DRINKING WATER SOURCE PROTECTION
Our Actions Matter

LAKE ERIE SOURCE PROTECTION REGION

Grand River Source Protection Area

SOURCE PROTECTION PLAN VOLUME I
Public Consultation Draft

Prepared on behalf of:
Lake Erie Region Source Protection Committee

Under the Clean Water Act, 2006
(Ontario Regulation 287/07)

November 28, 2024

www.sourcewater.ca

This project has received funding support from the Government of Ontario.

SECTION 34 DOCUMENT AMENDMENTS (CITY OF HAMILTON)

The following provides a high-level summary of amendments made to the Grand River Source Protection Plan (City of Hamilton) under Section 34 of the *Clean Water Act, 2006*. Amendments were made using the 2021 Technical Rules.

Source Protection Plan Volume II:

Chapter 13 (City of Hamilton):

Section 13.0 – Text added to clarify which Technical Rules apply to each water system

Section 13.3 – editorial edits to all prescribed drinking water threat policies to ensure consistent policy language and structure

Section 13.3 – Revised policies:
CH-MC-3.8, CH-MC-3.9, CH-MC-3.10, CH-MC-3.11, CH-MC-5.1, CH-MC-8.1, CH-NB-15.1

Section 13.3 – New policies:
CH-NB-15.2, CH-NB-15.3, CH-NB-15.4

Revised Schedules (to incorporate new replacement well FDL1R):

- Schedule CH-A: Areas where significant threats are possible in Lynden WHPA-A, -B, -C

New Schedules:

- Schedule CH-B: Areas where low/moderate threats are possible (liquid hydrocarbon pipelines)

EXECUTIVE SUMMARY

A Plan to Protect Drinking Water in the Grand River Watershed

The *Clean Water Act* (2006) provides a framework for the development and implementation of local, watershed-based source protection plans, and is intended to implement the drinking water source protection recommendations made by Justice Dennis O'Connor in Part II of the Walkerton Inquiry Report.

The key objectives of the source protection planning process are to complete science-based Assessment Reports that identify the risks to municipal drinking water sources, and to develop local Source Protection Plans that put policies in place to reduce the risks to protect current and future sources of municipal drinking water. The Grand River Source Protection Plan sets out policies to protect sources of municipal drinking water.

Volume I of the Grand River Source Protection Plan provides the context for the overall Plan, including a brief history of source protection planning and the *Clean Water Act*, *2006,* Source Protection Plan objectives, and a description of the watershed/source protection area. This volume also includes a description of plan components, key steps in the planning process, public consultation, interaction with other Source Protection Regions, source water threats, guidance on how to read the plan, and details on plan implementation and enforcement.

Volume II of the Grand River Source Protection Plan contains municipal chapters that contain Source Protection Plan policies for each municipality. These policies address existing and future drinking water threats.

How the Source Protection Plan was Developed

The Source Protection Planning process is being led by a multi-stakeholder steering committee called the Lake Erie Region Source Protection Committee. The Committee was formed in November 2007, and is responsible for directing the development and update of the Assessment Reports and Source Protection Plans for each of the four Source Protection Areas in the Lake Erie Region.

In December 2008, the Source Protection Committee submitted to the Minister of the Environment their Terms of Reference for the Grand River Source Protection Area Assessment Report and Source Protection Plan. The Terms of Reference that set out the work plan for completing both the Assessment Report and Source Protection Plan received Ministerial approval on July 6, 2009. A copy of the Grand River Source Protection Area Terms of Reference is available on the Lake Erie Source Protection Region website.

Consultation with the public and stakeholders is key to developing and updating a locally derived Source Protection Plan and is required under the *Clean Water Act, 2006* at each key point in the planning process. Broad public consultation was conducted throughout the development and update of the Source Protection Plan, involving municipalities, conservation authorities, property owners, farmers, industry, businesses,

community groups, public health officials, and First Nations. Key consultation mechanisms have included stakeholder workshops, public meetings and open houses, and opportunities to comment on discussion papers, technical work, and policies. Additional work has been completed since the original approval of the Grand River Source Protection Plan. Source water protection is a program of continuous improvement and the *Clean Water Act, 2006* outlines the requirements for amending and updating the Source Protection Plan to ensure that sources of drinking water remain protected.

Locally driven amendments have been made to municipal sections of the Grand River Assessment Report and Source Protection Plan where there has been a need for updated technical work or policy approaches. A comprehensive review and update under s.36 of the *Clean Water Act, 2006* is currently underway. One round of formal consultation is undertaken with implementing bodies and the public each time the Source Protection Plan is revised. All comments received during consultation are documented and considered by the Source Protection Committee as part of the amendment process.

Note: In June 2014, the Ministry of the Environment changed its name to the Ministry of the Environment and Climate Change, and in June 2018, to the Ministry of the Environment, Conservation and Parks. In June 2014, the Ministry of Natural Resources changed its name to the Ministry of Natural Resources and Forestry, and in June 2021, was re-organized into the Ministry of Northern Development, Mines, Natural Resources and Forestry. The name was changed back to the Ministry of Natural Resources and Forestry in 2022 and to Ministry of Natural Resources in 2024. Also in 2024, the Ministry of Agriculture, Food and Rural Affairs split into two ministries: Ministry of Agriculture, Food and Agribusiness and the Ministry of Rural Affairs. The new and former names of these Ministries are used within this document.The new and former names of these Ministries are used within this document.

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LIST OF MAPS

These maps are for information purposes only. Therefore, the Grand River Conservation Authority takes no responsibility for, nor guarantee, the accuracy of all the information contained within these maps.

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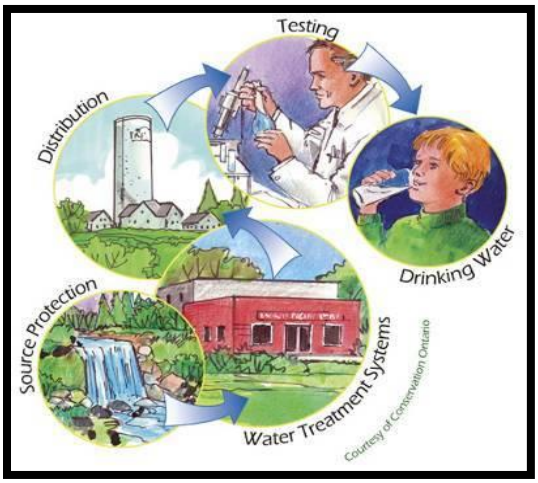
1.0 INTRODUCTION TO DRINKING WATER SOURCE PROTECTION

Following the public inquiry into the Walkerton drinking water crisis in May 2000, Justice Dennis O'Connor released a report in 2002 containing 121 recommendations for the protection of drinking water in Ontario. Since the release of the recommendations, the Government of Ontario has introduced legislation to safeguard drinking water from the source to the tap, including the *Clean Water Act* in 2006. The *Clean Water Act*, 2006 provides a framework for the development and implementation of local, watershed-based source protection plans, and is intended to implement the drinking water source protection recommendations made by Justice Dennis O'Connor in Part II of the Walkerton Inquiry Report. The *Clean Water Act*, 2006 came into effect in July 2007, along with the first five associated regulations.

The intent of the *Clean Water Act, 2006* is to ensure that communities are able to protect their municipal drinking water supplies now and in the future from overuse and contamination. It sets out a risk-based process on a watershed basis to identify vulnerable areas and associated drinking water threats and issues. It requires the development of policies and programs to reduce or eliminate the risk posed by significant threats to sources of municipal drinking water through science-based source protection plans.

The *Clean Water Act, 2006* and Drinking Water Source Protection are one component of a multi-barrier approach to protecting drinking water supplies in Ontario. The five steps in the multi-barrier approach include:

- Source Water Protection
- Adequate treatment
- Secure distribution system
- Monitoring and warning systems
- Well thought-out responses to adverse conditions



After the Walkerton Inquiry, the Government of Ontario enacted the *Safe Drinking Water Act*, *2002* which provides new requirements and rules for the treatment, distribution and testing of municipal drinking water supplies. Together, the *Clean Water Act, 2006* and *Safe Drinking Water Act*, *2002* along with their associated regulations, provide the legislative and regulatory framework to implement the multi-barrier approach to municipal drinking water protection in Ontario.

The protection of municipal drinking water supplies through the *Clean Water Act, 2006* is one piece of a much broader environmental protection framework in Ontario. Water resources in Ontario are protected directly and indirectly through the federal and provincial governments, municipalities, conservation authorities and public health units.

2.0 SOURCE PROTECTION PLANNING PROCESS

The key objectives of the source protection planning process are to complete science-based Assessment Reports that identify the risks to municipal drinking water sources, and to develop local Source Protection Plans that put policies in place to reduce the risks to current and future sources of municipal drinking water.

Since 2005, municipalities and conservation authorities have been undertaking studies to delineate areas around municipal drinking water sources that are most vulnerable to contamination and overuse. Within these vulnerable areas, technical studies have identified historical, existing, and possible future land use activities that are or could pose a threat to municipal water sources. The draft Grand River Assessment Report was the first version of the report made available for public consultation in 2010. Several rounds of consultation and revisions followed until it was approved by the Ministry of the Environment in 2012. Since that time, the Assessment Report has been revised, updated and approved a number of times to incorporate new information made available over the years.

Further revisions and new additions have since been made since the Assessment Report was last approved. These revisions are included in the fifth draft Updated Assessment Report which was posted for a 30-day public consultation period from June 21 to July 20, 2021.

The Source Protection Plan is a document that sets out policies to protect sources of drinking water against a list of prescribed drinking water threats identified by the Ministry of the Environment, Conservation and Parks.

Public input and consultation has played a significant role throughout the process of developing and updating the Source Protection Plan. The task of plan development and update involved municipalities, conservation authorities, property and business owners, farmers, industry, health officials, community groups and others working together to develop a fair, practical, and implementable Source Protection Plan.

Following Source Protection Plan approval, annual progress reports on implementation are required. Implementation of the Source Protection Plan is led by municipalities in most cases. The provincial government, as well as conservation authorities, public health units and other organizations also have roles in implementing policies in the Source Protection Plans. The agencies identified in the Source Protection Plan use a range of voluntary and regulatory programs and tools, including outreach and education, incentive programs, land use planning (zoning by-laws, and Official Plans), new or amended provincial instruments, risk management plans and prohibition.

2.1 Public Consultation on the Grand River Source Protection Plan

Consultation with the public and stakeholders was the key to developing a locally derived Source Protection Plan. Consultation is required under the *Clean Water Act, 2006* at each key point in the source protection planning process.

Public consultation was conducted using the following methods for various versions of the Grand River Source Protection Plan:

- Distribution of factsheets, brochures, and pamphlets: samples available on the Lake Erie Source Protection Region website;
- Property specific mailings to landowners affected by the Source Protection Process;
- Stakeholder workshops on policy options;
- Public open houses on the technical work, policy development and the three major documents under the Source Protection Program: the Terms of Reference, Assessment Report and Source Protection Plan;
- Early engagement of the public on draft Assessment Report technical work and Source Protection Plan policy options;
- Formal public consultation on the Terms of Reference, Assessment Report and Source Protection Plan;
- Pre-consultation and formal consultation with Municipal Councils and First Nations; and
- Availability of hard copies of Source Protection Plan materials and the Assessment Report at Conservation Authority and municipal administrative offices.

2.2 Source Protection Plan Objectives

The Grand River Source Protection Plan is a document that sets out the policies to protect sources of municipal drinking water against potential existing and future drinking water threats. The objectives of the Source Protection Plan are detailed in the *Clean Water Act, 2006* (O. Reg. 287/07. s.22) and are described below.

22. (1) Every source protection plan shall set out the following as objectives of the plan:
    1. To protect existing and future drinking water sources in the source protection area.
    2. To ensure that, for every area identified in an assessment report as an area where an activity is or would be a significant drinking water threat,
        i. the activity never becomes a significant drinking water threat, or
        ii. if the activity is occurring when the source protection plan takes effect, the activity ceases to be a significant drinking water threat. O. Reg. 246/10, s. 12.

2. If a source protection plan sets out policies relating to conditions resulting from past activities, the plan shall set out that an objective of the plan is to ensure that for every area identified in the assessment report as an area where a condition that results from a past activity is a significant drinking water threat, the condition ceases to be a significant drinking water threat. O. Reg. 246/10, s. 12.

3. If, under subsection 85 (6) of the Act, the Minister has directed that a report be prepared and submitted that recommends policies that should be set out in the source protection plan for the source protection area to assist in achieving a Great Lakes target, the plan shall set out that an objective of the plan is to achieve the target for the source protection area. O. Reg. 246/10, s. 12.

4. No objectives other than the objectives set out in subsections (1) to (3) shall be contained in a source protection plan. O. Reg. 246/10, s. 12.

3.0 SOURCE PROTECTION PLAN AND SUPPORTING DOCUMENTS

The Source Protection Plan is divided into two volumes, including appendices and supporting documents.

3.1 Volume I

The first volume (Volume I) of the Grand River Source Protection Plan provides the context for the overall Plan, including a brief history of source protection planning and Source Protection Plan objectives under the *Clean Water Act*, *2006*, and a description of the watershed/source protection area. This volume also includes a description of plan components, key steps in the planning process, public consultation, interaction with other Source Protection Regions, drinking water threats, guidance on how to read the Plan, and details on Plan implementation and enforcement.

The Grand River Source Protection Area Assessment Report is another key component of the Source Protection Plan. Since 2005, numerous technical studies have been completed and are summarized in the Grand River Source Protection Area Assessment Report. This Assessment Report examined and identified:

- The vulnerable areas around municipal-residential drinking water sources;
- Intrinsic susceptibility to contamination;
- Where potential threats to water quality and quantity may exist in each vulnerable area;
- The activities that pose drinking water threats to human health; and
- How significant the risks of these drinking water threats are to contaminating or depleting the water supply.

Based on this analysis, significant drinking water threats were identified. The information contained in the Assessment Report was used to prepare the Source Protection Plan. For this reason, and based on the requirements under section 22 (2) of the *Clean Water Act*, *2006,* the Assessment Report is included as part of the submission of this Source Protection Plan to the Ministry.

3.2 Volume II

The second volume (Volume II) of the Grand River Source Protection Plan contains the Source Protection Plan policies. These policies address both existing (where applicable) and future drinking water threats. Volume II only includes policies for significant drinking water threats and optional content. Policies for moderate and low drinking water threats may be incorporated into the Source Protection Plan at the discretion of the Source Protection Committee (e.g. liquid hydrocarbon pipelines).

As in the Assessment Report, each municipality has been designated its own section in Volume II. Each municipal section includes the following:

- A description of where the Source Protection Plan policies apply;
- Definitions specific to the identified municipality (i.e., existing and future);
- Source Protection Plan policies;
- Required Appendices as per section 34 of O. Reg. 287/07; and
- Maps showing where the Source Protection Plan policies apply.

Chapter 1 and 2 of Volume II contain information about the legal effect of the Source Protection Plan policies, as well as guidance on how to read the Source Protection Plan. The Source Protection Plan policies for the Grand River Source Protection Area are included in the following chapters:

- Chapter 3: County of Grey – Township of Southgate
- Chapter 4: Dufferin County – Townships of Amaranth and East Garafraxa
- Chapter 5: Dufferin County – Town of Grand Valley
- Chapter 6: Dufferin County – Township of Melancthon
- Chapter 7: County of Wellington
- Chapter 8: City of Guelph
- Chapter 9: Regional Municipality of Halton
- Chapter 10: Regional Municipality of Waterloo
- Chapter 11: County of Perth – Township of Perth East
- Chapter 12: County of Oxford
- Chapter 13: City of Hamilton – Lynden Rural Settlement Area
- Chapter 14: County of Brant
- Chapter 15: City of Brantford
- Chapter 16: Haldimand County

3.3 Explanatory Document

Before publishing the Source Protection Plan under section 41 of O. Reg. 287/07, the Source Protection Committee prepared an Explanatory Document. This document contains the following, as described in the regulation, to aid in the review of the Source Protection Policies:

1. An explanation of the Source Protection Committee's reasons for each policy set out in the source protection plan.

2. An explanation of the Source Protection Committee's reasons for designating an activity under paragraph 1 of subsection 22 (3) of the Act, including the reasons relied on by the committee to form the opinion that the activity must be prohibited in order to ensure that it ceases to be a significant drinking water threat.

3. A summary of the comments received under sections 35 to 39 and an explanation of how the comments affected the development of the policies set out in the Source Protection Plan.

4. An explanation of how the summary referred to in paragraph 7 of subsection 13 (1) affected the development of the policies set out in the Source Protection Plan.

5. A summary of how the consideration of the potential financial implications for persons and bodies who would be implementing or affected by the Source Protection Plan influenced the development of the policies set out in the plan.

6. If a policy described in subsection 22 (7) of the Act or paragraph 1 of section 26 of this Regulation is the only policy set out in a source protection plan to deal with an activity that has been identified as a significant drinking water threat, a statement that the Source Protection Committee is of the opinion that,

    i. the policy, if implemented, will promote the achievement of the objectives of the plan in accordance with paragraph 2 of subsection 22 (2) of the Act, and

    ii. a policy to regulate or prohibit the activity is not necessary to achieve those objectives. O. Reg. 246/10, s. 12.

The Source Protection Committee resolved that the Source Protection Plan does not consider any direct drinking water threats not identified as such under the *Clean Water Act, 2006*. However, a number of activities that currently are not considered drinking water threats were also discussed. Section 2.2 of the Explanatory Document seeks to provide clarification on issues and concerns raised throughout the Source Protection Plan process by either the Lake Erie Region Source Protection Committee, other interested bodies and the general public.

The Source Protection Committee felt that it was important to provide clarification as to why certain activities that the public or other agencies may expect to be included in the Source Protection Plan were not included.

4.0 THE LAKE ERIE SOURCE PROTECTION REGION

In an effort to share knowledge and resources for the purposes of developing source protection plans, a partnership was formed in 2004 between the Kettle Creek, Long Point Region, Catfish Creek and Grand River Conservation Authorities to create the Lake Erie Source Protection Region. The partnership was formalized in 2007 by Ontario Regulation 284/07 (Source Protection Areas and Regions) under the *Clean Water Act, 2006*. The Grand River Conservation Authority, exercising the legislated responsibilities of the Grand River Source Protection Authority, acts as the lead source protection authority for the region. **Map 4-1** presents the territory covered by the Lake Erie Source Protection Region, including municipal boundaries and main rivers and tributaries.

The four Source Protection Authorities agreed to jointly undertake research, public education, and watershed planning and management for the advancement of drinking water source protection for the respective watersheds. The watersheds have a long history of partnership and cooperation, and also have a natural association by containing the majority of inland rivers and streams flowing from Ontario directly into Lake Erie.

Combined, the Lake Erie Source Protection Region represents a diverse area, ranging from intense agricultural production to large and rapidly expanding urban areas. The region spans an area from the City of St. Thomas in the west, to Dunnville / Port Maitland on the east, and as far north as Dundalk. The area includes 52 upper, lower and single tier municipalities, as well as two First Nations reserves.

4.1 The Lake Erie Region Source Protection Committee

The Source Protection Planning process is being led by a multi-stakeholder steering committee called the Lake Erie Region Source Protection Committee. The Committee was formed in November 2007, and is responsible for directing the development and update of the Assessment Reports and Source Protection Plans and annual reporting for each of the four Source Protection Areas in the Lake Erie Region. The list of current and past members is published on the Lake Erie Source Protection Region website.

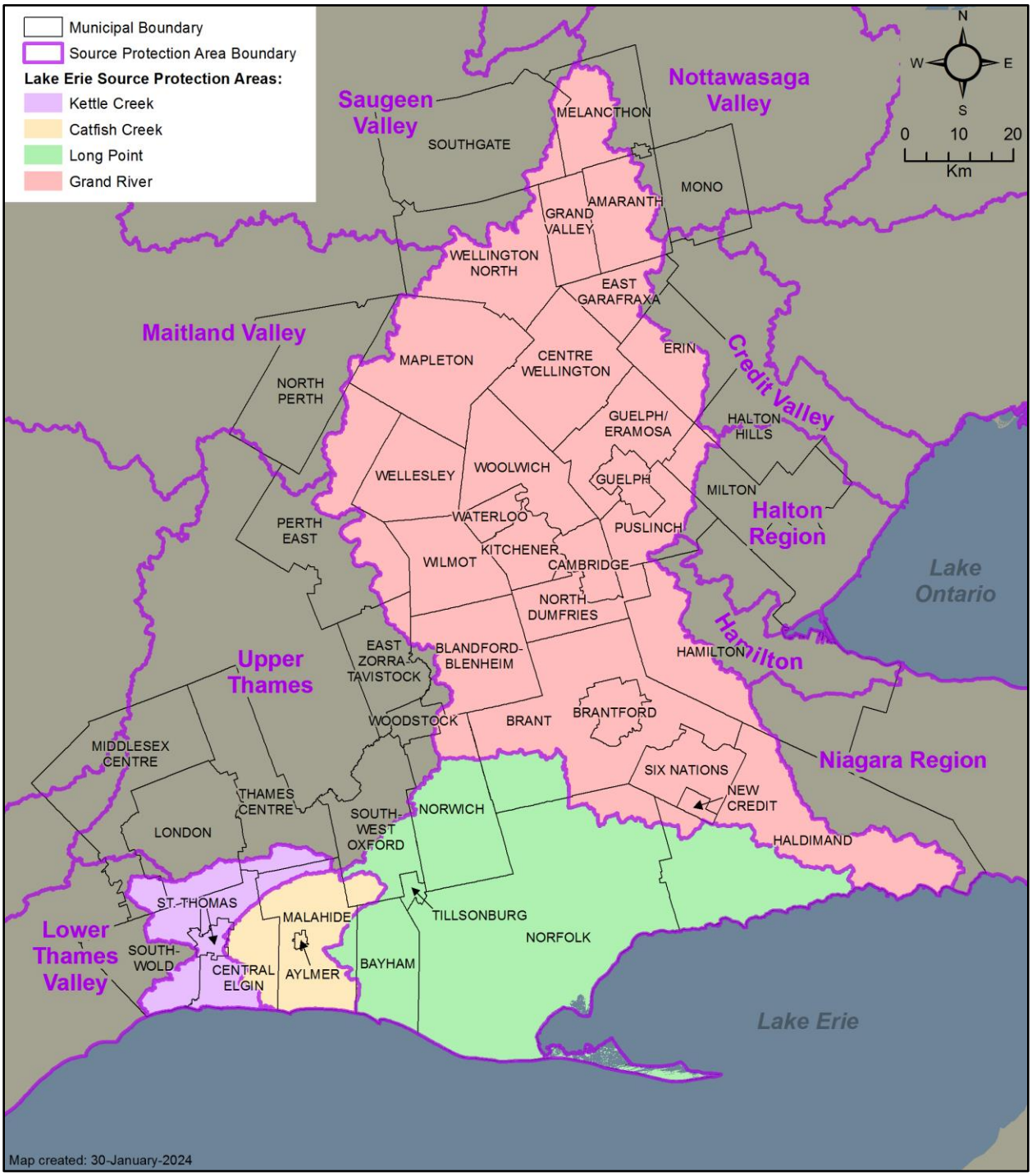
Message from the Committee

The overall objective of the Lake Erie Region Source Protection Committee, in partnership with local communities and the Ontario government, is to direct the development of source protection plans that protect the quality and quantity of present and future sources of municipal drinking water in the Lake Erie Source Protection Region. We will work with others to gather technical and traditional (local and Indigenous) knowledge on which well-informed, consensus-based decisions can be made in an open and consultative manner. In developing the Source Protection Plan, the Lake Erie Region Source Protection Committee intends to propose policies that are environmentally protective, effective, economical, and fair to local communities.

The Committee will strive to develop policies that are practical and implementable, and that focus limited resources on areas that net the greatest benefit, while recognizing that

the plan must address significant threats so that they reduce the risk to drinking water sources. Where possible, the Committee will strive to develop policies and programs that also provide a benefit to broader protection of water quality and quantity. The process to assess drinking water threats and Issues will be based on the best available science, and where there is uncertainty, we will strive to follow the precautionary approach.

Map 4-1: Lake Erie Source Protection Region



4.2 Grand River Source Protection Area

The Grand River watershed, as shown on **Map 4-2** covers an area of approximately 6,800 km^2 in south central Ontario, and contains 39 upper-, lower- and single-tier municipalities, and two First Nations communities. The watershed contributes about 10 percent of the drainage to Lake Erie. The length of the Grand River itself is 300 kilometres, while the average width of the watershed is 36 kilometres.

The population of the Grand River Source Protection Area is approximately 1,000,000 people. The municipal population projection estimates the population to reach 1,435,917 in 2041 and 1,869,853 in 2066. The central portion of the watershed is the most densely populated area with the Cities of Waterloo, Kitchener, Cambridge, Guelph and Brantford being the largest urban centres. The remaining areas in the watershed are mainly rural agricultural and, as such, have lower population density.

The major tributaries of the Grand River include: the Conestogo and Nith River, draining the western half of the watershed; and the Speed River, which drains the north-east. Several smaller tributaries drain the southern half of the watershed. The largest of these include the Fairchild, Whitemans and McKenzie Creeks. Forested areas in the Grand River watershed make up approximately 16 percent of the total land cover, which is below the minimum of 30 percent advocated by Environment Canada. There are many significant wetland complexes found throughout the watershed. Wetland coverage in the Grand River watershed meets the minimum 10 percent wetland coverage suggested by Environment Canada within a watershed. However, in over half of the sub-watersheds in the Grand watershed, the percentage of existing wetlands is significantly lower, indicating considerable regional variation in wetland loss from one sub-watershed to another.

In total, there are 11 physiographic regions within the Grand River, including, from north to south: Dundalk Till Plain, Stratford Till Plain, Hillsburg Sandhills, Guelph Drumlin Field, Horseshoe Moraines, Waterloo Hills, Flamborough Plain, Norfolk Sand Plain, Oxford Till Plain, Mount Elgin Ridges, and Haldimand Clay Plain. Significant topographic features within the watershed include the moraine features (Waterloo, Orangeville among others), clay/till plains (Haldimand Clay Plain, Stratford Till Plain), drumlin fields, and incised river valleys.

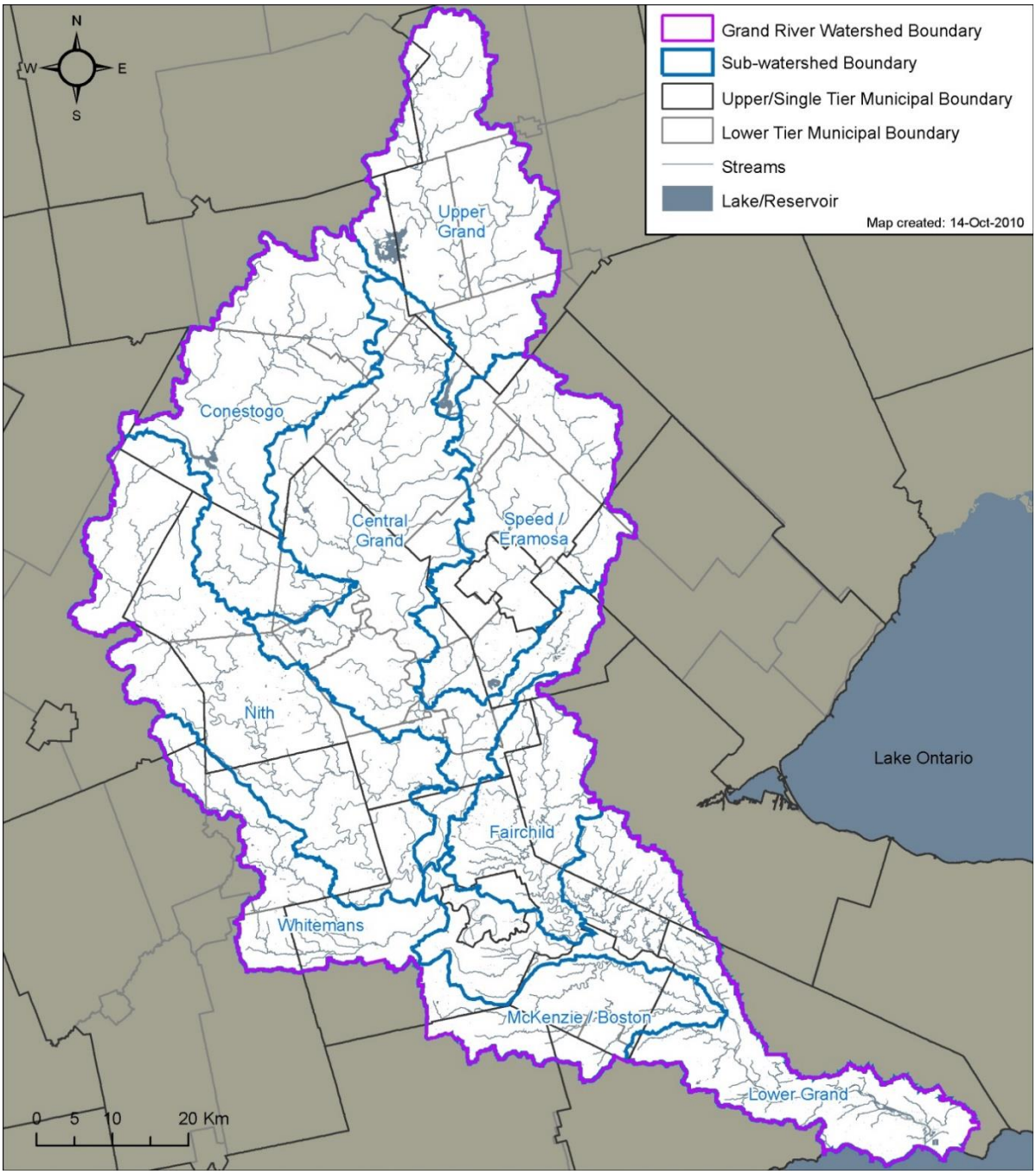
Approximately 82 percent of the population of the Grand River watershed relies on groundwater for their drinking water supply. Agriculture, industry, and commercial production of bottled water for export also rely on groundwater sources in the Grand River region. Groundwater resources are found within both bedrock and overburden aquifers. Both the quality and quantity of groundwater are strongly influenced by the bedrock and overburden geology within the watershed.

4.3 Municipal Systems and Private Wells

The population of the watershed that receives municipal water supplies is approximately 900,000. Groundwater forms the largest portion of municipal supply in the watershed with approximately 68% of all municipal demand coming from groundwater sources. The remaining 32% of municipal supply is from riverine sources and the Great Lakes.

The estimated total rural municipally-unserviced population for the Grand River watershed is approximately 129,000 residents.

Map 4-2: Grand River Source Protection Area



5.0 DEVELOPMENT OF THE SOURCE PROTECTION PLAN

5.1 Establishing a Framework (Terms of Reference)

The Source Protection Committee established a Terms of Reference prepared in accordance with the *Clean Water Act, 2006*. This Terms of Reference was approved by the Minister of the Environment on July 6, 2009, and included a description of the source protection planning process; maps of the source protection area and region; a description of the source protection area; a list of members of the Source Protection Committee; a list of municipalities wholly or partially within the Source Protection Area; a list of existing and planned municipal drinking water systems in the Source Protection Area; a list of matters that affect other source protection regions; and high level cost estimates, schedules, and assignment of responsibility for tasks.

The municipal role as defined with the source protection planning process was critical to the success of this program. Each task within the process was given an assigned lead – either municipalities or the Conservation Authority acting as the Source Protection Authority on behalf of the Source Protection Committee. Regardless of which party takes the lead for undertaking a particular task, the Lake Erie Region Source Protection Committee has the decision-making authority regarding the acceptability of the work or findings to be included in the Assessment Report and Source Protection Plan to be submitted, through the Source Protection Authority, to the Ministry of the Environment, Conservation and Parks for final approval.

Where municipalities intended to take the lead on a task, a municipal council resolution was required to assume the responsibility to undertake the task.

5.2 Preparing and Updating the Source Protection Plan

The Source Protection Plan builds on the information contained in the earlier reports. It sets out the actions required to address the drinking water threats identified in the science based Assessment Report and to meet the objectives outlined in the *Clean Water Act, 2006*. The Source Protection Plan sets out: how drinking water threats will be reduced, eliminated or monitored; who is responsible for taking action; timelines; and, how progress will be measured.

5.2.1 Discussion Papers

As part of the Source Protection Plan development process, a series of Discussion Papers were developed in 2011 by the Lake Erie Source Protection Committee for the prescribed drinking water quality threats and sub-threats, local threats, and optional content as outlined in **Section 10.0.** These Discussion Papers provide background information on the drinking water threats and available policy tools that could be used to address each threat.

Consultation with agency and industry stakeholders was conducted between February and April 2011 through a series of 9 workshops. Participants offered input on the potential policy options and policy tools provided by the *Clean Water Act, 2006*. The results of the workshops were recorded and compiled in threat specific outcome reports.

These outcome reports were subsequently reflected in the Discussion Papers, which served to elicit further feedback from stakeholders and the Source Protection Committee on policy options. After completion of the Discussion Papers, policy choices were selected by the Lake Erie Region Source Protection Committee and municipal councils with input from various stakeholders and policy developers. The policies were then consolidated into the Source Protection Plan.

A water quantity discussion paper for drinking water quantity threats 19 and 20 was developed between March and June 2018 as part of the Guelph-Guelph/Eramosa Water Quantity Policy Development Study. The development of water quantity policy approaches and draft water quantity policies was initiated with input from various stakeholders following the completion of the discussion paper. Final water quantity policies will be incorporated into a future update of the Grand River Source Protection Plan.

5.2.2 Pre-consultation with Implementing Bodies

In preparing the Grand River Terms of Reference, the Assessment Report and Source Protection Plan, the Source Protection Committee considered all feedback received from the public and stakeholders.

Before this Source Protection Plan was released to the public for review and comment, the Source Protection Committee conducted pre-consultation on draft policy amendments with individuals and agencies that are responsible for implementing them. Notices of pre-consultation for the Grand River Source Protection Plan were distributed to implementing bodies and government ministries that have obligations under the *Clean Water Act, 2006.* All comments made on the draft policies are considered. The following is a summary of what is required during pre-consultation in O. Reg. 287/07 under the *Clean Water Act, 2006*:

Section 34: Notice of plan revisions, draft policy text, summary of rationale for amendments and request for submission of written comments.

Notices were sent to implementing bodies that have obligations under the *Clean Water Act, 2006,* informing them of the opportunity for pre-consultation on Plan amendments prior to release of this Source Protection for public review and comment. The pre-consultation comment period was set from November 10 to December 11, 2022.Following pre-consultation and prior to public consultation, O. Reg. 287/07 under the *Clean Water Act, 2006* requires that source protection authorities obtain a municipal council resolution from each municipality affected by the amendments.

5.2.3 Public Consultation

<u>Grand River Source Protection Plan Terms of Reference:</u>

The *Clean Water Act, 2006* under Section 8 requires the development of a Terms of Reference for the preparation of the Assessment Report and Source Protection Plan for each Source Protection Area.

The public was invited to review and comment on the draft Terms of Reference on September 5, 2008. The 35-day public comment period ended on October 10, 2008, and included three (3) public meetings in Brantford on October 1, 2008; in Cambridge on October 2, 2008 and in Fergus on October 6, 2008.

At the October 16 and November 6, 2008 Source Protection Committee meetings, the committee reviewed and considered all of the comments received during the public consultation period. The committee's responses to the comments are reflected in the Terms of Reference.

The Committee submitted the Terms of Reference to the Grand River Source Protection Authority on November 6, 2008, and released the Terms of Reference for an additional 30-day public comment period starting on November 7, 2008 closing on December 6, 2008.

Formal comments received were submitted to the Minister of the Environment with the Proposed Terms of Reference by the Grand River Source Protection Authority on December 19, 2008. The Minister approved the Terms of Reference on June 24, 2009 and it was officially posted to the Environmental Registry on July 6, 2009.

Grand River Source Protection Plan

Additional work has been completed since the first approval of the Grand River Source Protection Plan (including the assessment report) in November 2015. The public consultation period for the Grand River Source Protection Plan was set from January 25 to February 28, 2023. This consultation period provides an opportunity for stakeholders and the public to view and provide comment on the Grand River Source Protection Plan. The following steps are undertaken to satisfy the requirements of the *Clean Water Act, 2006.*

- The draft source protection plan is posted publically on the Lake Erie Source Protection Region website
- Notification of public consultation is to affected implementing bodies
- Notification of the opportunity for public consultation is published in local newspapers
- Notification is sent to all persons believed to be engaged in significant drinking water threat activities, and affected municipalities
- Public meetings are held virtually or in person

5.2.4 First Nations Involvement

The involvement of First Nations was very important to the planning and implementation of source protection plans to achieve source protection both on and off First Nations' land. The *Clean Water Act, 2006* included provisions that allow a First Nation's drinking

water system, on a voluntary basis, to be considered as part of the source protection planning process.

The *Clean Water Act, 2006* and its Regulation required Source Protection Authorities to give the Chief of a Band for each reserve within the Source Protection Area/Region notice as per section 6 of O. Reg. 288/07 that advises of the opportunity for the Band Council to jointly select Source Protection Committee members. Lake Erie Region has two First Nations Reserves: Mississaugas of the New Credit First Nation and Six Nations of the Grand River.

The Mississaugas of the New Credit are connected to the Nanticoke water supply pipeline from Lake Erie, operated by Haldimand County. Their interest is likely to be in the protection of their own water supply.

The Six Nations of the Grand River supply water to the Ohsweken village and area from an intake and water treatment plant on the Grand River. The Six Nations intake is located in the lower part of the Grand River immediately downstream of the County of Brant and the City of Brantford. The majority of the intake protection zone located off reserve is within the County of Brant. A small portion to the north is located within the City of Brantford.

The *Clean Water Act, 2006* allows for drinking water sources for First Nations in reserves in source protection areas to be protected under the Act. Band Councils may submit a resolution to the Minister requesting that the Lieutenant Governor in Council make a regulation (under subsection 109(1)(w) of the Act) that prescribes an existing or planned drinking water system serving or planned to serve a reserve, for purposes of including the drinking water system in an assessment report (sub clause 15(2)(e)(iv) of the Act). Six Nations of the Grand River made a Band Council Resolution requesting inclusion of the Ohsweken (Grand River) drinking water system on October 21, 2008. This system is included in the source protection planning process.

The development of source protection policies for significant drinking water threats identified off-reserve is undertaken by the Grand River Conservation Authority acting as the Grand River Source Protection Authority on behalf of the Lake Erie Region Source Protection Committee, in consultation with Brant County and the City of Brantford following the same process used to develop policies for threats to the municipal drinking water systems, as identified in the Terms of Reference. Six Nations of the Grand River Band Council is investigating on-reserve threats and risks in a separate but parallel initiative.

5.2.5 Liaison with Other Source Protection Partners

The Grand River Source Protection Area neighbours other Source Protection Areas and conservation authorities (see **Map 4-1**) as follows:

Within the Lake Erie Source Protection Region

- Long Point Region Conservation Authority

Outside of the Lake Erie Source Protection Region

- Thames, Sydenham and Region Source Protection Region
    - Upper Thames River Conservation Authority
- Halton-Hamilton Source Protection Region
    - Hamilton Region Conservation Authority
    - Halton Region Conservation Authority
- CTC (Credit Valley, Toronto & Region and Central Lake Ontario) Source Protection Region
    - Credit Valley Conservation Authority
- Niagara Peninsula Source Protection Region
    - Niagara Peninsula Conservation Authority
- Ausable Bayfield Maitland Valley Source Protection Region
    - Ausable Bayfield Conservation Authority
    - Maitland Valley Conservation Authority
- Saugeen Valley, Grey Sauble, Northern Bruce Peninsula Source Protection Region
    - Saugeen Valley Conservation Authority
- South Georgian Bay Lake Simcoe Source Protection Region
    - Nottawasaga Valley Conservation Authority

In cases where two or more Source Protection Committees have jurisdiction in one municipality, the municipality has been engaged and has provided guidance to ensure consistent policy direction where possible. The same is true for bordering source protection authorities.

Communication with neighbouring regions throughout the source protection planning process has included sharing information available on the Lake Erie Region Source Protection website, teleconferences, workshops and meetings. Although not a requirement, consistency in policy direction was strived for through this sharing of information and early engagement activity.

6.0 DRINKING WATER THREATS

6.1 Identifying Drinking Water Threats

The Ontario *Clean Water Act*, *2006* defines a drinking water threat as “an activity or condition that adversely affects or has the potential to adversely affect the quality or quantity of any water that is or may be used as a source of drinking water, and includes an activity or condition that is prescribed by the regulation as a drinking water threat.”

The Technical Rules (MECP, 2021) list five ways to identify a drinking water threat:

1. Through an activity prescribed by the *Clean Water Act, 2006* as a Prescribed Drinking Water Threat;
2. Through an activity identified by the Source Water Protection Committee as an activity that may be a threat and (in the opinion of the Director) a hazard assessment confirms that the activity is a local threat;
3. Through a condition that has resulted from past activities that could affect the quality of drinking water;
4. Through an activity associated with a drinking water issue; and
5. Through an activity identified through the events based approach.

The methods used to identify drinking water threats are described in detail in the Assessment Report and summarized below**.** To identify drinking water threats, studies were completed in the areas around municipal wells and surface water intakes to identify activities that could threaten municipal water supplies. A summary of the technical studies and enumeration of significant drinking water threats undertaken to characterize the Grand River watershed are found in the Assessment Report. Brief descriptions of the key components of this report are provided below.

6.2 Water Quality Risk Assessment

The Water Quality Risk Assessment identified groundwater and surface water vulnerable areas within the Grand River Source Protection Area, and evaluated the risk of contamination from specific drinking water threats (existing or future activities, or existing conditions that results from a past activity) entering drinking water supplies.

6.3 Water Quantity Risk Assessment

The Water Quantity Risk Assessment provides a framework to evaluate the reliability of surface water intakes or wellheads in the context of the local watershed. The objective of the framework is to help managers identify: 1) drinking water sources which may not be able to meet current or future demands and 2) the drinking water threats contributing to the water quantity problem. The risk assessment is carried out using three tiers that have been designed to minimize the amount of water budgeting work needed for wells and surface water intakes that are not under hydrologic stress.

6.4 Groundwater Vulnerability

The *Clean Water Act, 2006* identifies water quality Wellhead Protection Areas (WHPA) A, B, C, D and E around municipal drinking water supply wells, highly vulnerable aquifers (HVA), and significant groundwater recharge areas (SGRA). The relative vulnerability within each of these areas (with the exception of SGRAs) was characterized with a numeric score. The categorization reflected the susceptibility of the aquifer(s) in the vulnerable areas to surface (or near surface) sources of contamination. Vulnerable areas were delineated and assigned vulnerability scores along with the level of uncertainty associated with each score.

Water quantity Wellhead Protection Areas (WHPA-Q) were also identified around Grand River municipal drinking water wells. The relative vulnerability or "risk level" of the area corresponding to each of the WHPA-Qs was characterized as significant, moderate or low. The characterization reflected susceptibility of the aquifer(s) in the WHPA-Q to water use and a reduction in recharge. Vulnerable areas were delineated and assigned a risk level along with a level of uncertainty (high or low).

6.5 Surface Water Vulnerability

The *Clean Water Act, 2006* identifies water quality Intake Protection Zones (IPZ) 1, 2 and 3 for Lake Erie and riverine water supplies.A vulnerability score was assigned to each of the zones referring to the comparative likelihood of a contaminant of concern reaching an intake. Vulnerability scores were obtained by multiplying the source vulnerability factor with the area vulnerability factor. A level of uncertainty was associated with each score.

Potential human-made pathways that may allow contaminants of concern to enter the water directly, such as storm sewers, sanitary sewers, combined sewers, cooling water discharge sewers, and open drainage ditches, were analyzed when delineating the IPZs.

Contaminants of concern reaching an intake in significant quantities would likely be associated with storm events, spills or upset conditions such as extended power outages or pipes rupturing where they cross water courses.

Water quantity Intake Protection Zones (IPZ-Q) were identified for Grand River surface water intakes. IPZ-Qs correspond to the drainage area that contributes water to an intake, and the area that provides groundwater recharge to aquifers that contribute groundwater discharge to the drainage area. The area corresponding to the IPZ-Q is assigned a Risk Level of significant, moderate or low, depending on the intake's current and long-term sustainability. The Tier Three Assessment also identifies the level of uncertainty (high or low) associated with the Risk Level.

6.6 Issue Contributing Area (WHPA-ICA)

Through the Source Water Protection program, historical raw water groundwater chemistry was also analyzed for each municipal drinking water system. The analysis determined if concentrations of contaminants are present at the well which would lead to the deterioration of the quality of the water used for drinking water. For each identified Issue an Issue Contributing Area (WHPA-ICA) was developed, which in most cases is

the 25-year time of travel capture zone. The WHPA-ICA is the area within which activities have or are likely to contribute to the elevated contaminant at the well.

6.7 Threats Inventory and Issues Evaluation

The water quality Threats Inventory and Issues Evaluation included the areas around each drinking water intake and well. A hazard rating associated with the inventoried drinking water threats was used to rate the likelihood of a chemical or pathogenic contamination of a drinking water source, as well as the potential severity of its impact. An inventory of contaminant pathways was mapped, and each threat was categorized as significant, based on the qualitative assessments in the vulnerable areas. In most cases, moderate and low drinking water threats were not enumerated.

6.8 A water quantity threats inventory included areas around municipal wells and intakes assigned a moderate or significant risk level. Prescribed Drinking Water Threats

Section 1.1 of O. Reg. 287/07, made under the *Clean Water Act, 2006* identifies 22 activities as 'prescribed drinking water threats'. This includes twenty (20) drinking water quality threats and two (2) drinking water quantity threats.

The twenty-two (22) drinking water threats identified in the regulations established under the *Clean Water Act, 2006* are as follows:

1. The establishment, operation or maintenance of a waste disposal site within the meaning of Part V of the *Environmental Protection Act, 1990*.**
2. The establishment, operation or maintenance of a system that collects, stores, transmits, treats or disposes of sewage.
3. The application of agricultural source material to land.**
4. The storage of agricultural source material.
5. The management of agricultural source material.*
6. The application of non-agricultural source material to land.**
7. The handling and storage of non-agricultural source material.
8. The application of commercial fertilizer to land.**
9. The handling and storage of commercial fertilizer.
10. The application of pesticide to land.
11. The handling and storage of pesticide.
12. The application of road salt.†
13. The handling and storage of road salt.
14. The storage of snow.
15. The handling and storage of fuel.
16. The handling and storage of a dense non-aqueous phase liquid.
17. The handling and storage of an organic solvent.
18. The management of runoff that contains chemicals used in the de-icing of aircraft.
19. An activity that takes water from an aquifer or a surface water body without returning the water taken to the same aquifer or surface water body.
20. An activity that reduces the recharge of an aquifer
21. The use of land as livestock grazing or pasturing land, an outdoor confinement area or a farm-animal yard.

22. The establishment and operation of a liquid hydrocarbon pipeline. O. Reg. 385/08, s. 3; O. Reg. 206/18, s. 1.

* No policies were included for the management of agricultural source material, i.e., aquaculture (prescribed drinking water threat #5) as the circumstances for this threat are such that it is not considered a significant threat in the vulnerable areas in the Grand River Source Protection Area.

** The application of processed organic waste to land (sub-threat under #1), application of agricultural source material to land (#3), application of non-agricultural source material to land (#6), and application of commercial fertilizer to land (#8) can only be significant drinking water threats if the percent managed land and livestock density meet specific criteria.

† The application of road salt (#12) is only a significant drinking water threat if the percent impervious area meets specific criteria.

For a more complete description of the drinking water quality and quantity threats, see **Section 10.0**.

6.9 Drinking Water Quality Threat Tables

The Technical Rules (MECP, 2021) include tables of drinking water quality threats that outline the circumstances under which a given activity is classified as a low, moderate, or significant threat. The Grand River Source Protection Plan addresses primarily significant drinking water threats. Additional drinking water threat policies and optional content, as approved by the Source Protection Committee, are also included and described below.

6.10 Optional Content

O. Reg 287/07 under the *Clean Water Act, 2006* provides for optional content to be included in the Source Protection Plan. The Source Protection Committee decided that the first Source Protection Plans should not include policies for moderate and low drinking water threats; incentive programs or education/outreach programs for systems not included in the Terms of Reference; or policies for data collection for climate change. On January 13, 2011, the Source Protection Committee passed a resolution (Res. No. 05-11) that determined the Source Protection Plans shall include the policies listed below:

1. Policies on Conditions from past activities that have been identified as significant drinking water threats in the Assessment Reports;
2. Policies to update spill prevention, spill contingency or emergency response plans along highways, railways or shipping lanes in Intake Protection Zones (IPZ) or Wellhead Protection Area (WHPA);
3. Policies that govern transport pathways;
4. Policies for the monitoring of moderate and low threats in specific situations;
5. Anything that will assist in understanding the plan; and
6. Dates for when the policies take effect.

Further detail on the rationale behind what topics were not included in this Source Protection Plans is provided in the Explanatory Document.

A more complete description of each of the optional content sections is presented in **Section 10.0.**

6.11 Grand River Watershed and Great Lakes Agreements

Under the *Clean Water Act*, 2006, the following Great Lakes agreements must be considered in the work undertaken in Assessment Reports:

- Canada – United States Great Lakes Water Quality Agreement (GLWQA)
- Canada – Ontario Agreement Respecting the Great Lakes Basin Ecosystem (COA)
- Great Lakes Charter
- Great Lakes – St. Lawrence River Basin Sustainable Water Resources Agreement

The Great Lakes Water Quality Agreement and the Canada – Ontario Agreement generally deal with water quality concerns, while the Great Lakes Charter, the Great Lakes Charter Annex, and the Great Lakes – St. Lawrence River Basin Sustainable Water Resources Agreement provide principles for joint water resources management and water quantity and quality concerns in the Great Lakes Basin.

The Grand River watershed drains directly into Lake Erie and has the potential to contribute pollutants to the lake. The work described in the approved Assessment Report considered the impact of the Great Lakes Agreement on the Dunnville drinking water intake. The Great Lakes – St. Lawrence River Basin Sustainable Water Resources Agreement sets out conditions under which transfers of water from one Great Lake watershed into another (intra-basin transfer) can occur. The surface water intakes in Grand River watershed are not intra-basin transfers since wastewater is discharged back into the Lake Erie watershed.Therefore no Great Lake Policies will be included in the Grand River Source Protection Plan at this time.

7.0 HOW TO READ THE SOURCE PROTECTION PLAN

7.1 Legal Effect of the Source Protection Plan

As required by the *Clean Water Act*, *2006* the Source Protection Plan policies must identify who will be responsible for implementation. The legal effect describes whether there is a legal obligation for the responsible party to implement the policy. Three factors determine the legal effect of a policy: 1) the policy tool, 2) the ranking of the threat (significant/moderate/low), and 3) the implementing body. Further information about the legal effects of the Plan is presented in Volume II.

7.2 Source Water Protection Policy Tools

The *Clean Water Act*, 2006 (O. Reg. 287/07) enables a range of approaches or "policy tools" to achieve the objectives of the Source Protection Plan.

7.2.1 Part IV Tools

Part IV of the *Clean Water Act, 2006* created additional tools that can be used to implement a significant threat policy to address significant drinking water threat activities. Specifically, Part IV provides Source Protection Committees with the following tools to address significant drinking water activities:

- Prohibiting the activity (section 57)
- Requiring a Risk Management Plan for the activity (section 58)
- Restricted Land Use (section 59)

Section 57: Prohibition

Section 57 Prohibition can be used to prohibit both existing and/or future occurrences of an activity.

Section 58: Risk Management Plans

Section 58 Risk Management Plans are site-specific documents, established after the approval of the Source Protection Plan. A Risk Management Plan outlines the actions required to address identified significant drinking water threat(s), accounting for risk management measures already in place. The Risk Management Plans are negotiated between the Risk Management Official and the person engaging in the activity that is or would be causing a significant drinking water threat. A Risk Management Plan can be thought of as a means of applying regulatory controls to an activity; it is a plan that regulates how a significant drinking water threat activity is undertaken – one which offers the opportunity for practical considerations and local agreement. A Risk Management Plan must be established for the significant drinking water threat activity to be undertaken or continue to be undertaken at a site thus ensuring reasonable mitigated measures are in place to protect the water supply.

While the intent is for Risk Management Plans to be voluntarily negotiated wherever possible, the authority does exist within the *Clean Water Act, 2006* for a Risk Management Plan to be imposed by a Risk Management Official on a person engaged

(or proposing to engage) in an activity. Under section 58 of the *Clean Water Act, 2006* the Risk Management Official can give the property owner a notice establishing a deadline for negotiating the Risk Management Plan. If this deadline is not met, the Risk Management Official may establish a Risk Management Plan by order. It is intended that this authority would be used only as a last resort.

Section 59: Restricted Land-use

Where the Source Protection Plan includes policies using section 57 prohibition or section 58 Risk Management Plans, a complementary policy that uses section 59 may exist. The purpose of section 59 is to ensure that, if a development that may include a significant drinking water threat activity is proposed in an area that is subject to section 57 or 58 policy, then approvals for the proposal (i.e. municipal approvals, planning approvals or building permits) cannot be issued until the Risk Management Official has an opportunity to review the proposal and ensure its compliance with those provisions (MOE Administering & Enforcement of Part IV, 2011).

7.2.2 Land-use Planning

The *Clean Water Act, 2006* recognizes the authority of the *Planning Act* and *Condominium Act* to regulate land uses and provides for the implementation of certain source protection plan policies through Ontario's existing land use planning framework. The *Planning Act* and *Condominium Act* in Ontario provide tools with which municipalities can regulate development as they plan their communities, such as allocating land for agricultural, residential, commercial or mixed uses.

7.2.3 Prescribed Instruments

Under the *Clean Water Act*, 2006 an "instrument" is defined as any document of legal effect, including a permit, licence, approval, authorization, direction or order issued or otherwise created under an Act. These instruments listed in section 1.0.1(1) of O. Reg. 287/07 are prescribed for the purposes of the *Clean Water Act, 2006* policy development.

Prescribed Instruments listed in section 1.0.1(1) of O. Reg. 287/07 under the *Clean Water Act, 2006* are as follows:

- Section 39 of the *Environmental Protection Act* with respect to environmental compliance approvals for the use, operation, establishment, alteration, enlargement or extension of waste disposal sites or waste management systems;

- Sections 7 and 11 of the *Pesticides Act* with respect to permits for land exterminations, structural exterminations and water exterminations;

- Sections 10, 14, 15.2, and 28 of O. Reg. 267/03 made under the *Nutrient Management Act* with respect to nutrient management plans, nutrient management strategies and non-agricultural source material plans;

- Sections 8, 11, 13, 20, 30, 36, and 37 of the *Aggregate Resources Act* with respect to licenses, wayside permits, aggregate permits or site pans accompanying applications for wayside permits or aggregate permits;

- Sections 34 and 53 *Ontario Water Resources Act* with respect to permits to take water and approvals to establish, alter, extend or replace new or existing sewage works; and

- Sections 40 and 44 of the *Safe Drinking Water Act* with respect to drinking water works permits and municipal drinking water licenses

7.2.4 Non- Regulatory Tools

In addition to the tools listed above a Source Protection Plan can use a number of non-regulatory tools to manage existing and future drinking water threats. The legal effect of these policy tools is dependent on the party responsible for implementation and the risk level of the threat being addressed. The following are the non-regulatory tools provided by the *Clean Water Act, 2006*:

- education and outreach programs;
- incentive programs;
- establishment of stewardship programs;
- specify and promote best management practices;
- establishment of pilot programs;
- govern research; or
- specify actions to be taken to implement the plan or to achieve the plan's objectives.

These policy approaches may be applied alone or in combination with other policy approaches to deal with a particular drinking water threat.

7.2.5 Education and Outreach and Incentive Programs

Education and outreach programs can be used to inform the identified property owners of the drinking water threats associated with their property. Further, these programs can encourage the use of best management practices to manage the drinking water threat. Incentives are used to encourage an action by means of support, usually financial.

7.2.6 Stewardship Programs

In Ontario, stewardship programs are typically collaborative partnerships between organizations (who provide financial or technical assistance, information, or data) and individuals who take action at a local scale. This assistance may be provided for the development of educational materials, incentives for infrastructure upgrades, or to maintain a monitoring and information network. Local conservation authorities may already administer stewardship programs for drinking water source protection or for environmental conservation that also benefits source protection.

7.2.7 Best Management Practices

Often, with activities like agriculture or construction, there are also sector established best management practices that promote the safest or most efficient way of doing something. Information on typical best management practices may be available from professional organizations and industry associations as well as from people who operate in that sector. Best management practices can apply to a range of measures from operational procedures to administrative processes. While best management practices are generally voluntary in nature, source protection plan policies can support the continuation of these practices and encourage their use at other sites where similar threat activities occur.

7.2.8 Pilot Programs

Emerging technologies or new methods to address certain threats to drinking water may need to be assessed for their applicability in different situations, or for their suitability to address a wider range of threats. Pilot programs could test these methods or technologies and look at the feasibility of the approach in addressing particular threats or to examine potential improvements to these methods or technologies.

7.2.9 Research

There may be situations where the Source Protection Committee feels that further research is necessary to develop new methods or new technologies for addressing certain threats. This may be the case where; existing methods to address the threat have not been as effective as desired under local conditions and the committee feels that research may find a better solution or modification.

7.2.10 Specify Actions

The Source Protection Plan can include specific actions to achieve the Plan's objectives. Specify Action refers to a set of policy tools described within portions of section 26 and 27 of O. Reg. 287/07 under the *Clean Water Act, 2006*. This type of policy specifies that an implementing body undertake a particular action to address either a specific threat identified in the Assessment Report or a transport pathway. A specify action policy can be a significant threat policy if it addresses an activity that is identified as a significant threat. Some specify action policies can have a 'comply with' (CW) legal effect if they address significant drinking water threats and are directed at a municipality, local board or source protection authority (these appear on List E within the appendices of the Plan). Others are 'non binding' (NB), for example if the rely on specify action tools and are directed at an implementing body other than a municipality, local board or source protection authority, such as a provincial ministry (these appear on List K within the appendices). Specify action policies can also be grouped as strategic action policies (List J) if they meet the criteria set out in section 33 of O. Reg. 287/07 under the *Clean Water Act, 2006*.

Specify Action policies are policies identified in the following sections of the O. Reg. 287/07:

- Section 26– policies that specify the actions to implement the SPP or achieve the plans objectives with respect to drinking water threats identified in the Assessment Report
- Section 26 – policies that specify the actions with regards to climate data gathering
- Section 26 – policies that specify the actions with regards to updating spill prevention and spill contingency plans or emergency response plans along highways, railway lines, or shipping lanes
- Section 27 – policies that specify the actions with regard to transport pathways

7.2.11 Strategic Action

Strategic Action refers to a group of policies as per section 33 of O. Reg. 287/07 under the *Clean Water Act, 2006*. These are policies that do not address significant threats, are not Great Lakes policies, are not monitoring policies, and are not "have regard to" policies under the *Planning Act* or the *Condominium Act*, *1998* or "have regard to" policies that affect Prescribed Instruments. For the most part, these policies address items such as Transport Pathways, Spills Prevention & Response Plans, and moderate or low threat policies that use tools other than *Planning Act* or Prescribed Instruments. Strategic action policies appear on List J within the appendices of Volume II of the Source Protection Plan and are non binding.

8.0 SOURCE PROTECTION PLAN IMPLEMENTATION

8.1 Status and Effect

Following the Minister of the Environment, Conservation and Park's approval of the Source Protection Plan, the decision notice will be posted on the Environmental Bill of Rights Registry. The Source Protection Plan takes effect on the date set by the Minister.

8.2 Roles and Responsibilities

The implementation of the source protection policies included in Volume II of this Plan requires the cooperation of the various source protection partners. The following section outlines the key roles and responsibilities of the players in the implementation of the Source Protection Plan.

8.2.1 Source Protection Committee

The Source Protection Planning process is being led by a multi-stakeholder steering committee called the Lake Erie Region Source Protection Committee. The Committee was formed in November 2007, and is responsible for directing the development and updates of the Assessment Reports and Source Protection Plans and annual reporting for each of the four Source Protection Areas in the Lake Erie Region. The committee is comprised of twenty-four (24) local stakeholders and a Chair as defined in the Regulation.

The Lake Erie Region Source Protection Committee has the decision-making authority regarding the acceptability of the work or findings to be included in the Assessment Report and Source Protection Plans.

8.2.2 Source Protection Authority

The conservation authority exercises the responsibilities of a Source Protection Authority under the *Clean Water Act, 2006* and is responsible for providing technical and administrative support to the Source Protection Committee. The Source Protection Authority, along with municipalities and other partners, has an important role in monitoring and reporting on the progress of the Source Protection Plan's implementation. They will continue their role as liaison with the Ministry of Environment, Conservation and Parks and local conservation authorities and municipalities. The Source Protection Authority submits any Updated Source Protection Plans, Terms of Reference, and Assessment Reports to the Ministry of the Environment, Conservation and Parks for approval.

8.2.3 Province

The Province is required to carry out the significant threat policies associated with provincial instruments as prescribed in O. Reg. 287/07 section 1.0.1 and implement monitoring policies developed under section 45 of the *Clean Water Act, 2006*. Also, other non binding policies will request the Province to take specific actions as an implementing body.

8.2.4 Municipalities

Municipalities have a strong role in implementing Source Protection Plans. Currently, municipalities are responsible for the delivery of municipal drinking water and land use planning.

Many of the Source Protection Plan policies included in this plan build on these roles, meaning implementation of the Source Protection Plan policies is for the most part incorporated into existing municipal planning processes.

Municipalities are responsible for bringing their Official Plans, by-laws into conformity with the significant threat policies contained in the Source Protection Plan. They are required to ensure that any future undertaking does not conflict with the Source Protection Plan.

For the implementation of policies that use Part IV Tools, two roles are required of municipalities as outlined in the *Clean Water Act, 2006* – a Risk Management Official and a Risk Management Inspector (section 52). The Risk Management Official is responsible for negotiating or establishing Risk Management Plans (section 58). In addition, the Risk Management Official has the authority to establish interim Risk Management Plans by order (section 56), establish enforcement orders (section 63), and cause things to be done (section 64), enter property if appropriately trained (section 66), issue orders to pay costs (section 67), and submit annual reports (section 81). The Risk Management Inspector has authority to conduct inspections (section 62), issue enforcement orders (section 63), issue an order causing a thing to be done (section 65 where person liable is unknown), and enter property (section 66). The Risk Management Inspector is also responsible for prosecution related to activities stipulated by section 106 of the *Clean Water Act, 2006.*

The Risk Management Official and Risk Management Inspector are needed to meet specific regulatory requirements to manage certain drinking water threat activities; they must hold specific qualifications and receive proper training, as outlined in the O. Reg. 287/07. It is permitted that Risk Management Officials and Risk Management Inspectors may be cross-appointed; i.e. an individual who is appointed as a Risk Management Official can also be appointed as a Risk Management Inspector. The *Clean Water Act, 2006* contains provisions whereby a municipality can enter into an agreement with other entities, including a board of health, planning board, other municipalities or the Source Protection Authority, in which case that entity would be responsible for Part IV enforcement. Two or more municipalities can also share the responsibility for enforcing Part IV, under the *Clean Water Act, 2006*.

8.2.5 Landowners and Business Owners

Individual property owners and local businesses may be asked to take action on significant drinking water threats occurring on their properties, where they are located within wellhead and intake protection areas. The action taken will be dependent on the Source Protection Plan policy outlined in Volume II of this Source Protection Plan.

8.2.6 Other Agencies / Parties

Source Protection Plan policies can also provide direction to other agencies and parties such as the Federal Government and the Technical Safety and Standards Authority (TSSA). The action taken and legal effect is dependent on the Source Protection Plan policy outlined in Volume II of this Source Protection Plan.

8.3 Annual Review Process

The *Clean Water Act, 2006* requires that the Source Protection Authority prepare and submit an annual progress report and supplemental form describing the measures taken to address existing and future significant drinking water threats, the results of monitoring and the progress that has been achieved in meeting the Source Protection Plan's objectives. Annual reports are submitted to the Director by May 1 in the year following the year to which the reports apply. The annual progress reports and supplemental forms rely on several sources for information. Further details on what information must be included in these annual reports can be found in section 46 of the *Clean Water Act, 2006* and section 52 of O. Reg. 287/07.

Prior to the submission to the Director of the Ministry of the Environment, Conservation and Parks, the annual report will be submitted to the Source Protection Committee with the opportunity to provide comments. The report, along with the comments from the Source Protection Committee, will then be submitted to the Director of the Ministry of the Environment, Conservation and Parks allowing them to monitor progress of the Source Protection Plan policies against the objectives outlined in the *Clean Water Act, 2006*.

The annual progress report and supplemental form provide the basis for future Source Protection Plan amendments and will serve as important information in the ongoing assessment of progress towards source water protection.

9.0 DEFINITIONS

"**Activity**" includes land use as defined in the *Clean Water* Act*, 2006*. Activities are prescribed in the Table of Drinking Water Threats*: Clean Water Act, 2006* and in the Technical Rules: Assessment Report.

"**Chemical**" means a substance of distinct molecular composition which has been deemed to be of concern to drinking water due to its toxicity, environmental fate, quantity, method of release into the environment and type of vulnerable area into which it might be released.

Conditions: Are referred to in section 15(2)(g) of the *Clean Water Act, 2006* and are identified in the Grand River Source Protection Area Assessment Report.

"**Director"** means the director appointed under the *Clean Water Act, 2006.*

"**Drinking Water**" has the same meaning as in the *Safe Drinking Water Act, 2002*.

"**Drinking Water Threat**" means an activity or condition that adversely affects or has the potential to adversely affect the quality (chemical or pathogen) or quantity of any water that is or may be used as a source of drinking water, and includes an activity or condition that is prescribed by the regulations as a drinking water threat. O. Reg. 287/07 sets out in Section 1.1(1) a prescribed list of drinking water threats.

"**Existing**" see definition stated in the municipal sections of Volume II of the Grand River Source Protection Plan.

"**Future or New**" see definition stated in the municipal sections of Volume II of the Grand River Source Protection Plan.

"**Groundwater**" is water that has percolated into the ground and occupies spaces between soil particles or cracks and fissures in otherwise solid rock. *(*Source: Ministry of the Environment. 2004. White Paper on Watershed-based Source Protection Planning).

"**Implementing Body**" can be a provincial ministry, municipality, local board, source protection authority, or other body.

"**Intake Protection Zone**" (IPZ) means a zone established around a surface water intake of drinking water as prescribed in the Technical Rules: Assessment Report.

"Issue Contributing Area" (ICA) means an area established around a well or intake where an Issue has been identified as per the Technical Rules: Assessment Report

"**Legal Effect**" The policies in the Source Protection Plan have one of three types of legal effect – "must conform/comply with" policies, "have regard to" policies, and "non binding" policies (Source: Conservation Ontario. 2011. Legal Effect of Source Protection Policies).

"**Low Drinking Water Threat**" means a drinking water threat that, according to a risk assessment, poses or has the potential to pose a low risk *(Source: Clean Water Act, 2006. O Reg. 287/07)*

"**Moderate Drinking Water Threat**" means a drinking water threat that, according to a risk assessment, poses or has the potential to pose a moderate risk *(Source: Clean Water Act, 2006. O Reg. 287/07).*

"**Pathogen**" means a microscopic organism capable of producing infection or infectious disease in humans (Source: Tables of Drinking Water Threat, *Clean Water Act, 2006)*.

"Planned" means, with respect to a drinking water system, a drinking water system that is to be established, or a part of a drinking water system that is to be established, if, (a) approval to proceed with the establishment of the system or part has been given under Part II of the *Environmental Assessment Act*, (b) the establishment of the system or part has been identified as the preferred solution within a completed planning process conducted in accordance with an approved class environmental assessment under Part II.1 of the *Environmental Assessment Act* and no order has been issued under subsection 16 (1) of that Act, or (c) the system or part would serve a reserve as defined in the *Indian Act* (Canada) (Source: O. Reg. 287/07).

"Policy Lead/ Task Lead/ Developer": The lead authority as outlined in the appropriate Approved Terms of Reference for the Preparation of the Source Protection Plan.

"**Prescribed Instrument**" is any document of legal effect, including a permit, licence, approval, authorization, direction or order, that is issued or otherwise created under an Act and listed in Section 1.0.1 of O. Reg. 287/07.

"**Risk Management Inspector**" means a Risk Management Inspector appointed under Part IV of the *Clean Water Act, 2006 (Source: Clean Water Act, 2006).*

"**Risk Management Official**" means the Risk Management Official appointed under Part IV of the *Clean Water Act, 2006 (Source: Clean Water Act, 2006).*

"**Risk Management Plan**" means a plan for reducing a risk prepared in accordance with the regulations and the rules of the *Clean Water Act, 2006 (Source: Clean Water Act, 2006).*

"**Significant Drinking Water Threat**" means a drinking water threat that, according to a risk assessment, poses or has the potential to pose a significant risk. The Director's Technical Rules (2021) along with the vulnerability score in the Assessment Report provides the basis for the risk assessment.

"**Significant Groundwater Recharge Area**" means an area within which it is desirable to regulate or monitor drinking water threats that may affect the recharge of an aquifer. (*Source: O. Reg. 287/07)*

"**Source Protection Authority**" means a conservation authority or other person or body that, under subsection 4 (2) or section 5, is required to exercise and perform the powers and duties of a drinking water source protection authority under the *Clean Water Act, 2006.* In this Source Protection Plan, it refers specifically to the Grand River Source Protection Authority.

"**Source Protection Committee**" means a drinking water source protection committee established under section 7 of the *Clean Water Act, 2006.* In this Source Protection Plan, it refers specifically to the Lake Erie Region Source Protection Committee.

"**Source Protection Plan**" means a drinking water source protection plan prepared under the *Clean Water Act*; *2006*. In this Source Protection Plan, it refers specifically to the Grand River Source Protection Plan.

"**Source Protection Region**" means a drinking water source protection region established by the regulations (*Source: Clean Water Act, 2006.).* In this Source Protection Plan, it refers specifically to the Lake Erie Source Protection Region.

"**Surface Water**" means water collecting in a stream, river, lake, and wetland. It is the source for drinking water for Intakes in the Great lakes and other water bodies (Source: Ministry of the Environment. 2004. White Paper on Watershed-based Source Protection Planning).

"**Surface Water Intake Protection Zone**" means an area that is related to a surface water intake and within which it is desirable to regulate or monitor drinking water threats (*Source: O. Reg. 287/07).*

"Tier 3 Model" means a computer model that incorporates the best available information about local geology, groundwater and surface water resources, precipitation, infiltration and water withdrawals to help evaluate the sustainability of the municipal water supplies (Source: Tier 3 Water Budget and Local Area Risk Assessment – Glossary).

"Tier 3 Water Budget and Local Area Risk Assessment" means a detailed scientific technical study aimed at assessing the water quantity risk to current and future municipal drinking water sources under a variety of scenarios, such as future increased municipal water needs due to growth and a prolonged drought. (Source: Tier 3 Water Budget and Local Area Risk Assessment – Glossary).

"**Transport Pathway**" means a condition of land resulting from human activity that increases the vulnerability of a raw water supply of a drinking water system set out in clause 15 (2) (e) of the *Clean Water Act, 2006* (Source: *Clean Water Act, 2006. O. Reg. 287/07).*

"Water Supply System" means one or more surface water intakes and/or groundwater wells that pump water to supply a municipal water distribution system (Source: Tier 3 Water Budget and Local Area Risk Assessment – Glossary).

"**Wellhead Protection Area**" means an area that is related to a wellhead and within which it is desirable to regulate or monitor drinking water threats (*Source: Clean Water Act, 2006).*

"**Vulnerable Area**" means, (a) a significant groundwater recharge area, (b) a highly vulnerable aquifer, (c) a surface water intake protection zone, or (d) a wellhead protection area (*Source: Clean Water Act, 2006).*

10.0 DRINKING WATER THREATS AND OPTIONAL CONTENT FOR THE LAKE ERIE SOURCE PROTECTION REGION

The following is a description of the twenty-two (22) drinking water threats prescribed by the *Clean Water Act*, *2006* and four (4) optional content policies.

10.1 Threat 1: The establishment, operation or maintenance of a waste disposal site within the meaning of Part V of the Environmental Protection Act

As defined in the *Environmental Protection Act*, a waste disposal site is any land, building, and/or structure in connection with the depositing, disposal, handling, storage, transfer, treatment or processing of waste. Operational activities associated with these sites are also included in the definition.

“Waste” is defined to include: ashes, garbage, refuse, domestic waste, industrial waste, or municipal refuse and such other materials as are designated in the regulations under the *Environmental Protection Act*. Waste disposal sites may be active, inactive, or closed. In most circumstances, a waste disposal site (particularly a medium to large operation) has the potential to be identified as a significant or moderate threat.

This drinking water threat contains fourteen (14) sub-threats:

1. Disposal of Hauled Sewage to Land
2. Application of Processed Organic Waste to Land
3. Storage, Treatment and Discharge of Tailings from Mines
4. Landfarming of Petroleum Refining Waste
5. Landfilling (Hazardous Waste or Liquid Industrial Waste)
6. Landfilling (Municipal Waste)
7. Liquid Industrial Waste Injection into a Well
8. PCB Waste Storage
9. Storage of Hauled Sewage
10. Storage of Processed Organic Waste or Waste Biomass;
11. Transfer/Processing Sites approved to receive Hazardous Waste or Liquid Industrial Waste;
12. Transfer/Processing Site approved to receive only Municipal Waste under Part V of the Environmental Protection Act;

13. Storage of Subject Waste at a Waste Generation Facility: site requires generator registration under Section 3 of O. Reg. 347;

10.2 Storage of Waste at a Waste Generation Facility: site that is exempt or excluded from generator registration requirements.Threat 2: The establishment, operation or maintenance of a system that collects, stores, transmits, treats or disposes of sewage.

This drinking water quality threat contains eight (8) sub-threats:

1. Onsite Sewage Works

2. Wastewater Collection Facilities and Associated Parts: Sanitary Sewers;

3. Wastewater Collection Facilities and Associated Parts: Outfall of a Combined Sewer Overflow (CSO), or a Sanitary Sewer Overflow (SSO) from a Manhole or Wet Well;

4. Wastewater Collection Facilities and Associated Parts: Sewage Pumping Station or Lift Station Wet Well, a Holding Tank or a Tunnel;

5. Wastewater Treatment Facilities and Associated Parts;

6. Industrial Effluent Discharges;

   ;

7. Storm Water Management Facilities and Drainage Systems: Outfall from a Storm Water Management Facility or Storm Water Drainage System;

8. Storm Water Management Facilities and Drainage Systems: Storm Water Infiltration Facility.

Onsite Sewage Works means any works for the collection, transmission, treatment and disposal of sewage or any part of such works, but does not include plumbing to which the Building Code Act, 1992 applies Leaching bed systems with septic tanks or holding tanks are the systems most commonly used. Onsite sewage works are considered a drinking water threat due to the potential discharge of chemicals and pathogens and their potential impact on the sources of drinking water.

Wastewater treatment facilities and associated parts: means a sewage works that treats or disposes of sewage but does not collect or transmit sewage. Associated parts include a final effluent outfall or a sewage treatment plan outflow outfall, a sewage lagoon, and a sewage treatment plant process tank or holding tank that forms part of a wastewater treatment facility and that may discharge sewage to groundwater.

All sewage treatment plants release treated wastewater that is called effluent. The effluent can be directly released to a watercourse or water body or its release from a lagoon can be scheduled.

Sometimes the capacity at a sewage treatment plant is overwhelmed and partially treated or untreated sanitary waste is released into the receiving water body. This is typically a result of an extreme wet weather event (i.e. significant rainfall or snow melt) where the sanitary sewer network is not completely isolated from stormwater. Combined sewers or sewer networks with inflow/infiltration issues are the root cause of such bypasses.

Many sewage treatment plants have sewage storage tanks as part of the treatment process.

Wastewater collection facilities and associated parts: sanitary sewers means a sewer for the collection and transmission of residential, commercial, institutional or industrial sewage, or any combination thereof. The sanitary sewer system is an underground pipe network that collects and directs the wastewater to a treatment plant where it is treated before being discharged. Leaking underground sewer lines are of concern to groundwater and surface water quality in Ontario. Leaks in sewer lines can happen for numerous reasons, including blockage from tree roots, soil slippage, washout resulting in loss of foundation, sewage backup, faulty materials, improperly constructed pipelines, lack of corrosion protection, age of the system, and ground subsidence.

Industrial effluent discharges refer to a system that discharges to surface water and has as its primary function, the collection, transmission or treatment of industrial sewage. These systems are collectively referred to as sewage works. Industrial effluent discharges could result in the presence of chemicals in both surface water and groundwater, and the presence of pathogens in surface water.

Combined sewers are those which function simultaneously as a storm sewer and a sanitary sewer and may discharge sanitary sewage containing human waste to surface water other than by way of a designed bypass. Traditional combined sewer discharges are not common practice in the Lake Erie Source Protection Region and they are unlikely to be built in the future. Situations where sanitary sewers and stormwater channels are separated by a dividing wall are more common.

Stormwater means rainwater runoff, water runoff from roofs, snowmelt and surface runoff. Where stormwater is managed, it is often under a stormwater management (SWM) plan which addresses runoff through conveyances and end of pipe collection systems. Stormwater can also be managed at source. A hierarchical approach to managing stormwater is preferred: at-source, then conveyance, and finally end-of-pipe controls. Stormwater management facilities/ ponds are designed to collect runoff from the local storm-sewer system following either a rainfall or snowmelt event, or from

activities such as washing cars. They are built to temporarily hold water, provide some treatment to remove some pollutants, and then slowly release it back to natural waterways or allow it to infiltrate into the ground. Not all SWM ponds are designed for quality control; many older ones only provide quantity control. The assessment of a SWM pond as a drinking water threat is dependent on the chemical or pathogen released, the size of the drainage area the facility serves, and the predominant surrounding land uses flowing into the facility.

10.3 Threats 3, 4 and 5: The application, storage, and management of agricultural source material (ASM)

Agricultural source material (ASM) is a type of nutrient that can be applied to land for the purpose of improving growth of agricultural crops and for soil conditioning. The *Nutrient Management Act* defines the materials that are considered to be ASM, to include manure, run-off from farm animal yards, wash water, anaerobic digestion output, organic materials, and regulated compost. ASM is produced on farms with livestock, and can be stored in a permanent nutrient storage facility (usually a steel or concrete manure storage facility or earthen lagoon), or on a temporary field nutrient storage site (only for solid ASM). The classification of the threat differs depending on whether it is being applied to land or stored.

The application of ASM is dependent on the vulnerability score of the specific area and the volume applied, as well as the combination of the managed land percentage and livestock density for the vulnerable area. The storage of ASM is dependent on the location of the storage facility (storage at, above, or below grade) and the type of storage (permanent or temporary). Both the application and storage of ASM are considered significant threats in any quantity and regardless of how and where it is stored.

The management of ASM refers to aquaculture facilities. The primary sources of pathogens in ASM from aquaculture are the water in which fish manure and by-products are in suspension or settled, the incoming water to an aquaculture facility contaminated with pathogens from other sources, and dead fish not removed from the water. These sources can negatively impact fish health, cause a food safety issue, and can increase the pathogens in the water.

10.4 Threats 6 and 7: The application, handling and storage of non-agricultural source material (NASM)

Non-agricultural source material (NASM) is a type of nutrient that can be applied to land for the purpose of improving growth of agricultural crops and for soil conditioning. The circumstances describe the NASM categories 1 (“non-herbivorous animal”) 2 and 3. Category 1, 2 and 3 means NASMs described in Tables 1, 2 and 3 of Schedule 4, respectively, in O. Reg. 267/03 under the Nutrient Management Act, 2002.

10.5 Threat 8 and 9: The application, handling and storage of commercial fertilizer

Fertilizer, as defined by the *Fertilizer Act,* is any substance or mixture of substances, containing nitrogen, phosphorus, potassium or other plant food, manufactured, sold or represented for use as a plant nutrient. Commercial fertilizer is not an agricultural source material (ASM) or non-agricultural source material (NASM) but is considered a nutrient as defined by the *Nutrient Management Act* and associated regulations. Commercial Fertilizer is used extensively by the agriculture industry, as well as for heavily landscaped commercial, institutional, recreational, industrial and residential areas. Commercial fertilizer products are also known as “chemical fertilizers”. The impacts from commercial fertilizer application generally stem from improper use, such as application without consideration for nutrients available in the soil and plant requirements; or inappropriate timing of application for plant growth cycles and weather conditions causing an excess of nutrients to enter the groundwater and surface water. Potential impacts from storage of commercial fertilizers relate to leaks and spills as a result of aging infrastructure or improper handling or storage.

10.6 Threat 10 and 11: The application, handling and storage of pesticides

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*. Historically, pesticide has been applied as part of many land uses including agricultural, active recreation, institutional, industrial, commercial and residential. Since 2009, there has been a ban on the cosmetic use of pesticide in Ontario that prohibits the application of pesticide on lawns, vegetable and ornamental gardens, patios, driveways, cemeteries, and in parks and school yards. However, the ban does make exceptions for various land uses, such as agricultural, golf courses, and public works operations.

10.7 Threat 12 and 13: The application, handling and storage of road salt

Road salt as a drinking water threat refers to any product containing sodium and/or chloride that is used to maintain roads and pedestrian areas. Most road salt is used as a de-icer or an ice prevention agent, but is sometimes also used for dust suppression. The most commonly used products for de-icing roads and preventing ice formation on roads are sodium chloride and calcium chloride because they are effective and inexpensive. The most common technique involves the use of liquid salts, either as an additive to conventional rock salt (pre-wetting) or applied on its own in advance of snow accumulation (direct liquid application). Given the extended winter season in Ontario, there is widespread use and storage of road salt. The majority of the material is handled by road authorities such as municipalities and the Ontario Ministry of Transportation; however, private businesses and residential property managers also store and use salt. At typical concentrations in drinking water, sodium and chloride are not risks to human health; however, at concentrations greater than 20 milligrams per litre (mg/L), sodium intake can present a health issue for some people.

The application, handling and storage of road salt can only be a significant drinking water threat if the impervious area is equal to or greater than 30%.

10.8 Threat 14: The storage of snow

For health and safety reasons (i.e., slipping hazard), snow removed from roads and parking lots must be melted on-site or transported to a location where it is either melted or stockpiled and allowed to melt. Since snow can be contaminated with salt, oil, grease and heavy metals from vehicles, litter, and airborne pollutants, it must be handled and stored in ways that protect water sources. The activities related to snow storage that are considered to be drinking water threats include:

- Snow that is pushed into large piles on a property (e.g. stored in parking lots);
- Snow that is transported to a central site from other locations (e.g. snow disposal sites); and,
- Large snow banks along roads that are close to municipal wellheads or surface water intakes.

10.9 Threat 15: The handling and storage of fuel

This category of drinking water threat includes the handling of liquid fuel as well as its storage. The types of storage facilities to be considered are defined in O. Reg. 213/01 (Fuel Oil) or O. Reg. 217/01 (Liquid Fuels). Both of these regulations are made under the *Technical Standards and Safety Act, 2000*. Facilities where fuel is manufactured or refined are also to be considered. The types of fuel storage facilities include those outlined in O. Reg. 217/01.

A facility is defined as:

- permanent or mobile retail outlets;
- bulk plant;
- marinas;
- cardlocks/ keylocks;
- private outlets; or
- farms.

Facilities properties that store greater than 250 Litres of liquid fuel at, above grade, partially below grade (including within a basement), and below grade, are also categorized as a significant drinking water threat.

The primary circumstance that determines whether an activity is a significant drinking water threat is related to quantity and type of fuel, and whether or not it is stored above, below or partially below grade.

10.10 Threat 16: The handling and storage of Dense Non-Aqueous Phase Liquid (DNAPL)

A Dense Non-Aqueous Phase Liquid (DNAPL) is a liquid chemical that is denser than water and tends to be sparingly soluble in water. The majority of DNAPLs are used in industrial and commercial applications. They can also be found in small quantities in common household products such as paints and adhesives. Historically, these compounds were also found in smaller quantities in personal care products (e.g., shampoo, cosmetics), but in many cases are being phased out of such products. If spilled, DNAPLs tend to sink into the ground and can contaminate even the deepest groundwater resources. The DNAPLs identified in the Source Water Protection Threats Tool are toxic to humans and/or the environment at even the lowest levels, meaning that even if only a small amount dissolves into the water, it would be harmful to humans. Therefore, these DNAPLs pose a significant threat to drinking water sources.

10.11 Threat 17: The handling and storage of organic solvents

Organic solvents are liquid organic compounds with the ability to dissolve solids, gases, or liquids. They have been used in vast quantities for decades in industrial and commercial applications and can also be found in small quantities in common household products such as adhesives and cleaners. Four organic solvents have been identified as potential concerns related to drinking water: carbon tetrachloride, chloroform, dichloromethane and pentachlorophenol. These substances have various properties, uses and negative environmental effects. The assessment of the risk to drinking water sources from these organic solvents is dependent on whether they are stored underground, at ground surface or above ground and the amount of material stored. Underground storage is of greater concern due to the potential for undetected leaks.

10.12 Threat 18: The management of runoff that contains chemicals used in the de-icing of aircraft

Chemicals used in the de-icing of aircraft contain contaminants that could make their way into surface and groundwater as a result of runoff. Ethylene glycol is the active ingredient in de-icing fluids, and dioxane-1, 4 may be used as an additive for its wetting or dispersing properties. These chemicals could threaten the safety of drinking water sources in certain situations. The classification of this activity as a significant, moderate or low drinking water threat is dependent on the classification of the airport as remote, small, regional or national airport. The activity may be classified as a significant threat only for airports that: i) have passenger traffic as part of definition of “regional “or “national “airport and; ii) where the run-off of de-icing substances may result in the release to land or water.

10.13 Threat 19: An activity that takes water from an aquifer or a surface water body without returning the water taken to the same aquifer or surface water body

This threat occurs when water is taken and not returned and is no longer available for other users of the same water source. This is called consumptive use. The taking of water from a municipal aquifer or surface water body (without returning it to the same source) could result in a depletion of available supply that could impair the long-term viability of a water system. Unlike water quality threats, where the threat level is a product of the vulnerability score and the hazard score (of the activity), water quantity threats are a function of exposure and tolerance.

Consumptive water taking is or would be a significant drinking water threat in areas assigned a significant risk level; water quantity vulnerable areas are delineated as part of a Tier 3 water budget and risk assessment study. There is currently no volume threshold for a consumptive taking to be identified as a significant threat, meaning that even small takings are considered a threat to drinking water under the *Clean Water Act, 2006*.

10.14 Threat 20: An activity that reduces the recharge of an aquifer

Threat 20 occurs when an activity reduces recharge of the water table. Examples of activities that could reduce the infiltration of water into the ground include paving of parking lots, construction of buildings and the pumping of water out of the ground rather than allowing water in, e.g., at a pit or quarry. A reduction in recharge could result in a depletion of available supply that may impair the long-term viability of a water system. Unlike water quality threats, where the threat level is a product of the vulnerability score and the hazard score (of the activity), water quantity threats are a function of exposure and tolerance.

Recharge reduction is or would be a significant drinking water threat in local areas assigned a significant risk level; water quantity vulnerable areas are delineated as part of a Tier 3 water budget and local area risk assessment study.

10.15 Threat 21: The use of land as livestock grazing or pasturing land, an outdoor confinement area (OCA) or a farm-animal yard

This threat can be divided into two sub-threats: 1) Outdoor Confinement Areas or farm animal yards; and 2) livestock grazing or pasturing. An Outdoor Confinement Area (OCA) is a yard, facility, or enclosure (for livestock, deer, elk or game animals) with a very high animal concentration, typically 15 or more animals per acre, often for extended periods of time. Grazing is crop production where the animals do the harvesting. Ontario grazing systems involve a concentration of up to 2 to 3 animals per acre during the grazing season, often on a rotational basis.

10.16 Threat 22: The establishment and operation of a liquid hydrocarbon pipeline

The establishment and operation of a liquid hydrocarbon pipeline was added prescribed threat in July 2018. Liquid hydrocarbon pipelines consist of the pipeline and associated equipment including compressors and pumps. Pipe diameters can range in size, but typical sizes found within the Lake Erie Region are approximately 12 inches. The main consideration for reducing or eliminating drinking water threats related to this threat is to prevent spills as a result of pipeline ruptures and to have an appropriate spill response. The Source Water Protection Tables of Drinking Water Threats and Circumstances (swpip.ca) identify BTEX (benzene, toluene, ethylene and xylene) and petroleum hydrocarbons F1 through F4 as contaminants that could make their way into groundwater; there is no volume associated with the circumstances. Significant threats occur in wellhead protection areas (WHPAs) A-D with a vulnerability score of 10, and Intake Protection Zones (IPZs) and WHPA-Es with a score of 9 or 10.

10.17 Optional Content

On January 13, 2011, the Source Protection Committee passed a resolution (Res. No. 05-11) which determined that policies for optional content shall be included within the Source Protection Plans as outlined in O. Reg. 287/07 and the report to the committee.

10.18 Conditions

Significant conditions are contaminated sites for which there is evidence of off-site contamination from a past activity that may have an immediate impact on drinking water quality, as outlined in Part XI.3, Rule 126 of the *Clean Water Act, 2006* Technical Rules.

10.19 Spill Prevention, Spill Contingency or Emergency Response Plans

Spill prevention plans outline the appropriate handling and storage (action plan) of potentially harmful substances and may include preventative maintenance standards and reporting. Spill prevention and contingency plans are outlined in the *Environmental Protection Act*, O. Reg. 224/07 and are developed by industries as described in O. Reg. 222/07, Environmental Penalties.

This includes, but is not limited to, industrial facilities (Table 1 of O. Reg. 222/07) and those that discharge sewage other than storm water to a watercourse. These plans must include the following: a written description of the facility; plans required by the Act to prevent or reduce the risk of spills of pollutants and prevent, eliminate or ameliorate any adverse effects that may result in a spill; and the date the plan must be developed and implemented.

Policies included for spill prevention, spill contingency or emergency response plans can only be included in the Source Protection Plan if they relate to a highway (as defined by the *Highway Traffic Act, 1990*), railway line or a shipping lane (i.e., along a transportation corridor). This does not include properties that are along highways and also within the vulnerable area (O. Reg. 287/07 section 26(6)).

Every municipality is responsible for creating an emergency plan governing the provision of necessary services during an emergency, and the procedures under and the manner in which employees of the municipality and other persons will respond to the emergency. The council of the municipality shall by by-law adopt the emergency plan. An emergency plan authorizes employees of the municipalities and public servants to take action prior to the declaration of the emergency; specifies the procedures to be taken for the safety and evacuation of persons in the emergency area; designates one or more members of the council who may perform the duties of the head of council, if the head of council is unable to act; provide for obtaining and distributing materials, equipment and supplies during an emergency; and provide for such other matters as are considered necessary or advisable for the implementation of the emergency plan during an emergency. Outdated plans may pose a risk to drinking water sources as they may not contain the most recent data and most appropriate response (e.g., personnel) to an emergency or spill.

Spill requirements found in Part X of the *Environmental Protection Act* (Spills) and applicable regulations (e.g. O. Reg. 675/98) set out obligations for various parties to take action (including, but not limited to duty to report spills, duty to mitigate and restore the environment etc.) in the event of a spill. Among others, various duties apply to the owner of spilled material, controller of spilled material, person who spills or causes or permits a spill, and the municipality where a spill occurs.

10.20 Transport Pathways

Transport pathways are defined in the *Clean Water Act, 2006* O. Reg. 287/07. Transport pathways are a land condition, resulting from human activity, which increases the vulnerability of a municipal drinking water system's raw water supply. This can include constructed pathways such as subsurface utility corridors, abandoned boreholes, deteriorating water wells, which do not meet applicable legal requirements, pits and quarries, geothermal systems, underground parking lots and excavations.

They are a concern to drinking water supplies because they may facilitate the movement of contaminants vertically or laterally below grade, and result in a more widespread distribution of contaminants.

In the Assessment Report, transport pathways are considered as part of the vulnerability assessment for the wellhead protection areas and intake protection zones. If a transport pathway(s) was identified, the vulnerability scoring may have been increased, therefore potentially causing activities (i.e., one of the prescribed drinking water threats) to become significant threats due to the vulnerability scoring change.

For example, in the case of groundwater wells which do not meet applicable legal requirements, transport pathways provide a conduit to an aquifer that bypasses the natural protection of the overburden layer resulting in a greater potential risk for contamination. In the case of surface water intakes, transport pathways include anthropogenic (storm sewersheds) conduits which can extend the delineation of intake protection zones two and three.

Under the *Clean Water Act, 2006*, transport pathways, albeit in many cases human-made pathways that increase the vulnerability, are not considered activities; therefore, they cannot be addressed the same way as the 21 Prescribed Drinking Water Threats. Inclusion of policies to address these transport pathways, as allowed by the *Clean Water Act, 2006*, under section 27 of O. Reg. 287/07 facilitates the need to ensure protection of drinking water sources.

Monitoring of Moderate and Low Threats Listed under mandatory content, the monitoring of moderate and low threats must be included in the source protection plans where the source protection committee thinks this is advisable to prevent them from becoming significant drinking water threats. However, moderate and low threats need to be inventoried, before they can be monitored and policies can be developed and applied.

10.21 Dates for When Policies Take Effect

Implementation dates must be included in the Source Protection Plan to help identify to municipalities and other bodies when the policies take effect and when compliance must be met.

10.22 Section 29: Additional Source Protection Plan Information

Under the *Clean Water Act*, 2006 O. Reg. 287/07 section 29, the Source Protection Committee has the ability to include content in the Source Protection Plan that allows for the inclusion, in their opinion, of anything that will assist in understanding the plan. The information is included to provide clarification on issues and concerns raised throughout the source protection planning process by either the Lake Erie Source Protection Committee, other interested bodies or the general public. Further information is presented in the Explanatory Document.

Sources:

- Discussion Papers prepared by the Grand River Source Protection Area, Region of Waterloo, County of Oxford, City of Guelph and Lura Consulting
- Grand River Source Protection Area – Approved Assessment Report (August 16, 2012)
- Clean Water Act, 2006

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