to the nutrient management strategy and/or plan), and provincial officer orders. Enforcement, including Provincial Offenses Act summons, investigation and prosecution, are used in situations where serious issues are identified.

Nutrient Management Act and Ontario Regulation 106/09 - Disposal of Dead Farm Animals

The Ministry of Agriculture, Food and Rural Affairs and the MOE, in consultation with stakeholders, developed new regulations for the disposal of deadstock in Ontario (Government of Ontario, 2009). The Dead Animal Disposal Act (1968) was replaced by the Disposal of Dead Farm Animals regulation under the Nutrient Management Act and the Disposal of Deadstock regulation under the Food Safety and Quality Act. The new regulations came into force March 27, 2009. They provide more disposal options for livestock producers and meat plant operators, with measures that will protect the environment.

Under the Nutrient Management Act, one of the nine permitted disposal methods for dead farm animals is to compost the dead animals. This regulated compost is considered ASM that can be applied to land. In Ontario, all on-farm compost must stay on the farm where it originates because federal regulations prohibit the sale or removal of on-farm composted material that could contain specific risk material. The Canadian Food Inspection Agency recommends that this compost not be spread on pasture or grazing land.
Composting sites are subject to various setbacks to reduce the potential for nuisance complaints (from odour) and any potential threat to water quality (from liquid runoff). The minimum setbacks for dead farm animal composting sites include a setback of 100 m from any municipal well.

Currently dead stock burial is not identified as a prescribed drinking water threat. A SPR can apply through MOE to have it added as a local threat.

Municipal

Municipal Act

Municipalities have authority to enact by-laws for specific matters within their jurisdiction under the Municipal Act. Municipalities have broad authorities to pass by-laws about the economic, social, and environmental well-being of the municipality, and about the health, safety, and well-being of people. There are limitations on these authorities which need to be taken into consideration. Very generally, these broad authorities may not conflict with specific authorities found in other legislation. For example, any municipal by-law with respect to construction or demolition of buildings is superseded by the Building Code Act and the Building Code. In addition, in the event of a conflict between a municipal by-law and federal and provincial legislation, the legislation prevails. For example, if a municipality wishes to enact legislation to protect its drinking water sources, the municipality must review the applicable legislation to ensure that the municipal by-law does not conflict with it. Municipalities can supplement provincial regulatory schemes, provided that the by-law does not conflict with the provincial legislation.

In a two tier system, each tier may have exclusive jurisdiction over a matter, for example, lower tiers may enact zoning by-laws whereas upper tiers may be responsible for public health. As a result, the upper tier municipality cannot use its broad authorities to pass a by-law which is specifically within the jurisdiction of the lower tier.

Municipalities may also use authorities under the Municipal Act to set up a licensing regime for businesses. The licensing system generally applies to how operators conduct the business, rather than how a product is applied. However, the municipality may determine that there are certain conditions to holding a license, such as certification or operators.

Minimum Distance Separation Formulae

Agricultural activities can include livestock facilities (e.g. barns and manure storage), and are generally permitted by municipalities on lands that are designated and zoned for agricultural and rural use. In order to reduce incompatibility concerns about odour from livestock facilities, provincial minimum distance separation (MDS) formulae are used by municipalities to separate land uses.

Different formulae are applied to new or expanding non-agricultural uses (such as houses) that could impact existing livestock facilities (MDS I), and to new or expanding livestock facilities that could impact existing non-agricultural uses (MDS II) (Ontario Ministry of Agriculture and Rural Affairs, 2006). The formulae are applied to lands subject to most types of Planning Act applications and to activities that require building permits. The MDS I formulae are applied to low-intensity uses (e.g. industry, one house) proposed within a 1 km radius of the livestock facility, and to high-intensity uses (e.g. a subdivision) proposed within a 2 km radius.

MDS may have the effect of providing separation between a livestock facility and a municipal well if the municipal well is located on a non-agricultural lot zoned, for example, Institutional. However, there are cases where municipal wells are located on a large property zoned for agricultural uses or on a separate lot that have an agricultural zoning. In those instances, MDS would not be applied as the well would not fall under either of the Type A or Type B land uses.

It is possible that private wells can be afforded some separation through the application of MDS, if the private well is located on a rural residential lot. However, if the private well is located on the same lot as a livestock facility MDS would not provide separation it would be O. Reg. 267/03 that would provide the minimum well separation.

Other

Canada-Ontario Environmental Farm Plan

The Environmental Farm Plan (EFP) is a program that is delivered locally through the Ontario Soil and Crop Improvement Association with expertise provided by the Ontario Ministry of Agriculture and Food. It is a voluntary educational program for farmers delivered through local workshops. Participants progress through a risk assessment and action plan development for their farm. The risk assessment gives the farmer the opportunity to assess the current level of environmental concern in up to 23 different areas on the farm and access funding to make improvements for areas of identified risk (Ontario Soil and Crop Association, 2005). The information sheets on nutrient management for the EFP program are consistent with the requirements of O. Reg. 267/03.

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 the application and storage of ASMs.

Table 2-5 Existing Gaps in the Legislation, Policies and Programs

Level of Government	Legislation/Policies/Programs	Gaps
Provincial	Environmental Protection Act (Government of Ontario, 1990)	• This legislation is very high level and reactionary.
	Nutrient Management Act (Government of Ontario, 2002)	• There are many farms in vulnerable areas that are not required to have NMS unless they submit a building permit application for the expansion of a livestock or manure storage facility, they would not be phased in (this primarily pertains to existing farm operations that generate between 5 and 300 NU annually); • Farms that do not fall under the NMA can complete a NMP voluntarily but they do not require approval by OMAFRA • Municipalities do not receive feedback on compliance with the NMA requirements • There is limited monitoring of NMS and NMP • NMS do not require documentation when ASM is spread (this is covered in NMP) • Issues could arise when nutrients are brought in from other farms; as a farm receiving ASM is not necessarily required to have a NMS/NMP e.g. the farm that receives the ASM is not phased in as a result of the transfer (although they are required to have an agreement with the ASM supplier. The NMS of the supplier contains the contact information and location information of the farm receiving the ASM, the amount of ASM being transferred, the approximate date of the transfer as well as a statement regarding the number of livestock and land available for ASM application on the receiving farm • The NMA only applies to nutrients not pathogens; pathogens can also contaminate drinking water and may not always act in the same way • A farm that is not required to have a NMS cannot be required to have a NMP even if the farm is within 100 m of a municipal well.
	Ontario Water Resources Act (Government of Ontario, 1990)	• The Ontario Water Resources Act relates to water discharges more than to the application and storage of ASM.
Municipal	Minimum Distance Separation (MDS) Formula	• The MDS Formula may affect the location of livestock or manure storage facilities by requiring setbacks from sensitive uses such as residential, it cannot be used directly and effectively to protect drinking water from ASM storage and application.
Other	Canada-Ontario Environmental Farm Plan (EFP)	• There is limited funding to implement practices that are identified under the plan. The EFP is voluntary and confidential and cannot be provided to a party responsible for policy implantation.

Policy Considerations

- REMINDER: The main consideration for reducing or eliminating drinking water threats related to the application and storage of ASM is to make sure that ASM does not enter surface water and/or groundwater.
- The agricultural sector has been actively raising environmental awareness and researching and implementing environmental best management practices for the last few decades.
- Under Ontario Regulation 267/03, NMS are required for large farms (> 300 nutrient units) and any farm that requires a building permit for barn expansion or manure storage. The idea is that at some point all livestock farms will require a building permit and then be phased into the NM regulations. For farms that do not fall under this regulation, NMS and NMP can be completed voluntarily, but cannot receive approval by OMAFRA.
- OMAFRA reviews a first time NMP/S. For the 5 year update of a NMP/S, review is by a consultant.
- Application of ASMs cannot be prohibited under land use planning because it is an activity. Only land uses can be prohibited, such as agricultural land use. New ASM storage can be prohibited through the land use planning tool. Acquiring land gives a municipality the most control around land use activities.
- The Fisheries Act, Environmental Protection Act, and Ontario Water Resources Act are reactive in nature. The Nutrient Management Act is proactive in that it strives to prevent contamination from occurring.
- In establishing Risk Management Plans, consideration should be given to allow for new technologies or BMPs to be integrated as they become available.
- Application of ASMs is an activity. The Restricted Land Use tool will not capture future activities if they are not in association with an application process related to land use.
- The use of Risk Management Plans (RMP) would require the property owner to work with the Risk Management Official to create a RMP that would manage the risk posed by ASM storage and application. These plans would allow for site specific considerations.
- Policy objectives for the storage of ASM
    - To control nitrogen and pathogens so that there is no deterioration of groundwater for the purposes of drinking water
    - To control pathogens so that there is no deterioration of surface water for the purposes of drinking water
    - To prevent spills and leaks
    - To ensure spills response plans are in place
    - To require storage that meets safety standards (e.g. size and containment)
    - To require storages are a safe distance from wells and surface water
    - To raise awareness of impact of threat on drinking water sources
- Policy objectives for the application of ASM
    - To control nitrogen and pathogens so that there is no deterioration of groundwater for the purposes of drinking water
    - To control pathogens and so that there is no deterioration of surface water for the purposes of drinking water
    - To prevent over application of ASMs
    - To manage nutrient application so that it matches nutrient uptake of plant
    - To minimize runoff of ASMs
    - To manage application of ASMs in proximity to municipal wells where drinking water could be adversely affected.
    - To raise awareness of impact of threat on drinking water sources

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.

Table 2-6 Proposed Policy Ideas for Application and Storage of ASM

Threat: Application of Agricultural Source Material
Storage of Agricultural Source Material

Policy Tool	Policy ideas
Education and Outreach	Promote or develop programs to landowners and application technicians on importance of buffers around wells and surface water where the management of ASMs is important • Appropriate size/widths
	Promote BMPs to protect drinking water sources from risks of ASMs • Include the promotion of nutrient management plans even where not currently required • Include spills management and response • Incorporate source water messaging into existing E&O or establish new programs • Can use local innovators to encourage BMPS
	Encourage farmers within vulnerable areas to complete an EFP • Allows farmer to develop plan for his location • This is not an action plan that farmers must complete, it is more intended to educate the farmer as to what they could do and how much it would cost
Incentive Programs	Encourage incentive programs to establish buffers on lands adjacent to surface water within WHPA-E or IPZ (with vulnerability score of 9) • Support concept to maintain buffers in the future ($) • Consider inclusion of moderate and low threats contingent on funding. Priority must be on significant threats • Concern that this sets up a process where ongoing management costs should be covered for all threats. • No significant threats for IPZs and WHPA-E in Thames-Sydenham Region
	Support existing incentive programs (including ODWSP, EFP, Clean Water Program and others) that contribute to protection of drinking water sources • Highly recommend that the ODWSP continue to adequately fund risk mitigation practices for significant drinking water threats • Encourage new and innovative practices which reduce risk • Long term support • Encourage the development of new programs. • To assist with implementation of non-required management • Funding should be administered through other responsible groups • Recommend emphasis on significant threats • Incentives may are not be necessary when regulations are in place and well established
Land Use Planning	Prohibit new storage of ASMs where they would be a significant threat • Flexibility in policy when expanding or replacing an existing facility to allow with improvements • Need interim tool to implement policy until Planning Act approvals are received • Concern if new wells are planned. Studies will dictate decision to minimize changes to existing land use
Prescribed Instruments	Require MOE and OMAFRA to emphasize protection of municipal wellheads in review of NMS/P for farms in WHPA-A • Through the use of existing setbacks from NMA

	Recommend MOE prioritize inspections of NMS/P in vulnerable areas and conduct regular inspections • Would be through specify action policy • Timeframe for inspection 5 years • Request MOE to include location in a source protection vulnerable area as a risk factor in selecting inspections
	Recommend review and inspections of voluntary NMS/P for significant threats • Would be through specify action policy
Risk Management Plans	Require RMP for existing and expanding storage of ASMs within areas where it is considered a significant threat on farms that are not governed under the NMA • should mirror nutrient management plan requirements
	Require RMP for existing and future application of ASMs within areas where it is considered a significant threat and not already governed under the NMA • should mirror nutrient management plan requirements • where N issues are identified additional management may be necessary • use of farm water protection plan or other ways of having access to third party expertise • flexibility for using new technologies as they arise
Prohibition	• Prohibit new storage only through Land use planning tool where this activity is a significant threat • Manage existing storage and application significant threats through Risk Management Plans • Explore ability to prohibit if failure to comply with RMP and if all other tools fail to mitigate the risk of significant threats
Restricted Land Use	Flag land uses associated with ASMs (e.g. agricultural) as restricted land uses where these activities pose a significant threat • advise a proponent to obtain clearance from the RMO prior to proceeding with their application
Land Securement	Encourage purchase land where these activities are significant threat areas • Where the municipality wishes to exceed the levels of protection identified above

Policy Examples

Policy examples presented within this section are based on the policy ideas noted above. These policy examples were presented to the SPC to facilitate discussion and have been further reviewed by the Source Protection Municipal Policy Advisory Committee.

Policy Example Number	4-1
Sub- Threat(s)	Application and Storage of ASMs
Circumstance	▪ The land application of ASM ▪ Storage of ASM (below grade permanent facility, partially below grade permanent facility, at or above grade using temporary storage)
Vulnerable Area	WHPA-A, B with a vulnerability score of 10
Risk	Significant, Moderate and Low
Body Responsible for Implementing	Municipal Watershed Partnership with Conservation Authority to lead. The implementation of this policy in this manner builds on the strengths and efficiencies of the Conservation Authorities as a partnership of the municipalities in the watershed.
Threat Status	Future, Existing, Expanding
Land Use	Agricultural
Legal Effect	Conform(significant); Have Regard (moderate, low)
Policy Tool	Education and Outreach
Policy Idea	Develop new or where possible expand on existing education and outreach programs to promote Best Management Practices to protect drinking water sources from chemical and

Policy Example Number	4-1
	pathogen risks of Agricultural Source Materials including: • Promotion of nutrient management plans even where not currently required under NMA; • Promotion of voluntary Environmental Farm Plan; • Promotion of planning and implementation of spills prevention and response; • Education to landowners and application technicians on importance of buffers around wells and surface water where the management of ASMs is important; • Incorporation of source water messaging into existing education and outreach or establish new materials to be provided to landowners whose properties may be utilized for the application or storage of agricultural source materials; and, • Promotion of partnerships with OMAFRA and others. • 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 of the uptake by the target audience will also be included in this report.

Policy Example Number	4-2
Sub- Threat(s)	Application and Storage of ASMs
Circumstance	▪ The land application of ASM ▪ Storage of ASM (below grade permanent facility, partially below grade permanent facility, at or above grade using temporary storage)
Vulnerable Area	WHPA-A, B with a vulnerability score of 10
Risk	Significant
Body Responsible for Implementing	Conservation Authority, Municipality, MOE, others (may need to separate to create policies for each type of responsible body)
Threat Status	Existing, Expanding and Future
Land Use	Agricultural
Legal Effect	Strategic Action
Policy Tool	Incentives
Policy Idea	The Ontario Drinking Water Stewardship program shall continue to adequately fund risk mitigation practices for significant drinking water threats over the long term. Existing incentive programs (including EFP, Clean Water Program and others) that contribute to protection of drinking water sources should continue to be supported. New incentive programs should be considered to assist with the implementation costs of risk mitigation practices for significant, moderate and low threats on drinking water sources. Where funding is limited, emphasis shall be on significant threat mitigation.
Implementation schedule	Ongoing implementation for existing programs or within 2 years of the approval of the SPP for new programs.
Monitoring Policy	Program operators shall report to the CA annually and include the number and type of risk management measures which have been applied for and the number in vulnerable areas.

Policy Example Number	4-3
Sub- Threat(s)	Storage of ASMs
Circumstance	Storage of ASM (below grade permanent facility, partially below grade permanent facility, at or above grade using temporary storage)
Vulnerable Area	WHPA-A, B with a vulnerability score of 10
Risk	Significant
Body Responsible for	Municipality

Policy Example Number	4-3
Implementing	
Threat Status	Future
Land Use	Agricultural
Legal Effect	Conform
Policy Tool	Land Use Planning
Policy Idea	The establishment of new storage facilities for agricultural source materials will not be permitted in vulnerable areas where they would be a significant threat.
Implementation schedule	Shall be initiated in all Official Plans within 6 months of Source Protection Plan approval with the goal to be completed within 2 years of the Source Protection Plan approval date. Zoning bylaws shall be updated within 3 years of the Source Protection Plan approval date.
Monitoring Policy	Municipalities shall report to SPA 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 Example Number	4-4a
Sub- Threat(s)	Storage of ASMs
Circumstance	Storage of ASM (below grade permanent facility, partially below grade permanent facility, at or above grade using temporary storage)
Vulnerable Area	WHPA-A, B with a vulnerability score of 10
Risk	Significant
Body Responsible for Implementing	OMAFRA (responsible for approval of Nutrient Management Strategies) ,MOE (responsible for inspections and enforcement)
Threat Status	Existing and Expanding
Land Use	Agricultural
Legal Effect	Conform
Policy Tool	Prescribed Instrument-Nutrient Management Act
Policy Idea	Province to review and ensure that Nutrient Management Strategies and Plans adequately manage the risk where the storage of ASMs is a significant threat. OMAFRA shall review Nutrient Management Strategies and Plans within areas >100 m of a municipal well, where the storage of ASM would be a significant threat.
Implementation schedule	Within 1 year of approval of the SPP
Monitoring Policy	Submit an annual report to the CA which identifies the number of NMP, and NMS which were reviewed and the number which required updates to adequately manage the significant threats. MOE will submit an annual report to the CA which identifies the number of inspections and enforcements under the Nutrient Management Act.

Policy Example Number	4-4b
Sub- Threat(s)	Application of ASMs
Circumstance	Land application of ASM
Vulnerable Area	WHPA-A, B with a vulnerability score of 10
Risk	Significant
Body Responsible for Implementing	OMAFRA (responsible for approval of Nutrient Management Strategies), MOE (responsible for inspections and enforcement)
Threat Status	Existing and Future
Land Use	Agricultural
Legal Effect	Conform
Policy Tool	Prescribed Instrument-Nutrient Management Act
Policy Idea	Province to review and ensure that Nutrient Management Strategies and Plans adequately manage the risk where the application of ASMs is a significant threat. OMAFRA shall review Nutrient Management Strategies and Plans within areas >100 m of a municipal well, where the application of ASM would be a significant threat.
Implementation schedule	Within 1 year of approval of the SPP
Monitoring Policy	Submit an annual report to the CA which identifies the number of NMP, and NMS which were reviewed and the number which required updates to adequately manage the

Policy Example Number	4-4b
	significant threats. MOE will submit an annual report to the CA which identifies the number of inspections and enforcements under the Nutrient Management Act.

Policy Example Number	4-5a
Sub- Threat(s)	Application and Storage of ASMs
Circumstance	▪ The land application of ASM ▪ Storage of ASM (below grade permanent facility, partially below grade permanent facility, at or above grade using temporary storage)
Vulnerable Area	WHPA-A, B with a vulnerability score of 10
Risk	Significant
Body Responsible for Implementing	MOE
Threat Status	Existing, Expanding and Future
Land Use	Agricultural
Legal Effect	Strategic action
Policy Tool	Other-Specify action
Policy Idea	It is recommended that through MOE's on-farm compliance program that location within a source protection vulnerable area is included as a factor in selecting inspection priorities. It is recommended that inspections are conducted every 5 years for significant threats.
Implementation schedule	The implementation of a program which targets significant threats shall be initiated within 1 year of the approval of the SPP. All significant threats shall be inspected within 5 years of the approval of the SPP.
Monitoring Policy	A report shall be submitted to the CA annually which indicates the number of inspections undertaken within the areas where these activities can be significant threats, the number of situation identified where the plan holder was found to be out of compliance with their plan or strategy, the number of orders issued, and the number of changes to strategies or plans as a result of the inspection.

Policy Example Number	4-5b
Sub- Threat(s)	Application and Storage of ASMs
Circumstance	
Vulnerable Area	WHPA-A, B with a vulnerability score of 10
Risk	Significant
Body Responsible for Implementing	OMAFRA (responsible for approving Nutrient Management Strategies), MOE (responsible for inspections and enforcement)
Threat Status	Existing, Expanding and Future
Land Use	Agricultural
Legal Effect	Strategic action
Policy Tool	Specify action
Policy Idea	It is recommended that OMAFRA include voluntary Nutrient Management Plans and Strategies in its review program where the application and storage of ASMs is a significant threat.
Implementation schedule	Within 1 year of approval of the SPP
Monitoring Policy	Submit an annual report to the CA with the number of voluntary NMP and NMS reviewed. MOE will submit an annual report to the CA which identifies the number of inspections and enforcements of these voluntary plans and strategies under the Nutrient Management Act.

Policy Example Number	4-6a
Sub- Threat(s)	Storage of ASMs
Circumstance	Storage of ASM (below grade permanent facility, partially below grade permanent facility, at or above grade using temporary storage)
Vulnerable Area	WHPA-A, B with a vulnerability score of 10
Risk	Significant
Body Responsible for	Municipality

Implementing	
Threat Status	Existing and Expanding
Land Use	Agricultural
Legal Effect	Conform
Policy Tool	Risk Management Plan
Policy Idea	Existing ASM storages deemed a significant threat and not regulated under the NMA shall have an approved Risk Management Plan. The Risk Management Plan must meet the requirements of the Nutrient Management Act provided it adequately manages the significant threat. In most cases, the Nutrient Management Plan is believed to adequately manage the risk. Where an adequate risk management plan cannot be negotiated, the significant threat cannot be undertaken. A spills contingency plan must be included as part of the RMP. The expansion of an existing storage site for agricultural source materials, for which a Nutrient Management Plan is not required, will only be permitted in accordance with a Risk Management Plan.
Implementation schedule	Within 1 year of the approval of the SPP
Monitoring Policy	The Risk Management Official shall submit an annual report which includes the number of RMP required and approved to the CA

Policy Example Number	4-6b
Sub- Threat(s)	Application of ASMs
Circumstance	The land application of ASM
Vulnerable Area	WHPA-A, B with a vulnerability score of 10
Risk	Significant
Body Responsible for Implementing	Municipality
Threat Status	Existing, Expanding, and Future
Land Use	Agricultural
Legal Effect	Conform
Policy Tool	Risk Management Plan
Policy Idea	Agricultural source material shall only be applied in accordance with an approved Risk Management Plan in areas where it has been deemed a significant threat and the farm managing the land within the vulnerable area is not regulated under the NMA. The Risk Management Plan shall be in accordance with the ASM application standards as laid out in the NMA provided it adequately manages the significant threat. In most cases, the Nutrient Management Plan is believed to adequately manage the risk. Where an adequate risk management plan cannot be negotiated, the significant threat cannot be undertaken. A spills contingency plan must be included as part of the RMP. The Risk Management Plan must be reviewed every 5 years.
Implementation schedule	Within 1 year of the approval of the SPP
Monitoring Policy	The Risk Management Official shall submit an annual report which includes the number of RMP required and approved to the CA

Policy Example Number	4-7
Sub- Threat(s)	Storage of ASMs
Circumstance	Storage of ASM (below grade permanent facility, partially below grade permanent facility, at or above grade using temporary storage)
Vulnerable Area	WHPA-A, B with a vulnerability score of 10
Risk	Significant
Body Responsible for Implementing	Municipality
Threat Status	Existing, Future
Land Use	Agricultural
Legal Effect	Conform
Policy Tool	Prohibition
Policy Idea	Temporary field nutrient storage sites will not be permitted within vulnerable areas where

	they are deemed a significant threat.
Implementation schedule	The policy takes effect one year after the approval date of the first source protection plan.
Monitoring Policy	The municipality shall submit a report which includes whether they have identified any storage which was used in contravention of this policy. The report shall be submitted annually to the CA

Policy Example Number	4-8
Sub- Threat(s)	Application and Storage of ASMs
Circumstance	▪ The land application of ASM ▪ Storage of ASM (below grade permanent facility, partially below grade permanent facility, at or above grade using temporary storage)
Vulnerable Area	WHPA-A, B with a vulnerability score of 10
Risk	Significant
Body Responsible for Implementing	Municipality
Threat Status	Existing, Expanding and Future
Land Use	Agricultural
Legal Effect	Conform
Policy Tool	Restricted Land use
Policy Idea	Within the area where the application or storage of ASM is a significant threat, the municipality shall amend its zoning by-laws and official plans to identify all land uses which could be associated with the application and/or storage of ASM as restricted.
Implementation schedule	Shall be initiated in all Official Plans within 6 months of Source Protection Plan approval with the goal to be completed within 2 years of the Source Protection Plan approval date. Zoning bylaws shall be updated within 3 years of the Source Protection Plan approval date.
Monitoring Policy	Municipalities shall report to SPA 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 Example Number	4-9
Sub- Threat(s)	Application and Storage of ASMs
Circumstance	▪ The land application of ASM ▪ Storage of ASM (below grade permanent facility, partially below grade permanent facility, at or above grade using temporary storage)
Vulnerable Area	WHPA-A, B with a vulnerability score of 10
Risk	Significant
Body Responsible for Implementing	Municipality
Threat Status	Existing, Expanding and Future
Land Use	Agricultural
Legal Effect	Strategic Action
Policy Tool	Land Securement
Policy Idea	Municipalities shall consider land securement around wellheads in instances where the municipality wishes to exceed the level of protection identified in the SPP.
Implementation schedule	N/A
Monitoring Policy	When land securement has been pursued the municipality shall report the progress and outcomes to the CA.

Draft Policies

Draft policies have been developed for the Thames-Sydenham and Region for the application and storage of ASM. The table below provides a brief description of these policies. Refer to the Source Protection Plan for a detailed version of the policies.

Table 2-7 Draft Policies for the Application and Storage of ASM

TSR Policy Number	Policy Database Number	Threat	Description	Risk Category	Threat Status	Policy Approach	Implementer
TS.3.1	1652	Application of ASM	Management of the application ASM to the land through Section 58 of the Clean Water Act	Significant	Existing and future	Section 58	Risk Management Official
TS.4.1	1653	Storage of ASM	Prohibition of temporary storage of ASM	Significant	Existing	Section 57	Risk Management Official
TS.4.2	1654	Storage of ASM	Management of permanent storage of ASM through Section 58 of the Clean Water Act	Significant	Existing and future	Section 58	Risk Management Official
G.5.1 to G.5.5	1694	Storage of ASM	Section 58 of the Clean Water Act general policies	Significant	Existing and future	Section 58	Risk Management Official
G.7.2	1689	Application and storage of ASM	Compliance monitoring for activities regulated under Nutrient Management Act	Significant	Existing and future	Specify Action	MOE
G.2.1.2	1691	Application and storage of ASM	Continued funding for Ontario Drinking Water Stewardship Program	Significant	Existing	Incentives	MOE
G.6.1 to G.6.2	1692	Application and storage of ASM	Section 59 of the Clean Water Act general restricted land use	Significant	Future	Section 59	Risk Management Official
G.3.1, G.3.3.1, G.3.4.1	1693	Application and storage of ASM	General land use planning policies	Significant	Future	Land Use Planning	Planning Approval Authority
G.1.1 to G.1.2	1696	Application and storage of ASM	General education and outreach policies	Significant Moderate Low	Existing and future	Education and Outreach	Municipality Conservation Authority Province
G.2.1.1	1724	Application and storage of ASM	Existing incentives program general policy	Significant	Existing	Incentives	Municipality Conservation Authority Province
G.2.2.1	1728	Application and storage of ASM	New incentives programs general policy	Significant	Existing	Incentives	Municipality Conservation Authority Province
G.7.1	1735	Application and storage of ASM	Section 26 of the Clean Water Act general specify	Significant	Existing and future	Specify Action	OMAFRA

TSR Policy Number	Policy Database Number	Threat	Description	Risk Category	Threat Status	Policy Approach	Implementer
			action policies				
G.1.3	1866	Application and storage of ASM	Provincial signage to locate WHPA and IPZ	Significant	Existing and future	Education and Outreach	MOE MTO
G.1.4	1867	Application and storage of ASM	Signage policy as part of Municipal education policy	Significant	Existing and future	Education and Outreach	Municipality

References

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Government of Ontario. 1990. Ontario Water Resources Act. www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_90o40_e.htm

Government of Ontario. 2001. Municipal Act. www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_01m25_e.htm

Government of Ontario. 2002. Nutrient Management Act. www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_02n04_e.htm

Government of Ontario. 2003. Nutrient Management Act. Ontario Regulation 267/03 - General Regulation. www.e-laws.gov.on.ca/html/regs/english/elaws_regs_030267_e.htm

Government of Ontario. 2009. Nutrient Management Act. Ontario Regulation 106/09 - Disposal of Dead Farm Animals. www.e-laws.gov.on.ca/html/source/regs/english/2009/elaws_src_regs_r09106_e.htm

Ontario Ministry of Agriculture and Rural Affairs. 2006. Provincial minimum distance separation formulae. www.omafra.gov.on.ca/english/landuse/guide_toc.htm

Ontario Ministry of Agriculture and Rural Affairs. 2009. Nutrient Management Protocol. www.omafra.gov.on.ca/english/nm/regs/nmpro/nmprotc_09.htm

Ontario Ministry of the Environment. 2009. Complying with Environmental Legislation on Farms. www.ene.gov.on.ca/publications/7212e.pdf

Ontario Ministry of the Environment. 2009. Tables of Drinking Water Threats. 2008, as amended in 2009. www.ene.gov.on.ca/publications/cw/7561e03.pdf

Ontario Soil and Crop Association. 2005. Canada-Ontario Environmental Farm Plan. www.ontariosoilcrop.org/en/programs/programsaboutefp.htm

2.2 Application and Handling/Storage of Non-Agricultural Source Material (NASM)

What is the Threat to Drinking Water

This paper provides background information for prescribed drinking water threat 6 – the application of non-agricultural source material and prescribed drinking water threat 7 – the handling and storage of non-agricultural source material (NASM).

According to Ontario Regulation 267/03 – General under the Nutrient Management Act, NASMs include the following that are intended to be applied to land as nutrients, but that are not produced on a farm:

- Pulp and paper biosolids
- Sewage biosolids
- Anaerobic digestion output where less than 50% of the total material is on-farm anaerobic digestion materials (anaerobic digestion is a process used to decompose organic matter by bacteria in an oxygen-limited environment)
- Any other material that is not from an agricultural source and that is capable of being applied to land as a nutrient (such as materials from dairy product or animal food manufacturing).

NASM that will be applied to fields on a farm can be stored in a permanent nutrient storage facility (usually a steel or concrete tank), or on a temporary field nutrient storage site (only for solid NASM stored for more than 24 hours). There are restrictions about what types of NASM can be stored on a farm and for how long.
The primary consideration for reducing or eliminating drinking water threats related to the application, handling and storage of NASM is to make sure it does not enter surface water and/or groundwater.

What Causes the Activity to be a Drinking Water Threat

The Ministry of the Environment (MOE) Tables of Drinking Water Threats (Ontario Ministry of the Environment, 2009) identify nitrogen, total phosphorus and pathogens as contaminants that could make their way into surface and groundwater as a result of the application of NASM to land (circumstances 37 to 54, 1970 and 1971), and the handling and storage of NASM (circumstances 1409 to 1432, 1965 to 1968). These nutrients and pathogens could threaten the safety of drinking water sources in certain situations due to runoff or spills.

The source of nitrogen and total phosphorus is dependent on the material that is found in the NASM. Examples may include, human waste, household and personal care products (e.g. soap), or animal by-products.
Threat 1970 and 1971 of the MOE Tables of Drinking Water Threats (2008, as amended in 2009) are the pathogen threats associated with the application of NASM. This threat specifically addresses the following sources of NASM:

- seafood processing operations
- dairy producers
- dairy product manufacturing operations
- pulp and paper mills
- animal food manufacturing operations (from animal sources)
- meat plants
- sewage works

While heavy metals and pharmaceuticals in biosolids are of concern, they are outside the scope of the *Clean Water Act* at this time.

What is the Local Scale of the Drinking Water Threat

The classification of these activities as a significant, moderate or low drinking water threat is dependent on the location as well as the combination of the managed land percentage and livestock density for the vulnerable area. In general, the greater the managed land percentage and the livestock density, the greater the risk to drinking water. As a reminder:

- The application of NASM (chemical threats 37 to 54), is designated based on a function of managed land percentage and livestock density;
- Nitrogen is a threat for wellhead protection areas (WHPAs) and Intake Protection Zones (IPZs), while Phosphorus is a threat for IPZs only;
- Nitrogen is a concern for both surface and groundwater;
- Total phosphorous is only considered a drinking water threat in IPZs and in WHPAs where the groundwater is under the direct influence of surface water (i.e. WHPA-E). This is because excessive inputs of total phosphorous in surface water results in eutrophication and can cause toxic algae blooms both of which impair water quality;
- Managed lands include cropland, fallow land, improved pasture, golf courses, sports fields and lawns to which ASM, NASM, or commercial fertilizer could be applied. This value was calculated based on MOE Technical Bulletin and is included in the Assessment Report;
- Livestock density is derived from the number of farm animals in a given area. Livestock density is standardized to nutrient units per acre to account for the fact that different types of animals produce different amounts of manure with different nutrient values. A nutrient unit is based on the manure equivalent of nutrients contained in 43 kg of nitrogen or 55 kg of phosphate. The livestock density value was calculated based on MOE Technical Rules and is included in the Assessment Report; and,
- The application of NASM (threats 1970, 1971) and the handling and storage of NASM (threats 1965 to 1968) of NASM (Pathogen) is tied to material source not managed land percentage or livestock density. The storage of NASM is tied to mass of nitrogen.

The table below identifies the local scale of the threat of application of NASM to the land.

Table 2-8 Local Scale of Application of NASM to the Land

System	Threat	Type	# Locations*	WHPA	Vulnerability Score
Birr	Application of NASM to land	Pathogen	1	A	10
Dorchester	Application of NASM to land	Pathogen	5	A	10
Dorchester	Application of NASM to land	Pathogen	16	B	10
Melrose	Application of NASM to land	Chemical	2	B	10
Thorndale	Application of NASM to land	Pathogen	2	A	10
Ridgetown	Application of NASM to land		5		
		Totals	31		

* identified as farm fields

Applicable Legislation, Policies and Programs

The following section provides a summary of the applicable legislation, policies and programs (federal, provincial, municipal and other) that address the drinking water threats of the application and storage of NASM.

Table 2-9 Outline of Applicable Legislation, Policies and Programs

Level of Government	Applicable Legislation, Policies and Programs
Federal	Fisheries Act (Government of Canada, 1985)
Provincial	Environmental Protection Act (Government of Ontario, 1990)
	Guidelines for the Utilization of Biosolids and Other Wastes on Agricultural Land (Government of Ontario, 1996)
	Nutrient Management Act and Ontario Regulation 267/03 (Government of Ontario, 2002) • Non-Agricultural Source Material Plans
Municipal	Municipal Act 2001
Other	Canada-Ontario Environmental farm Plan (Ontario Soil and Crop Improvement Association, 2005)

Federal

Fisheries Act

Section 36(3) of the Fisheries Act states that "… no person shall deposit or permit the deposit of a deleterious substance of any type in water frequented by fish or in any place under any conditions where the deleterious substance or any other deleterious substance that results from the deposit of the deleterious substance may enter any such water." The deposition of any deleterious substance (contaminant) is in contravention of the legislation. For example, if a licensed applicator spread NASM on land near a river and the NASM subsequently washed into the river (Government of Canada, 1985).In general the Fisheries Act is enforced by Fisheries and Oceans Canada; however, the section that applies to contamination is under the authority of Environment Canada.

Provincial

Environmental Protection Act

A Certificate of Approval issued by the Ontario Ministry of the Environment (MOE) under Part V of the Environmental Protection Act is required in order to apply NASM to land, or to store it. A separate Certificate of Approval is required for each specific site (called an Organic Soil Conditioning Site) and for the hauler/spreader (Organic Waste Management System) (Government of Ontario, 1990). As of January 1, 2011, the land application of NASM will be regulated under the Nutrient Management Act. Existing certificates of approval will remain valid until they are suspended, revoked or expire 5 years from the date of issue.
Section 39 of the Environmental Protection Act, which relates to the approval of Certificates of Approval, is a prescribed instrument under the Clean Water Act.

The MOE has published a "Guide for Applying for Approval of a Hauled Sewage (Septage) or Processed Organic Waste (Biosolids) Waste Disposal Site" (November 1999) that outlines the extensive documentation required to support an application for a certificate of approval. The supporting information includes, but is not limited to: source and type of material to be applied, waste analysis report, soil analysis report, terrain description, surface physiology and geology, depth to water table, water wells, separation distances, application areas, crops, schedule of use, notification to adjacent landowners, and confirmation from the municipality that NASM can be applied (i.e. no municipal restrictions).

Guidelines for the Utilization of Biosolids and Other Wastes on Agricultural Land

The MOE, in conjunction with the Ontario Ministry of Agriculture, Food and Rural Affairs, also prepared a document called "Guidelines for the Utilization of Biosolids and Other Wastes on Agricultural Land" (March 1996). The purpose of this document is to facilitate the use of biosolids and other waste materials on agricultural

land, while protecting environmental quality, consumer and animal health, food quality and the productivity of the land. These Guidelines are intended to supplement Ontario Regulation 347 under the Environmental Protection Act. This document outlines the criteria that must be met before biosolids and other waste materials (e.g. pulp sludge) can be considered for use on agricultural land. The materials should supply essential plant nutrients and/or organic matter, or other constituents that will maintain crop production or soil health. The minimum requirements in this document have generally been carried over to Ontario Regulation 267/03 – General, under the Nutrient Management Act.

Nutrient Management Act and Ontario Regulation 267/03 – General

Ontario Regulation 267/03 – General will be the principal piece of legislation related to the application and on-farm storage of NASM. Sections 15.2 and 28 of Ontario Regulation 267/03 – General are prescribed instruments under the Clean Water Act. These sections relate to the approval of, and compliance with, NASM plans (Government of Ontario, 2003). As of January 1, 2011, Amendment 267/03 will take effect. The new amendment will establish consistent standards and requirements across the province. These will focus on the quality of the material being applied (Table 2-10), ensuring it meets strict criteria and is beneficial to the soil. They also include greater consideration of the material quality and potential odor generation and will cover any Ontario farm where NASM will be applied. The new regulation now includes references to 11 metals. A local SPA would have to add these metals as an MOE approved local threat in their Assessment Report prior to creating policies relating to these specific metals.

NASM Plans

NASM plans will address the land application of NASM and the storage of NASM on farms, and will be required for any farm where these activities would occur, regardless of the number of nutrient units generated. The plans can be prepared for one to five year periods, and are subject to annual review and summary by the operator. The "Nutrient Management Protocol" (OMAFRA, 2009) provides technical standards and procedures related to O. Reg. 267/03 – General. A NASM plan is similar to a nutrient management plan (NMP), except that it only covers those fields where the NASM will be applied instead of the entire farm unit. Therefore it is possible that a farm could require a NMS, NMS/P and NASM Plan. According to the Protocol, a NASM Plan must contain numerous components including information about the nutrients that will be applied (source, type, content, application rate); the fields where the nutrients will be applied; cropping practices, crop rotation and yields; and on-farm storage (if applicable). The required contingency plan covers topics such as receiving more nutrients than addressed in the nutrient management plan, and unanticipated release of nutrients (e.g. spills). Consultants who prepare NASM plans must be certified through the Ministry of Agriculture, Food and Rural Affairs (OMAFRA).

The purpose of NASM plans are:

- To optimize the relationship between the land-based application of nutrients, farm management techniques and crop requirements; and
- To minimize adverse impacts to the environment by ensuring that fields and storage meet regulatory requirements.

With the recent amendment, NASMs are divided into three categories based on the source of the materials and the level of risk associated with them (Table 2-10).

Table 2-10 Plan requirements based on category of NASM

Category	Examples of material	Plan requirements
1	unprocessed plant material such as leaf and yard waste, and culled vegetables	NASM plan not required
2	processed plant material, bakery waste, organic matter that does not contain fish or meat	NASM plan registration with OMAFRA for NASM with low metal content; approval by OMAFRA for NASM with high metal content

Category	Examples of material	Plan requirements
3[1]	sewage biosolids, pulp and paper biosolids, washwater and waste from a process that involves animal products	NASM plan approval by OMAFRA
[1] Category 3 NASM are specified in the MOE Tables of Drinking Water Threats for pathogen threats.		

Requirements for the Application of NASM

Before NASM is approved for land application, the operator must demonstrate to Ontario Ministry of Agriculture Food and Rural Affairs (OMAFRA) that the NASM will have a beneficial use for agriculture. For example, it must increase organic matter, increase soil pH, contain plant available nutrients (nitrogen, phosphorus, potassium), or be a source of water between June 15 and September 30. OMAFRA may seek the advice of the Biosolids Utilization Committee (BUC) in determining the suitability of a NASM for land application. BUC is an advisory body, with agricultural and environmental expertise, to MOE and OMAFRA. It was responsible for developing the "Guidelines for the Utilization of Biosolids and Other Wastes on Agricultural Land" (MOE and OMAFRA, 1996).

There are restrictions on the application of NASM based on time of year, slope and application rate, application method, incorporation, crop residue, and distances from surface water. For example, NASM applied to land when the soil is snow-covered or frozen is subject to a number of restrictions. Sewage biosolids cannot be applied between December 1 and March 31 or when the ground is frozen or snow covered. Proponents, who apply nutrients to a field that will require a NASM plan, but who do not own, operate or work as an employee for the farm, must have a Nutrient Application Technician License.

The minimum setback requirements for the application of NASM to land are listed in Table 2-11. These setbacks reflect the amendments to O. Reg. 267/03 – General that will come into effect on January 1, 2011, and are similar to those specified in the "Guidelines for the Utilization of Biosolids and Other Wastes on Agricultural Land" (MOE and OMAFRA, 1996). Under the Nutrient Management Act, the operator will no longer need to provide notification to adjacent landowners or receive confirmation from the municipality. OMAFRA will provide a notice of NASM plan approval to the municipality. For the application of category 3 NASM or category 2 that is CM2, the MOE must be notified at least 24 hours before application begins.

Table 2-11 Minimum setback requirements for the application of NASM to land

Feature	Value
Minimum soil depth to bedrock	0.3 m [1]
Minimum depth to groundwater table	0.3 m or 0.9 m[2]
Minimum distance to municipal wells	100 m
Minimum distance to drilled wells (>15 m deep)	15 m
Minimum distance to all other wells including dug wells	30 m or 90 m[2]
Minimum distance to individual residences	25 to 450 m[3]
Minimum distance to residential areas, commercial, community or institutional uses	50 m to 900 m[3]
Minimum distance to watercourses	20 m[4]
[1] NASM cannot be applied if the soil depth to bedrock is less than 0.3 m. There are restrictions to the application of NASM for soil depth between 0.3 m and 1 m. [2] This requirement is dependent on the type of NASM and the method of application. [3] This distance depends on the odour classification of the NASM. [4] The minimum distance to a watercourse is dependent on slope, presence of vegetative buffer, method of incorporation into soil, a specified amount of crop residue, or if it is applied to a living crop (such as in a pasture).	

The minimum distances to other land uses such as residential areas relates to the odour associated with the NASM, however, in terms of drinking water source protection, it has the effect of providing separation between

the land application of NASM and municipal and private drinking water wells that may exceed the minimum well separation required under O. Reg. 267/03.

A vegetated buffer zone is required between land where NASM is applied and surface water. The buffer zone must have a minimum width of 3 m and be maintained under continuous vegetated cover including perennial grasses, other herbaceous plants, or trees and perennial forage crops that can be harvested as hay or silage.
O. Reg. 267/03 restricts the use of high trajectory irrigation guns to land apply liquid manure or NASM on all farms regardless of whether or not they have a nutrient management strategy, nutrient management plan or NASM plan. The regulation also contains rules for the land application of anaerobic digestion output on all farms regardless of whether or not they have a nutrient management plan. The minimum setback requirements listed in Table 2-11 generally apply to the application of anaerobic digestion output where it is considered to be a NASM.

Requirements for the Storage of NASM

The minimum setback requirements for a new permanent nutrient storage facility are listed in Table 2-12. Temporary field nutrient sites must also meet setback requirements if solid NASM is to be stored on the site for more than 24 hours (value in brackets if different). These setbacks reflect the amendments to O. Reg. 267/03 – General that will come into effect on January 1, 2011. Category 3 NASM cannot be stored on-farm.

Table 2-12 Location Requirement for NASM Storage

Feature	Value
Minimum distance to municipal wells	100 m
Minimum distance to drilled wells (>15 m deep)	15 m (45 m)
Minimum distance to all other wells including dug wells	90 m
Minimum distance to field drainage tiles or piped municipal drains	15 m
Minimum flow path to surface water or tile inlet	50 m
Minimum distance to individual residences	200 m (125 m or 200 m[1])
Minimum distance to residential areas, commercial, community or institutional uses	450 m (250 m or 450 m[1])
[1] This distance depends on the odour classification of the NASM.	

The minimum distances to other land uses such as residential areas relates to the odour associated with the NASM, however, in terms of drinking water source protection, in some cases, it may have the effect of providing separation between the storage of NASM and municipal and private drinking water wells that may exceed the minimum separation required under O. Reg. 267/03.

Permanent nutrient storage facilities built after June 30, 2003 can be used to store NASM provided that an engineer confirms that the facility meets the requirements of the Nutrient Management Act and is appropriate for the storage of NASM. NASM can only be stored in a permanent facility built before June 30, 2003 if it is subject to a Certificate of Approval under the Environmental Protection Act (Government of Ontario, 1990).
Under O. Reg. 267/03, a permanent solid NASM storage facility must have a runoff management system to handle all of the runoff generated by the facility (e.g. solid NASM piled on a concrete base). The system must consist of at least one of the following:

- A roof used to prevent the entry of precipitation, assuming that any water upstream of the facility has been diverted away from the facility;
- Vegetated filter strip systems;
- Properly sized runoff collection and storage systems;
- A permanently vegetated area (PVA), if runoff from the facility is generated from an area less than 300 sq. m. The location requirements for a PVA are similar to those for the nutrient storage facility (see Table 2-11); and,

- A sewage works approved under the OWRA or a sewage system approved under the Ontario Building Code.

Compliance

Compliance and enforcement of the Nutrient Management Act is the responsibility of the MOE. According to "Complying with Environmental Legislation on Farms" (Ontario Ministry of the Environment, 2009), the MOE's on-farm compliance program uses a problem-solving approach to help farmers comply with the law and manage environmental issues through education and outreach. Minor violations can be addressed through voluntary abatement plans, authorizing document amendments (to the nutrient management strategy and/or plan), and provincial officer orders. Enforcement, including Provincial Offenses Act summons and investigation and prosecution, would be used in situations where serious issues are identified.

Municipal

Municipal Act

Municipalities under the Municipal Act have the ability to pass by-laws about the economic, social and environmental well-being of the municipality, and about the health, safety and well-being of people (Government of Ontario, 2001).

Generally, these broad authorities may be in conflict with specific authorities found in other legislation. For example, any municipal by-law with respect to construction or demolition of buildings is superseded by the Building Code Act and the Building Code. In addition, in the event of a conflict between a municipal by-law and federal and provincial legislation, the legislation prevails. For example, if a municipality wishes to enact legislation to protect its drinking water sources, the municipality must review the applicable legislation to ensure that the municipal by-law does not conflict with it. Municipalities can supplement provincial regulatory schemes, provided that the by-law does not conflict with the provincial legislation.

In a two tier system, each tier may have exclusive jurisdiction over a matter, for example, lower tiers may enact zoning by-laws whereas upper tiers may be responsible for public health. As a result, the upper tier municipality cannot use its broad authorities to pass a by-law which is specifically within the jurisdiction of the lower tier.

Municipalities may also use authorities under the Municipal Act to set up a licensing regime for businesses. The licensing system generally applies to how operators conduct the business, rather than how a product is applied. However, the municipality may determine that there are certain conditions to holding a license, such as certification or operators.

Other

Canada-Ontario Environmental Farm Plan

The Environmental Farm Plan (EFP) is a program that is delivered locally through the Ontario Soil and Crop Improvement Association with expertise provided by the Ontario Ministry of Agriculture and Food. It is a voluntary educational program for farmers delivered through local workshops (Ontario Soil and Crop Association, 2005). Participants progress through a risk assessment and action plan development for their farm. The risk assessment gives the farmer the opportunity to assess the current level of environmental concern in up to 23 different areas on the farm and access funding to make improvements for areas of identified risk. The information sheets on nutrient management for the EFP program are consistent with the requirements of O. Reg. 267/03.

Gaps in Existing Legislation, Policies and Programs

The following table provides the gaps that exist in the legislation, policies and programs that are associated with the application and storage of NASM.

Table 2-13 Existing Gaps in the Legislation, Policies and Programs

Level of Government	Legislation/Policies/Programs	Gaps
Provincial	Environmental Protection Act (Government of Ontario, 1990)	• There is a five year period before farms with existing C of As are phased in under the NMA; existing C of As may not have the same level of requirements for nutrient management as presented in the Act.
	Utilization of Biosolids and Other Wastes on Agricultural Land	• These are only Guidelines are intended to supplement Ontario Regulation 347 under the Environmental Protection Act.
	Nutrient Management Act (Government of Ontario, 2002)	• Municipalities do not receive feedback on the compliance with the NMA requirements. • There is limited monitoring of NASM plans. • The requirements for the application and storage of NASM may or may not adequately protect drinking water in significant threat areas. • The NMA only applies to nutrients, not pathogens; pathogens can also contaminate drinking water, and may not always act in the same way.
Other	Canada-Ontario Environmental farm Plan (Ontario Soil and Crop Improvement Association, 2005)	• There is limited funding to implement practices that are identified under the plan. The EFP is voluntary and confidential and therefore cannot be provided to a party responsible for policy implementation.

Policy Considerations

- Each section of 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. For example, a general policy may be appropriate in an urban setting even if it is unlikely that NASM would be applied or stored there. The occurrence of the number of potential significant threats related to NASMs is related to the location of farm fields.
- NASM storage can be either governed by the Ontario Water Resources Act, the Environmental Protection Act, the Nutrient Management Act or not at all.
- Some municipalities don't have 240 days storage for NASMs and in the past have used random agricultural storages.
- Application of NASMs cannot be prohibited under land use planning because it is an activity. Only land uses can be prohibited, such as agricultural land use. New NASM storage can be prohibited through the land use planning tool.
- An applicant is required to keep records of how the conditions of a certificate of approval are met, but they are not submitted to MOE unless requested.
- No NASM storages have been identified as a significant risk in the Thames-Sydenham region. The number of significant threat locations identified for NASM application is based on farm field locations within the WHPA-A and B with a vulnerability score of 10, and the possibility of spreading NASMs on those lands.

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.

Table 2-14 Policy Ideas Application and Storage of NASM

Threat: The application and storage of Non-agricultural source materials
Circumstances: Where the application or storage of NASM would be a significant drinking water threat

Policy Tool	Policy ideas
Education and Outreach	• Encourage owners of storage to adopt risk management measures to reduce the risk that the NASM could reach surface or ground water • Encourage property owners to consider alternatives to NASM applications in vulnerable areas • Encourage the use of the current best management practices for application of NASM
Incentive Programs	• Incentive programs were considered and determined to not be applicable to this threat.
Land Use Planning	• Land Use Planning is not an appropriate tool to manage the application of NASMs. • Prohibit new NASM storages within areas where they would be a significant threat.
Prescribed Instruments	• Require MOE and OMAFRA to consider WHPA in review of NASM Plans under NMA for farms ensuring that where application or storage of NASM is a significant threat that the threat ceases to be significant including: • No new C of A for application of NASM are to be issued which would allow the application to occur in areas where the application of NASM would be a significant threat to drinking water • MOE to address location of temporary storage through their C of A to ensure that these are not permitted in areas where rupture or spills could result in the release into an area where application or storage is a significant threat • Existing C of A are to be amended such that application of NASM within areas where the application would be a significant threat is not permitted. • Recommend MOE to prioritize inspections of NASM Plans in vulnerable areas and conduct regular inspections (other – specified action)
S. 57 Prohibition	• Prohibit application of NASMs where this activity is considered a significant threat • Prohibit new and temporary storage of NASMs where this activity is considered a significant threat
S. 58 Risk Management Plans	• Risk Management Plans are not necessary for the application of NASM due to the proposed prohibition in those areas where the application is or would be a significant threat. • Risk Management Plans are not necessary for new storages as they are prohibited where they would be a significant threat. • Risk management plans are required for existing storage in areas where it is a significant threat. These risk management plans should rely upon best management practices to reduce the risk to the drinking water source to the extent that the activity is no longer considered a significant threat.
S. 59 Restricted Land Use	• Require prescreening of planning applications for activities related to storage of NASMs where the activity is considered a significant threat
S.26 p.1 Other Specify action	• Monitoring/inspection of permits to be a priority in vulnerable areas where it is a significant threat • Encourage the province to update the “Guidelines for the Utilization of Biosolids” and include SP principals including the restriction of application and storage of NASM in areas where it is or would be a significant drinking water threat.

S. 26 p.1 Other-Specify Action (Municipal Operations/ Infrastructure)	• Encourage municipalities when utilizing (or planning for the use of) facilities for the Storage of NASM, where that storage is or would be a significant threat, to seek alternate storage facilities or relocate the facility.

Policy Examples

Policy examples presented within this section are based on policy ideas noted above. These policy examples were presented to the SPC to facilitate discussion and have been further reviewed by the Source Protection Municipal Policy Advisory Committee.

Policy Example Number	6-1
Sub- Threat(s)	• Application of NASMs to land (including treated septage) and • Handling and storage of NASMs.
Circumstance	NASM is applied to the land and may result in a release to groundwater or surface water. The storage of NASM below grade is in a structure that is a permanent nutrient storage facility.
Vulnerable Area	WHPA-A, B with a vulnerability score of 10
Risk	Significant, Moderate and Low
Body Responsible for Implementing	Municipal Watershed partnership with Conservation Authority to lead. The implementation of this policy in this manner builds on the strengths and efficiencies of the Conservation Authorities as an existing partnership of the municipalities in the watershed.
Threat Status	Existing, Expanding, Future
Land Use	Agricultural
Legal Effect	Conform (significant),strategic (low, moderate)
Policy Tool	Education and Outreach
Policy Idea	Develop new or where possible expand on existing education and outreach programs to protect the drinking water sources from the nutrient and pathogen risks associated with the application of NASMs by promoting Best Management Practices. These practices may include: • Promotion of NASM plans even where not currently required under the NMA; • Promotion of the development of a voluntary Environmental Farm Plan; • Promotion of awareness of spills management and response; • Educate landowners in vulnerable areas on alternatives to NASM application; • Incorporation of source water messaging into existing education and outreach or establish new materials to be provided to landowners whose properties may be utilized for the application and storage of NASMs; and, • Promotion of the adoption of risk management measures to reduce the risk of NASMs that could reach surface or groundwater. • 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 tracking the uptake by the target audience will also be included in this report.

Policy Example Number	6-2
Sub- Threat(s)	• Application of NASMs to land (including treated septage) and • Handling and storage of NASMs.

Policy Example Number	6-2
Circumstance	• NASM is applied to the land and may result in a release to groundwater or surface water. • The storage of NASM below grade is in a structure that is a permanent nutrient storage facility.
Vulnerable Area	WHPA-A, B with a vulnerability score of 10
Risk	Significant
Body Responsible for Implementing	N/A
Threat Status	Existing, Expanding, Future
Land Use	Agricultural
Legal Effect	Strategic Action
Policy Tool	Incentive Programs
Policy Idea	Incentive programs were considered and determined to not be applicable to this threat.
Implementation schedule	N/A
Monitoring Policy	N/A

Policy Example Number	7-1
Sub- Threat(s)	Handling and Storage of NASMs.
Circumstance	The storage of NASM below grade is in a structure that is a permanent nutrient storage facility.
Vulnerable Area	WHPA-A, B with a vulnerability score of 10.
Risk	Significant
Body Responsible for Implementing	Municipality
Threat Status	Future
Land Use	Agricultural
Legal Effect	Conform
Policy Tool	Land Use Planning
Policy Idea	The establishment of new NASM storage areas will not be permitted in vulnerable areas where they would be a significant threat. Municipalities shall revise official plans and bylaws to be consistent with this policy. All land uses which could be associated with storage of NASM shall be flagged as restricted.
Implementation schedule	Shall be initiated in all Official Plans within 6 months of Source Protection Plan approval date with the goal to be completed within 2 years of the Source Protection Plan approval date. Zoning by-laws shall be updated within 3 years of the Source Protection Plan approval date.
Monitoring Policy	• Municipalities shall report annually to the SPA on new policies created 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. • Municipalities must update the SPA annually on progress towards completion of the implementation of relevant policies in their OP and Bylaws.

Policy Example Number	7-2
Sub- Threat(s)	Handling and Storage of NASMs
Circumstance	The storage of NASM below grade is in a structure that is a permanent nutrient storage facility.
Vulnerable Area	WHPA-A, B with a vulnerability score of 10.
Risk	Significant
Body Responsible for Implementing	• OMAFRA (review and approval of NASM Plans), • MOE (inspection and enforcement of NASM Plans)
Threat Status	Existing and Expanding
Land Use	Agricultural

Policy Example Number	7-2
Legal Effect	Conform
Policy Tool	Prescribed Instruments-Nutrient Management Act and Environmental Protection Act.
Policy Idea	The province, under the Nutrient Management Act, shall ensure all (new and existing) NASM Plans adequately manage the risk where the handling and storage of NASMs is a significant threat. The MOE under the Environmental Protection Act, shall review and amend existing C of A to ensure temporary storages are not permitted in areas where rupture or spills during handling could result in the release into an area where handling and storage is a significant threat. The MOE will complete inspections of NASM handling and storage sites in vulnerable areas as a first priority followed by regular inspections.
Implementation schedule	Within 1 year of approval of the Source Protection Plan
Monitoring Policy	• OMAFRA shall submit an annual report to the CA which identifies the number of NASM Plans that were reviewed and the number that required updates to adequately manage the updated threats. • MOE shall submit an annual report to the CA which identifies the number of inspections and enforcements completed under the Nutrient Management Act within the vulnerable areas associated with municipal water supply sources.

Policy Example Number	6-3
Sub- Threat(s)	Application of NASMs to land (including treated septage)
Circumstance	NASM is applied to the land and may result in a release to groundwater or surface water.
Vulnerable Area	WHPA-A, B with a vulnerability score of 10.
Risk	Significant
Body Responsible for Implementing	• OMAFRA (review and approval of NASM Plans), • MOE (inspection and enforcement of NASM Plans)
Threat Status	Existing and Future
Land Use	Agricultural
Legal Effect	Conform
Policy Tool	Prescribed Instruments-Nutrient Management Act and Environmental Protection Act.
Policy Idea	The OMAFRA, under the Nutrient Management Act, will not allow the application of NASMs in areas where the application of NASMs would be a significant threat to drinking water. The MOE, under the Environmental Protection Act, will amend existing C of A to not permit the application of NASMs where the application would be a significant threat to drinking water. As an alternative the MOE may consider revoking existing C of A requiring the review and approval under the NMA. The MOE will complete inspections of the application of NASMs in vulnerable areas as a first priority followed by regular inspections.
Implementation schedule	Amendment of existing C of A shall be completed within 1 year of approval of the Source Protection Plan. The aspects of this policy which pertain to new C of A shall be implemented immediately upon the Source Protection Plan coming into effect.
Monitoring Policy	• OMAFRA shall submit an annual report to the CA which identifies the number of NASM Plans that were reviewed and the number that required updates to adequately manage the updated threats. • MOE will submit an annual report to the CA which identifies the number of inspections and enforcements completed under the Nutrient Management Act and the Environmental Protection Act which pertain to application of NASM to land.

Policy Example Number	7-3
Sub- Threat(s)	Handling and Storage of NASMs.
Circumstance	The storage of NASM below grade is in a structure that is a permanent nutrient storage facility.
Vulnerable Area	WHPA-A, B with a vulnerability score of 10
Risk	Significant

Body Responsible for Implementing	Municipality
Threat Status	Existing and Expanding
Land Use	Agricultural
Legal Effect	Conform
Policy Tool	S. 58 Risk Management Plans
Policy Idea	Existing NASM storage areas deemed a significant threat will be required to have a Risk Management Plan. The Risk Management Plan must meet the requirements of the Nutrient Management Act provided it adequately manages the significant threat. The Risk Management Plan will rely upon best management practices to reduce the risk to the drinking water source. Where an adequate risk management plan cannot be negotiated, the significant threat cannot be undertaken. A spills contingency plan must be included as part of the Risk Management Plan. The expansion of an existing storage site for NASMs will only be permitted in accordance with the Risk Management Plan.
Implementation schedule	Within 1 year of the approval of the Source Protection Plan
Monitoring Policy	The Risk Management Official shall submit an annual report to the CA which includes the number of RMP required and approved. The report shall include a summary of the types of Risk Management Measures which were approved as part of Risk Management Plans.

Policy Example Number	6-4
Sub- Threat(s)	Application of NASMs to land (including treated septage)
Circumstance	NASM is applied to the land and may result in a release to groundwater or surface water.
Vulnerable Area	WHPA-A, B with a vulnerability score of 10
Risk	Significant
Body Responsible for Implementing	Municipality
Threat Status	Existing and Future
Land Use	Agricultural
Legal Effect	Conform
Policy Tool	S.58 Risk Management Plans
Policy Idea	This policy is not required and has been deleted as prohibition through various methods makes RMP redundant
Implementation schedule	Within 1 year of the approval of the Source Protection Plan
Monitoring Policy	The Risk Management Official shall submit an annual report to the CA which includes the number of RMP required and approved. The report shall include a summary of the types of Risk Management Measures which were approved as part of Risk Management Plans.

Policy Example Number	7-4
Sub- Threat(s)	Handling and Storage of NASMs.
Circumstance	The storage of NASM below grade is in a structure that is a permanent nutrient storage facility.
Vulnerable Area	WHPA-A, B with a vulnerability score of 10
Risk	Significant
Body Responsible for Implementing	Municipality
Threat Status	Existing and Future
Land Use	Agricultural
Legal Effect	Conform
Policy Tool	S. 57 Prohibition
Policy Idea	New permanent and temporary storage of NASMs will not be permitted within vulnerable areas where this activity is considered a significant threat.
Implementation schedule	This policy takes effect one year after the approval date of the first Source Protection Plan.
Monitoring Policy	The municipality shall submit a report which includes whether they have identified any storage which is in contravention of this policy and indicate efforts taken to correct. The

	report shall be submitted annually to the CA.

Policy Example Number	6-5
Sub- Threat(s)	Application of NASMs
Circumstance	NASM is applied to the land and may result in a release to groundwater or surface water.
Vulnerable Area	WHPA-A, B with a vulnerability score of 10
Risk	Significant
Body Responsible for Implementing	Municipality
Threat Status	Existing and Future
Land Use	Agricultural
Legal Effect	Conform
Policy Tool	S. 57 Prohibition
Policy Idea	The application of NASMs will not be permitted in vulnerable areas where this activity is considered a significant threat.
Implementation schedule	This policy takes effect one year after the approval date of the first Source Protection Plan.
Monitoring Policy	The municipality shall submit a report which includes whether they have identified any storage which is in contravention of this policy and indicates any steps taken to correct the contravention. The report shall be submitted annually to the CA.

Policy Example Number	7-5
Sub- Threat(s)	Handling and Storage of NASMs.
Circumstance	The storage of NASM below grade is in a structure that is a permanent nutrient storage facility.
Vulnerable Area	WHPA-A, B with a vulnerability score of 10
Risk	Significant
Body Responsible for Implementing	Municipality
Threat Status	Existing, Expanding and Future
Land Use	Agricultural (and all other land uses which could be associated with the handling and storage of NASM)
Legal Effect	Conform
Policy Tool	S.59 Restricted Land Uses
Policy Idea	Within the area where the handling and storage of NASMs is a significant threat, the municipality shall amend its official plan and zoning by-laws to identify, as restricted, all land uses which could be associated with the application or storage of NASMs.
Implementation schedule	Shall be initiated in all Official Plans within 6 months of the approval of the Source Protection Plan with the goal to be completed within 2 years of the Source Protection Plan approval date. Zoning by-laws shall be updated within 3 years of the Source Protection Plan approval date.
Monitoring Policy	Municipalities shall report to SPA on new policies incorporated into 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 by-laws meet the requirements of this policy.

Policy Example Number	6-6
Sub- Threat(s)	Application of NASMs to land (including treated septage) and Handling and Storage of NASMs.
Circumstance	NASM is applied to the land and may result in a release to groundwater or surface water. The storage of NASM below grade is in a structure that is a permanent nutrient storage facility.
Vulnerable Area	WHPA-A, B with a vulnerability score of 10
Risk	Significant
Body Responsible for Implementing	MOE
Threat Status	Existing, Expanding and Future

Policy Example Number	6-6
Land Use	Agricultural
Legal Effect	Strategic
Policy Tool	S.26 p.1 Other- Specify Action
Policy Idea	The MOE shall consider updating the "Guidelines for the Utilization of Biosolids" and include Source Protection principles including the restriction of application and handling and storage of NASMs in areas where it is or would be a significant drinking water threat (i.e. IPZs and WHPAs)..
Implementation schedule	N/A
Monitoring Policy	MOE shall report on the progress and outcomes to the CA.

Policy Example Number	7-6
Sub- Threat(s)	Handling and Storage of NASMs.
Circumstance	The storage of NASM below grade is in a structure that is a permanent nutrient storage facility.
Vulnerable Area	WHPA-A, B with a vulnerability score of 10
Risk	Significant
Body Responsible for Implementing	Municipality
Threat Status	Existing, Expanding and Future
Land Use	Municipal Operations/Infrastructure
Legal Effect	Conform
Policy Tool	S.26 p.1 Other- Specify Action (Municipal Operations/Infrastructure)
Policy Idea	Municipalities shall consider when utilizing (or planning for the use of) facilities for the handling and storage of NASMs, where that storage is or would be a significant threat and seek alternate storage facilities or relocation of the facility.
Implementation schedule	N/A
Monitoring Policy	The municipality shall report any storage which they utilize which is or would be a significant threat and report on the progress and outcomes of the shift to utilizing alternative facilities. The report is to be submitted annually to the CA.

Policy Example Number	6-7
Sub- Threat(s)	Application of NASMs to land (including treated septage) and Handling and Storage of NASMs.
Circumstance	NASM is applied to the land and may result in a release to groundwater or surface water.
Vulnerable Area	WHPA-A, B with a vulnerability score of 10
Risk	Significant
Body Responsible for Implementing	MOE
Threat Status	Existing, Expanding and Future
Land Use	Agricultural
Legal Effect	Strategic
Policy Tool	S.26 p.1 Other-Specify Action
Policy Idea	It is recommended that through MOE's on-farm compliance program that location within a source protection vulnerable area is included as a factor in selecting inspection priorities. It is recommended that inspections are conducted every 5 years for significant threats.
Implementation schedule	The implementation of a program which targets significant threats shall be initiated within 1 year of the approval date of the Source Protection Plan. All significant threats shall be inspected within 5 years of the approval of the SPP.
Monitoring Policy	A report shall be submitted to the CA annually which indicates the number of inspections undertaken within the areas where these activities can become significant threats, the number o situations identified where the plan holder was found to be out of compliance with their NASM Plan, the number of orders issued and the number of changes to the NASM Plans as a result of the inspection.

Draft Policies

Draft policies have been developed for Thames-Sydenham and Region for the application and storage of NASM. The table below provides a brief description of these policies. Refer to the Source Protection Plan for a detailed version of the policies.

Table 2-15 Draft Policies for the Application and Handling/Storage of NASM

TSR Policy Number	Policy Database Number	Threat	Description	Risk Category	Threat Status	Policy Approach	Implementer
TS.6.1	1655	Application of NASM	Prohibition of application of NASM to land through Nutrient Management Act and Environmental Protection Act	Significant	Existing and future	Prescribed Instruments	OMAFRA MOE
TS.6.2	1656	Application of NASM	Section 57 prohibition of application of NASM to land not subject to Nutrient Management Act	Significant	Existing and future	Section 57	Risk Management Official
TS.7.1	1657	Handling and storage of NASM	Management of existing permanent storage of NASM through Section 58 of the Clean Water Act	Significant	Existing	Section 58	Risk Management Official
TS.7.2	1658	Handling and storage of NASM	Prohibition of temporary NASM storage through Nutrient Management Act and Environmental Protection Act	Significant	Existing and future	Prescribed Instruments	OMAFRA MOE
TS.7.3	1659	Handling and storage of NASM	Management of existing permanent NASM storage through Nutrient Management Act and Environmental Protection Act	Significant	Existing	Prescribed Instruments	OMAFRA MOE
TS.7.4	1660	Handling and storage of NASM	Prohibition of temporary NASM storage facilities through Section 57 of the Clean Water Act	Significant	Existing and future	Section 57	Risk Management Official
TS.7.5	1661	Handling and storage of NASM	Prohibition of future permanent NASM storage	Significant	Future	Section 57	Risk Management Official

TSR Policy Number	Policy Database Number	Threat	Description	Risk Category	Threat Status	Policy Approach	Implementer
			facilities through Section 57 of the Clean Water Act				
G.5.1 to G.5.5	1694	Handling and storage of NASM	Section 58 of the Clean Water Act general risk management policies	Significant	Existing and future	Section 58	Risk Management Official
G.7.2	1689	Application, handling and storage of NASM	Compliance monitoring for activities regulated under the Nutrient Management Act	Significant	Existing and future	Specify Action	MOE
G.7.3	1690	Application, handling and storage of NASM	Geo-referencing of prescribed instruments	Significant	Existing and future	Specify Action	MOE
G.6.1 to G.6.2	1692	Application, handling and storage of NASM	Section 59 of the Clean Water Act restricted land use general policies	Significant	Future	Section 59	Risk Management Officials
G.3.1, G.3.3.1, G.3.4.1	1693	Application, handling and storage of NASM	General land use planning policies	Significant	Future	Land Use Planning	Planning Approval Authority
G.1.1 to G.1.2	1696	Application, handling and storage of NASM	General education and outreach policies	Significant Moderate Low	Existing and future	Education and Outreach	Municipality Conservation Authority Province
G.7.1	1735	Application, handling and storage of NASM	Section 26 of the Clean Water Act general specify action policies	Significant	Existing and future	Specify Action	OMAFRA
G.1.3	1866	Application, handling and storage of NASM	Provincial signage to locate WHPA and IPZ	Significant	Existing and future	Education and Outreach	MOE MTO
G.1.4	1867	Application, handling and storage of NASM	Signage policy as part of Municipal education policy	Significant	Existing	Education and Outreach	Municipality

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2.3 Application and Handling/Storage of Commercial Fertilizers

What is the Threat to Drinking Water

This paper provides background information for prescribed drinking water threat 8 – the application of commercial fertilizer and prescribed drinking water threat 9 – the handling and storage of commercial fertilizer.

Commercial fertilizer is a synthetic substance containing nitrogen, phosphorus, potassium or other plant food intended for use as a plant nutrient. For the purposes of the drinking water source protection initiative, commercial fertilizer does not include agricultural source material or non-agricultural source material.

The majority of commercial fertilizers contain nitrogen (important for leaf development), phosphorus (promotes good root development) and potassium (contributes to overall plant vigour). Commercial fertilizers also include supplements such as lime and gypsum (Halton-Hamilton SPC, 2011). The application of commercial fertilizer to land is associated with a range of land uses including agricultural, active recreational, institutional, industrial, commercial, and residential (Halton-Hamilton SPC, 2011).

From the literature, the main problems associated with the land application of commercial fertilizer appear to be improper use. Two examples of its potential improper use include: (1) application without consideration for nutrients available in the soil and plant requirements, (2) inappropriate timing of application for plant growth cycles and weather conditions. Problems associated with the storage of commercial fertilizers are leaks and spills as a result of aging infrastructure or improper storage. For both storage and application of commercial fertilizer, it should be noted that the movement of phosphorus is often, but not exclusively, associated with runoff and soil erosion.

Commercial fertilizer can be stored in a variety of locations, inside or outside, for retail sale or in relation to its application to land. Although storage for these purposes can occur year-round, the greatest volume of fertilizer is stored in the spring before the growing season begins and application occurs (Halton-Hamilton SPC, 2011).

The main consideration for reducing or eliminating drinking water threats related to the land application, handling and storage of commercial fertilizer is to make sure it does not enter surface water and/or groundwater sources.

What Causes the Activity to be a Drinking Water Threat

The Ontario Ministry of the Environment (MOE) Tables of Drinking Water Threats (Ontario Ministry of the Environment, 2009) identify nitrogen and total phosphorus as substances that could make their way into surface and groundwater as a result of the application of commercial fertilizer to land (circumstances 19 to 36), and through spills resulting from the handling and storage of fertilizer (circumstances 1273 to 1288). These nutrients could threaten the safety of drinking water sources in certain situations due to runoff or spills.

According to the MOE Tables of Drinking Water Threats, total phosphorus associated with commercial fertilizer can only be a drinking water threat in intake protection zones (IPZ) and in wellhead protection areas (WHPA) where the groundwater is under the direct influence of surface water (GUDI i.e. WHPA-E). While nitrogen is a concern for both surface and groundwater, total phosphorous is only considered a concern for surface water because excessive inputs of total phosphorous results in eutrophication and can cause toxic algae blooms both of which impair water quality.

What is the Local Scale of the Drinking Water Threat

The local scale of the application, handling and storage of commercial fertilizers within the Thames-Sydenham and Region Source Protection Region is outlined within Table 2-16:

Table 2-16 Local Scale of the Application, Handling and Storage of Commercial Fertilizers

System	Threat	Type	# Locations	WHPA	Vulnerability Score
Dorchester	Handling and Storage of Commercial Fertilizer	Chemical	3	A,B	10
Thorndale	Handling and Storage of Commercial Fertilizer	Chemical	1	A	10
Ingersoll	Handling and Storage of Commercial Fertilizer	Chemical	2	A, B	10
Stratford	Handling and Storage of Commercial Fertilizer	Chemical	1	A	10
St.Marys	Handling and Storage of Commercial Fertilizer	Chemical	5	B	10
Ridgetown	Handling and Storage of Commercial Fertilizer	NA	2	A	10
Melrose	Application of Commercial Fertilizer	Chemical	2	B	10
Hickson	Application of Commercial Fertilizer	Chemical	10		10
Ingersoll	Application of Commercial Fertilizer	Chemical	6	A, B	10
Lakeside	Application of Commercial Fertilizer	Chemical	6	A	10
Woodstock-rural	Application of Commercial Fertilizer	Chemical	3	A	10
Shakespeare	Application of Commercial Fertilizer	Chemical	1	A, B	10
St. Pauls	Application of Commercial Fertilizer	Chemical	1	A	10
Stratford	Application of Commercial Fertilizer	Chemical	1	A	10
St.Marys	Application of Commercial Fertilizer	Chemical	8	B	10
Ridgetown	Application of Commercial Fertilizer	NA	4		
	TOTALS		56		

Application of Fertilizer

The classification of this activity as a significant, moderate or low drinking water threat is dependent on its location as well as the combination of the managed land percentage and livestock density for the vulnerable area. In general, the greater the managed land percentage and livestock density, the greater the risk to drinking water. As a reminder:

- Managed lands include cropland, fallow land, improved pasture, golf courses, sports fields and lawns to which agricultural source material, non-agricultural source material, or commercial fertilizer could be applied. This value was calculated based on MOE Technical Rules and is included in the Assessment Report.
- In determining the livestock density in an area, committees have to determine nutrient units (NU) generated as a percentage of the total agricultural managed lands in the area. Livestock density is standardized to nutrient units per acres since different types of animals produce different amounts of manure with different nutrient values. A nutrient unit is based on the manure equivalent of nutrients contained in 43 kg of nitrogen or 55 kg of phosphate. The livestock density value was calculated based on MOE Technical Rules and is included in the Assessment Report.

Significant Drinking Water Threats

Based on the MOE Tables of Drinking Water Threats (2008, as amended in 2009), the land application of commercial fertilizer can be a significant threat in intake protection zones (IPZ) that have a vulnerability score of 9 or higher and in wellhead protection areas (WHPA) that have a vulnerability score of 10, and that have a specific combination of the managed land percentage and livestock density for the vulnerable area.

Moderate Drinking Water Threats

Based on the MOE Tables of Drinking Water Threats (2008, as amended in 2009), the land application of commercial fertilizer can be a moderate threat in IPZs that have a vulnerability score of 6 or higher and in WHPAs that have a vulnerability score of 8 or higher that have a specific combination of the managed land percentage and livestock density for the vulnerable area.

Low Drinking Water Threats

The land application of commercial fertilizer is or would be a low threat in IPZs with a vulnerability score of 4.5 to 8.1, in WHPAs with a vulnerability score of 6 to 8, as well as in highly vulnerable aquifers and significant groundwater recharge areas with a vulnerability score of 6. As for moderate and significant threats, a specific combination of the managed land percentage and livestock density for the vulnerable area must be met for it to be a low threat.

Handling and Storage of Fertilizer

The storage of commercial fertilizer is divided into two categories in the MOE Tables of Drinking Water Threats (2008, as amended in 2009): (1) storage at a facility where it is manufactured or processed, or from which it is wholesaled, and (2) storage for retail sale or in relation to its application to land.

Manufacturing, processing and wholesale activities are generally permitted on lands that are zoned for industrial uses to provide separation between industrial establishments and incompatible land uses. Future industrial land uses ('would be' threats) would likely occur in the same location as existing industries because these are the only locations zoned for this use in our municipalities. Municipalities have strict control over where these activities can occur within their municipal boundaries.

Storage of commercial fertilizer can be occur inside or outside and is associated with a majority of land uses including agricultural, active recreational, institutional, industrial, commercial and residential. Although storage for these purposes can occur year-round, the greatest volume of fertilizer is stored in the spring before the growing season begins and application occurs. Storage of fertilizers on farm rarely occurs with dry materials. Liquid storage of 28% nitrogen and liquid starters are more the norm.

Significant Drinking Water Threats

Based on the MOE Tables of Drinking Water Threats (2008, as amended in 2009), for both retail sale and manufacturing, the storage of commercial fertilizer can be a significant threat in IPZs and WHPAs that have a vulnerability score of 10, and the amount of fertilizer being stored is greater than 2500 kg.

Moderate Drinking Water Threats

Based on the MOE Tables of Drinking Water Threats (2008, as amended in 2009), the storage of commercial fertilizer can be a moderate threat in IPZs that have a vulnerability score of 6 or higher and in WHPAs that have a vulnerability score of 8 or higher. If the storage is associated with the retail sail of fertilizer, the quantity can be less than 25 kg. However, if the storage is associated with manufacturing the quantity must be greater than 25 kg.

Low Drinking Water Threats

Based on the MOE Tables of Drinking Water Threats (2008, as amended in 2009), the storage of commercial fertilizer can be a low threat in IPZs that have a vulnerability score of 4.8 or higher, in WHPAs that have a vulnerability score of 6 or higher, and in HVAs and SGRAs with a vulnerability score of 6.

Applicable Legislation, Policies and Programs

The following section provides a summary of the applicable legislation, policies and programs (federal, provincial, municipal and other) that address the threats of application, handling and storage of commercial fertilizers.

Table 2-17 Applicable Legislation, Policies and Programs

Level of Government	Applicable Legislation/Policies/Programs
Federal	Fisheries Act (Government of Canada, 1985)
	Transportation of Dangerous Goods Act
	Canadian Food Inspection Agency-The Fertilizer Act
	Canadian Fertilizer Quality Assurance Program
	Canadian Fertilizer Industry Storage and Handling Guidelines
Provincial	Environmental Protection Act (Government of Ontario, 1990)
	Nutrient Management Act and Ontario Regulation 267/03
	Spills Action Centre
Municipal	Municipal Act 2001
Other	Canada-Ontario Environmental Farm Plan (Ontario Soil and Crop Association, 2005)
	Golf Course Best Management Practices
	Canadian Fertilizer Industry Storage and Handling Guidelines

Federal

Fisheries Act

Section 36(3) of the Fisheries Act states that "… no person shall deposit or permit the deposit of a deleterious substance of any type in water frequented by fish or in any place under any conditions where the deleterious substance or any other deleterious substance that results from the deposit of the deleterious substance may enter any such water" (Government of Canada, 1986). The deposition of any deleterious substance (contaminant), including commercial fertilizer, which could result from the improper application, handling and storage or from spills, is in contravention of the legislation. In general the Fisheries Act is enforced by Fisheries and Oceans Canada; however, the section that applies to contamination is under the authority of Environment Canada.

Transportation of Dangerous Goods Act

Anhydrous ammonia and ammonium nitrate are two commonly used fertilizer products that are classified under the Transportation of Dangerous Goods Act (TDGA). The Act is enforced by Transport Canada who develops safety standards and regulations, provides oversight and gives expert advice on dangerous goods accidents to promote public safety. The regulations require that anyone handling, transporting or offering dangerous goods for transport must use containers in accordance with certain safety standards, and must receive TGD training. The Canada Customs and Revenue Agency (CCRA) is responsible for the verification of shipping documents to ensure that required information is provided, as well as determining if the safety marks on containers, transport units, etc., are present. This documentation is required for all fertilizer operations using anhydrous ammonia or ammonium nitrate.

The Fertilizer Act 1985

All fertilizers or supplements sold in or imported into Canada, are regulated under the Federal Fertilizer Act. The Fertilizer Act sets out the requirements for the legal registration, safe use, labeling and regulates the environmental effects of fertilizers and stipulates that all regulated products must be safe with respect to human, plant, animal health and the environment, effective for the intended purpose and properly labeled to avoid misrepresentation in the marketplace and fraud.

The manufacture, proper use and safe disposal of these products are controlled by provincial rules and regulations (Halton-Hamilton SPC, 2011). The Canadian Food Inspection Agency works with the province and municipalities to ensure that all fertilizers and supplements meet the highest standards for safety and efficacy (Halton-Hamilton SPC, 2011). Officers from the Canadian Food Inspection Agency and Canadian Border Services Agency carry out compliance and enforcement under the Fertilizer Act. Compliance efforts are focused on verifying that products meet label guarantees and satisfy the safety standards for biological and chemical contaminants.

Canadian Fertilizer Quality Assurance Program

The Canadian Food Inspection Agency is also responsible for the administration of the Canadian Fertilizer Quality Assurance Program. The objective of the program is to implement an effective monitoring program while ensuring there would be no compromise in health and safety.

Canadian Fertilizer Industry Storage and Handling Guidelines

The Canadian Fertilizer Institute (CFI) has published the "Canadian Fertilizer Industry Storage and handling Guidelines" (2001). These guidelines were developed to improve the level of safety associated with the handling and storage of fertilizers. The guidelines are based on industry best practices and regulatory requirements under the Transportation of Dangerous Goods Act, WHIMIS Act, Occupational Health & Safety Act, and Boiler & Pressure Regulations. These guidelines include:

- Locating all new fertilizer storage facilities a minimum of 50 m from surface water and environmentally sensitive areas;
- Locating liquid fertilizer facilities a minimum of 50 m from private wells and 300 m from sources of public water supply (e.g. municipal wells) unless a hydrogeological assessment is prepared that permits a closer setback;
- Requiring an emergency response plan that addresses how to contain emergency response water (e.g. from a fire);
- Designing specifications for fertilizer containment areas and the collection of runoff water;
- Training employees; and,
- Planning and practicing emergency responses in conjunction with the local emergency response officials (Halton-Hamilton SPC, 2011).

Provincial

Environmental Protection Act

The Environmental Protection Act (EPA), which is enforced by the MOE, prohibits the discharge of contaminants into the natural environment. A person who uses or stores commercial fertilizer must ensure that discharges and spills do not occur. If a spill should occur that causes or may cause an adverse effect, the discharger is required under the EPA to report the spill to the MOE through the Spills Action Centre, as well as to the municipality in which the spill occurred. Reporting must be done as soon as possible, and convictions may be laid if reporting is not completed in a timely fashion. Additionally, there is a responsibility to contain and clean up the spill to pre-

spill conditions, where this can reasonably be expected, for spills of pollutants that cause or are likely to cause adverse effects as defined by the EPA.

Nutrient Management Act and Ontario Regulation 267/03 – General

The Nutrient Management Act passed on June 27, 2002. It addresses land-applied materials containing nutrients. This includes provisions for the development of strong new standards for all land-applied materials containing nutrients, a proposal to ban the land application of untreated septage over a five-year period, and proposed strong new requirements such as: the review and approval of nutrient management plans, certification of land applicators and a new registry system for all land applications (Government of Ontario, 2002).

The Act provides a comprehensive nutrient management framework for Ontario's agricultural industry, municipalities and other generators of materials containing nutrients, including clear environmental protection guidelines. It builds on the existing system by giving current best management practices the force of law, and creating comprehensive, enforceable, province-wide standards to regulate the management of all land- applied materials containing nutrients. The Act contains amendments to the Environmental Protection Act, the Highway Traffic Act, the Ontario Water Resources Act and the Pesticides Act, and consequential amendments to the Farming and Food Production Protection Act, 1998 to ensure consistency and give higher recognition to the standards.

Farms are regulated under the Nutrient Management Act if the farm generates greater than 300 nutrient units annually or generate between 5 and 300 NU annually and have applied for a building permit to construct a building used to hold farm animals or manure. Nutrient management strategies (NMS) are required for farms that generate more than 300 NU annually, if there is a building permit application to construct or expand barns or ASM storage facilities so that more than 5 NU would be generated, or if there is a regulated mixed anaerobic digester on the farm. The strategy must be approved by the Ministry of Agriculture, Food and Rural Affairs (OMAFRA). Nutrient management plans (NMP) are required if a farm generates more than 300 NU annually, or if a farm with greater than 5 NU is located within 100 m of a municipal well. These plans are filed on the farm and are reviewed by the MOE Agricultural Environmental Officer during compliance inspections. Under the Regulation, a farm that is not required to have a nutrient management strategy cannot be required to have a nutrient management plan, even if the farm is within 100 m of a municipal well. A NMS is required first. The NMP focuses on issues in the farm field including the use and application of nutrients (fields), application setbacks to wells and surface water, application rates of nutrients, etc.

O. Reg. 267/03 addresses land applied materials that contain nutrients (Government of Ontario, 2003). The regulation contains land application standards that are applicable to all farms. These standards include timing restrictions for application, vegetated buffer zones adjacent to surface water, and setbacks from surface water and wells. Sections 10, 14 and 28 of Ontario Regulation 267/03 – General are prescribed instruments under the Clean Water Act. These sections relate to the approval of nutrient management strategies and nutrient management plans, and compliance (Government of Ontario, 2003).

With respect to commercial fertilizer, O. Reg. 267/03 states that nutrients, for which a Nutrient Management Plan is required, cannot be applied to land within 100 m of a municipal well or within 3 m of any other type of water well. Nutrient management plans must take into account all sources of nutrients that would be applied to land including commercial fertilizer since one of the purposes of the plans is to optimize the relationship between the land-based application of nutrients, farm management techniques and crop requirements.

Spills Action Centre

Part X of the Environmental Protection Act requires that spills be reported immediately and that the spilled materials are promptly cleaned up and the environment restored. MOE is the lead provincial agency for environmental emergencies and operates the Spills Action Centre, a 24 hour service for emergency action and

response. Agricultural operations with a nutrient management strategy or plan will have a contingency plan that provides details on how to respond to a spill (Halton-Hamilton SPC, 2011).

Municipal

Land Use Planning

Application of Fertilizer

Municipalities have the ability to pass by-laws about the economic, social and environmental well-being of the municipality, and about the health, safety and well-being of people, under the section 11(2) of the Municipal Act (Government of Ontario, 2001).

Storage of Fertilizer

Manufacturing, processing and wholesale activities are generally permitted on lands that are zoned for industrial uses. Future industrial land uses ("would be" threats) would likely occur in the same location as existing industries. Municipalities have strict control over where these activities can occur within their municipal boundaries, and consideration should be given for potential changes to zoning by-laws to accommodate changes in existing land uses.

The location and type of storage used for retail sale or for the purpose of application could be addressed through site plan control, provided that the municipality has enabled this tool for this use in these areas. Under the Planning Act, municipalities may use site plan approvals to further address the details of the layout of the site, such as the location of internal roadways, storage areas, building and septic envelopes, etc., prior to the issuance of a building permit. Site plan control, where it is required, is considered applicable law under the Building Code Act, and the municipality is able to ensure these details are agreed upon prior to issuing a building permit.

Other

Canada-Ontario Environmental Farm Plan

The Environmental Farm Plan (EFP) is delivered locally through the Ontario Soil and Crop Improvement Association with expertise provided by the Ontario Ministry of Agriculture, Food and Rural Affairs. It is a voluntary educational program for farmers delivered through local workshops. Participants are provided instruction on how to progress through the risk assessment and action plan development contained in the EFP workbook. One of the 23 areas assessed through the EFP is the handling and storage of fertilizer (Ontario Soil and Crop Association, 2005).

Golf Course Best Management Practices

Voluntary best management practices (BMPs) identified by the Ontario Allied Golf Associations for the use and storage of fertilizer at golf courses include:

- The use of slow release fertilizers in environmentally sensitive areas;
- Basing fertilizer application rates on soil tests;
- Naturalizing out-of-play areas;
- Increased buffer areas along watercourses and ponds;
- Keeping records of all fertilizer applications; and
- Storage of fertilizers in enclosed structures to keep the product dry, away from the elements and manageable in the event of a spill.

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 the application, handling and storage of commercial fertilizers.

Table 2-18 Gaps in Existing Legislation, Policies and Programs

Level of Government	Applicable Legislation/Policies/Programs	Gaps
Federal	Fisheries Act 1985 (Government of Canada, 1985)	• This legislation is very high level and reactionary
Provincial	Environmental Protection Act (Government of Ontario, 1990)	• This legislation is very high level and reactionary.
	Nutrient Management Act (Government of Ontario, 2002)	• This legislation is proactive striving to prevent contamination • Nutrient Management Strategies and Plans are regulated based on farms with animal nutrient units. Unless a farm has livestock, it does not fall under the NMA. Farms that are cash-crop only applying commercial fertilizers cannot be regulated under this prescribed instrument. • There are many farms in vulnerable areas that are not required to have NMS unless they submit a building permit application for the expansion of a livestock or manure storage facility; they would not be phased in (this primarily pertains to existing farm operations that generate between 5 and 300 NU annually) • Farms that do not fall under the NMA can complete a NMP voluntarily but they do not require approval by OMAFRA • OMAFRA reviews a first time NMP/S. After that such as for the 5 year update of a NMP/S, it doesn't get reviewed by OMAFRA but rather by a consultant. • Municipalities do not receive feedback on compliance with the NMA requirements • There is limited monitoring of NMS and NMP • A farm that is not required to have a NMS cannot be required to have a NMP even if the farm is within 100 m of a municipal well.
Other	Canada-Ontario Environmental Farm Plan (EFP)	• There is limited funding to implement practices that are identified under the plan. The EFP is voluntary and confidential and cannot be provided to a party responsible for policy implantation.
	Golf Course Best Management Practices	• The use of BMP is voluntary

Policy Considerations

- REMINDER: The main consideration for reducing or eliminating drinking water threats related to the application and storage of commercial fertilizer is to make sure that it does not enter surface water and/or groundwater.
- 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.

- The application of commercial fertilizers is primarily conducted in the Spring and Fall which creates a nuance to consider with the timing of transportation of large volumes of fertilizers for short periods of time.
- Temporary storage sites such as retail stores where large quantities are stored for short periods of time often on an outdoor cement pad should be considered.
- Liquid and granular forms of commercial fertilizer may need to be given separate consideration in some circumstances.
- Application of commercial fertilizers cannot be prohibited under land use planning because it is an activity. Only land uses can be prohibited, such as agricultural land use. New fertilizer storage can be prohibited through the land use planning tool. Acquiring land gives a municipality the most control around land use activities.
- Clean Water Act Part IV tools
    - In establishing Risk Management Plans, consideration should be given to allow for new technologies or BMPs to be integrated as they become available.
    - The use of Risk Management Plans (RMP) would require the property owner to work with the Risk Management Official to create a RMP that would manage the risk posed by commercial fertilizer storage and application. These plans would allow for site specific considerations.
    - Application of commercial fertilizers is an activity. The Restricted Land Use tool will not capture future activities if they are not in association with an application process related to land use.
- Objectives of policies related to the storage of commercial fertilizers include:
    - To control nitrogen so that there is no deterioration of groundwater for the purposes of drinking water
    - To prevent spills and leaks
    - To ensure spills response plans are in place
    - To require storage that meets safety standards (e.g. size and containment)
    - To prevent temporary storage within WHPA-A
    - To require storages are a safe distance from wells and surface water
    - To raise awareness of impact of threat on drinking water sources
    - That emergency responders need to be aware of the contents in the storage in the case of fires or spills
- Objectives of policies related to the handling of commercial fertilizers include:
    - To control nitrogen so that there is no deterioration of groundwater for the purposes of drinking water
    - To prevent spills from occurring
    - To ensure spills response plans are in place
    - To require handling procedures meet safety standards
    - To require safe handling distance away from wells and surface water
    - To raise awareness of impact of threat on drinking water sources
- Objectives of policies related to the application of commercial fertilizers include:
- To control nitrogen so that there is no deterioration of groundwater for the purposes of drinking water
    - To prevent over application of commercial fertilizers
    - To manage nutrient application so that it matches nutrient uptake of plant
    - To minimize runoff of commercial fertilizers
    - To manage application of commercial fertilizers in proximity to municipal wells where drinking water could be adversely affected.
    - To raise awareness of impact of threat on drinking water sources

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.

Table 2-19 Policy Ideas for Application of Commercial Fertilizer

Threat: Application of Commercial Fertilizer
Handling and Storage of Commercial Fertilizer

Policy Tool	Policy ideas
Education and Outreach	Promote or develop programs to landowners and application technicians on importance of buffers around wells and surface water where the management of nitrogen fertilizer is important • Appropriate size/widths
	Promote BMPs for all sectors to match fertilizers needed for plant uptake. • Include the promotion of nutrient management plans even where not currently required • Recognize similar nutrient management programs from other industries • Include spills management and response
Incentive Programs	Incentive programs to establish buffers on lands adjacent to surface water within WHPA-E or IPZ (with vulnerability score of 9)
	Support existing incentive programs (including ODWSP, EFP, Clean Water Program and others) • Highly recommend that the ODWSP continue to adequately fund risk mitigation practices for significant drinking water threats • Encourage new and innovative practices which reduce risk • Long term support • Encourage appropriate over winter plant cover to reduce risk
Land Use Planning	Prohibit new storage of commercial fertilizers where they would be a significant threat • For retail sale or application, greater than 2500 kg • In any form • only N
Prescribed Instruments	Require MOE and OMAFRA to emphasize protection of municipal wellheads in review of NMS/P for farms in WHPA-A • Through the use of existing setbacks from NMA
	Recommend MOE prioritize inspections of NMS/P in vulnerable areas and conduct regular inspections • Would be through specify action policy • Timeframe for inspection 5 years • Request MOE to include location in a source protection vulnerable area as a risk factor in selecting inspections
	Recommend review and inspections of voluntary NMS/P for significant threats • Would be through specify action policy

S. 57 Prohibition	• Prohibit new storage only through Land use planning tool where this activity is a significant threat • Manage existing storage and application through Risk Management Plans 1. Explore ability to prohibit if failure to comply with RMP
S. 58 Risk Management Plans	Require RMP for existing and expanding storage of commercial fertilizers within areas where it is considered a significant threat
	Require RMP for application of commercial fertilizers within areas where it is considered a significant threat • only N • should mirror nutrient management plan requirements • where N issues are identified additional management may be necessary • use of farm water protection plan or other ways of having access to third party expertise • flexibility for using new technologies as they arise
S. 59 Restricted Land Use	Flag land uses associated with fertilizers (e.g. agricultural, active recreational, municipal public works) as restricted land uses where these activities pose a significant threat • advise a proponent to obtain clearance from the RMO prior to proceeding with their application
S. 26 p.1 Other-Specify Action (Land Securement)	Encourage purchase land where these activities are significant threat areas • Where the municipality wishes to exceed the levels of protection identified above

Policy Examples

Policy examples presented within this section are based on the policy ideas noted above. These policy examples were presented to the SPC to facilitate discussion and have been further reviewed by the Source Protection Municipal Policy Advisory Committee.

Policy Example Number	8-1
Sub- Threat(s)	Application and Storage and Handling of Commercial Fertilizers
Circumstance	Application is based on a specific combination of the managed land percentage and livestock density for a vulnerable area while handling and storage is based on the amount of fertilizer being stored is >2500 kg.
Vulnerable Area	WHPA-A, B with a vulnerability score of 10
Risk	Significant, Moderate and Low
Body Responsible for Implementing	Municipal Watershed Partnership with Conservation Authority to lead. The implementation of this policy in this manner builds on the strengths and efficiencies of the Conservation Authorities as a partnership of the municipalities in the watershed.
Threat Status	Future, Existing, Expanding
Land Use	All
Legal Effect	Conform
Policy Tool	Education and Outreach

Policy Example Number	8-1
Policy Idea	Develop new or where possible expand on existing education and outreach programs to promote Best Management Practices to protect drinking water sources from risks of Commercial Fertilizer: • Promotion of nutrient management plans even where not currently required under NMA and recognize similar nutrient management programs from other industries; • Promotion of voluntary Environmental Farm Plan; • Promotion of planning and implementation of spills prevention and response; • Promotion of matching fertilizer application with plant uptake; • Education to landowners and application technicians on importance of buffers around wells and surface water where the management of commercial fertilizers is important; • Incorporation of source water messaging into existing education and outreach or establish new materials to be provided to landowners whose properties may be utilized for the application or storage of agricultural source materials; and, • Promotion of partnerships with OMAFRA and others. • 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 annually 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. Measures of tracking the uptake by the target audience will also be included in this report.

Policy Example Number	8-2
Sub- Threat(s)	Application and Storage and Handling of Commercial Fertilizers
Circumstance	Application is based on a specific combination of the managed land percentage and livestock density for a vulnerable area while handling and storage is based on the amount of fertilizer being stored is >2500 kg.
Vulnerable Area	WHPA-A, B with a vulnerability score of 10
Risk	Significant
Body Responsible for Implementing	Conservation Authority, Municipality, MOE, others
Threat Status	Existing, Expanding and Future
Land Use	Agricultural
Legal Effect	Strategic Action
Policy Tool	Incentives
Policy Idea	The Ontario Drinking Water Stewardship program shall continue to adequately fund risk mitigation practices for significant drinking water threats over the long term. Existing incentive programs (including EFP, Clean Water Program and others) that contribute to protection of drinking water sources should continue to be supported.

Policy Example Number	8-2
	New incentive programs reducing risks (i.e. encouraging appropriate over-winter plant cover) should be considered to assist with the implementation costs of risk mitigation practices for significant, moderate and low threats on drinking water sources. Where funding is limited, emphasis shall be on significant threat mitigation.
Implementation schedule	Ongoing implementation for existing programs or within 2 years of the approval of the SPP for new programs.
Monitoring Policy	Program operators shall report to CA annually and include number and type of risk management measures which have been applied for and the number funded in vulnerable areas.

Policy Example Number	8-3
Sub- Threat(s)	Storage of commercial fertilizers
Circumstance	Both retail sale and manufacturing storage and the amount of fertilizer being stored is greater than 2500 kg.
Vulnerable Area	WHPA-A, 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	Land Use Planning
Policy Idea	The establishment of new storage for retail sale or application of commercial fertilizers greater than 2500kg in any form will not be permitted in vulnerable areas where they would be a significant threat.
Implementation schedule	Shall be initiated in all Official Plans within 6 months of Source Protection Plan approval with the goal to be completed within 2 years of the Source Protection Plan approval date. Zoning bylaws shall be updated within 3 years of the Source Protection Plan approval date.
Monitoring Policy	Municipalities shall report to SPA 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 Example Number	8-4
Sub- Threat(s)	Application of Commercial Fertilizers
Circumstance	Application is based on a specific combination of the managed land percentage and livestock density for a vulnerable area.
Vulnerable Area	WHPA-A, B with a vulnerability score of 10
Risk	Significant
Body Responsible for Implementing	OMAFRA (responsible for approving Nutrient Management Strategies); MOE (responsible for inspections and enforcement)
Threat Status	Existing and Future

Policy Example Number	8-4
Land Use	All
Legal Effect	Conform
Policy Tool	Prescribed Instrument-Nutrient Management Act
Policy Idea	Province to review and ensure Nutrient Management Strategies and Plans adequately manages the risk where the application of commercial fertilizers is a significant threat.
Implementation schedule	Within 1 year of approval of the SPP
Monitoring Policy	OMAFRA will submit an annual report to the CA which identifies the number of NMP, and NMS which were reviewed and the number which required updates to adequately manage the significant threats. MOE will submit an annual report to the CA which identifies the number of inspections and enforcements under the Nutrient Management Act.

Policy Example Number	8-5a
Sub- Threat(s)	Application and Storage and Handling of Commercial Fertilizers
Circumstance	Application is based on a specific combination of the managed land percentage and livestock density for a vulnerable area while handling and storage is based on the amount of fertilizer being stored is >2500 kg.
Vulnerable Area	WHPA-A, B with a vulnerability score of 10
Risk	Significant
Body Responsible for Implementing	MOE
Threat Status	Existing, Expanding and Future
Land Use	All
Legal Effect	Strategic action
Policy Tool	Specify action
Policy Idea	It is recommended that through MOE's on-farm compliance program that location within a source protection vulnerable area is included as a factor in selecting inspection priorities. It is recommended that inspections are conducted every 5 years for significant threats.
Implementation schedule	The implementation of a program which targets significant threats shall be initiated within 1 year of the approval of the SPP. All significant threats shall be inspected within 5 years of the approval of the SPP.
Monitoring Policy	A report shall be submitted by MOE to the CA annually which indicates the number of inspections undertaken within the areas where these activities can be significant threats, the number of situation identified where the plan holder was found to be out of compliance with their plan or strategy, the number of orders issued, and the number of changes to strategies or plans as a result of the inspection.

Policy Example Number	8-5b
Sub- Threat(s)	Application and Storage and Handling of Commercial Fertilizers
Circumstance	Application is based on a specific combination of the managed land percentage and livestock density for a vulnerable area while handling and storage is based on the amount of fertilizer being stored is >2500 kg.
Vulnerable Area	WHPA-A, B with a vulnerability score of 10

Policy Example Number	8-5b
Risk	Significant
Body Responsible for Implementing	OMAFRA (responsible for approving Nutrient Management Strategies), MOE (responsible for inspection and enforcement)
Threat Status	Existing, Expanding and Future
Land Use	All
Legal Effect	Strategic action
Policy Tool	Specify action
Policy Idea	It is recommended that OMAFRA include voluntary Nutrient Management Plans and Strategies in its review program where the application and storage of commercial fertilizers is a significant threat.
Implementation schedule	Within 1 year of approval of the SPP
Monitoring Policy	OMAFRA will submit an annual report to the CA with the number of voluntary NMP and NMS reviewed. MOE will submit an annual report to the CA which identifies the number of inspections and enforcements under the Nutrient Management Act.

Policy Example Number	8-6a
Sub- Threat(s)	Storage of Commercial Fertilizers
Circumstance	Storage is based on the amount of fertilizer being stored is >2500 kg.
Vulnerable Area	WHPA-A, B with a vulnerability score of 10
Risk	Significant
Body Responsible for Implementing	Municipality
Threat Status	Existing and Expanding
Land Use	All
Legal Effect	Conform
Policy Tool	Risk Management Plan
Policy Idea	Existing commercial fertilizer storages deemed a significant threat and not regulated under the NMA shall have an approved Risk Management Plan. The Risk Management Plan must meet the requirements of the Nutrient Management Act provided it adequately manages the significant threat. In most cases, the Nutrient Management Plan is believed to adequately manage the risk. Where an adequate risk management plan cannot be negotiated, the significant threat cannot be undertaken. A spills contingency plan must be included as part of the RMP. The expansion of an existing commercial fertilizer storage site will only be permitted in accordance with a Risk Management Plan.
Implementation schedule	Within 1 year of the approval of the SPP.
Monitoring Policy	The Risk Management Official shall submit an annual report to the CA which includes the number of RMP required and approved.

Policy Example Number	8-6b
Sub- Threat(s)	Application of commercial fertilizers
Circumstance	Application is based on a specific combination of the managed land percentage and

	livestock density for a vulnerable area.
Vulnerable Area	WHPA-A, B with a vulnerability score of 10
Risk	Significant
Body Responsible for Implementing	Municipality
Threat Status	Existing, Expanding, and Future
Land Use	Agricultural
Legal Effect	Conform
Policy Tool	Risk Management Plan
Policy Idea	Commercial fertilizers shall only be applied in accordance with an approved Risk Management Plan in areas where it has been deemed a significant threat, excluding farms managing the land within the vulnerable area regulated under the NMA. The Risk Management Plan shall be in accordance with the requirements for the application of commercial fertilizers as laid out in the Nutrient Management Act provided it adequately manages the significant threat. In most cases, the Nutrient Management Plan is believed to adequately manage the risk. Where an adequate risk management plan cannot be negotiated, the significant threat cannot be undertaken. A spills contingency plan must be included as part of the Risk Management Plan. The Risk Management Plan must be reviewed every 5 years.
Implementation schedule	Within 1 year of the approval of the SPP
Monitoring Policy	The Risk Management Official shall submit to the CA an annual report which includes the number of RMP required and approved.

Policy Example Number	8-7
Sub- Threat(s)	Storage of Commercial Fertilizers
Circumstance	Storage is based on the amount of fertilizer being stored is >2500 kg.
Vulnerable Area	WHPA-A, B with a vulnerability score of 10
Risk	Significant
Body Responsible for Implementing	Municipality
Threat Status	Existing, Future
Land Use	All
Legal Effect	Conform
Policy Tool	Prohibition
Policy Idea	Temporary fertilizer storage sites will not be permitted within vulnerable areas where they are deemed a significant threat.
Implementation schedule	The policy takes effect one year after the approval date of the first source protection plan.
Monitoring Policy	The municipality shall submit a report annually to the CA which includes whether they have identified any storage which was used in contravention of this policy.

Policy Example Number	8-8
Sub- Threat(s)	Application and Storage and Handling of Commercial Fertilizers

Circumstance	Application is based on a specific combination of the managed land percentage and livestock density for a vulnerable area while handling and storage is based on the amount of fertilizer being stored is >2500 kg.
Vulnerable Area	WHPA-A, B with a vulnerability score of 10
Risk	Significant
Body Responsible for Implementing	Municipality
Threat Status	Existing, Expanding and Future
Land Use	All
Legal Effect	Conform
Policy Tool	Restricted Land use
Policy Idea	Within the area where the application or storage or handling of commercial fertilizers is a significant threat, the municipality shall amend its zoning by-laws and official plans to identify, as restricted, all land uses where application, storage or handling of commercial fertilizers can occur.
Implementation schedule	Shall be initiated in all Official Plans within 6 months of Source Protection Plan approval with the goal to be completed within 2 years of the Source Protection Plan approval date. Zoning bylaws shall be updated within 3 years of the Source Protection Plan approval date.
Monitoring Policy	Municipalities shall report to SPA 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 Example Number	8-9
Sub- Threat(s)	Application and Storage and Handling of Commercial Fertilizers
Circumstance	Application is based on a specific combination of the managed land percentage and livestock density for a vulnerable area while handling and storage is based on the amount of fertilizer being stored is >2500 kg.
Vulnerable Area	WHPA-A, B with a vulnerability score of 10
Risk	Significant
Body Responsible for Implementing	Municipality
Threat Status	Existing, Expanding and Future
Land Use	Agricultural
Legal Effect	Strategic Action
Policy Tool	Land Securement
Policy Idea	Municipalities shall consider land securement around wellheads in instances where the municipality wishes to exceed the level of protection identified in the SPP.
Implementation schedule	N/A
Monitoring Policy	When land securement has been pursued the municipality shall report the progress and outcomes to the CA.

Draft Policies

Draft policies have been developed for the Thames-Sydenham and Region for the application, handling and storage commercial fertilizers. The table below provides a brief description of these policies. Refer to the Source Protection Plan for a detailed version of the policies.

Table 2-20 Draft Policies for the Application, Handling and Storage of Commercial Fertilizers

TSR Policy Number	Policy Database Number	Threat	Description	Risk Category	Threat Status	Policy Approach	Implementer
TS.8.1	1662	Application of commercial fertilizer to land	Management of the application of commercial fertilizer through Section 58 of the Clean Water Act	Significant	Existing and future	Section 58	Risk Management Official
G.7.2	1689	Application of commercial fertilizer to land	Compliance monitoring for activities regulated under the Nutrient Management Act	Significant	Existing and future	Specify Action	MOE
G.7.1	1735	Application of commercial fertilizer to land	Section 26 of the Clean Water Act general specify action policies	Significant	Existing and future	Specify Action	OMAFRA
TS.9.1	1749	Handling and storage of commercial fertilizer	Management of existing permanent storage facilities for commercial fertilizer through Section 58 of the Clean Water Act	Significant	Existing	Section 58	Risk Management Official
TS.9.2	1750	Handling and storage of commercial fertilizer	Prohibition of future permanent commercial fertilizer storage facilities through Section 57 of the Clean Water Act	Significant	Future	Section 57	Risk Management Official
TS.9.3	1751	Handling and storage of commercial fertilizer	Prohibition of temporary commercial fertilizer storage facilities through Section 57 of the Clean Water Act	Significant	Existing and future	Section 57	Risk Management Official
G.2.1.2	1691	All threats	Continued funding of Ontario Drinking Water	Significant	Existing	Incentives	MOE

TSR Policy Number	Policy Database Number	Threat	Description	Risk Category	Threat Status	Policy Approach	Implementer
			Stewardship Program				
G.6.1 and G.6.2	1692	All threats	Section 59 of the Clean Water Act general restricted land use policies	Significant	Future	Section 59	Risk Management Official
G.3.1, G.3.3.1, G.3.4.1	1693	All threats	General land use planning policies	Significant	Future	Land Use Planning	Planning Approval Authority
G.5.1 to G.5.5	1694	All threats	Section 58 of the Clean Water Act general risk management policies	Significant	Existing and future	Section 58	Risk Management Official
G.1.1 and G.1.2	1696	All threats	General education and outreach policies	Significant Moderate Low	Existing and future	Education and Outreach	Municipality Conservation Authority MOE
G.2.1.1	1724	All threats	Existing incentive programs general policy	Significant	Existing	Incentives	Municipality Conservation Authority MOE
G.2.2.1	1728	All threats	New incentive programs general policy	Significant	Existing	Incentives	Municipality Conservation Authority MOE
G.1.3	1866	All threats	Provincial signage to locate WHPA and IPZ	Significant	Existing and future	Education and Outreach	MOE MTO
G.1.4	1867	All threats	Signage policy as part of Municipal education policy	Significant	Existing and future	Education and Outreach	Municipality

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Ontario Ministry of the Environment. 1995. Compatibility between industrial facilities and sensitive land uses. www.ene.gov.on.ca/envision/gp/3272.pdf

Ontario Ministry of the Environment. 2009. Tables of Drinking Water Threats. 2008, as amended in 2009. www.ene.gov.on.ca/publications/cw/7561e03.pdf

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2.4 Application and Handling/Storage of a Pesticide

What is the Threat to Drinking Water

This paper provides background information for prescribed drinking water threat 10 – application of pesticide to land and prescribed drinking water threat 11 – handling and storage of pesticide.

In Ontario, the Pesticides Act defines "pesticide" as any organism, substance or thing that is manufactured, represented, sold or used as a means of directly or indirectly controlling, preventing, destroying, mitigating, attracting or repelling any pest or altering the growth, development or characteristics of any plant life that is not a pest and includes any organism, substance or thing registered under the federal Pest Control Products Act. All of the pesticides considered through the drinking water source protection initiative are chemicals used to control weeds or fungi.

What Causes the Activity to be a Drinking Water Threat

There are eleven (11) chemicals listed in the Ontario Ministry of the Environment (MOE) Tables of Drinking Water Threats (Ontario Ministry of the Environment, 2009) that could make their way into surface and groundwater as a result of the application of pesticides to land (circumstances 55 to 87), and through spills resulting from the improper handling and storage of pesticides (circumstances 1113 to 1200). These substances, which are listed below, are active ingredients in herbicides; with the exception of Dichloropropene-1, 3 are a nematicide (used to control nematodes) and Metalaxyl that are fungicides.

- Atrazine
- Dicamba
- 2,4-Dichlorophenoxy Acetic Acid (2,4-D)
- Dichloropropene-1,3
- MCPA (2-methyl-4-chlorophenoxyacetic acid)
- MCPB (4-(4-chloro-2-methylphenoxy)butanoic acid)
- Mecoprop
- Metalaxyl
- Metolachlor or s-Metolachlor
- Pendimethalin
- Glyphosate (only a chemical of concern at a moderate and low threat level)

What is the Local Scale of the Drinking Water Threat

Application of Pesticides

The application of pesticides to land has been associated with a majority of land uses including agricultural, active recreational, institutional, industrial, commercial and residential. While the provincial ban prohibits the use of pesticides for cosmetic purposes, certain uses of pesticides are excepted; the ban contains exceptions for public health or safety (including the protection of public works and other buildings and structures), golf courses, specialty turf, specified sports fields, arboriculture and to protect natural resources, if certain conditions are met. There are also exceptions for agriculture, forestry, research and scientific purposes, and uses of pesticides for structural exterminations and uses of pesticides required by other legislation. Although the ban prohibits certain uses, the application of pesticides can still occur on agricultural, recreational, institutional, industrial, commercial

and residential lands considered to be highly vulnerable aquifers (HVA), significant groundwater recharge areas (SGRA), intake protection zones (IPZ), and wellhead protection areas (WHPA).

Whether this activity is a significant, moderate or low drinking water threat depends on the proximity to the wellhead/intake and the vulnerability score. The provincial table of circumstances provides further details on determining the significance of the threat activity. The extent of pesticide application also affects the threat categorization: less than 1 ha, 1 to 10 ha, or greater than 10 ha are the circumstances that may increase or decrease the significance of the threat. In general, the greater the application area, the greater the risk to drinking water.

Significant Threat

The application of pesticides is a significant drinking water threat if:

- Application area is 1 to 10 ha based on the application of MCPA or mecoprop in WHPA-A and B with a vulnerability score of 10 and WHPA-E with a vulnerability score of 9;
- Application area is greater than 10 ha for the other chemicals of concern in WHPA-A and B with a vulnerability score of 10 and WHPA-E with a vulnerability score of 9
- Application area is greater than 10 ha based on the application of MCPA in WHPA-E with a vulnerability score of 8.1.

Moderate Threats

Based on the MOE Tables of Drinking Water Threats (2008, as amended in 2009), the land application of specific pesticides can be a moderate threat in IPZs that have a vulnerability score of 6.3 or higher and in WHPAs that have a vulnerability score of 8 or higher.

Low Threats

The land application of pesticides is or would be a low threat in all of the IPZs and WHPAs, as well as on the highly vulnerable aquifers and significant groundwater recharge areas (with a vulnerability score of 6).

Handling and Storage of Pesticides

The storage of pesticides is divided into two categories in the MOE Tables of Drinking Water Threats (2008, as amended in 2009): (1) storage at a facility where it is manufactured or processed, or from which it is wholesaled, and (2) storage for retail sale or extermination.

Manufacturing, processing and wholesale activities are generally permitted on lands that are zoned for industrial uses to provide separation between industrial establishments and incompatible land uses. Future industrial land uses ('would be' threats) would likely occur in the same location as existing industries because these are the only locations zoned for this use.

Pesticides can be stored for retail sale or for use in extermination (such as application to land) since this activity is generally associated with agricultural, recreational, and commercial land uses, and public works (roads and utility corridors).

The classification of this activity as a significant, moderate or low drinking water threat is dependent on the location as well as the quantity of pesticide stored. The circumstances in the MOE Tables of Drinking Water Threats (2008, as amended in 2009) are divided into four groups: less than 25 kg, between 25 kg and 250 kg, between 250 kg and 2500 kg, and greater than 2500 kg of product containing pesticide stored at the location. In general, the greater the amount of pesticide stored on-site, the greater the risk to drinking water.

Significant Threats

The handling and storage of pesticides is a significant drinking water threat if:

- Material is stored for retail sale or extermination and the mass of the materials that contain pesticide is either between 250 and 2500 kg or greater than 2500 kg depending on the chemicals of concern in WHPA-A and B with a vulnerability score of 10
- Material is stored where manufactured or processed or where wholesaled and the mass of the materials that contain the pesticides is greater than 2500 kg for MCPA or mecopro in WHPA-A or B within a vulnerability score of 10
- Material that is stored for retail sale or extermination and the mass of materials that contain the pesticide is greater than 2500 kg based on MCPA or mecoprop in WHPA-E with a vulnerability score of 9

The table below provides the local scale of the application and handling/storage of pesticide within the Thames-Sydenham and Region.

Table 2-21 Local Scale of the Application, handling and storage of pesticide

System	Threat	Type	# Locations	WHPA	Vulnerability Score
Dorchester	The application of pesticide	Chemical	4	A	10
Dorchester	The application of pesticide	Chemical	9	B	10
City of London-Fanshawe	The application of pesticide	Chemical	2*	A	10
Thorndale	The application of pesticide	Chemical	2	A	10
Hickson	The application of pesticide	Chemical	1	A	10
Ingersoll	The application of pesticide	Chemical	1	B	10
Innerkip	The application of pesticide	Chemical	1	A	10
Lakeside	The application of pesticide	Chemical	1	A	10
Mount Elgin	The application of pesticide	Chemical	1	A	10
Thamesford	The application of pesticide	Chemical	2	A	10
Woodstock-rural	The application of pesticide	Chemical	10	A, B	10
Shakespeare	The application of pesticide	Chemical	1	A, B	10
St. Pauls	The application of pesticide	Chemical	1	A	10
Stratford	The application of pesticide	Chemical	1	A	10
St.Marys	The application of pesticide	Chemical	6	B	10
Highgate	The application of pesticide	Chemical	1	A	10
Ridgetown	The application of pesticide	Chemical	1*	A	10
Dorchester	The handling and storage of pesticide	Chemical	2	B	10
Thorndale	The handling and storage of pesticide	Chemical	1	A	10
Ingersoll	The handling and storage of pesticide	Chemical	2	A, B	10
Stratford	The handling and storage of pesticide	Chemical	1	A	10
Ridgetown	The handling and storage of pesticide.	Chemical	3	A	10
Woodstock-rural	The handling and storage of pesticide	Chemical	2	A, B	10
TOTAL			56		
* identified golf course					

Applicable Legislation, Policies and Programs

The following section provides a summary of the applicable legislation, policies and programs (federal, provincial, municipal and other) that addresses the drinking water threat of the application, storage and handling of pesticides.

Table 2-22 Applicable Legislation, Policies and Programs

Level of Government	Applicable Legislation/Policies/Programs
Federal	Pest Control Products Act and Regulations (Government of Canada, 2002) • Pesticide Label
	Fisheries Act (Government of Canada, 1985)
	Agrichemical Warehousing Standards Association
Provincial	Pesticides Act • Ontario Regulation 63/09 o Cosmetic Pesticide Ban o Integrated Pest Management Accreditation/Certification o Pesticide Permits o Pesticides Storage and Handling
	Environmental Protection Act 1990 • O. Reg. 347 General Waste Management
	Ontario Water Resources Act 1990
	Farming and Food Production Act 1998
Municipal	Municipal Act 2001
Other	Best Management Practices for Industrial Sectors
	Canada-Ontario Environmental Farm Plan (Ontario Soil and Crop Association, 2005)
	Safe Pesticide Education
	Natural Gardening Outreach and Education Programs

Federal

The federal government is responsible for registering and evaluating new pesticides, and for protecting human health and the natural environment from certain aspects of pesticide contamination. Federal legislation relevant to pesticides are: *Pest Control Products Act, Food and Drugs Act, Fisheries Act, Migratory Birds Convention Act, and Transportation of Dangerous Goods Act*.

In Canada, the federal government, through the Pest Management Regulatory Agency (PMRA), is responsible for approving the registration of pesticides across Canada and thereby prevent what it considers unacceptable risks to human health and the environment from the use of pesticides.

Pest Control Products Act and Regulations

Health Canada through the Pest Management Regulatory Agency (PMRA) is responsible for pesticide regulation in Canada. Under the Pest Control Products Act 2002 (PCPA), PMRA ensures that pesticides pose minimal risk to human health and environment. In assessing pesticide products for registration, the PMRA uses a science-based approach to conduct detailed health, environmental and efficacy assessment for safety, value and merit. Before a pesticide can be sold or used in Canada, it must be registered under the federal PCPA. Following registration, pesticides are re-evaluated every 15 years and as new science evolve. The pesticide label, a legal document, which contains important information regarding use directions and restrictions, use precautions, toxicological information, is approved by PMRA (Government of Canada, 1985).

The Pesticide Label

There are two main panels, the front panel (principle display panel) and the back or side panel (secondary display panel). A pesticide label displays important information such as: the active ingredient, what the hazards are when you use the product, how dangerous the pesticide is, how to use it safely, the rates at which the product should be used, what to do in case of an accident.

Additional restrictions are placed on certain pesticides to lessen risk. For example, certain pesticide labels may specify buffer zones requirements, timing and frequency of applications, or rate at which the product must be applied.

Fisheries Act

Section 36(3) of the Fisheries Act states that "… no person shall deposit or permit the deposit of a deleterious substance of any type in water frequented by fish or in any place under any conditions where the deleterious substance or any other deleterious substance that results from the deposit of the deleterious substance may enter any such water" (Government of Canada, 1985). The deposition of any deleterious substance that could result from the improper application, handling and storage of pesticides, is in contravention of the legislation.
In general the Fisheries Act is enforced by Fisheries and Oceans Canada: however, the section that applies to contamination is under the authority of Environment Canada.

Agrichemical Warehousing Standards Association

The Agrichemical Warehousing Standards Association (AWSA) consists of Canadian warehouse operators, manufacturers, distributors, and governments that cooperatively establish standards to ensure that crop protection products, such as pesticides, are stored in certified warehouses. They also inform, educate and communicate with stakeholders and provide other services as required.

The AWSA Certified Warehousing Standards apply to products based on their federal registration classification and their user. Currently, the standards apply to the storage facilities of vendors of all pesticides classified as agricultural or industrial, and to the storage facilities of custom applicators (e.g. ground or aerial crop sprayers). There is no distinction based on the volume or weight of pesticides in storage or on the length of time that they are in storage. These standards do not apply to the storage facilities of someone who is only an end user (such as a farmer or golf course operator).
In general, the standards address and manage 11 areas of potential storage-related risk such as spills, floods, and shipping and receiving design safety. To address these potential risk areas, the standards have three primary components:

- Construction and structural requirements
- Employee training
- Documentation

Structural requirements incorporate the National Fire Code, National Building Code and Canadian Electrical Code. New pesticide storage facilities can only be built in certain areas, and precautions such as dyking and containment must be taken to prevent potential contamination of environmentally sensitive areas. Persons storing pesticides must ensure that in addition to any standards set by the AWSA, any requirements set out in the provincial legislation must be followed.

Warning and emergency signs must be clearly posted at all storage facilities. For flammable and combustible products, special storage precautions must be provided. Every warehouse employee must be trained in the safe handling of pesticide products, first aid and emergency procedures. Emergency response planning for each storage facility is mandatory.

Warehouses are audited every two years by independent auditors who are specially trained and certified. The standards are enforced through the issuing and withdrawing of certificates by AWSA. Agrichemical manufacturers will not ship product to uncertified warehouses, and the AWSA maintains a database for certification and compliance tracking. Approximately 300 certified warehouses exist in Ontario.

Provincial

In Ontario, the Ministry of the Environment is responsible for managing the sale, use, storage, transportation and disposal of federally registered pesticides. The Pesticides Act and Ontario Regulation 63/09 provide a comprehensive regulatory framework to prevent adverse effects of pesticides on health and the natural environment.

The ministry's pesticides program provides for mandatory licensing and training for pesticide applicators and vendors, restricting access to only federally registered pesticide products, issuing permits for special use pesticides, public notification for land based applications, risk- based inspections, emergency response and ensures compliance with ministry acts (e.g. the Pesticides Act) and regulations.

Pesticides Act

The Pesticides Act, 1990, is the legislation used to regulate the sale, use, transportation, storage and disposal of pesticides in Ontario. Sections 7 and 11 of the Pesticides Act are prescribed instruments under the Clean Water Act. These sections relate to the issuance, renewal and revocation of permits for land extermination, structural exterminations and water exterminations. The agricultural use of pesticides is highly regulated and these sections of the Act are not applicable.

In general, pesticide applications that may pose a higher risk to human and environmental health require a permit from the ministry. Permits are specific to a particular application and may impose further site specific restrictions/requirements on the use of the pesticide. The purpose of issuing pesticide permits for particular applications is to manage the use and to prevent excessive and indiscriminate use of pesticides that may pose a higher risk to human health and the environment. This is accomplished by placing additional limits, controls, and requirements on the selection, use, and reporting of pesticides regulated under the Pesticides Act. In addition to the terms and/or conditions included on a permit, any person who uses a pesticide is also required, under provincial and federal legislation, to comply with all label requirements. The federally approved pesticide label specifies how to use a product safely and effectively and contains information related the use precautions to minimize any potential risks to human health or the environment. Pesticide permits are only valid for one year and are not required to be posted on the Environmental Registry in accordance with the Environmental Bill of Rights. Permits may be appealed to Environmental Review Tribunal.

The application of a pesticide by a person without the required permit or not in accordance with all the terms and conditions of a permit may be considered an offence under the Pesticides Act and is subject to the penalties as prescribed in the legislation. The MOE manages its approach to compliance and enforcement through education and outreach, inspections, response to incidents, voluntary abatement, orders, tickets and prosecutions. The MOE uses a risk-based approach when determining how to respond to issues of non-compliance, in accordance with the Ministry's Compliance Policy. Provincial Officers who have power of inspection, seizure and evacuation, are responsible for ensuring compliance and providing enforcement under the Pesticides Act.

Ontario Regulation 63/09

Under Ontario Regulation 63/09 under the Pesticides Act, pesticides are classified according to toxicity, concentration, usage and other factors. All pesticide manufacturers, operators and vendors must be certified and

are required to follow specific storage and disposal procedures. There are a variety of programs and requirements associated with O. Reg. 63/09, which will be discussed below. These include:

- Pesticide Classification Guideline
- Cosmetic Pesticide Ban
- Integrated Pest Management Accreditation/Certification
- Pesticide Licensing and Certification
    - Operators
    - Vendors
    - Certified farmers (certified growers)
    - Licensed exterminators and technicians
- Pesticide Permits
- Pesticide Storage, Use and handling Requirements

Pesticide Classification Guideline

O. Reg. 63/09 establishes a classification system for pesticides. The Pesticide Classification Guideline for Ontario sets out specific criteria based on scientific and technical information for each Class of pesticides to establish which products can be sold and used in Ontario. Refer to Table 2-23 for specific classifications.

Table 2-23 Pesticides Classification Guideline

Classification	Description	Criteria
Class 1	Products intended for manufacturing purposes	The pesticide is designated under the Pest Control Products Act (Canada) as a pesticide of the Manufacturing class or is registered under the Fertilizers Act (Canada).
Class 2	Restricted or commercial products	1. The pesticide is designated under the Pest Control Products Act (Canada) as a pesticide of the Commercial or Restricted class or is registered under the Fertilizers Act (Canada). 2. The pesticide meets the description of Very Hazardous in the Guideline mentioned in subsection 4 (5). 3. The pesticide does not meet the description of a Controlled Sales pesticide in the Guideline mentioned in subsection 4 (5).
Class 3	Restricted or commercial products	1. The pesticide is designated under the Pest Control Products Act (Canada) as a pesticide of the Commercial or Restricted class or is registered under the Fertilizers Act (Canada). 2. The pesticide meets the description of Moderately Hazardous in the Guideline mentioned in subsection 4 (5). 3. The pesticide does not meet the description of a Controlled Sales pesticide in the Guideline mentioned in subsection 4 (5).
Class 4	Restricted or commercial products	1. The pesticide is designated under the *Pest Control Products Act* (Canada) as a pesticide of the Commercial or Restricted class or is registered under the Fertilizers Act (Canada). 2. The pesticide meets the description of Less or Least Hazardous in the Guideline mentioned in subsection 4 (5). 3. The pesticide does not meet the description of a Controlled Sales pesticide set out in the Guideline mentioned in subsection 4 (5).
Class 5	Domestic products intended for household use	1. The pesticide is, i. designated under the *Pest Control Products Act* (Canada) as a pesticide of the Domestic class and meets the description of Less Hazardous in the Guideline mentioned in subsection 4 (5), or ii. registered under the *Fertilizers Act* (Canada) and the size of its container is greater than 1 kg or 1L.

Classification	Description	Criteria
		2. If the pesticide may be used in, on or over land, i. the only pesticide ingredient it contains is a Class 11 pesticide, or ii. every use set out on the pesticide's label is a use mentioned in subsection 7.1 (2) of the Act.
Class 6	Domestic products intended for household use	1. The pesticide is, i. designated under the *Pest Control Products Act* (Canada) as a pesticide of the Domestic class and meets the description of Least Hazardous in the Guideline mentioned in subsection 4 (5), or ii. registered under the *Fertilizers Act* (Canada) and the size of its container is less than or equal to 1 kg or 1L. 2. If the pesticide may be used in, on or over land, i. the only pesticide ingredient it contains is a Class 11 pesticide, or ii. every use set out on the pesticide's label is a use mentioned in subsection 7.1 (2) of the Act.
Class 7	Controlled sales products (domestic and restricted)	1. The pesticide is designated under the *Pest Control Products Act* (Canada) as a pesticide of the Domestic or Restricted class. 2. The pesticide may be used in, on or over land. 3. The pesticide meets the description of a Controlled Sales pesticide set out in the Guideline mentioned in subsection 4 (5).
Class 8	Domestic products that are banned for sale and use in Ontario	1. The pesticide is designated under the *Pest Control Products Act* (Canada) as a pesticide of the Domestic class or is registered under the *Fertilizers Act* (Canada). 2. The pesticide may be used in, on or over land. 3. The pesticide contains a Class 9 pesticide. 4. The pesticide meets one of the following descriptions: i. Its label does not set out any of the uses mentioned in subsection 7.1 (2) of the Act. ii. If its label sets out a use mentioned in paragraph 4 of subsection 7.1 (2) of the Act, the pesticide does not meet the description of a Controlled Sales pesticide set out in the Guideline mentioned in subsection 4 (5).
Class 9	Ingredients in products for use only under exceptions to the ban	1. The pesticide is an ingredient in a Class 2, 3, 4, 5, 6, 7 or 8 pesticide. 2. The label of the Class 2, 3, 4, 5, 6, 7 or 8 pesticide sets out at least one use that is not a use mentioned in subsection 7.1 (2) of the Act. 3. The pesticide does not meet the description of a Category I pesticide in the Guideline mentioned in subsection 4 (5).
Class 10	Ingredients in products for the poisonous plant exception	1. The pesticide is a Class 9 pesticide. 2. The pesticide meets the description of a Category II pesticide in the Guideline mentioned in subsection 4 (5).
Class 11	Ingredients in products for cosmetic use	1. The pesticide is an ingredient in a Class 2, 3, 4, 5, 6 or 7 pesticide. 2. The pesticide meets the description of a Category I pesticide in the Guideline mentioned in subsection 4 (5).

The pesticides listed in the MOE Tables of Drinking Water Threats (2008, as amended in 2009) may be ingredient in products under various classes.

Cosmetic Pesticide Ban

Ontario's cosmetic pesticides ban took effect April 22, 2009. The requirements of the ban are detailed in Ontario Regulation 63/09 of the Pesticides Act, which was amended by the Cosmetic Pesticides Ban Act, 2008 (Government of Ontario, 2009).

The provincial ban renders inoperative municipal by-laws that regulate the use, sale or transfer of cosmetic pesticides to create one clear, transparent and understandable set of rules across the province. The ban prohibits the sale and use of pesticides for cosmetic purposes on lawns, vegetable and ornamental gardens, patios, driveways, cemeteries, and in parks and school yards and includes many herbicides, fungicides and insecticides. There are no exceptions for pest infestations (insects, fungi or weeds) in these areas.
The ban contains exceptions for public health or safety (including the protection of public works and other buildings and structures), golf courses, specialty turf, specified sports fields, arboriculture and to protect natural resources, if certain conditions are met. There are also exceptions for agriculture, forestry, research and scientific purposes, and uses of pesticides for structural exterminations and uses of pesticides required by other legislation.

Under the Pesticides Act and Ontario Regulation 63/09, certain pesticides can be purchased and used in and around home to protect the health and safety of your family, including:

- Controlling wasps or mosquitoes that can transmit West Nile Virus
- Killing plants that are poisonous to the touch, such as poison ivy and giant hogweed.

The pesticides with both non-cosmetic and cosmetic uses are listed in Class 7. Such pesticides will only be allowed for non-cosmetic purposes. A retailer must notify you of this when you purchase the product. For example, the use of a pesticide to control poison ivy cannot be used on patios or driveways to control other weeds. Other pesticide uses that are allowed around the home include:

- To protect the health of pets (e.g. to control fleas)
- To control indoor pests or pests that can cause structural damage to the home.

Biopesticides (e.g., microorganisms that control pests, such as the bacterial insecticide used to control Gypsy moths) and lower risk pesticides (such as acetic acid) to manage weeds, insects and plant diseases can be used following instructions on their label.

Integrated Pest Management Accreditation/Certification

In order to be exempt from the cosmetic pesticides ban and continue using Class 9 pesticides in their maintenance operations, golf courses must meet certain conditions including becoming fully accredited by the Integrated Pest Management Council of Canada (IPMCC), which is the integrated pest management (IPM) body approved for the purpose of Section 18 of Ontario Regulation 63/09.

Accredited golf courses are able to apply Class 9 pesticides only on the actual playing surfaces and not on lawns, gardens, patios and other outdoor areas associated with the facility. Other conditions that must be met in order to be exempt from the ban include: preparing annual reports on pesticide use, and holding public meetings to present the annual reports
The IPM accreditation program involves:

- employing an IPM certified agent who is responsible for IPM at the golf course,
- completing annual desk audits assessing conformance with pest monitoring, sprayer calibration, pesticide usage, alternative treatments, pesticide use reduction where appropriate, and employee training on the principles of IPM.
- completing an on-site audit once every three years further assessing golf course management activities as they relate to the principles of IPM

Owners or operators of specialty turf or public works must also prepare annual reports on pesticide use, detailing their use of pesticides, why they were used, and how future uses could be reduced. In addition, pesticide use on specialty turf (such as lawn bowling, cricket, lawn tennis or croquet), and certain public works (related to health or safety) are exempt from the cosmetic pesticide ban provided the treatment is done by a licensed exterminator certified by the IPMCC.

Pesticide Licensing and Certification

Unless exempted under Ontario Regulation 63/09, a pesticide licence is required to sell pesticides (Vendor Licence), apply pesticides (Exterminator Licence), or to operate a business that employs persons that apply pesticides commercially (Operator Licence). Pesticide vendors and exterminators are also required to meet certain certification requirements.

Table 2-24 Pesticide Licensing and Certification Categories

Category of License	Summary
Operators	Any person that operates a pesticide extermination business in Ontario must hold an Operator Licence of the General class issued by the Ministry of the Environment. If you apply pesticides commercially you must have an Operator Licence or be working for someone that has an Operator Licence. A licensed Operator must have insurance for their extermination business.
Vendors	A person or business that sells and/or transfers pesticides must hold a pesticide Vendor Licence. There are two types of vendor licence – a Limited Vendor Licence and a General Vendor Licence. A Limited Vendor Licence authorizes the holder to sell Class 5, 6 or 7 pesticides, or a Class 3 pesticide that is a bactericide in cutting oil, marine or aviation fuel. A General Vendor Licence authorizes the holder to sell Class 1-7 pesticides, whether wholesale or retail. A General Vendor must employ a full-time, certified outlet representative that has completed the Pesticide Vendor Certificate Course. Vendor training and certification is administered by Ridgetown Campus, University of Guelph under the Ontario Pesticide Education Program (www.opep.ca). Once certified, vendors can apply for a "General Vendor Licence" from the MOE.
Certified Farmers (Certified Growers)	Farmers, as defined under Ontario Regulation. 63/09, require certification in order to buy or use Class 2 or 3 pesticides on the land they farm. To become certified, they must attend and pass the Grower Pesticide Safety Course (GPSC) administered by Ridgetown Campus, University of Guelph under the Ontario Pesticide Education Program (www.opep.ca). Grower certification is valid for five years. Certified Farmers cannot use pesticides as part of a business or sell pesticides. Pesticide safety training is also mandatory for any farmer assistant, such as a farm employee, farm family member, or seasonal foreign worker, who handles Class 2 or 3 pesticides. Trained Assistants cannot buy Class 2 or 3 products and may only handle these products under the supervision of a Certified Farmer. Training is valid for five years.
Licensed Exterminators and Technicians	A person that applies pesticides commercially and is not a Technician or Trainee requires an Exterminator Licence from the MOE authorizing pesticide use according to the terms and conditions of the licence. All new exterminators are required to take an MOE approved course (including passing a certification exam). Exterminator training and certification is administered by Ridgetown Campus, University of Guelph under the Ontario Pesticide Training and Certification Program (www.ontariopesticide.com/optc/). The following is a summary of the main types and classes of exterminator licences: • Structural (termite, greenhouse/interior plant, fumigation-general, vault, commodity, soil) • Land (landscape, agriculture, industrial, vegetation, aerial, forestry) • Water (aquatic, vegetation, mosquito/biting flies, fish/mollusc) Exterminators may also include farmers who custom apply pesticides for other farmers and charge a fee for the service. All pesticide exterminator licence holders must be at least

Category of License	Summary
	sixteen years of age. Exterminator licences are valid for a five year period, after which time the licence may be renewed. A Technician is defined as a person who has successfully completed (within the last 24 months) a course approved by the ministry concerning basic pesticide safety. A Technician may perform specific duties and apply certain types of pesticides under the in-direct supervision of a licensed exterminator The ministry has agreements in place with Ridgetown Campus – University of Guelph www.ontariopesticide.com/optc/) and two pesticide industry associations (Pesticide Industry Council (www.ptppic.com) and Pesticide Industry Regulatory Council (www.oipma.ca) to administer ministry approved pesticide safety courses for Technician certification. These organizations issue Technician certificates to applicants that have successfully completed the approved safety course and training program. Unlicensed assistants who do not train to become technicians are considered “Trainees” and must be directly supervised by licensed exterminators at all times.

Pesticide Permits

As outlined in Ontario Regulation 287/07 under the Clean Water Act, 2006 only pesticide applications to land and the handling and storage of pesticides are prescribed as drinking water threats... For the land application of pesticides, Ontario Regulation 63/09 (section 72) requires permits for the following types of pesticide applications.

- For use of a Class 2, 3, or 4 pesticide that contains picloram (i.e., Tordon101);
- For aerial application of a Class 3 or 4 pesticide performed in connection with the management of a Crown forest;
- For aerial application of a Class 2 pesticide:
- For aerial application of a Class 3 pesticide that contains 2,4-D, 2,4-DB, mecoprop, MCPA, MCPB, dichlorprop, dicamba, paraquat or triclopyr.

Pesticide Storage, Use and Handling Requirements

Ontario Regulation 63/09 sets out requirements related to: pesticide storage, mixing and loading of pesticides, washing of pesticide equipment, safe and secure transportation of pesticides, proper disposal of empty and damaged pesticide containers, and pesticide spill cleanup. It is illegal to store pesticides under unsafe conditions. Storage requirements under Ontario Regulation 63/09 include ensuring:

- The pesticides are not likely to impair the health or safety of any person;
- The pesticides will not come into contact with food or drink intended for human or animal consumption;
- The storage area is maintained in good repair with precautions to prevent pesticides from contaminating the environment or other pesticides;
- The storage area is properly secured, posted with warning signs, and has emergency telephone numbers prominently displayed nearby;
- Pesticides stored in an unsupervised vehicle must be in a place inaccessible to the public or in a locked compartment and the vehicle must display the required warning sign.
- Class 1, 2 and 3 pesticides are to be stored in areas that are inaccessible to the public, ventilated to the outdoor atmosphere, do not have floor drains leading to a watercourse, and with emergency response equipment readily available.
- Licensed vendors, licensed operators, manufacturers, and persons storing Class 1 pesticides are required to provide written notice annually to the fire department responsible for the area in which the pesticide is stored.

Unsold pesticides or unused surplus pesticide concentrate must be disposed of in accordance with Ontario Regulation 63/09 and Regulation 347 (General Waste Management) under the Environmental Protection Act. Generally, all pesticide wastes must be disposed of at a waste disposal facility that has been approved by the MOE, and can only be transported by a waste management company that has obtained the appropriate approvals from the MOE.

Ontario Regulation 63/09 (sections 114 to 115) outlines the requirements for transportation of pesticides. Pesticides are to be secured to prevent discharge of the pesticide from the vehicle, and are to be separated from food and drink and other commodities.

In accordance with section 12 of Ontario Regulation 63/09, appropriate measures must be taken to prevent the backflow of pesticides into the water if using water from a well or from a lake, river or other body of surface water in an extermination. In additional, any equipment used in an extermination must not be washed in or near a well or in or near a lake, river or other body of surface water in a manner that causes or may cause a pesticide to be directly or indirectly discharged into the well, or into the lake, river or other body of surface water.

Environmental Protection Act, Ontario Regulation 347 (Government of Ontario, 1990)

Ontario Regulation 347 s.61 to 73 under the Environmental Protection Act regulates the requirements for "pesticide container depots" (locations that receive containers originally used to hold commercial pesticides). Procedures and requirements are described for owning or operating a depot, including restricting access to the depot and ensuring that workers are familiar with safe pesticide handling and storage practices. Additional provisions describe methods of safe handling and storage, such as labeling, security, inspection, ventilation, and record keeping.

Ontario Water Resources Act (Government of Ontario, 1990)

The Ontario Water Resources Act (OWRA) contains general prohibitions against discharging pollutants to surface or groundwater.

Farming and Food Production Protection Act (Government of Ontario, 1998)

The Farming and Food Production Protection Act (FFPPA), 1998, protects and encourages the development and improvement of agricultural lands for the production of food, fibre and other agricultural and horticultural products. The FFPPA protects farming operations from nuisance complaints as well as from restrictive municipal by-laws. The Act does not give farmers the right to pollute the natural environment or to contravene the Environmental Protection Act, Pesticides Act or the Ontario Water Resources Act.

Municipal

Municipal Act 2001

Manufacturing, processing and wholesale activities are generally permitted on lands that are zoned for industrial uses to provide separation between industrial establishments and incompatible land uses. Municipalities have strict control over where these activities can occur within their municipal boundaries, and the majority of IPZs and WHPAs are in small established settlement areas that are unlikely to accommodate an industrial use of this magnitude.

Municipalities often designate certain types of uses, such as commercial, industrial and larger scale residential uses, as being subject to site plan control. Site plan control allows the municipality to negotiate the layout of a site; including locating internal roadways, waste disposal areas, storage areas, building and septic envelopes, etc. The location and type of storage could be addressed at the site plan control stage for new construction. This can only occur where the property is subject to site plan control (i.e. the building official can only then negotiate the layout of the site beyond the requirements of the zoning by-law).

Other

Best Management Practices for Industrial Sectors

XCG Consultants Ltd. (2007) prepared a number of documents for the Ministry of the Environment that describe various best management practices (BMPs) to achieve pollution prevention and a reduction of specific contaminants that may be present in the effluent discharges of specific facilities. The sectors that are targeted include: textiles, fabricated metal products, motor vehicle parts manufacturing, automotive repair and maintenance, dry cleaning and laundry services, and chemical manufacturing. The BMPs for the pesticide, fertilizer and other agricultural chemical manufacturing sector focus on the manufacture of pesticides, and ways to reduce risks posed by their component chemicals.

Canada-Ontario Environmental Farm Plan

The Environmental Farm Plan (EFP) is delivered locally through the Ontario Soil and Crop Improvement Association with expertise provided by the Ontario Ministry of Agriculture, Food and Rural Affairs. It is a voluntary educational program for farmers delivered through local workshops. Participants are provided instruction on how to progress through the risk assessment and action plan development contained in the EFP workbook. Limited funds (50/50 cost share) are available to address areas identified in the plan as needing improvement. One of the 23 areas assessed through the EFP is the handling and storage of pesticides (Ontario Soil and Crop Association, 2005).

Safe Pesticide Education

Both the federal and provincial government provides information on the proper storage, disposal, and application of pesticides allowable for domestic use. For example, the federal government publishes “Homeowner Guidelines for Pesticide Use” and “Proper Use of Pesticides.”

Natural Gardening Outreach and Education Programs

Many voluntary education-based programs promote eco-friendly lawn and garden care that does not rely on pesticides. Eco-friendly management includes using mowing, aeration, watering, fertilization and seeding techniques to produce a healthy lawn that discourages weeds and better resists insect infestations. The Ontario government provides links to useful information through their “add it up” website, and the federal government also provides information to interested community members. Many non-governmental organizations are also involved in communicating this information.

Other programs, such as the “yellow fish” stormwater drain program remind community members of the potential environmental consequences of using harmful products, and passively encourage the use of gentler products.

Gaps in Existing Legislation, Policies and Programs

The following table provides the gaps in the legislation, policies and programs that are currently associated with the drinking water threat of the application, storage and handling of pesticides.

Table 2-25 Existing Gaps in the Legislation, Policies and Programs

Level of Government	Applicable Legislation/Policies/Programs	Gaps
Federal	Fisheries Act	• Legislation is reactive in nature
	Agrichemical Warehousing Standards Association	• The standards are very high and only apply to pesticide dealers
Provincial	Pesticides Act and O. Reg. 63/09	• Enforcement of regulation is lacking; legislation is generally self-regulated • Inspections conducted by MOE officers are limited • Several industries are exempt from requiring pesticide permits
	Environmental Protection Act 1990	• Legislation is reactive
	Farming and Food Protection Act	• There are no special requirements for vulnerable areas (WHPA and IPZ)
Municipal	Land Use Planning	• Land use planning addresses the location of storage facilities however tools such as site plan control does not the interior layout of a facility (e.g. where and how pesticides are stored in a warehouse)
Other	Environmental Farm Plan	• Voluntary in nature • Limited funding to implement practices identified under plan

Policy Considerations

- REMINDER: The main consideration for reducing or eliminating drinking water threats related to the application and storage of pesticides is to make sure that it does not enter surface water and/or groundwater.
- 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.
- Application of pesticides cannot be prohibited under land use planning because it is an activity. Only future land uses can be prohibited, such as agricultural land use. New pesticide storage can be prohibited through the land use planning tool. Acquiring land gives a municipality the most control around land use activities.
- Clean Water Act Part IV tools
    - In establishing Risk Management Plans, consideration should be given to allow for new technologies or BMPs to be integrated as they become available.
    - Application of pesticides is an activity. The Restricted Land Use tool will not capture future activities if they are not in association with an application process related to land use.
    - The use of Risk Management Plans (RMP) would require the property owner to work with the Risk Management Official to create a RMP that would manage the risk posed by pesticide storage and application. These plans would allow for site specific considerations.
- Policy will be written to generally state significant risk only rather than defining specific circumstances
- Policy objectives for storage of pesticides
    - To control pesticides so that there is no deterioration of groundwater for the purposes of drinking water
    - To control MCPA (pesticide) so that there is no deterioration of surface water for the purposes of drinking water
    - To prevent spills and leaks
    - To ensure spills response plans are in place
    - To require storage that meets safety standards (e.g. size and containment)
    - To prevent temporary storage within WHPA-A

  - To require storages are a safe distance from wells and surface water
  - To raise awareness of impact of threat on drinking water sources
  - That MOE consider new pesticides in the tables of drinking water threats as they are introduced
  - That emergency responders need to be aware of the contents in the storage in the case of fires or spills
- Policy objectives for the handling of pesticides
  - To control pesticides so that there is no deterioration of groundwater for the purposes of drinking water
  - To prevent spills from occurring
  - To ensure spills response plans are in place
  - To ensure spills response plans are in place
  - To require handling procedures meet safety standards
  - To require safe handling distance away from wells and surface water
  - To raise awareness of impact of threat on drinking water sources
- Policy objectives for the application of pesticides
  - To control pesticides so that there is no deterioration of groundwater for the purposes of drinking water
  - To control MCPA so that there is no deterioration of surface water for the purposes of drinking water
  - To prevent over application of pesticides
  - To adhere to pesticide labels
  - To manage application of pesticides in proximity to municipal wells where drinking water could be adversely affected
  - To raise awareness of impact of threat on drinking water sources
  - To minimize runoff of pesticides

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.

Table 2-26 Policy Ideas for Application, Handling and Storage of Pesticide

Threat: The application of pesticide to land
The handling and storage of pesticide

Policy Tool	Policy ideas
Education and Outreach	Promote or develop programs to landowners and application technicians on importance of buffers around wells and surface water where the management of pesticides is important
	Promote Agricultural BMPs, the Environmental Farm Plan, Golf Course BMPs (IPM), residential, and sport fields through education and outreach programs • Increase awareness of the existing cosmetic pesticide ban • Retail, wholesale and end user education program and spill contingency plans • Increase awareness of areas which are vulnerable
Incentive Programs	Support existing incentive programs (including ODWSP, EFP, Clean Water Program, and others) • For storage (incentives not applicable to application) • Highly recommend that the ODWSP continue to adequately fund risk mitigation practices for significant drinking water threats
Land Use Planning	Prohibit pesticide storages involving manufacturing, processing, wholesaling, and retailing of pesticides, as well as storage for extermination where they would be a significant threat. • Through land use planning tool rather than Section 57 • Expansion would be seen as new for retail/wholesale and manufacturing

	• Other expansion would be allowed if it provides for a reduced risk from the existing
Prescribed Instruments	Prohibit issuing pesticide application permits under *Pesticides Act* in areas where the pesticides are considered a significant threat • in areas where it would be a significant threat • only for pesticides which are considered a significant threat
	Require MOE and OMAFRA to emphasize protection of municipal wellheads in review of applications for permits under the Pesticides Act for people or businesses that apply pesticides commercially
	Require MOE to review approved permits to ensure compliance with the Source Protection Plan (I.e. require amendments to existing permits). • No application of mecroprop and MCPA • For application in the Thames-Sydenham, mecoprop and MCPA are a significant risk where application area is 1 -10 ha in WHPA-A. The 100 m zone of WHPA-A is less than 10 ha. Must give consideration to WHPA-B with a vulnerability score of 10.
	Encourage MOE to prioritize inspections for these areas, and to conduct regular inspections. • Specify Action policy • Permits are only effective for one year
S. 57 Prohibition	• Prohibit new storage only through Land use planning tool where this activity is a significant threat • Manage existing storage and application through Risk Management Plans where this activity is a significant threat • Explore ability to prohibit if failure to comply with RMP and if all other tools fail to mitigate the risk
S. 58 Risk Management Plans	Require RMP for existing and expanding storage of pesticides within areas where it is considered a significant threat
	Require RMP for application of pesticides listed as prescribed threats within areas where it is considered a significant threat • use of farm water protection plan or other ways of having access to third party expertise • flexibility for using new technologies as they arise
	Require RMP for activities involving manufacturing, processing or wholesaling of pesticides, retailing of pesticides, as well as storage for extermination where the activities are considered a significant threat. •
	RMP can include operating guidelines for management and containment of pesticides as well as for spills contingency plans. •
S. 59 Restricted Land Use	Flag land uses associated with pesticides (e.g. agricultural, active recreational, municipal public works) as restricted land uses where these activities pose a significant threat. • advise a proponent to obtain clearance from the RMO prior to proceeding with their application
S. 26 p.1 Other-Specify Action (Land Securement)	Encourage purchase land where these activities are significant threat areas • Where the municipality wishes to exceed the levels of protection identified above

Policy Examples

Policy examples presented within this section are based on the policy ideas noted above. These policy examples were presented to the SPC to facilitate discussion and have been further reviewed by the Source Protection Municipal Policy Advisory Committee.

Policy Example Number	10-1
Sub- Threat(s)	Application and Storage and Handling of Pesticides
Circumstance	Pesticides and application circumstances which are significant drinking water threats
Vulnerable Area	WHPA-A, B with a vulnerability score of 10
Risk	Significant, Moderate and Low
Body Responsible for Implementing	Municipal Watershed Partnership with Conservation Authority to lead. The implementation of this policy in this manner builds on the strengths and efficiencies of the Conservation Authorities as a partnership of the municipalities in the watershed.
Threat Status	Future, Existing, Expanding
Land Use	All
Legal Effect	Conform
Policy Tool	Education and Outreach
Policy Idea	Develop new or where possible expand on existing education and outreach programs to promote agricultural, recreational and industrial Best Management Practices to protect drinking water sources from risks of pesticides including: • Promotion of Integrated Pest Management; • Increase awareness of the existing cosmetic pesticide ban including retail, wholesale and end user education programs • Promotion of spill contingency plans; • Increase awareness of areas which are vulnerable; • Education of landowners and application technicians on importance of buffers around wells and surface water where the management of pesticides is important; • Incorporation of source water messaging into existing education and outreach or establish new materials to be provided to landowners whose properties may be utilized for the application or storage of pesticides; and, • Promotion of partnerships with OMAFRA and others. • 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 annually 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. Measures of tracking the uptake by the target audience will also be included in this report.

Policy Example Number	10-2
Sub- Threat(s)	Application and Storage and Handling of Pesticides
Circumstance	Pesticides and application circumstances which are significant drinking water threats
Vulnerable Area	WHPA-A, B with a vulnerability score of 10
Risk	Significant
Body Responsible for Implementing	Conservation Authority, Municipality, MOE, others
Threat Status	Existing, Expanding and Future
Land Use	All
Legal Effect	Strategic Action
Policy Tool	Incentives
Policy Idea	The Ontario Drinking Water Stewardship program shall continue to adequately fund risk mitigation practices for significant drinking water threats over the long term. Existing incentive programs (including EFP, Clean Water Program and others) that contribute to protection of drinking water sources should continue to be supported. New incentive programs should be considered for the storage of pesticides to assist with the implementation costs of risk mitigation practices for significant, moderate and low

Policy Example Number	10-2
	threats on drinking water sources. Where funding is limited, emphasis shall be on significant threat mitigation.
Implementation schedule	Ongoing implementation for existing programs or within 2 years of the approval of the SPP for new programs.
Monitoring Policy	Program operators shall report to the CA annually and include the number and type of risk management measures which have been applied for and the number funded in vulnerable areas.

Policy Example Number	10-3
Sub- Threat(s)	Storage of pesticides
Circumstance	Pesticides and application circumstances which are significant drinking water threats
Vulnerable Area	WHPA-A, 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	Land Use Planning
Policy Idea	The establishment of new pesticide storage facilities involving manufacturing, processing, wholesaling, and retailing of pesticides, as well as storage for extermination will not be permitted in vulnerable areas where they would be a significant threat.
Implementation schedule	Shall be initiated in all Official Plans within 6 months of Source Protection Plan approval date with the goal to be completed within 2 years of the Source Protection Plan approval date. Zoning by-laws shall be updated within 3 years of the Source Protection Plan approval date.
Monitoring Policy	Municipalities shall report to SPA 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 Example Number	10-4
Sub- Threat(s)	Application of pesticides
Circumstance	Pesticides and application circumstances which are significant drinking water threats
Vulnerable Area	WHPA-A, B with a vulnerability score of 10
Risk	Significant
Body Responsible for Implementing	MOE
Threat Status	Existing and Future
Land Use	All
Legal Effect	Conform
Policy Tool	Prescribed Instrument – Pesticide Act
Policy Idea	Where a property is required to have a pesticide application permit as per the *Pesticide Act*, MOE shall ensure existing and future permits adequately manage the threat to drinking water by. • Prohibiting the application of pesticides which are significant threats in areas where they are a significant threat; and, • Including conditions on the permit which emphasize the protection of municipal wellheads where the application of the pesticide is not a significant threat.
Implementation schedule	All new permits shall conform with this policy from the date of approval of the SPP. Existing permits at the time of the approval of the SPP will be amended within 6 months of the approval date.
Monitoring Policy	A report shall be submitted by MOE to the CA annually which indicates the number of permit applications issued and if any, the number that were found to be out of compliance with the Source Protection Plan.

Policy Example Number	10-5
Sub- Threat(s)	Application and Storage and Handling of Pesticides
Circumstance	Pesticides and application circumstances which are significant drinking water threats
Vulnerable Area	WHPA-A, B with a vulnerability score of 10
Risk	Significant
Body Responsible for Implementing	MOE
Threat Status	Existing, Expanding and Future
Land Use	All
Legal Effect	Strategic action
Policy Tool	Specify action
Policy Idea	Location within a source protection vulnerable area shall be included as a factor in selecting inspection priorities for pesticide application permits. It is recommended that inspections are conducted at least every 5 years for significant threats where pesticide application under a permit occurs more than once.
Implementation schedule	The implementation of a program which targets significant threats shall be initiated within 1 year of the approval of the SPP. All significant threats shall be inspected within 5 years of the approval of the SPP.
Monitoring Policy	A report shall be submitted to the CA annually which indicates the number of inspections undertaken within the areas where these activities can be significant threats, the number of situation identified where the plan holder was found to be out of compliance with their plan or strategy, the number of orders issued, and the number of changes to strategies or plans as a result of the inspection.

Policy Example Number	10-6a
Sub- Threat(s)	Storage of pesticides
Circumstance	Pesticides and application circumstances which are significant drinking water threats
Vulnerable Area	WHPA-A, B with a vulnerability score of 10
Risk	Significant
Body Responsible for Implementing	Municipality
Threat Status	Existing and Expanding
Land Use	Agricultural
Legal Effect	Conform
Policy Tool	Risk Management Plan
Policy Idea	Existing pesticide storage deemed a significant threat shall have an approved Risk Management Plan. A spills contingency plan must be included as part of the Risk Management Plan. The expansion of an existing pesticide storage site shall only be permitted in accordance with a Risk Management Plan. As such, where an adequate risk management plan cannot be negotiated, the significant threat cannot be undertaken. It is believed that in most cases BMPs, if properly implemented, can adequately manage the significant threat.
Implementation schedule	Existing pesticide storage facilities shall be brought into compliance with the SPP within 1 year of the approval of the SPP. For new pesticide storages this policy shall come into effect when the SPP is approved.
Monitoring Policy	The Risk Management Official shall submit an annual report which includes the number of RMP required and approved to the CA

Policy Example Number	10-6b
Sub- Threat(s)	Application of pesticides
Circumstance	Pesticides and application circumstances which are significant drinking water threats
Vulnerable Area	WHPA-A, B with a vulnerability score of 10
Risk	Significant
Body Responsible for Implementing	Municipality

Threat Status	Existing and Future
Land Use	All
Legal Effect	Conform
Policy Tool	Risk Management Plan
Policy Idea	Pesticides which are considered significant threats shall only be applied in accordance with an approved Risk Management Plan in areas where application is a significant threat. As such, where an adequate risk management plan cannot be negotiated, the significant threat cannot be undertaken. It is believed that in most cases BMPs, if properly implemented, can adequately manage the significant threat. The Risk Management Plan must be reviewed every 5 years.
Implementation schedule	Within 1 year of the approval of the SPP
Monitoring Policy	The Risk Management Official shall submit an annual report which includes the number of RMP required and approved to the CA

Policy Example Number	10-7
Sub- Threat(s)	Storage of Pesticides
Circumstance	Pesticides and application circumstances which are significant drinking water threats
Vulnerable Area	WHPA-A, B with a vulnerability score of 10
Risk	Significant
Body Responsible for Implementing	Municipality
Threat Status	Existing, Future
Land Use	All
Legal Effect	Conform
Policy Tool	Prohibition
Policy Idea	Temporary pesticide storage sites will not be permitted within vulnerable areas where they are deemed a significant threat.
Implementation schedule	The policy takes effect one year after the approval date of the first source protection plan.
Monitoring Policy	The municipality shall submit a report which includes the number of storage facilities which were found in contravention of this policy. The report shall be submitted annually to the CA

Policy Example Number	10-8
Sub- Threat(s)	Application and Storage and Handling of Pesticides
Circumstance	Pesticides and application circumstances which are significant drinking water threats
Vulnerable Area	WHPA-A, B with a vulnerability score of 10
Risk	Significant
Body Responsible for Implementing	Municipality
Threat Status	Existing, Expanding and Future
Land Use	All
Legal Effect	Conform
Policy Tool	Restricted Land use
Policy Idea	Within the area where the application, storage or handling of pesticides is a significant threat, the municipality shall amend its zoning by-laws and official plans to identify, as restricted, all land uses where application, storage or handling of pesticides could occur.
Implementation schedule	Shall be initiated in all Official Plans within 6 months of Source Protection Plan approval with the goal to be completed within 2 years of the Source Protection Plan approval date. Zoning bylaws shall be updated within 3 years of the Source Protection Plan approval date.
Monitoring Policy	Municipalities shall report to SPA 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 Example Number	10-9
Sub- Threat(s)	Application and Storage and Handling of Pesticides

Policy Example Number	10-9
Circumstance	Pesticides and application circumstances which are significant drinking water threats
Vulnerable Area	WHPA-A, B with a vulnerability score of 10
Risk	Significant
Body Responsible for Implementing	Municipality
Threat Status	Existing, Expanding and Future
Land Use	All
Legal Effect	Strategic Action
Policy Tool	Land Securement
Policy Idea	Municipalities shall consider land securement around wellheads in instances where the municipality wishes to exceed the level of protection identified in the SPP.
Implementation schedule	N/A
Monitoring Policy	When land securement has been pursued the municipality shall report the progress and outcomes to the CA.

Draft Policies

Draft policies have been developed for the Thames-Sydenham and Region for the application, handling and storage of pesticides. The table below provides a brief description of these policies. Refer to the Source Protection Plan for a detailed version of these policies.

Table 2-27 Draft Policies for the Application, Handling and Storage of Pesticides

TSR Policy Number	Policy Database Number	Threat	Description	Risk Category	Threat Status	Policy Approach	Implementer
TS.10.1	1663	Application of pesticides to the land	The management of application of pesticides through Section 58 of the Clean Water Act	Significant	Existing and future	Section 58	Risk Management Official
TS.10.2	1664	Application of pesticides to the land	Management of application of pesticides through Pesticide Act	Significant	Existing and future	Prescribed Instruments	MOE
TS.10.4	1665	Application of pesticides to the land	Compliance monitoring for the application of pesticides	Significant	Existing and future	Specify Action	MOE
TS.10.3	1752	Application of pesticides to the land	Management of pesticide application through pesticide permits for low and moderate threats	Moderate Low	Existing and future	Prescribed Instruments	MOE
G.7.3	1690	Application of pesticide to the land	Geo-referencing of prescribed instruments	Significant	Existing and future	Prescribed Instruments	MOE
G.2.1.2	1691	Handling and storage of pesticides	Continued funding of Ontario Drinking Water	Significant	Existing	Incentives	Municipality Conservation Authority Province

TSR Policy Number	Policy Database Number	Threat	Description	Risk Category	Threat Status	Policy Approach	Implementer
			Stewardship Program				
TS.11.2	1755	Handling and storage of pesticides	Prohibition of future pesticide storage (greater than 2500 kg or 2500 L) through Section 57 of the Clean Water Act	Significant	Future	Section 57	Risk Management Official
TS.11.3	1757	Handling and storage of pesticides	Prohibition of temporary pesticide storage facilities through Section 57 of the Clean Water Act	Significant	Existing and future	Section 57	Risk Management Official
G.6.1 to G.6.2	1692	Application, handling and storage of pesticides	Section 59 of the Clean Water Act restricted land use general policies	Significant	Future	Section 59	Risk Management Official
G.3.1, G.3.3.1, G.3.4.1	1693	Application, handling and storage of pesticides	General land use planning policies	Significant	Future	Land Use Planning	Planning Approval Authority
G.5.1 to G.5.5	1694	Application, handling and storage of pesticides	Section 58 of the Clean Water Act general risk management policies	Significant	Existing and future	Section 58	Risk Management Official
G.1.1 to G.1.2	1696	Application, handling and storage of pesticides	General education and outreach policies	Significant Moderate Low	Existing and future	Education and Outreach	Municipality Conservation Authority Province
G.2.1.1	1724	Application, handling and storage of pesticides	Existing incentive programs general policy	Significant	Existing	Incentives	Municipality Conservation Authority Province
G.2.2.1	1728	Application, handling and storage of pesticides	New incentive programs general policy	Significant	Existing	Incentives	Municipality Conservation Authority Province
G.1.3	1866	Application, handling and storage of pesticides	Provincial signage to locate WHPA and IPZ	Significant	Existing and future	Incentives	MOE MTO
G.1.4	1867	Application, handling and storage of pesticides	Signage policy as part of Municipal education policy	Significant	Existing and future	Education and Outreach	Municipality

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2.5 The Use of Land as Livestock Grazing or Pasture Land, Outdoor Confinement Area or Farm-Animal Yard

What is the Threat to Drinking Water

This paper provides background information for prescribed drinking water threat 21 - Livestock grazing/pasturing and outdoor confinement area/farm animal yard. Any farm where fencing is in place that could be used to keep livestock outdoors is associated with this drinking water threat.

Ontario Regulation 267/03 defines outdoor confinement areas as follows:

1) It has no roof, except as described below (#3);
2)It is composed of fences, pens, corrals or similar structures;
3)It may contain a shelter to protect the animals from the wind or another shelter with a roof of an area of less than 20 square metres;
4)It has permanent or portable feeding or watering equipment;
5)The animals are fed or watered at the enclosure;
6)The animals may or may not have access to other buildings or structures for shelter, feeding or watering; and
7)Grazing and foraging provides less than 50 per cent of dry matter intake.

Although grazing/pasturing, farm animal yards and outdoor confinement areas are different (i.e. the latter is a more concentrated animal area requiring more active management), many sections of this background report apply to all.

What Causes the Activity to be a Drinking Water Threat

The Ontario Ministry of the Environment (MOE) Tables of Drinking Water Threats (Ontario Ministry of the Environment, 2009) identify nitrogen, total phosphorus and pathogens (such as e-coli) as contaminants that could make their way into surface and groundwater from outdoor livestock areas (circumstances 335 to 346, 1945 and 1946). Nitrogen is a concern for both surface and groundwater. When water with high nitrate concentrations is given to babies less than six months of age, high levels of methemoglobin are formed in the blood. Oxygen is not distributed to the body's cells and methemoglobinemia or Blue Baby Syndrome results. Total phosphorous is only considered for surface water because excessive inputs result in eutrophication and can cause toxic algae blooms.

These nutrients and pathogens found in animal manure could threaten the safety of drinking water sources in certain situations. Generally speaking, keeping greater numbers of livestock in a space intensifies the accumulation of nutrients and pathogens, thereby increasing the risk of contamination and the requirement for more active management. As such, the ranking of drinking water threat in the MOE Tables increases proportional to the concentration of manure in a given area.

What is the Local Scale of the Drinking Water Threat

The use of land as livestock grazing or pasturing land, an outdoor confinement area or farm-animal yard for one or more animals is a significant drinking water threat in WHPA-A and B areas with a vulnerability score of 10 as well as in IPZ or WHPA-E areas with vulnerability scores greater than or equal to 8.

In livestock grazing or pasturing land, the circumstances for chemicals (nitrogen and phosphorus) are based on the number of animals (NUs) divided by the area of the grazing/pasturing land:

- Less than 0.5 NU/acre
- At least 0.5 but not more than 1 NU/acre
- Greater than 1 NU/acre

The circumstances for chemicals (nitrogen and phosphorus) for outdoor confinement areas, farm-animal yards are based on the number of NU divided by confinement area/farm-animal yard:

- Less than 120 NU/ha/year;
- At least 120 but not more than 300 NU/ha/year;
- Greater than 300 NU/ha/year.

The table below provides the local scale of this threat within the Thames-Sydenham and Region Source Protection Region.

Table 2-28 Local Scale of the Use of Land as Livestock Grazing and Pasturing, Outdoor Confinement Area and Farm-Animal Yard

System	Type	# of significant threat locations	WHPA	Vulnerability score
Dorchester	Pathogen	1	A, B	10
Embro	Pathogen	1	A	10
Ingersoll	Pathogen	1	A	10
Mount Elgin	Pathogen	1	A	10
Woodstock-rural	Chemical	2	B	10
Total		**6**		

Applicable Legislation, Policies and Programs

The following section provides a summary of the applicable legislation, policies and programs (federal, provincial, municipal and other) that address the drinking water threat of livestock grazing/pasturing and outdoor confinement area/farm animal yard.

Table 2-29 Applicable Legislation, Policies and Programs

Level of Government	Applicable Legislation/Policy/Program
Federal	Fisheries Act (Government of Canada, 1985)
Provincial	Environmental Protection Act (Government of Ontario, 1990)
	Ontario Water Resources Act (Government of Ontario, 1990)
	Nutrient Management Act and Ontario Regulation 267/03
	Farm Practices Protection Act (Government of Ontario, 1998)
Municipal	Municipal Act 2001
Other	Canada-Ontario Environmental Farm Plan (Ontario Soil and Crop Association, 2005)

Federal

Fisheries Act

Section 36 (3) states) "… no person shall deposit or permit the deposit of a deleterious substance of any type in water frequented by fish or in any place under any conditions where the deleterious substance or any other deleterious substance that results from the deposit of the deleterious substance may enter any such water"

(Government of Canada, 1985). The deposition of any deleterious substance (contaminant) is in contravention of the legislation. Manure and sediment runoff are considered deleterious substances. Manure and sediment could enter surface water as a result of unrestricted livestock access to surface water or runoff from outdoor livestock areas. In general, the Fisheries Act is enforced by Fisheries and Oceans Canada; however, the section that applies to contamination is under the authority of Environment Canada.

Provincial

Environmental Protection Act

The Environmental Protection Act (EPA) generally prohibits anyone from polluting the environment and is enforced by the Ontario Ministry of the Environment. Sections 6 and 14 of the EPA prohibit pollutant releases except where the discharge of a contaminant is a result of normal farming practices (Government of Ontario, 1990). The exception for normal farming practices allows activities that are necessary for raising livestock (e.g. manure to be spread on fields) without the approvals that are required for other wastes. Section 14 is set out below.

- 14.1 Subject to subsection (2) but despite any other provision of this Act or the regulations, a person shall not discharge a contaminant or cause or permit the discharge of a contaminant into the natural environment, if the discharge causes or may cause an adverse effect.

  Exceptions
  (2) Subsection (1) does not apply to,
  (a) a discharge that is authorized under this Act or the Ontario Water Resources Act, if the discharge does not cause and is not likely to cause an adverse effect; or
  (b) a discharge of a contaminant that arises when animal wastes are disposed of in accordance with normal farming practices, if the only adverse effect that is caused or that may be caused by the discharge is an adverse effect referred to in clause (a) of the definition of "adverse effect".
  Adverse effect means,
  (a) "impairment of the quality of the natural environment for any use that can be made of it", not the other portions of the definition which are as follows:
  (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.

Normal farming practices (i.e. a farm operation that uses proper and acceptable customs and standards as well as technology consistent with proper advanced farm management practices) by their nature do affect natural systems, but not cause adverse impacts as noted above.

Ontario Water Resources Act

The Ontario Water Resources Act (OWRA) contains general prohibitions against discharging pollutants to surface or groundwater. This includes manure and sediment. The Ontario Ministry of the Environment is responsible for enforcement of the Ontario Water Resources Act (OWRA). Two sections apply to outdoor livestock areas.

- Section 30(1): "Every person that discharges or causes or permits the discharge of any material of any kind into or in any waters or on any shore or bank thereof or into or in any place that may impair the quality of the water of any waters is guilty of an offence." This includes manure and sediment.

- Under Section 32 of the Act the Ministry can order a person who holds a certificate of approval to make changes if it is found that material is being discharged into the water that could impair its quality (Government of Ontario, 1990).

Nutrient Management Act – Ontario Regulation 267/03

The Nutrient Management Act provides a comprehensive nutrient management framework for Ontario's agricultural industry, municipalities and other generators of materials containing nutrients, including clear environmental protection guidelines. It builds on the existing system by giving current best management practices the force of law, and creating comprehensive, enforceable, province-wide standards to regulate the management of all land- applied materials containing nutrients.

Farms are regulated under the Nutrient Management Act if the farm generates greater than 300 nutrient units annually or generate between 5 and 300 NU annually and have applied for a building permit to construct a building used to hold farm animals or manure. Nutrient management strategies and plans are used by some farms to optimize the relationship between the land-based application of nutrients, farm management techniques and crop requirements; to maximize the efficient use of on-site nutrients; and to minimize adverse impacts to the environment.

Where there is overlap between the Nutrient Management Act (NMA) and the Environmental Protection Act (EPA) the NMA applies. For example, should a storm cause manure to flow from an outdoor confinement to a watercourse and the farm has a Nutrient Management Strategy the NMA applies, otherwise the EPA and the Ontario Water Resources Act would apply.

Sections 10, 14 and 28 of Ontario Regulation 267/03 – General are prescribed instruments under the Clean Water Act. These sections relate to the approval of nutrient management strategies and nutrient management plans, and to compliance with nutrient management strategies and plans that are in force (Government of Ontario, 2003). Permanent outdoor confinement areas (OCAs) on farms that are required to have a nutrient management strategy must comply with the following sections under O. Reg. 267/03. There are no requirements for pasturing and grazing.

- Section 55: “A person who owns or controls a low-density or high-density permanent outdoor confinement area shall not construct a new structure or pave all or part of the load-bearing surface of the confinement area, so as to increase the capacity of the confinement area, unless the confinement area is not located” within 100 m of a municipal well, 15 m of a drilled well that is at least 15 m deep with at least six m of casing, within 30 m of any other well or within 15 m of a field drainage tile;
- Section 57: Animals in a high-density or permanent OCA where the farm unit generates at least 300 nutrient units cannot have access to surface water. Note that low density outdoor/non-permanent OCA animals may have access to surface water. Other legislation generally prohibits this activity, but these acts and regulations are operated on a complaint basis and therefore have limited impact;
- Section 58: Animals may only be kept in a permanent OCA if there is a nutrient management strategy for the operation, the manure produced is in accordance with the strategy and a runoff management system is in place;
- Section 60: Manure may be mounded (i.e. mixed with bedding material to make it more solid and manageable) in an OCA and if it’s used for bedding material, as identified in an approved nutrient management strategy, it may be left (i.e. not moved to a storage facility or applied);
- Section 61: Describes special requirement for applying and storing snow with manure (e.g. gentle field slopes, reduced application rate and buffers along surface water);
- Section 81. (2, 3) : All runoff from farm animal yards and outdoor confinement areas must be equipped with a runoff management system capable of managing all the runoff from the area; and,

- Section 81. (5): Permanently vegetated areas such as permanent hay fields or permanent pastures can be used to manage runoff from outdoor confinement areas, farm animal yards and small solid manure storages (less than 300 m^2) per the requirements below.

    - 3 m minimum distance to field tile;
    - 100 m minimum distance to municipal well;
    - 15 m minimum distance to a drilled well
    - 90 m minimum distance to any other well provided that the area is used for a permanent solid nutrient storage facility that is used to store non-agricultural source materials
    - 30 m minimum distance to any other well
        - Other requirements for permanent vegetated areas (PVAs) under the Regulation include:
            - Minimum soil depth of 0.5 m
            - PVA for a permanent solid nutrient storage facility or yard must have a flow path that measures at least 150 m from surface water or tile inlets where it handles manure with a dry matter content of greater than or equal to 30 percent or at least 50 m where it handles manure with a dry matter content of 50 percent or greater.
            - PVA for outdoor confinement area must have a flow path that measures at least 100 meters if the outdoor confinement area is less than 500 m^2 or at least 150 if the outdoor confinement are is 500 m^2 or more.
            - There must be no more than 150 NU in an outdoor confinement area using a PVA for runoff and the outdoor confinement area cannot be more than 2,000 m^2.

There are no requirements for pasturing and grazing.

Vegetated filter strips, an engineered method to treat runoff from outdoor confinement areas, farm-animal yards and solid manure storages are also identified in O. Reg. 267/03 (Part IX 2). Requirements include:

- The strip must designed by a Professional Engineer and built to their specifications based on factors such as slope, infiltration rate for the soil, volume of runoff to be treated, etc.
- 100 percent of the flow must infiltrate the strip.
- Pretreatment of runoff to remove solids is necessary.
- The strip must be inspected at least every six months and repaired when necessary.
- Records of the design, inspections and any actions to ensure proper function must be kept.

There are other options under the NM Regs for managing runoff such as:

a) diverting up slope water away and putting a roof over the area;
b) building a liquid storage facility to store the runoff (and potentially manure);
c) sewage works as approved s. 53 OWRA; and,
d) sewage works approved under part 8 of Building Code.

Farm Practices Protection Act (Government of Ontario, 1998)

The Farm Practices Protection Act, commonly referred to as the "right-to-farm" act, was enacted to provide farmers with protection to carry on normal farm practices. Essentially, normal farming practices (i.e., a farm operation that uses proper and acceptable customs and standards as well as, technology consistent with proper advanced farm management practices) by their nature do affect natural systems, but do not cause adverse impacts on the quality of the natural environment

Municipal

Municipal Act

Municipalities have authority under the Municipal Act enact by-laws the economic, social, and environmental well-being of the municipality, and about the health, safety, and well-being of people. There are limitations on these authorities which need to be taken into consideration. For example, any municipal by-law with respect to construction or demolition of buildings is superceded by the Building Code Act and the Building Code. In addition, in the event of a conflict between a municipal by-law and federal and provincial legislation, the legislation prevails. For example, if a municipality wishes to enact legislation to protect its drinking water sources, the municipality must review the applicable legislation to ensure that the municipal by-law does not conflict with it. Municipalities can supplement provincial regulatory schemes, provided that the by-law does not conflict with the provincial legislation.

In a two tier system, each tier may have exclusive jurisdiction over a matter, for example, lower tiers may enact zoning by-laws whereas upper tiers may be responsible for public health. As a result, the upper tier municipality cannot use its broad authorities to pass a by-law which is specifically within the jurisdiction of the lower tier.

Municipalities may also use authorities under the Municipal Act to set up a licensing regime for businesses. The licensing system generally applies to how operators conduct the business, rather than how a product is applied. However, the municipality may determine that there are certain conditions to holding a license, such as certification or operators.

Other

Canada-Ontario Environmental Farm Plan

The Environmental Farm Plan (EFP) is a program that is delivered locally through the Ontario Soil and Crop Improvement Association with expertise provided by the Ontario Ministry of Agriculture and Food. It is a voluntary educational program for farmers delivered through local workshops. Participants progress through a risk assessment and action plan development for their farm. The risk assessment gives the farmer the opportunity to assess the current level of environmental concern in up to 23 different areas on the farm and access funding to make improvements for areas of identified risk (Ontario Soil and Crop Association, 2005). The information sheets on nutrient management for the EFP program are consistent with the requirements of O. Reg. 267/03.

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 drinking water threat of livestock grazing/pasturing and outdoor confinement area/farm animal yard

Table 2-30 Existing Gaps in the Legislation, Policies and Programs

Level of Government	Applicable Legislation/Policies/Programs	Gaps
Federal	Fisheries Act (Government of Canada, 1985)	• Legislation is reactionary and does not address groundwater
Provincial Municipal	Environmental Protection Act (Government of Ontario, 1990)	• This legislation is reactionary • There are exemptions for normal farming practices which are not specific to vulnerable areas (WHPA and IPZ)
	Ontario Water Resources Act (Government of Ontario, 1990)	• Legislation is reactionary • Although unrestricted livestock access to surface water

Level of Government	Applicable Legislation/Policies/Programs	Gaps
		is illegal (Fisheries Act, Environmental Protection Act, Ontario Water Resources Act), the general practice of enforcement agencies is to enforce on a complaint basis only
	Nutrient Management Act (Government of Ontario, 2002)	• Although O. Reg 267/03 has requirements associated with outdoor confinement areas, the majority of the farms are not subject to the Regulation because they do not meet the requirements for a NMS. The operation must be large enough, new or expanding to be captured under the NMA and be required to have a NMS • OCAs may look very different from property to property and some may not need building permits and therefore would not be flagged under the legislation. Although defined in the NMA, what an individual considers and OCA can be interpreted differently from the property owner • Identifying threats from livestock and non-compliance of the regulations is complaint driven • Inspections of the operations that require approval under O. Reg. 267/03 are scheduled based on complaints, the inherent risk and past communications
	Farm Practices Protection Act (Government of Ontario, 1998)	• There are no special requirements for vulnerable areas (WHPA and IPZ)
	Minimum Distance Separation (MDS) Formulae	• MDS only applies to structures and not activities • MDS is intended to address land use incompatibility due to odour and nothing else.
Other	Canada-Ontario Environmental Farm Plan	• There is limited funding to implement practices that are identified under the plan. • EFP is voluntary and confidential and cannot be provided to a party responsible for policy implementation.

Policy Considerations

- Run-off from outdoor confinement areas and farm-animal yards is the greatest risk for livestock manure to enter surface water.
- Only farms regulated under the NMA will have a nutrient management strategy or plan. The NMP/S will only have sections applicable to outdoor confinement areas but not to grazing and pasturing.
- Grazing of livestock cannot be prohibited under land use planning because it is an activity. Only land future uses can be prohibited, such as agricultural land use. New outdoor confinement areas can only be prohibited through the land use planning tool if they require a planning application for a building. Acquiring land gives a municipality the most control around land use activities.
- The Restricted Land Use tool will not capture future activities if they are not in association with an application process related to land use.
- The use of Risk Management Plans (RMP) would require the property owner to work with the Risk Management Official to create a RMP that would manage the risk posed by livestock grazing or outdoor confinement areas. These RMP would allow for site specific considerations.
- Policy objectives for the use of land as livestock grazing and pasturing of land as well as outdoor confinement area or farm animal yard
- To control nitrogen, and pathogen contaminants in livestock manure so that there is no deterioration of groundwater for the purposes of municipal drinking water

- To manage grazing and outdoor confinement so that pathogens do not enter surface water where it could result in the deterioration of the water for the purposes of municipal drinking water
- To prevent runoff from outdoor confinement areas from entering wells and surface water through active management. (Livestock manure is at greater concentrations from outdoor confinement areas and farm-animal yards and therefore the accumulation of nutrients is intensified, thereby increasing the risk of contamination.)
- To avoid high intensity grazing too close to wells and in surface water where drinking water could be affected
- To raise awareness of impact of threat on drinking water sources

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.

Table 2-31 Policy Ideas for livestock grazing, pasturing, outdoor confinement or farm-animal yard

Threat: The use of land as livestock grazing or pasturing land, an outdoor confinement area or a farm-animal yard

Policy Tool	Policy ideas
Education and Outreach	Support BMPs to manage risk for pasturing/grazing and outdoor confinement areas • Include promotion of vaccinations which would reduce pathogens in livestock manure • Include the promotion of nutrient management plans even where not currently required for outdoor confinement areas and farm-animal yards which speaks to runoff management, management of snow containing manure and manure management
	Promote the benefits of EFPs for all farms in vulnerable areas • Incorporate SWP messaging
	Include acknowledgement of the impact of wildlife in education programs
Incentive Programs	Incentive programs to establish buffers on lands adjacent to surface water within WHPA-E (with vulnerability score of 9 or 8.1)
	Support existing incentive programs (including ODWSP, EFP, Clean Water Program and others) for agricultural BMPs which protect source water. • Runoff management and fencing from surface water • Highly recommend that the Ontario Drinking Water Stewardship Program continue to adequately fund risk mitigation practices for significant drinking water threats
	Encourage relocation of significant threats to where they would not be significant within the same farm unit
	Encourage granting of fencing through the Drainage Act for municipal drains
	Encourage new incentives to encourage new technology (e.g. vaccination)
Land Use Planning	• Cannot regulate activities only land use. Land Use planning not applicable to this activity
Prescribed Instruments	Recommend MOE and OMAFRA to emphasize protection of municipal wellheads in review of NMS/P for farms in WHPA-A • Request MOE to include location in a source protection vulnerable area as a risk factor in selecting inspections
S. 58 Risk Management Plans	Require RMP for outdoor confinement areas and farm-animal yards within areas where it is considered a significant threat on farms that are not governed under the NMA
	Require RMP for livestock grazing and pasturing

	• See what farm water protection plan includes – add more specifics if it does not cover this
S,57 Prohibition	• Prohibit future outdoor confinement areas where this activity is a significant threat • Manage existing and expanding outdoor confinement and grazing significant threats through Risk Management Plans
S. 59 Restricted Land Use	Require pre-screening of applications where land use may result in a significant threat • advise a proponent to obtain clearance from the RMO prior to proceeding with their application.
S.26 p.1 Other-Specify Action (Land Securement)	Encourage purchase land where these activities are significant threat areas • Where the municipality wishes to exceed the levels of protection identified above

Policy Examples

Policy examples presented within this section are based on the policy ideas noted above. These policy examples were presented to the SPC to facilitate discussion and have been further reviewed by the Source Protection Municipal Policy Advisory Committee.

Policy Example Number	21-1
Sub- Threat(s)	The use of land as livestock grazing or pasturing land, an outdoor confinement area or a farm-animal yard
Circumstance	The use of land as livestock grazing or pasturing land, an outdoor confinement area or farm-animal yard for one or more animals where the land use may result in the presence of one or more pathogens in groundwater or surface water.
Vulnerable Area	WHPA-A, B with a vulnerability score of 10
Risk	Significant, Moderate and Low
Body Responsible for Implementing	Municipal Watershed Partnerships with Conservation Authority to lead. . The implementation of this policy in this manner builds on the strengths and efficiencies of the Conservation Authorities as a partnership of the municipalities in the watershed.
Threat Status	Future, Existing, Expanding
Land Use	Agricultural
Legal Effect	Conform (significant), Have Regard (moderate, low)
Policy Tool	Education and Outreach
Policy Idea	Develop new or where possible expand existing education and outreach programs to promote Best Management Practices to protect drinking water sources from chemical and pathogen risks generated from livestock including: • Promotion of nutrient management plans even where not currently required under NMA; • Promotion of voluntary Environmental Farm Plan; • Promotion of runoff management; • Promotion of innovative risk management measures; • Education to landowners and application technicians on importance of buffers around wells and surface water where the management of livestock manure is important; • Incorporation of source water messaging into existing education and outreach or establish new materials to be provided to landowners whose properties may be utilized for livestock grazing or pasturing, outdoor confinement areas or farm animal yards and, • Where possible the programs should involve partnerships with OMAFRA and others. • 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

Policy Example Number	21-1
	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 annually 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. Measures of tracking the uptake by the target audience will also be included in this report.

Policy Example Number	21-2
Sub- Threat(s)	The use of land as livestock grazing or pasturing land, an outdoor confinement area or a farm-animal yard
Circumstance	The use of land as livestock grazing or pasturing land, an outdoor confinement area or farm-animal yard for one or more animals where the land use may result in the presence of one or more pathogens in groundwater or surface water.
Vulnerable Area	WHPA-A, B with a vulnerability score of 10
Risk	Significant
Body Responsible for Implementing	Conservation Authority, Municipality, MOE, others
Threat Status	Existing, Expanding and Future
Land Use	Agricultural
Legal Effect	Strategic Action
Policy Tool	Incentives
Policy Idea	The Ontario Drinking Water Stewardship program shall continue to adequately fund risk mitigation practices for significant drinking water threats over the long term. Existing incentive programs (including EFP, Clean Water Program and others) that contribute to protection of drinking water sources should continue to be supported. New incentive programs reducing risks (i.e. runoff management and fencing from surface water, encourage relocation of significant threats to where they would not be significant within the same farm unit)should be considered to assist with the implementation costs of risk mitigation practices for significant, moderate and low threats on drinking water sources. Where funding is limited, emphasis shall be on significant threat mitigation.
Implementation schedule	Ongoing implementation for existing programs or within 2 years of the approval of the SPP for new programs.
Monitoring Policy	Program operators shall report to the CA annually and include the number and type of risk management measures which have been applied for and the number funded in the vulnerable areas. The report shall identify how many were considered to significant drinking water threats.

Policy Example Number	21-4
Sub- Threat(s)	The use of land as livestock grazing or pasturing land, an outdoor confinement area or a farm-animal yard
Circumstance	The use of land as livestock grazing or pasturing land, an outdoor confinement area or farm-animal yard for animals where the land use may result in the presence of one or more pathogens in groundwater or surface water and where a NMP or NMS is required.
Vulnerable Area	WHPA-A, B with a vulnerability score of 10
Risk	Significant
Body Responsible for Implementing	OMAFRA (responsible for approving Nutrient Management Strategies); MOE (responsible for inspection and enforcement)
Threat Status	Existing and Expanding
Land Use	Agricultural
Legal Effect	Conform
Policy Tool	Prescribed Instrument-Nutrient Management Act
Policy Idea	Province to review and ensure Nutrient Management Strategies and Plans adequately manages the risk where livestock grazing or pasturing land, outdoor confinement area or

Policy Example Number	21-4
	farm-animal yard is a significant threat.
Implementation schedule	All new NMP and NMS shall be consistent with the SPP immediately following the approval of the SPP. Existing NMS and NMP shall be reviewed and where necessary updated to be in conformance with the SPP within 1 year of approval of SPP.
Monitoring Policy	OMAFRA will submit an annual report to the CA which identifies the number of NMP, and NMS which were reviewed, the number approved and the number which required updates to adequately manage the significant threats. MOE will submit an annual report to the CA which identifies the number of inspections and enforcements under the Nutrient Management Act.

Policy Example Number	21-5
Sub- Threat(s)	The use of land as livestock grazing or pasturing land, an outdoor confinement area or a farm-animal yard
Circumstance	The use of land as livestock grazing or pasturing land, an outdoor confinement area or farm-animal yard for one or more animals where the land use may result in the presence of one or more pathogens in groundwater or surface water.
Vulnerable Area	WHPA-A, B with a vulnerability score of 10
Risk	Significant
Body Responsible for Implementing	OMAFRA (responsible for approving Nutrient Management Strategies), MOE (responsible for inspection and enforcement)
Threat Status	Existing, Expanding and Future
Land Use	Agricultural
Legal Effect	Strategic action
Policy Tool	Specify action
Policy Idea	It is recommended that OMAFRA include voluntary Nutrient Management Plans and Strategies in its review program where the use of land as livestock grazing or pasturing of land, outdoor confinement areas or a farm-animal yard is a significant threat.
Implementation schedule	Within 1 year of approval of the SPP
Monitoring Policy	OMAFRA will submit an annual report to the CA with the number of voluntary NMP and NMS reviewed. MOE will submit an annual report to the CA which identifies the number of inspections and enforcements under the Nutrient Management Act.

Policy Example Number	21-6a
Sub- Threat(s)	The use of land as an outdoor confinement area or a farm-animal yard
Circumstance	The use of land as an outdoor confinement area or farm-animal yard for one or more animals where the land use may result in the presence of one or more pathogens in groundwater or surface water and where a NMP or NMS is not required.
Vulnerable Area	WHPA-A, B with a vulnerability score of 10
Risk	Significant
Body Responsible for Implementing	Municipality
Threat Status	Existing and Expanding
Land Use	Agricultural
Legal Effect	Conform
Policy Tool	Risk Management Plan
Policy Idea	Existing outdoor confinement areas deemed a significant threat and not regulated under the NMA shall have an approved Risk Management Plan. The Risk Management Plan must meet the requirements of the Nutrient Management Act for outdoor confinement standards provided it adequately manages the significant threat. In most cases the Nutrient Management plan is believed to adequately manage the risk. Where an adequate risk management plan cannot be negotiated, the significant threat cannot be undertaken..
Implementation schedule	Existing outdoor confinement areas and farm animal yards shall be reviewed within 1 year of the approval of the SPP and brought into compliance within 2 years of the approval of the SPP. Expanding areas/yards after the approval of the SPP shall be brought into

Policy Example Number	21-6a
	compliance through the expansion.
Monitoring Policy	The Risk Management Official shall submit an annual report which includes the number of RMP required and approved to the CA

Policy Example Number	21-6b
Sub- Threat(s)	The use of land as livestock grazing or pasturing land,
Circumstance	The use of land as livestock grazing or pasturing land, for one or more animals where the land use may result in the presence of one or more pathogens in groundwater or surface water.
Vulnerable Area	WHPA-A, B with a vulnerability score of 10
Risk	Significant
Body Responsible for Implementing	Municipality
Threat Status	Existing and Future
Land Use	Agricultural
Legal Effect	Conform
Policy Tool	Risk Management Plan
Policy Idea	Livestock grazing and pasturing, where it has been deemed a significant threat, shall occur in accordance with an approved Risk Management Plan which relies to the extent possible accepted Best Management Practices to manage the significant threat. Where an adequate risk management plan cannot be negotiated, the significant threat cannot be undertaken.. The Risk Management Plan must be reviewed every 5 years.
Implementation schedule	Within 1 year of the approval of the SPP
Monitoring Policy	The Risk Management Official shall submit an annual report which includes the number of RMP required and approved to the CA

Policy Example Number	21-7
Sub- Threat(s)	The use of land an outdoor confinement area or a farm-animal yard
Circumstance	The use of land as an outdoor confinement area or farm-animal yard for one or more animals where the land use may result in the presence of one or more pathogens in groundwater or surface water.
Vulnerable Area	WHPA-A, B with a vulnerability score of 10
Risk	Significant
Body Responsible for Implementing	Municipality
Threat Status	Future
Land Use	Agricultural
Legal Effect	Conform
Policy Tool	Prohibition
Policy Idea	New outdoor confinement areas and farm animal yards will not be permitted within vulnerable areas where they are deemed a significant threat.
Implementation schedule	The policy takes effect one year after the approval date of the first source protection plan.
Monitoring Policy	The municipality shall submit an annual report to the CA which includes whether they have identified any outdoor confinement area or farm animal yard which was used in contravention of this policy.

Policy Example Number	21-8
Sub- Threat(s)	The use of land as livestock grazing or pasturing land, an outdoor confinement area or a farm-animal yard
Circumstance	The use of land as livestock grazing or pasturing land, an outdoor confinement area or farm-animal yard for one or more animals where the land use may result in the presence of one or more pathogens in groundwater or surface water.
Vulnerable Area	WHPA-A, B with a vulnerability score of 10
Risk	Significant
Body Responsible for	Municipality

Policy Example Number	21-8
Implementing	
Threat Status	Existing, Expanding and Future
Land Use	All
Legal Effect	Conform
Policy Tool	Restricted Land use
Policy Idea	Within the area where livestock grazing or pasture land, an outdoor confinement area or a farm-animal yard are significant threats, the municipality shall amend its zoning by-laws and official plans to identify, as restricted, all land uses where livestock grazing and pasturing, outdoor confinement areas or farm-animal yards can occur.
Implementation schedule	Shall be initiated in all Official Plans within 6 months of Source Protection Plan approval with the goal to be completed within 2 years of the Source Protection Plan approval date. Zoning bylaws shall be updated within 3 years of the Source Protection Plan approval date.
Monitoring Policy	Municipalities shall report to SPA 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 Example Number	21-9
Sub- Threat(s)	The use of land as livestock grazing or pasturing land, an outdoor confinement area or a farm-animal yard
Circumstance	The use of land as livestock grazing or pasturing land, an outdoor confinement area or farm-animal yard for one or more animals where the land use may result in the presence of one or more pathogens in groundwater or surface water.
Vulnerable Area	WHPA-A, B with a vulnerability score of 10
Risk	Significant
Body Responsible for Implementing	Municipality
Threat Status	Existing, Expanding and Future
Land Use	Agricultural
Legal Effect	Strategic Action
Policy Tool	Land Securement
Policy Idea	Municipalities shall consider land securement around wellheads in instances where the municipality wishes to exceed the level of protection identified in the SPP.
Implementation schedule	N/A
Monitoring Policy	When land securement has been pursued the municipality shall report the progress and outcomes to the CA.

Draft Policies

Draft policies have been developed for the Thames-Sydenham and Region for this threat. The table below provides a brief description of these policies. Refer to the Source Protection Plan for a detailed version of these policies.

Table 2-32 Draft Policies for the Use of Land for Livestock Grazing and Pasturing, Outdoor Confinement Area and Farm-Animal Yard

TSR Policy Number	Policy Database Number	Sub-Threat	Description	Risk Category	Threat Status	Policy Approach	Implementer
TS.21.2	1683	Livestock grazing and pasturing	Management of ASM by future livestock grazing or pasturing land through Section 58 of the Clean	Significant	Future	Section 58	Risk Management Official

TSR Policy Number	Policy Database Number	Sub-Threat	Description	Risk Category	Threat Status	Policy Approach	Implementer
			Water Act				
TS.21.3	1684	Livestock outdoor confinement area and farm-animal yard	Management of ASM by future outdoor confinement area and farm-animal yard through Section 57 of the Clean Water Act	Significant	Future	Section 57	Risk Management Official
TS.21.1	1682	All sub-threats	Management of Agricultural Source Material (ASM) by Existing Livestock Grazing or Pasturing Land, an Outdoor Confinement Area or a Farm Animal Yard	Significant	Existing	Section 58	Risk Management Official
G.2.1.2	1691	All sub-threats	Continued funding of Ontario Drinking Water Stewardship Program	Significant	Existing	Incentives	MOE
G.6.1 to G.6.2	1692	All sub-threats	Section 59 of the Clean Water Act general restricted land use policies	Significant	Future	Section 59	Risk Management Official
G.3.1, G.3.3.1, G.3.4.1	1693	All sub-threats	General land use planning policies	Significant	Future	Land Use Planning	Planning Approval Authority
G.5.1 to G.5.5	1694	All sub-threats	Section 58 of the Clean Water Act general risk management policies	Significant	Existing and future	Section 58	Risk Management Official
G.1.1 to G.1.2	1696	All sub-threats	General education and outreach policies	Significant Moderate Low	Existing and future	Education and Outreach	Municipality Conservation Authority Province
G.2.1.1	1724	All sub-threats	Existing incentives program general policy	Significant	Existing	Incentives	Municipality Conservation Authority Province
G.2.2.1	1728	All sub-threats	New incentives programs general policy	Significant	Existing	Incentives	Municipality Conservation Authority Province
G.1.3	1866	All sub-threats	Provincial signage to locate WHPA and IPZ	Significant	Existing and future	Education and Outreach	MOE MTO

TSR Policy Number	Policy Database Number	Sub-Threat	Description	Risk Category	Threat Status	Policy Approach	Implementer
G.1.4	1867	All sub-threats	Signage policy as part of Municipal education policy	Significant	Existing and future	Education and Outreach	Municipality

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