City of Kingston
Information Report to Council
Report Number 21-173

To:	**Mayor and Members of Council**
From:	**Peter Huigenbos, Commissioner, Business, Environment & Projects**
Resource Staff:	**Julie Salter-Keane, Manager, Climate Leadership Division**
Date of Meeting:	**June 22, 2021**
Subject:	**Drinking Water Source Protection and Private Wells**

Council Strategic Plan Alignment:

Theme: 1. Demonstrate leadership on climate action

Goal: See above

Executive Summary:

At the September 17, 2019 Council meeting, Council passed a motion directing staff to work with the Cataraqui Region Conservation Authority (CRCA) and KFL&A Public Health to assess the impact of Council's decision to declare a Climate Emergency on private wells through the lens of the Cataraqui Source Protection Plan and pending changes to the Provincial Policy Statement, and to report back to Council in Q1 2020 with an update.

Staff provided Report Number 20-097 to Council on March 24, 2020 to provide an update on the scope of the Cataraqui Source Protection Plan, the water quality and quantity monitoring programs conducted by the CRCA, the new Provincial Policy Statement 2020, and the current City practices and procedures when evaluating new development/projects on private wells.

As indicated in Report Number 20-097, this report includes a review of practices in other municipalities on how groundwater data is developed that identifies groundwater quality and quantity strategies for private services within the rural areas.

This report also provides an overview of the Guidance Documents that CRCA have developed for source water protection including the Groundwater Vulnerability Guideline. CRCA recently provided the Guideline to City staff preparing this report. This guideline has been prepared to

help support the protection of clean and plentiful drinking water sources in the Cataraqui Source Protection Area (CSPA). The objective of the guideline is to identify the requirements for proponents of developments, consultants and planning approval authorities to:

- Assess the inherent vulnerability of the groundwater in a local area (i.e. property parcel or small group of contiguous parcels) based on typically available desktop and field data such as nearby well records, soil maps and bedrock information, soil test pits and field surveys.
- Identify the presence, extent and impact on groundwater vulnerability of karst features on a property.

Water security is a significant endeavour and the CSPA Groundwater Vulnerability Guideline was created to be used by municipalities and others as a reference for determining areas of concern on a site-specific scale. The outcome of the guideline is similar to the other studies in Ottawa and Hamilton described within this report.

The overall protection of groundwater resources (water security) is a priority of CRCA and the City. The implementation of the guideline would support municipal development review processes, help protect the sensitive groundwater areas (highly vulnerable aquifer) and identify requirements proponents of developments, consultants and planning approval authorities to assess the vulnerability of groundwater at a property scale.

The following review outlines some of the existing tools available through CRCA and outlines the thorough review that City staff undertake on development applications demonstrating that the objective for the long-term protection of groundwater resources are in progress.

Recommendation:

The report is for information only.

Authorizing Signatures:

ORIGINAL SIGNED BY COMMISSIONER

Peter Huigenbos, Commissioner, Business, Environment & Projects

ORIGINAL SIGNED BY CHIEF ADMINISTRATIVE OFFICER

Lanie Hurdle, Chief Administrative Officer

Consultation with the following Members of the Corporate Management Team:

Paige Agnew, Commissioner, Community Services	
Brad Joyce, Commissioner, Corporate Services	Not required
Jim Keech, President & CEO, Utilities Kingston	Not required
Desirée Kennedy, Chief Financial Officer & City Treasurer	Not required
Sheila Kidd, Commissioner, Transportation & Public Works	Not required

Options/Discussion:

Staff presented an Information Report to Council in March 2020 titled 'Drinking Water Source Protection and Private Wells' (Report Number 20-097). The report provided an update to Council on the scope of the Cataraqui Source Protection Plan, the water quality and quantity monitoring programs conducted by CRCA, the new Provincial Policy Statement 2020 and the current City practices and procedures when evaluating new development/projects on private wells.

As indicated in Report Number 20-097, this report includes a review of best practices in other municipalities on how groundwater data is developed that identifies groundwater quality and quantity strategies for private services within the rural areas. This report also includes an overview of the CSPA Groundwater Vulnerability Guideline that has been prepared to help support the protection of clean and plentiful drinking water sources in the CSPA.

Staff also undertook a review of the Official Plan to ensure the policies are consistent with the Provincial Policy Statement 2020 and submitted Report Number PC-20-040 to the Planning Committee in May 2020.

Municipal Programs - Groundwater Resources

City of Ottawa - East Ottawa Groundwater Study Analysis and Mapping (Aquifer Screening (Vulnerability/Capacity) Tool)
The City of Ottawa is developing an aquifer capability screening tool (ACST) within eastern rural Ottawa to assist in determining the development potential of lands for private servicing (private wells). The ACST will consist of maps of predicted water quantity and water quality. The maps will be created using existing water quantity and water quality information. The ACST is a map that describes the relative degree of natural protection of groundwater resources from contamination due to the physical characteristics of the land and subsurface. The mapping is conducted at a regional scale and is used as a screening tool to support regulation of land use in sensitive areas. These overview studies do not replace site specific investigation and are not used for lot scale assessment.

City of Ottawa - Thin Soils Vulnerability Tool
A thin soils vulnerability tool (map development) was conducted by the City of Ottawa, primarily to deal with thin soils found towards the western boundary. The mapping project was undertaken to determine hydrogeologically sensitive areas (i.e. no development in karst areas unless there is adequate protection). City staff created maps of overburden thickness by using pre-existing data from:

- Environment Protection Act (O. Reg 153)
- On-site testing results
- Ontario Geological Survey overburden mapping
- Geological Society of Canada overburden mapping
- City of Ottawa LIDAR and bedrock mapping to calculate overburden

If the area had less than 2 metres of soil in either of the three maps, it was noted as “thin soils” and considered vulnerable. This is a warning to developers as a conservative screening tool that for these areas a hydrogeological report would be required and proof that adequate protection would be provided.

City of Hamilton - Rural Development Status Report
The City of Hamilton's Sustainable Initiatives (SI) Department is consolidating the Source Water Protection (SWP) studies, subwatershed assessments and Stormwater Master Plan studies to better understand and plan around hydrogeologically vulnerable areas in rural Hamilton. The purpose of this project is to develop mapping products that will identify where development could be more easily facilitated and, conversely, where local features may constrain development plans.

The goal is to build on existing Clean Water Act Aquifer Vulnerability Index (AVI) mapping by including other data sources and map layers to produce a scoring or screening system to support the development review process. The objective of this project is to develop comprehensive mapping tools to help applicants through the planning approval process. The goal is to produce a scoring or screening system to support the development review process.

Cataraqui Source Protection Area Groundwater Vulnerability Guideline
The CSPA Groundwater Vulnerability Guideline was completed by GeoFirma Engineering and outlines the process required to determine whether an individual site has a highly vulnerable aquifer (HVA) and if there are karstic features present. CRCA recently provided the guideline to City staff to assist in the preparation of this report. The goal of the guideline is to prevent future problems in communities by identifying potential pathways of water into the subsurface before development begins, and tailor the development to meet the needs of the proponent while curtailing environmental impacts. This guideline was prepared to help support the protection of clean and plentiful drinking water sources in the CSPA.

The objective of the guideline is to identify the requirements for proponents of developments, consultants and planning approval authorities to:

- Assess the inherent vulnerability of the groundwater in a local area (i.e. property parcel or small group of contiguous parcels), based on typically available desktop and field data such as nearby well records, soil maps and bedrock information, soil test pits and field surveys.
- Identify the presence, extent and impact on groundwater vulnerability of karst features on a property.

This is important because of the shallow soils, fractured bedrock and high-water table in much of the CSPA, and because karst is present in some areas.

The guideline is intended to assist land use planning authorities, development proponents and consultants within the CSPA in the assessment of groundwater vulnerability during the development application process.

This guidance applies to:

- multi-lot severances and developments;
- commercial developments;
- industrial developments; and
- any new land use that will store or handle hazardous materials such as those identified by Policy 5.5.1-HR in the Cataraqui Source Protection Plan (CRCA, 2014).

The overall objective of the vulnerability assessment is to determine whether a site is underlain by an HVA. The approach is to determine the intrinsic susceptibility index (ISI) for the site and determine if the regional identification of an HVA is still valid at the site scale. In this document the term “site” refers to a proposed development site.

Water security is a significant endeavour and the CSPA Groundwater Vulnerability Guideline was created to be used by municipalities and others as a reference for determining areas of concern on a site-specific scale. The implementation of the guideline supports municipal development review processes, helps protect the sensitive groundwater areas (HVA) and identifies requirements proponents of developments, consultants and planning approval authorities to assess the vulnerability of groundwater at a property scale.

The outcome of the findings of the CSPA Groundwater Vulnerability Guideline is similar to the other studies described above in other municipalities.

When the City assesses development applications for land use changes in the rural area, applicants are required to submit a planning rationale and other supporting documents which must address the HVA and Significant Groundwater Recharge Area’s (SGRA) policies applicable to the site.

As per Section 5.A.5. of the City’s Official Plan, “*Within the Highly Vulnerable Aquifers and Significant Groundwater Recharge Areas shown on Schedule 11-B, proposals for new development, or the expansion of existing development for land uses that constitute a drinking water threat may be required to incorporate measures to adequately mitigate and manage any risk to source water posed by the proposed development, to the satisfaction of the City in consultation with the Cataraqui Source Protection Authority*.”

The CRCA assists City staff in the review of the HVA and SGRA policies in the Official Plan when reviewing development applications in the rural area. This generally applies to uses where certain activities such as the handling or storage of large quantities of dense non-aqueous-phase liquids, organic solvents, commercial fertilizer, pesticide, liquid fuel, etc. are considered a potential risk within an HVA and/or SGRA. As per section 5.A.7 of the Official Plan, proposals in the rural area that involve a risk activity should incorporate measures/management practices to adequately manage the risk to groundwater activity.

Western Cataraqui Region Groundwater Study
Trow Associates Inc., on behalf of the CRCA, has undertaken a Groundwater Study in the rural areas of the City of Kingston, Loyalist Township, The Town of Greater Napanee and South Frontenac Township, occupying the Western Cataraqui Region Watershed. The study examines groundwater in relation to its supply, natural quality characteristics and its potential vulnerability to contamination.

The following were the general objectives for the study:

1. To compile a groundwater resource inventory which identifies fundamental groundwater characteristics across the Study Area including:
    - sources of water, including primary areas of groundwater recharge and discharge;
    - water well yields, including areas of low yields;
    - water quality, including areas of poor water quality;
    - directions of groundwater flow;
    - the vulnerability of groundwater to contamination; and
    - pathways from land and surface water to groundwater.

2. To examine the use of groundwater and existing conservation practices.

3. To evaluate and develop region-specific measures to protect existing groundwater resources.

City of Kingston Environmental Review of Planning and Development Applications
Planning and/or development applications for non-serviced rural lands are reviewed by qualified staff from the City's Environment Division to ensure that the groundwater quality and quantity is sufficient for the intended land use and that the proposed development will not likely adversely impact the water supply of adjacent lots.

The ability of a proposed development to access sufficient and clean groundwater while not adversely affecting their neighbours is determined through a Hydrogeological Assessment process. For small developments (1 to 3 lots) in areas of low groundwater vulnerability a Basic Hydrogeological Assessment is required. Small developments in areas of high vulnerability require a Full Hydrogeological Assessment. Larger developments (i.e. estate residential subdivisions) require a Full Hydrogeological Assessment compliant with the provincial D-5-5 standard regardless of aquifer vulnerability status. Basic assessments rely on information provided by licensed well drillers while full assessments must be completed by qualified hydrogeologists and may be subject to peer review.

The objective of any hydrogeological assessment is to provide a demonstration of safe water quality, adequate water quantity and absence of unacceptable interference with pre-existing wells in addition to protection of the groundwater resource through proper well installation. The Hydrogeological Assessment process currently in use is designed to be protective of current groundwater conditions and does not assess the potential for future impacts to lot-level

groundwater quantity or quality that may come about because of a changing climate and related extreme weather events.

Next Steps
The City of Kingston's Climate Leadership Plan, which will be released later this year, will outline the City`s long-term goals and objectives to reduce greenhouse gas emissions and adapt to climate change. Strategies to increase our rural community's resilience to climate related stresses on groundwater aquifers are under consideration as action items coming out of the Climate Leadership Plan.

Existing Policy/By-Law:

Cataraqui Source Protection Plan
City of Kingston Official Plan
Provincial Policy Statement 2020

Notice Provisions:

None

Accessibility Considerations:

None

Financial Considerations:

None

Contacts:

Julie Salter-Keane, Manager, Climate Leadership Division 613-546-4291 extension 1163

Other City of Kingston Staff Consulted:

Paul MacLatchy, Environment Director, Business, Real Estate & Environment

Sukriti Agarwal, Acting Manager, Policy Planning, Planning Services

James Bar, Acting Manager, Development Approvals, Planning Services

Exhibits Attached:

None