# FREQUENTLY ASKED QUESTIONS

# GUELPH-GUELPH/ERAMOSA TIER 3 WATER BUDGET, RISK ASSESSMENT AND WATER QUANTITY POLICY DEVELOPMENT STUDY

## Contents

## Overview

### 1. What is a Tier 3 Water Budget Study?

A Tier 3 Water Budget is 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 sustained drought. The water budget study uses a computer model to simulate groundwater and surface water flow to evaluate how water levels will change within the municipal wells under the various scenarios. The development of the water budget models will use best available data at the time to understand the groundwater flow system from recharge to discharge areas, and quantify the volume of water flowing through the area. Quantity-related Wellhead Protection Areas and Intake Protection Zones are delineated to identify the subsurface and surface areas where the municipal wells and intakes are sensitive to water takings and reductions to infiltrations of precipitation caused by land use changes.

### 2. How does a Tier 3 Water Budget study fit into the Source Protection Program?

The Source Protection Program under the Province's *Clean Water Act, 2006* (CWA) was developed to protect the water quality and quantity of existing and proposed municipal drinking water systems across the Province. To date, the water quality components of the Grand River Source Protection Plan have been approved and in place since July 1, 2016. A Tier 3 water budget study is a major piece of technical work in the process, and the water quantity components for the Grand River Source Protection Plan are still underway. The Guelph-Guelph/Eramosa Tier 3 Water Budget has been completed, presented to the Lake Erie Source Protection Committee on April 6, 2017, and has been accepted by the Ministry of the Environment and Climate Change. Work has now shifted to developing water quantity policies for the Guelph-Guelph/Eramosa water quantity vulnerable areas

### 3. What is the goal of doing a Tier 3 Water Budget study?

The goal of a Tier 3 Water Budget study is to provide a measured assessment of current and future sustainability of municipal drinking water systems in light of municipal growth and development and climate change such as drought. Specifically, the goal of the study is:

1) to identify municipal systems at risk of water quantity shortages under current conditions, considering the effect of increased water demand from municipal growth, and in the event of a prolonged drought;
2) to identify risk management measures that could be used to ensure the sustainability of the municipal water supplies; and
3) to support the development of water quantity policies for inclusion in a future update of the Grand River Source Protection Plan.

### 4. Why was a Tier 3 Water Budget study undertaken?

The Tier 2 Water Budget and Subwatershed Stress Assessment completed for the Grand River Watershed in 2009 identified the Upper Speed Assessment Area as having a moderate potential for groundwater stress. Since the municipal drinking water systems for the City of Guelph and Guelph/Eramosa Township take groundwater from the Upper Speed Assessment area, a Tier 3 Water Budget and Local Area Risk Assessment was triggered under the *Clean Water Act, 2006*.

### 5. How was the Tier 3 Water Budget study developed?

As part of the Tier 3 Water Budget study, complex surface water and groundwater computer models were developed to help evaluate the sustainability of the municipal water supplies. The models incorporated the best available information about local geology, groundwater and surface water resources, precipitation and infiltration and water withdrawals.

Using the models, the consulting team developed a water budget for municipal water supplies that quantified the additions (e.g., precipitation infiltrating into the ground, runoff to streams and rivers, flow within and between the aquifers) and withdrawals (e.g., surface water and groundwater flowing out of the study area, water taking by municipalities and other users and groundwater contributions to rivers) from a study area. The groundwater and surface water systems are in balance when the water additions and withdrawals are approximately equal.

In addition to the water budget calculations, the models were also used to determine an area where the municipal drinking water systems could be affected by other existing, new or expanded water takings, referred to as a water quantity wellhead protection area (WHPA-Q).

The final task of the Tier 3 Water Budget study was to assign a risk level to the groundwater and surface water quantity vulnerable areas. According to the Technical Rules, the risk level may be “low”, “moderate” or “significant” depending on whether the municipal water supply is predicted to be able to meet the water needs of its customers under the modelled risk scenarios.

### 6. Who is paying for the Tier 3 Water Budget study?

The Tier 3 Water Budget Study is funded by the Ministry of the Environment and Climate Change (MOECC), now the Ministry of the Environment, Conservation and Parks (MECP) and administered by the Grand River Source Protection Authority as the lead authority in the Lake Erie Source Protection Region.

### 7. Who is leading this Tier 3 Water Budget study?

The Grand River Source Protection Authority is the lead authority in the Lake Erie Source Protection Region, responsible for the administration of the Source Protection Program

under the *Clean Water Act, 2006* throughout the Grand River, Long Point Region, Kettle Creek, and Catfish Creek Watersheds. The Lake Erie Region Source Protection Committee has the responsibility to develop and update the Grand River Source Protection Plan, and to ensure that municipal drinking water sources are protected. The Grand River Source Protection Authority was the overall project manager and was responsible for providing the Project Management Team and the Peer Review for the Tier 3 Water Budget study. The Ministry of Natural Resources and Forestry and the Ministry of the Environment and Climate Change participated on the Project Management Team.

The City has been the technical lead with respect to the City's drinking water system and participated on the Project Management Team. Guelph/Eramosa Township has provided input such as operating information/statistics for the model development to ensure proper characterization of the Township's drinking water system.

### 8. What is the role of the municipalities in this Tier 3 Water Budget study?

The initial focus of the study was on the City of Guelph municipal drinking water system, and, as the study area expanded, the municipal drinking water systems of Guelph/Eramosa Township were included in the study. The City of Guelph has provided project management for City tasks and the City's consultant (Matrix Solutions Inc.) for the Tier 3 Water Budget study as per the funding agreement between the City and the Grand River Conservation Authority. The City has been the technical lead with respect to the City's drinking water system and participated on the Project Management Team and as a municipal peer reviewer. Guelph/Eramosa Township owns and operates municipal drinking water systems within the study area, provided input such as operating information/statistics for the model development with respect to their systems, and participated as a municipal peer reviewer in the Tier 3 Water Budget study. The Township of Puslinch and the Town of Erin also participated as municipal peer reviewers and along with the County of Wellington provided comments and input on the draft Tier 3 Water Quantity Risk Assessment phase of the project. The Region of Waterloo was consulted where the Guelph/Guelph-Eramosa Tier 3 model overlapped with the Cambridge Tier 3 model. The Region of Halton has been kept informed by the Grand River Source Protection Authority as the study area extended into Halton.

### 9. What data was included in this Tier 3 Water Budget study?

The study used publicly available data such as geological and hydrogeological datasets of the study area, MECP water well records and logs from high quality boreholes, municipal data such as well pumping rates, well water level data and hydrogeologic and hydrologic data collected during pumping tests, and Grand River Conservation Authority monitoring data such as stream flow data. The initial groundwater flow model for the project was based on earlier models for the City and was expanded to include a larger study area. Information, data and insights from previous hydrogeological studies were also incorporated into this

project. The study has also used high quality water monitoring data from other permitted water takers in important areas, where it was available.

### 10. Who reviewed the Tier 3 Water Budget study?

All Tier 3 Water Budget studies are peer reviewed on behalf of the province by a team of highly qualified third party technical experts working in both academia and private consulting. The goal of the peer review is to ensure the technical merits of the study.

The peer review team was made up of three members:

Tony Lotimer – ARL Groundwater Resources Ltd.
Dr. David Rudolph – University of Waterloo
Dr. Hugh Whiteley – University of Guelph

Information about the municipal drinking water systems was reviewed by the owners of the systems, the City of Guelph and the Guelph/Eramosa Township.

The Townships of Guelph/Eramosa and Puslinch, the Town of Erin, together with Wellington County, were invited as municipal peer reviewers and provided input and comments on the Tier 3 Water Budget study.

### 11. Have other Tier 3 Water Budget studies been done in the Lake Erie Source Protection Region?

Under the *Clean Water Act, 2006,* excluding the Guelph-Guelph/Eramosa Tier 3 Water Budget study, there are four studies that have been/are being conducted: the Long Point Region (Norfolk County) Tier 3 Water Budget study is complete and water quantity policies have been developed and included in the updated Long Point Region Source Protection Plan; the Region of Waterloo Tier 3 Water Budget study is also complete (no policy development required as a result of a low risk level assignment); the risk assessment phase for the Whitemans Creek Tier 3 Water Budget study (municipal supplies in Brant and Oxford Counties) is nearing completion and; the Centre Wellington Tier 3 Water Budget study is ongoing.

### 12. How are neighbouring Tier 3 water budget studies handling any overlap with the Guelph-Guelph/Eramosa Tier 3 study?

Each Tier 3 water budget study is an individual project that follows the same requirements and direction given through the *Clean Water Act, 2006*, and its regulation and technical rules to assess the sustainability of the municipal drinking water systems in the study area.

The Region of Waterloo Tier 3 and Guelph-Guelph/Eramosa Tier 3 Water Budget studies were completed in parallel to ensure that the model results would be consistent in the area where the two Wellhead Protection Area Quantity (WHPA-Q) overlap.

The Centre Wellington Tier 3 Water Budget study has used the most up to date information from the Guelph-Guelph/Eramosa Water Budget study (e.g., geological stratigraphy) when developing the characterization and numerical models. Although not expected, it is too early to know whether the respective WHPA-Qs will overlap.

## Results of the Tier 3 Water Budget Study

### 13. How were Water Quantity Wellhead Protection Areas (WHPA Q) delineated?

The Wellhead Protection Area for water quantity (WHPA-Q) was determined using the groundwater flow model. A technical definition of the WHPA-Q is found in the provincial Technical Rules, but essentially the WHPA-Q is the drawdown from the municipal water supply wells when pumping plus the additional drawdown of other permitted water takings (residential, industrial, commercial, institutional, recreational, etc.) when pumping. It also includes any surface water drainage area that contributes a significant proportion of surface water to the wells and any area where a future reduction in recharge would have a measureable impact on the municipal wells. Since the WHPA-Q must include the influence of drawdown from other permitted takings, it extends beyond what it would if it contained only the municipal wells. As a result, the WHPA-Q extends beyond the City's limits into other municipalities.

### 14. How was the Water Quantity Intake Protection Zone (IPZ-Q) determined?

For surface water intakes, the surface water quantity intake protection zone (IPZ-Q), corresponds to the drainage area that contributes surface water to the intake and the area that provides recharge to aquifers that contribute groundwater discharge to the drainage area. For this Tier 3 Water Budget study, the drainage area that contributes surface water to the City of Guelph's Eramosa River Intake was delineated as the Eramosa River upstream of the intake and tributaries which supply the Eramosa River (e.g., Blue Springs Creek). Areas that lie outside of this drainage area but still provide recharge to an aquifer that contributes groundwater discharge to the drainage area were delineated using particle tracking tools in the groundwater flow model.

### 15. How were risk levels assigned to WHPA-Qs?

The municipal water supply systems were assessed using the groundwater flow model to determine the sustainability of the system under a number of scenarios. The scenarios included existing and future pumping rates as well as under average climate and prolonged drought conditions. According to the Technical Rules, the risk level may be "low", "moderate" or "significant" depending on whether the municipal water supply is predicted to be able to meet the water needs of its customers under the modelled risk scenarios. For example, if, under sustained drought conditions, the water level in a municipal well is predicted to be lowered to a level too close to the well pump intake for safe operation, the

well would trigger a significant risk level. The Technical Rules guiding the Tier 3 Water Budget study followed a conservative approach to ensure the cumulative effects of water takings across the vulnerable area are included in the assessment. As a result, the highest risk level triggered in at least one well is assigned to the entire vulnerable area. For example, if the scenario for current and future municipal needs produced a "low" risk, but the added stress of a sustained drought produced a "significant" risk level, the vulnerable area would be assigned a "significant" risk level. If this significant risk level was found for one well, the significant risk level was also assigned to the entire water quantity vulnerable area.

The Tier 3 Water Budget study scenarios predicted that the City of Guelph's and Guelph/Eramosa Township's municipal wells can meet current needs. However, the assessment predicted that the City's Queensdale municipal well would be unable to meet future needs under normal climate conditions and during prolonged drought. All of the City's other wells and Guelph/Eramosa Township's wells are expected to be able to meet future needs under all scenarios, but there is a high level of uncertainty with the results for the City's Arkell Well 1. As a result of these assessments, and since the City's drinking water system is dependent on the contribution of water from the Eramosa River intake, the WHPA-Q and IPZ-Q for the City of Guelph and Guelph/Eramosa Township's municipal wells for Hamilton Drive are assigned a significant risk level.

### 16. Do the results align with the current understanding of the municipal water supply systems?

The Tier 3 Water Budget study results are supported by historical operating experience in the City of Guelph where many of the wells reliably provided water over prolonged periods of time. The City primarily draws water from the deep bedrock aquifer which is protected in most areas by a protective layer. The protective layer isolates the deep bedrock aquifer from short-term changes in climate (e.g., a dry summer with little rainfall) and it takes a prolonged drought, as Ontario experienced in the early 1960s, for declines in water levels to be observed in City's wells. The significant risk level assigned to the WHPA-Q is triggered by a simulated water level that falls below the safe available drawdown in the Queensdale Well and due to a high level of uncertainty with the results for the City's Arkell Well 1. However, a number of other City wells (Arkell Well 1, Arkell Well 8, Arkell Well 14, Arkell Well 15, Burke Well, Carter Well, Emma Well) and Guelph/Eramosa Township's Bernardi Well 3 were very close to trigger limits indicating they may be more susceptible to prolonged drought. This information helps the City and Guelph/Eramosa Township develop plans for how to service their communities during drought periods. With the addition of new Arkell Spring Grounds wells, the City's water supplies have the capacity to meet the 2031 estimated water demand.

### 17. What are Significant Water Quantity Threats?

Significant water quantity threat activities are defined by the Province in the *Clean Water Act, 2006* and include the consumptive taking of water and recharge reduction. Since the

Tier 3 Water Budget study identified areas where the municipal systems may be affected by water takings (WHPA-Q or IPZ-Q), all water takings that could potentially impact the municipal systems were identified. For water quantity wellhead protection areas with a significant risk level, all existing and new water takings located within the area that draw water from the source aquifers or Eramosa River or activities that reduce groundwater recharge are classified as Significant Drinking Water Quantity Threats (significant threats). The City and Guelph/Eramosa Township municipal wells are significant threats as are all other permitted water takings in the WHPA-Q and the IPZ-Q.

**18. Did the Tier 3 Water Budget study consider groundwater – surface water interactions?**

The Tier 3 Water Budget study used integrated groundwater and surface water models. The groundwater flow model relied on a surface water model to provide recharge rates across the model area with the recharge rates determined based on comparisons to local streamflow. In addition, the groundwater flow model was calibrated to stream flow to ensure that the model adequately predicted groundwater discharge to surface water. The groundwater flow model was found to have a reasonable match between model predicted flows and the actual stream flows, which means the groundwater recharge rates and the stream discharge rates used in the model are representative of existing conditions. These results are important because it provides validation that the water budget estimates for groundwater and surface water are generally reliable.

**19. The provincial peer reviewers deemed the Tier 3 model "fit for purpose" – what does that mean?**

Surface water and groundwater models are designed to answer specific questions using the best available data for a certain scale (i.e., watershed vs property scale). The Tier 3 water budget was designed to assess the sustainability of the municipal water systems at the regional scale. While the model adequately captures the regional water budget and predicts water levels in municipal wells, there may be local geographical areas were the model does not predict groundwater and surface water flow as well. For example, the model captures the water flowing in and out of certain section of a river on a larger scale, but may not capture all of the complex water movement between the river and the underlying aquifer at the local scale.

A model is considered "fit for purpose" if it meets its intended purpose. The purpose of the Tier 3 model was to assess the sustainability of the municipal water supplies. For the Tier 3 model, the determination of "fit for purpose" was made on behalf of the province by a team of highly qualified third party technical experts working in both academia and private consulting.

Based on the technical review by the provincial peer reviewers, the Ministry of the Environment and Climate Change has also endorsed the results of this Tier 3 Water Budget study in March 2017.

**20. Will the outstanding technical concerns raised by municipal peer reviewers be addressed?**

During the municipal peer review process the Townships of Guelph/Eramosa and Puslinch raised technical concerns about how specific geographical areas were captured in the model (e.g. Eramosa River downstream of Eden Mills). Since the Tier 3 is a regional scale model, it may not accurately predict water movement at the local scale (i.e., movement of water between the Eramosa River and the fractured bedrock aquifer for a specific section of the river), but still adequately captures the regional water balance. The provincial peer reviewers determined that the Tier 3 Water Budget study was "fit for purpose" (see FAQ question 19) and could move forward because the model adequately captures the regional and predicted water levels in the municipal wells.

However, the provincial peer reviewers also commented on the need to consider new information as it becomes available and look at opportunities for further hydrogeological studies to refine the Tier 3 model and reduce areas of uncertainties. Lake Erie Source Protection Region will consider including additional projects in future work plans, as necessary, to update the Grand River Assessment Report and Source Protection Plan.

## How will the Tier 3 Water Budget study results help with water management in the area?

**21. How will the Tier 3 Water Budget study results be used by municipalities?**

The results of the Tier 3 Water Budget study help guide municipalities in optimizing their current and future water takings across the water quantity wellhead protection area and intake protection zone (WHPA-Q and IPZ-Q).

The numerical groundwater flow model provides valuable information to assist municipalities in developing optimal pumping schedules for their municipal wells so that the municipal drinking water wells can provide the maximum amount of drinking water with minimal environmental impact. The results of the Risk Management Measures Evaluation Process also provide a foundation and a technical basis that will inform the development of water quality policies for the Grand River Source Protection Plan.

**22. Will the Tier 3 Water Budget study results affect private residential wells?**

The Tier 3 Water Budget study, while it considers all water takings, is primarily focused on larger permitted water takings such as municipal and industrial/commercial/institutional

takings. The results of the Risk Management Measures Evaluation Process will inform what measures may be considered to manage the risks of the permitted water takers and to what extent the water quantity policies will impact private residential wells. Residential wells are dispersed, single wells with low pumping rates which generally would have a limited effect on the WHPA-Q and IPZ-Q.

**23. Will the Tier 3 Water Budget study results also be used to protect private residential wells?**

Private residential water supplies are protected through the Ontario Water Resources Act (OWRA), in particular the Wells Regulation, and associated guidelines for developing new private water supplies. The OWRA was developed to protect all water users and ensure that additional water takings do not impact existing users, including private wells. In addition, municipal Official Plans have general policies regarding protecting and maintaining existing urban and rural water supplies.

The results of the Tier 3 Water Budget study and the new modelling tools provide the MECP and municipalities with better understanding of regional hydrogeology, and a new tool to evaluate proposed permitted water takings and the potential for cumulative effects. As such, the technical results of the Tier 3 Water Budget study can be used together with the OWRA and municipal plans to identify the opportunities and constraints of taking additional water supply in the WHPA-Q and IPZ-Q. In this manner, proposals for increased or new water takings can be evaluated to ensure that they do not have an adverse effect on existing residential wells.

**24. How will the Tier 3 Water Budget study results inform municipal land use planning?**

Protecting groundwater and surface water resources is already a component of municipal planning through requirements in the Provincial Policy Statement. The Tier 3 Water Budget study will complement existing municipal planning to ensure that the quality and quantity of groundwater and surface water are protected as an essential resource for water supplies, agricultural production, the maintenance of the natural systems, and future growth.

**25. How will the Tier 3 Water Budget study results impact municipalities' ability to grow?**

The Tier 3 Water Budget study provides municipalities with information to help manage the planned growth and future water demands needed for the growing communities. The Tier 3 Water Budget study results will complement and enhance the existing municipal planning process. There is now resource management information on how much water supply is available locally which can be used to determine how growth can be sustained and where growth may be located to minimize effects on groundwater and surface water.

**26. Will the Tier 3 Water Budget study results restrict industrial development on private water services?**

New water takings will be evaluated in a similar manner as in the past. Where necessary the Tier 3 Water Budget study results and new modelling tools will be used to better understand the potential impacts of the new taking. It is too early to determine whether new takings may be restricted in certain areas. The results of the Risk Management Measures Evaluation Process (RMMEP) show that existing non-municipal water takings within WHPA-Q, with the exception of dewatering at the Dolime quarry, have little impact on the municipal wells. The results also show that there may be some capacity within WHPA-Q in some areas for increased/new takings. The water quantity policy development is the next phase in addressing the significant risk level and will provide better information to answer this question.

**27. How will the Significant Water Quantity Threats be addressed?**

The Risk Management Measures Evaluation Process (RMMEP) concluded with a list of recommended Risk Management Measures; these provide information about the most promising measures to reduce the risk to the municipal drinking water supplies. Potential risk management measures for municipal water systems may include a variety of water conservation and efficiency and demand management methods as well as wellfield optimization and water loss control programs. The addition of new water supplies is also recommended. Industrial and commercial management measures may include methods such as increased water efficiency, water reuse and industrial operation/process changes. Measures that help maintain or increase groundwater recharge may also be used.

**28. How will the Ministry of the Environment and Climate Change incorporate the Tier 3 Water Budget study results into Permit to Take Water decisions?**

The completion of the Tier 3 Water Budget study and the Risk Management Measures Evaluation Process provides the Ministry with additional technical information about cumulative effects of the water takings in the Guelph area, in particular the effects on the City of Guelph and the Guelph/Eramosa Township municipal water systems. The results of these technical studies indicate that there is a need to look closely at all long-term Permits to Take Water within the water quantity wellhead protection area and intake protection zone (WHPA-Q and IPZ-Q) to evaluate their contribution to water quantity stress in this area.

In addition to site specific information, applicants will also be expected to consider the results of the technical studies in the preparation of their applications. The Ministry will consider the results of the Tier 3 water budget study and RMMEP when reviewing Permit to Take Water applications and ensure appropriate conditions are in place to manage the takings.

**29. How should applicants incorporate the Guelph-Guelph/Eramosa (GGET) Tier 3 Water Budget study results into their Permit to Take Water applications?**

Permit applicants located in the Guelph-Guelph/Eramosa water quantity wellhead protection area and intake protection zone (WHPA-Q and IPZ-Q) can access the GGET Tier 3 Water Budget study technical report to further review the findings of the study. The Ministry is working with the City of Guelph and Lake Erie Source Protection Region to provide Permit applicants access to supporting data and models when relevant to the proposed water taking. This information is intended to be available by the time the Grand River Source Protection Plan is updated to include the Tier 3 Water Budget study results and water quantity policies (anticipated in 2019). In the meantime, the Ministry encourages Permit applicants to contact the Permit to Take Water Evaluator (telephone: 905-521-7394 or 1-800-668-4557) at the Ministry's West Central Office in Hamilton to discuss these new considerations before submitting an application for a Permit To Take Water.

**30. Will PTTW applicants have to use the GGET Tier 3 water budget model to prepare their applications?**

The water budget technical work considered all of the existing permitted water within the Tier 3 water budget study area, a large area beyond the water quantity vulnerable areas. In most cases, existing permit holders will not need to use the model in the preparation of their renewal applications.

However, proponents seeking new or increased takings will need to consult the results of the Tier 3 water budget technical study and may need to access the model to further evaluate any effects their proposed taking might have on the long-term sustainability of the municipal wells.

The Ministry is funding the Lake Erie Source Protection Committee to undertake an assessment of the sensitivity of the municipal wells within the vulnerable areas to water takings to better define where applications may need to be evaluated using the model.

**31. What if a PTTW applicant disagrees with the model results?**

The amount of geological and hydrogeological information supporting the Tier 3 water budget model varies across the modelled area with the highest density of information available in the vicinity of the municipal wells and other large water takers that shared hydrogeological data. The Province will work to engage relevant parties to discuss the available technical data and consider best available information in the review of the application.

The project partners recognize that the continued use of the Tier 3 model in water management decisions is contingent upon ensuring that the model continues to reflect the best available information about area geology, groundwater and surface water conditions.

The Grand River Conservation Authority and the City of Guelph is leading the development of processes to ensure that the model is maintained and updated as needed.

## Information about other resource management issues

**32. What is the Province doing to enhance groundwater protection in light of Source Protection?**

Source Protection Plans and technical work are an important piece of the Province's commitment to protecting water supplies against climate change (i.e., drought), population growth and increasing water demand. The Province has worked closely with source protection authorities and municipalities through the water budget process and has committed to implementing the source protection plan polices. The information generated through source protection will help to inform decisions on Permit to Take Water (PTTW) applications. The PTTW program is Ontario's primary tool to ensure water takings are sustainable and that the source protection water budget results are being considered in water taking management decisions.

On December 17, 2016, the Ministry of the Environment and Climate Change also enacted a moratorium banning new water bottling facilities from taking groundwater, and prohibiting existing facilities from increasing their groundwater taking or testing for future groundwater sources throughout Ontario.

While the moratorium is in force, the Province plans to further strengthen water protection in Ontario by:

- Undertaking research to improve understanding of water resources by building on existing information, including the source protection water budgets,
- Examining how pricing and other program and policy tools could be used to help manage and protect water resources,
- Reviewing existing rules for water takers to ensure long-term water protection, including considering the impacts of climate change and population growth on future demands of water sources, and
- Consulting with communities, industry and Indigenous partners on changes to water management practices before they are implemented.

**33. How will the Moratorium and the Tier 3 Water Budget study results affect Nestlé Waters Canada's Aberfoyle water bottling facility and their water taking permit?**

The moratorium applies only to new water bottling facilities that are required to obtain a permit to take water or to an existing bottling facility that wants to increase the amount of water it is authorized to take under its permit. Nestlé Waters Canada is applying to renew its

existing permit to take water at the Aberfoyle facility for the same amount of water. Therefore, the moratorium does not apply.

The Ministry is currently reviewing Nestlé Waters Canada's Aberfoyle permit renewal application and supporting documentation. Under the Ontario Water Resources Act, if an application for renewal of an existing permit is made at least 90 days before its expiry, the permit remains in force until the Ministry makes a final decision on the permit renewal application.

Nestlé Waters Canada's permit renewal is subject to the new stringent rules for existing water bottlers. As such, Nestlé Waters Canada will be required to update their application to comply with these new rules. For Nestlé Waters Canada to meet the new provincial guidelines for water taking permits, the City of Guelph has signed an agreement to provide Nestlé Waters Canada with access to analysis from its science-based Tier 3 groundwater flow model through a consultant.

Once revised, Nestlé Waters Canada's permit application for Aberfoyle will be posted on the Environmental Registry for 90 days public review. All comments received during the comment period will be carefully considered by the MECP before a decision is made

**34. How does the proposed study area for potential Greenbelt expansion to protect water resources in the outer ring of the Greater Golden Horseshoe affect the water quantity policy development process?**

The Province recently consulted on a study area for potential Greenbelt expansion under EBR#013-1661. The study area includes locations with high concentrations of important water features (e.g., moraines, coldwater streams, wetlands, and recharge features). The Province is concerned about pressure from current or forecasted urban development. At this time, the Province is not consulting on a proposed Greenbelt boundary. Input received through the EBR consultation will help inform decisions on how to move from a study area to a proposed Greenbelt boundary. The Province would consult further on a proposed boundary before any boundary changes are made. The water quantity policy development study is undertaken independently from the Greenbelt study area consultation, and focuses on the protection of sources of municipal drinking water. Specifically, Permits to Take Water are not subject to the Greenbelt Plan.

## Water Quantity Policy Development

**35. What is a Risk Management Measures Evaluation Process?**

Following the completion of the Tier 3 Water Budget study, and as a first step in developing water quantity policies, a Risk Management Measures Evaluation Process (RMMEP) has been undertaken. The RMMEP is a collaborative project amongst municipal partners, the

Province and the Lake Erie Source Protection Region. The purpose of the RMMEP is to identify and rank the significant drinking water quantity threats, using the Tier 3 model, including permitted and non-permitted consumptive water takings and recharge reduction.

Informed by the threats ranking, a number of Risk Management Measures (RMMs) are then selected and evaluated. Risk management measures that are evaluated include options such as optimized municipal pumping; water conservation and efficiency, water loss management, recharge maintenance, and education and outreach programs. The results of the RMMEP are then summarized in a Threats Management Strategy (TMS), including a discussion of the specific RMMs recommended to address the water quantity risk. The results of the RMMEP will be used to help guide the development of Source Protection Plan water quantity policies.

### 36. What are the results of the Risk Management Measures Evaluation Process?

The following presents a summary of the results of the RMMEP. More detailed results can be found in the technical reports available at www.sourcewater.ca/GGET-Tier3.

Threats Ranking and Identification of Impact

The threats ranking quantifies the influence pumping wells have on the predicted drawdown at each municipal well. This influence is presented as percent impact and the pumping wells are ranked in order of descending percent impact. The results are a relative comparison of threats.

*Municipal Well Results*

Municipal wells can be a threat to themselves. That means that when municipal wells pump water out of the ground, the drawdown at the municipal wells is increased, leaving less water available for taking. Queensdale well is ranked #1 with a 72% impact on itself, meaning that 72% of the overall drawdown at the Queensdale well is caused by the pumping of this well. The Arkell system as a whole is ranked #2 with a 53% impact on Arkell Well 8. It was expected that Queensdale well and Arkell Well 1 (as part of the Arkell system) ranked high as these were the two wells that triggered the significant risk level. Results for other municipal wells vary in percent impact and can be viewed in the technical reports.

*Non-Municipal Results*

Individually, the majority of non-municipal water taking has little influence on municipal wells. The exception is the dewatering permit at the Dolime Quarry that is ranked #3 and responsible for 50% of the predicted drawdown at the Membro well. All other permitted, non-municipal takings exert 10% influence on the municipal wells. As examples, the 10% influence includes Gay Lea (rank #19), responsible for 2% drawdown at the Emma well, and Nestle (rank #20), responsible for 1% drawdown at the Burke well.

*Recharge Reduction and Domestic Wells*

The combined influence of recharge reduction from planned land development (rank #15) is responsible for 9% drawdown at the Burke well, and the combined influence of all domestic wells (rank #21) is 1% drawdown at the Helmar well.

Selection and Evaluation of Risk Management Measures

Evaluation results show that measures that included pumping optimization and a combination of either demand reductions through conservation programs, the addition of new supplies, or cessation of dewatering at Dolime Quarry were successful in reducing the risk to municipal wells. However, these scenarios also predicted potential reductions in groundwater discharge to some cold water streams that need to be managed through source protection plan policies and further evaluated through water supply management. The results of a sensitivity analysis also show that there may be some capacity within WHPA-Q in some areas for increased/new takings.

Threats Management Strategy and Recommended Risk Management Measures

The Threats Management Strategy (TMS) makes recommendations about risk management measures based on what was learned from the model scenarios. Recommended measures include: well optimization, water conservation and efficiency, addition of new water supplies, maintaining pre-development aquifer recharge rates, and mitigating impacts from non-municipal consumptive water takings.

### 37. What is a Water Quantity Discussion Paper and what is its purpose?

The water quantity discussion paper is part of the process to update the Grand River Source Protection Plan to address water quantity threats in the vulnerable areas and aids policy makers by providing background information on technical studies, drinking water quantity threats, existing legislation, policies and programs, and a review of policy tools and approaches available. The discussion paper also considers promising policy tools that could be used to protect water quantity sources. The promising policy tools are informed by the results of the Risk Management Measures Evaluation Process (RMMEP) and specifically focus on the higher ranked threats.

### 38. How have other Source Protection Regions managed water quantity threats?

To a large degree, water quantity policies relied on the provincial Permit To Take Water (PTTW) program to address significant drinking water threats for water takings. Policies were developed that direct the MECP to ensure that existing and future PTTW include terms and conditions that protect the quantity of municipal drinking water sources.

To address significant drinking water threats for reduction in recharge, land use planning policies were used to ensure land development maintains groundwater recharge, and ensuring growth and development decisions consider the results of the Tier 3 water budget.

A number of specify action policies were also used to direct the province and municipalities to undertake specific actions, such as water conservation, enhanced local coordination about water management decisions, strengthening linkages between growth planning, land development and water management decisions, and future funding for maintenance of the Tier 3 water budget models.

**39. Can a water quantity policy be directed at an individual PTTW holder?**

The *Clean Water Act, 2006*, its regulations and rules do not restrict the use of policy tools to individual PTTW holder, and as such this would be an option that could be considered. As part of the policy development process, many factors will be considered and evaluated, and it is too early to speculate whether a policy would be directed at an individual permit holder. The Lake Erie Region Source Protection Committee, a multi-stakeholder committee, is ultimately responsible for the development of source protection plan policies. The currently approved Source Protection Plans in the Lake Erie Region do not include policies directed at individual permit or license holder.

**40. Can prohibition policies be used to address significant water quantity threats?**

Prohibition is a policy option that is allowed under the *Clean Water Act, 2006*. It is the strongest tool available under the Act. As per regulation under the Act, the Source Protection Committee can only use prohibition of existing activities if no other policy option would satisfactorily address the significant drinking water threat.

For significant water quality threats, only in very few instances have existing activities been prohibited in the approved Source Protection Plans in the Lake Erie Region. For future significant water quality threat activities, prohibition has been a more common approach in the immediate area of a municipal well (i.e., WHPA-A).

For water quantity, the technical work undertaken as part of the Guelph-Guelph/Eramosa Tier 3 Water Budget and Risk Assessment indicates there is some capacity within some areas of the WHPA-Q1 for existing and additional water takings if managed sustainably. As part of the policy development process, many factors will be considered and evaluated to ensure sustainable use, and all policy tools will be considered as policy options to address water quantity.

**41. Can policies be directed to non-permitted water takings**

All water takings located in the water quantity vulnerable area that draw water from the municipal aquifer without returning it to the aquifer are identified as significant drinking water threats. Currently, under the *Ontario Water Resources Act,* some of these takings may be exempt from water taking regulations including takings for private residential use, livestock watering, frost protection for crops and firefighting. With the exception of firefighting, the exemption applies to these water takings below a rate of 379,000 L/day in accordance with

the Great Lakes-St. Lawrence River Basin Sustainable Water Resources Agreement of 2005.

The *Clean Water Act* provides the Source Protection Committee with Part IV policy tools to address gaps in the provincial regulatory framework. For example, Part IV tools could be used to require exempted takers to measure and report their water usage. As part of the policy development process, the Project Team will be evaluating whether the technical work identifies a need to increase management efforts for these takings.

**42. Who is participating in the water quantity policy development process?**

A Project Team comprised of staff from the City of Guelph, Wellington County, Wellington Source Water Protection, Township of Guelph/Eramosa, Grand River Conservation Authority, and the Ministry of Environment, Conservation and Parks is leading the policy development process on behalf of the Lake Erie Region Source Protection Committee, which ultimately is responsible for the development of the policies and update to the Source Protection Plan.

An Implementing Municipalities Group (IMG) and Community Liaison Group (CLG) have been established to include municipalities, stakeholders and the general public in the policy development process. The IMG consists of representatives from municipalities on the Project Team, plus Township of Puslinch, Town of Erin, Region of Halton, Towns of Milton and Halton Hills, Region of Waterloo, and Township of Woolwich. The CLG consists of representatives from the communal/commercial sector (Victoria Park Golf, Springfield Golf and Country Club), business (Meadows of Aberfoyle), Academia (University of Guelph), Conservation (Eden Mills Millpond Conservation Association), Industrial (Nestle Waters, Bount Canada, LafargeHolcim, River Valley Development), Environment (Wellington Water Watchers), public at large, and the neighbouring Source Protection Region (Halton-Hamilton). All PTTW holders in the WHPA-Q were invited to participate on the CLG.

Draft water quantity policies, once developed, are presented to the Lake Erie Region Source Protection Committee for discussion and endorsement, and are then included in an updated Grand River Source Protection Plan. The updated Plan is undergoing public consultation before being submitted to the Ministry of Environment, Conservation and Parks.

## Next Steps

**43. What are the next steps following the completion of the Risk Management Measures Evaluation Process and Water Quantity Policy Discussion Paper?**

With the completion of the RMMEP and Water Quantity Policy Discussion Paper, the Project Team has started discussions on policy development to address the significant water quantity risks in WHPA-Q. The discussions include input from the Community Liaison Group

(CLG) and Implementing Municipalities Group (IMG), and updates are brought forward to the Lake Erie Region Source Protection Committee on a regular basis for their discussion and direction. It is expected that an updated Grand River Source Protection Plan including proposed water quantity policies for the Guelph-Guelph/Eramosa WHPA-Q will be ready for formal public consultation in April 2019.

## How do I learn more?

**44. Where can I find ongoing communications and information about the Tier 3 Water Budget study?**

Updates are provided through the Lake Erie Source Protection Region website: www.sourcewater.ca/GGET-Tier3.

**45. Is the Tier 3 report written in plain language or is it technical?**

The Tier 3 Water Budget study is a detailed scientific technical study. The reports are written as technical documents. However, to help interpret the findings, an executive summary is also available along with the final report and can be found at www.sourcewater.ca/GGET-Tier3.

**46. Where can I find the Lake Erie Region Source Protection Committee's meeting agenda package and meeting minutes?**

The Committee's agenda package and meeting minutes can be found on the Lake Erie Region's website at https://calendar.sourcewater.ca/