

Grand River Source Protection Area

ASSESSMENT REPORT

**Prepared on behalf of:
Lake Erie Region Source Protection Committee**

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

April 1, 2025

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



SECTION 34 DOCUMENT AMENDMENTS

The following provides a high-level summary of amendments made to the Grand River Assessment Report, under Ontario Regulation 287/07, Section 34. Amendments were made using the 2017 Director's Technical Rules.

Entire document:

- General formatting to enhance readability and/or AODA compliance
- References to Issue Contributing Areas updated to include Wellhead Protection Area (e.g. ICA to WHPA-ICA)

Chapter 1 (Executive Summary and Introduction):

- Text removed to reduce duplication where information also appears in other Assessment Report chapters, Source Protection Plan and/or Explanatory Document

Chapter 8 (Region of Waterloo):

- Water system updates, including capture zone re-delineation; updated vulnerability scoring; updated managed lands, livestock density and impervious surface (MLLDIS) area mapping; updated threats/conditions/Issues evaluation:
 - Erb Street
 - Strange Street
 - William Street
 - Blair Road
- Removal of the Conestogo wellfield section (decommissioned)
- General editing and reformatting

Chapters 24-28:

- General editing and reformatting
- Reference list updated
- Chapter 25: Consideration of Great Lakes Agreements updated to include recent information
- Chapter 26: Conclusion revised to remove redundant information and ease edit burden

EXECUTIVE SUMMARY

The Grand River Source Protection Area Assessment Report was submitted to the Ministry of the Environment on April 30, 2012, and received approval on August 16, 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.

The Assessment Report summarizes the technical studies undertaken in the Grand River Source Protection Area (watershed) to delineate areas around municipal drinking water sources that are most vulnerable to contamination and overuse. Within these vulnerable areas, historical, existing and possible future land use activities were identified that could pose a threat to municipal water sources. Technical studies include a characterization of the human and physical geography of the watershed, a water budget and water quantity stress assessment, an assessment of groundwater and surface water vulnerability, a land use activity inventory, and an evaluation of existing water quality and quantity issues.

The Assessment Report provides an introduction to the Source Protection Planning process, and the roles and responsibilities of the Lake Erie Region Source Protection Committee, municipalities and conservation authorities.

- Chapter 2 of the Assessment Report provides a summary of the human and physical geography of the Grand River watershed area.
- Chapter 3 summarizes water quality threat assessment methodology.
- Chapters 4 through 16 summarize the studies undertaken for the municipal residential drinking water systems in the Grand River Source Protection Area. These chapters include the delineation of vulnerable areas (groundwater Wellhead Protection Areas and surface water Intake Protection Zones) and summaries of the threats assessment and issues evaluation in each vulnerable area.
- Chapter 17 and 18 summarize the Tier 3 water budget framework and methods and Tier 2 water budget results, respectively.
- Chapters 19 through 23 summarize the Tier 3 studies undertaken for Region of Waterloo, Whitemans Creek, Orangeville, Centre Wellington and Halton Hills.
- Chapters 24 and 25 provide information on how climate change in the area may affect the results of the Assessment Report and how Great Lakes agreements were considered as part of the work undertaken.
- Chapter 26 summarizes the findings in the Assessment Report and provides an outline of the next steps in developing a source protection plan for the Grand River Source Protection Area.

The Grand River watershed area contains 42 municipal drinking water systems, including one system that services a First Nations reserve. These systems are primarily groundwater sourced with only five systems containing a surface water source in the watershed.

The findings of the Tier 2 Water Budget and Risk Assessment studies (AquaResource, 2009b) indicate that ten municipal water systems require additional Tier 3 Water Quantity Risk Assessments: Elora/Fergus in the Township of Wellington Centre; Rockwood and

Hamilton Drive in the Township of Guelph/Eramosa; the City of Guelph system including the Eramosa intake; Elmira, West Montrose, Conestogo Plains, and the Integrated Urban System in the Regional Municipality of Waterloo; and Bright in the County of Oxford. The subwatersheds within which these water supplies were assessed as having either the potential for moderate or significant stress under current or future conditions.

Within the Grand River watershed, Tier 3 studies have been completed for municipal drinking water systems within the City of Guelph, Guelph/Eramosa Township (GGET), the Region of Waterloo, the Bethel Wellfield in the County of Brant, the Bright Wellfield in Oxford County, and the Township of Centre Wellington. Further information on the Region of Waterloo Tier 3 study, the Whitemans Creek Tier 3 study and the Centre Wellington Tier 3 study is found in Chapters 19, 20 and 22, respectively. The results of the GGET Tier 3 study will be incorporated into the assessment report through future updates.

The vulnerable areas in the Waterloo Tier 3 Assessment are represented by four wellhead protection areas for water quantity (WHPA-Qs). The consumptive water users and potential reductions to groundwater recharge within the WHPA-Qs were not classified as Significant or Moderate water quantity threats, therefore no water quantity policies were created for the WHPA-Qs.

A Tier 3 Assessment was completed for the Centre Wellington (Fergus and Elora) drinking water system. A WHPA-Q was delineated surrounding the Centre Wellington municipal wells and around other water takers in the portions of neighbouring townships of Woolwich, East Garafraxa, Mapleton, Guelph/Eramosa, Wellington North and Towns of Grand Valley and Erin. The Centre Wellington WHPA-Q is assigned a significant risk level, therefore water quantity threats were identified in the WHPA-Q.

Tier 3 Assessments were completed for the Town of Halton Hills and the Town of Orangeville. Although the Town of Halton Hills and the Town of Orangeville do not have wells located within the Grand River Watershed, the Wellhead Protection Areas for Quantity extend into the Grand River Source Protection Area.

Threats relating to excavation activities below the water table that breach the confining layer protecting an aquifer for drinking water source are not currently identified as activities that may be a threat to drinking water. The Lake Erie Region Source Protection Committee has urged the Minister of the Environment and the Director of the Source Protection Programs Branch to add excavation that breaches the aquitard protecting a municipal drinking water supply aquifer to the list of activities that are local drinking water threats. The letters sent to the Ministry as well as Ministry's response are attached in **Appendix C**.

The results of the technical studies have been used to develop policies to protect sources of municipal drinking water. These policies have been developed by 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. Public input and consultation has played a significant role throughout the 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. In 2022 the name was changed back to the Ministry of Natural Resources and Forestry. The new and former names of these Ministries are used within this document

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1.0 INTRODUCTION

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 Act 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 Act 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.

Source Protection Committees are working in partnership with municipalities, Conservation Authorities, water users, property owners, the Ontario Ministry of the Environment, Conservation and Parks (MECP), Ministry of Natural Resources and Forestry (MNRF), and other stakeholders to facilitate the update of local, 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. These agencies are responsible for protecting and improving water quality, water quantity and aquatic habitats, providing land use planning and development rules to ensure that water resources are not negatively affected, providing flood management and responses to low water availability, and many others.

1.1 Source Protection Planning Process

The key objectives of this process are the completion of science-based Assessment Reports that identify the risks to municipal drinking water sources, and locally-developed Source Protection Plans that put policies in place to reduce the risks to protect current and future sources of 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. This Assessment Report is a compilation of the findings of the technical studies undertaken in the Grand River Source Protection Area (watershed area).

The Grand River Draft 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.

The Source Protection Plan is a document that contains policies to protect sources of drinking water against threats identified in the Assessment Report. The Plan sets out:

- how the risks posed by drinking water threats will be reduced or eliminated;
- policy, threat and issues monitoring programs;
- who is responsible for taking action;
- timelines for implementing the policies and programs; and
- how progress will be measured.

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. Public input and consultation played a significant role throughout the process.

Following Source Protection Plan approval, annual progress reports on implementation are required. Implementation of the Source Protection Plan is led by municipalities and provincial agencies. In some cases, conservation authorities, public health units, or other organizations may be involved in implementing policies in the Source Protection Plans. The

implementers 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. Actions to reduce the risk posed by activities found to be significant threats are mandatory, since the *Clean Water Act, 2006* requires that all identified significant threats cease to be significant.

1.2 Source Protection Authorities and Regions

The province has organized the Source Protection Program using watershed boundaries, rather than municipal or other jurisdictions. The watershed boundary is the most appropriate scale for water management, since both groundwater and surface water flow across political boundaries. For Source Protection planning purposes, the watershed is referred to as a Source Protection Area under the *Clean Water Act, 2006*. The Grand River watershed forms the Grand River Source Protection Area. Similarly, Conservation Authorities are referred to as Source Protection Authorities under the *Clean Water Act, 2006* and are responsible for facilitating and supporting the development and update of source protection plans.

For the purposes of source protection, the Grand River Source Protection Authority is partnered with the Catfish Creek Source Protection Authority, Kettle Creek Source Protection Authority and Long Point Region Source Protection Authority to create the Lake Erie Source Protection Region. The Lake Erie Source Protection Region is one of 19 Regions established across the province. The Grand River Source Protection Authority acts as the lead Source Protection Authority in the Lake Erie Region.

1.3 Source Protection Committee

In the Grand River Source Protection Area, the source protection planning process is led by a steering committee called the Lake Erie Region Source Protection Committee. The Committee was formed in November 2007, and met monthly until the Proposed Grand River Source Protection Plan was submitted to the Ministry of the Environment in January 2013. Since then the Committee has continued to meet on a quarterly basis. The Committee 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. 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 aboriginal) 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 cease to be significant. 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.

1.4 Framework of the Assessment Report

The Grand River Source Protection Area Assessment Report was completed in compliance with Ontario Regulation 287/07 (General) under the *Clean Water Act, 2006* which sets out the minimum requirements for Assessment Reports. In addition, the technical work summarized in this Assessment Report was completed in conformance with the *Technical Rules: Assessment Report* under O. Reg. 287/07. The technical work was undertaken by municipalities and the Grand River Conservation Authority. Funding to complete the technical studies for the Assessment Report was provided by the Province of Ontario.

Within the Grand River Source Protection Area (SPA), there are 39 upper and lower tier municipalities and two First Nations communities. At present, there are 46 municipal residential drinking water systems, including two integrated groundwater/inland river systems and one inland river system. In addition, one Lake Erie intake located outside of the source protection area (Nanticoke) and one pipeline system from Lake Ontario also supply water to residents in the Grand River SPA.

The *Clean Water Act, 2006* focuses on the protection of municipal drinking water supplies; however, the Act allows for other water systems to be considered, including clusters of private wells, communal systems, and other non-municipal supplies. Only municipalities within which the supplies are located or the Minister of the Environment, Conservation and Parks, have the power to add additional non-municipal systems. To date, no municipalities in the Grand River Source Protection Area have designated non-municipal drinking water supplies under the *Clean Water Act, 2006*. The Minister of the Environment included the Ohsweken Water Treatment Plant: a non-municipal system that serves a major residential development on the reserve of the Six Nations of the Grand River.

The technical studies summarized in this Assessment Report start with information at the watershed scale, and then move to the municipal drinking water system scale. The document is organized into the following sections: Watershed Characterization, Water Quality Threat Assessment Methodology, Water Quality Risk Assessment (including groundwater vulnerability, Water Budget Framework, Tier 2 Water Budget, Tier 3 Water Budgets, and sections dedicated to each municipality's Wellhead Protection Areas and Intake Protection Zones); State of Climate Change Research; Great Lakes Considerations; and Conclusions.

1.5 Continuous Improvement

The findings of this Assessment Report are based on the best available information. It is recognized that new information that informs the findings of this Assessment Report will become available in the future. Beyond the completion of this Assessment Report, municipalities and conservation authorities will continue to refine and improve the findings, and attempt to address the data gaps documented in the Report. As new or improved information becomes available, the relevant components of the Assessment Report will be amended as required. Opportunities for input and review of updated Assessment Reports will be made available to those affected by the proposed changes.