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TO: Mayor and Members of Council

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FROM: Susan Johns  
Director, Asset Management,  
Infrastructure and Water Services  
Department  
613-580-2424, 16003,  
susan.johns@ottawa.ca

Contact : Tessa Di Iorio, Risk  
Management Official, Source Water  
Protection, Infrastructure and Water  
Services Department, 613-580-2424,  
17658, tessa.dilorio@ottawa.ca

EXPÉDITEUR : Susan Johns  
Directrice, Gestion des actifs, Direction  
des infrastructures et des services de  
l'eau  
613-580-2424, 16003,  
susan.johns@ottawa.ca

Personne ressource : Tessa Di Iorio,  
Responsable de gestion des risques,  
protection des sources d'eau, Direction  
des infrastructures et des services de  
l'eau, 613-580-2424, 17658,  
tessa.dilorio@ottawa.ca

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FILE NUMBER: ACS2024-IWS-AM-0001

SUBJECT: Annual Drinking Water Source Protection Status Update - 2023

OBJET: Compte rendu annuel concernant la protection des sources d'eau  
potable - 2023

## **PURPOSE**

The purpose of this memorandum is to provide Members of the Environment and Climate Change Committee, with an annual status update on the City's Drinking Water Source Protection Program.

Source Protection Municipal Implementation and Risk Management Official (RMO) Reports are required to be submitted to the Source Protection Authorities (Conservation Authorities) by February 1 of each calendar year, as legislated under the Ontario [Clean Water Act \(2006\)](#).

## **BACKGROUND**

Drinking Water Source Protection safeguards public health from drinking water threats by raising awareness and protecting our groundwater and surface water resources. Ontario's *Clean Water Act (2006)* requires municipalities to implement Source Protection Plans to protect existing and future sources of municipal drinking water from various threats.

The City of Ottawa lies within two Source Protection Regions, each with their own locally-developed, science-based source protection plan that contain policies to protect municipal drinking water resources:

- [Mississippi-Rideau Source Protection Plan](#) (effective date January 1, 2015); contains policies related to the Intake Protection Zones for the Britannia and Lemieux Island surface water systems and the Wellhead Protection Areas for the groundwater wells at Carp, Munster, Richmond King's Park and Richmond West.
- [Raisin-South Nation Source Protection Plan](#) (effective date April 1, 2015); contains policies related to the WHPAs for the groundwater wells Vars and Greely - Shadow Ridge Subdivision.
- Document 1 shows a map with the City of Ottawa's Drinking Water Protection Zones.

The City has a proactive approach to raising public awareness and managing threats to drinking water resources as part of the Source Water Protection Program, this includes developing risk management plans for existing or new activities that may be a threat to drinking water resources as well as outreach and communications to impacted residents.

Notable work accomplished in 2023 to support the City's Source Protection program include:

1. Fuel Tank (Home Heating Oil) Incentive Program: Home heating oil (fuel storage) is considered a significant drinking water threat within the highest vulnerable areas near municipal supply wells. Source Protection Plan policies require Risk Management Plans (RMP) for fuel storage within these zones to manage the threat; a RMP is a document that outlines measures to reduce or eliminate the risk that an activity will contaminate municipal drinking water. Fuel tank RMPs outline that tanks must meet specific design and operational standards, are inspected regularly, and are replaced every 10 to 25 years depending on the type of tank.

The Fuel Tank Incentive Program was approved by the [Agricultural and Rural Affairs Committee on May 5, 2022 \(ACS2022-IWS-AM-0003\)](#) and Council on May 11, 2022. It is expected to be complete by 2024. The program offers financial incentives to remove existing fuel oil tanks that are located near municipal wells and replace them with an alternate heating source (air source heat pump or natural gas), that are not considered a significant drinking water threat. Additional incentives were included to support a green energy option (air source heat pump), to coincide with the City's climate change initiatives. The goal of the fuel tank incentive program is to eliminate existing fuel threats and protect rural communal drinking water resources.

Program eligibility includes 15 residences that had a fuel oil tank within a Wellhead Protection Area (vulnerability score 10) since 2017 when the City completed a source protection threats verification project. Of the 15 eligible residences, three residents had proactively converted to natural gas heating prior to 2022, and there were 12 recorded existing fuel oil tanks at the start of the program. Of the 12 existing fuel tanks, RMPs had been negotiated for six existing fuel tanks and fuel threats were unmanaged at six residences with existing fuel tanks (no RMP) due to non-responsive or non-compliant landowners.

Program organization began in fall 2022 with the development of program workplans, processes, communication materials, a program application form and legal agreements and financial procedures; which were complete by spring 2023. The City partnered with Rideau Conservation Authority, who helped prepare the landowner communication package and engaged with eligible residents since they had previously contacted all homeowners as part of the threats verification project in 2017. The program launched in June 2023, with all eligible residents receiving

program information and invitations to participate; in-person visits were scheduled interested residents. Most homeowners were very receptive to the program; 11 out of 15 eligible residents have either participated or have signed up to participate in the rebate program in 2024.

2023 Results - Removal or management of 12 existing Fuel tank threats near municipal wells:

- Of the six residents who had RMPs for their fuel tanks: three residents converted to natural gas (two converted as part of the program and one converted prior to the start of the program); one resident applied to participate in the program and plans to convert to natural gas in 2024; one resident has opted to retain their home heating oil system and will maintain their fuel oil tank through the negotiated RMP; and one resident has been non-responsive and staff will continue communication to encourage program participation in 2024.
- Of the 6 residents who did not have RMPs for their fuel tanks: five residents had converted to natural gas heating proactively prior to the start of the program and all were included in the Fuel Tank Incentive Program and received a rebate; and one resident has applied to participate in the program and plans convert remove their fuel oil tank and convert to natural gas heating in 2024.

In summary, of the 12 existing fuel tank threats: eight threats have been removed, two threats will be removed in 2024, and there are negotiated RMPs for the two remaining fuel tank threats, thus all fuel tank threats will be eliminated or managed by 2024.

2. Greely – Shadow Ridge Municipal Well Update: The existing municipal supply wells for the Shadow Ridge development in Greely extract water from the overburden sand aquifer. The supply wells have experienced issues related to elevated nitrate levels (approaching, but not exceeding, half of the Maximum Acceptable Concentration for drinking water). The nitrate source is likely anthropogenic due to shallow contamination potentially from private septic systems, agricultural nutrient application (manure or chemical fertilizer) and storage of non-agricultural source material (i.e. compost) within the existing wellhead protection area.

The Raisin-South Nation Source Protection Plan includes a policy which recommends that the City of Ottawa explore the opportunity to deepen the Shadow Ridge Municipal Well to the Nepean Aquifer to reduce the significant threats related to septic systems and septic system holding tanks in the Village of Greely ([Policy SEWG-4c](#)), as such the City has committed to exploring the option.

The City of Ottawa initiated the Nepean Aquifer Study in December 2016 to investigate the potential to deepen the Shadow Ridge Municipal well system to the Nepean Aquifer and gain information about the hydrogeologic properties of the Nepean Aquifer within Greely. Study results indicated that the Nepean Aquifer is a viable and prolific groundwater source and project deliverables were used to support the new municipal well system design. In 2019, the City acquired land to construct the new municipal wells for Shadow Ridge, adjacent to the existing pumping station and municipal water treatment and distribution facility.

The City moved forward with drilling two 250 millimetre diameter, 150 metre deep production wells. The first production well was completed in January 2023 and the second production well was completed in April 2023. Aquifer testing (pump tests) were completed in May 2023. Test results identified that the two wells are sufficient to support the yield and a third well was not needed. Data from the aquifer testing is currently being analyzed to support decision-making related to the future water supply for the Shadow Ridge subdivision, including detailed design and an assessment of pump station modifications and upgrades needed to treat the deeper aquifer groundwater supply, should the City move forward.

Results from the pump tests are also used to support the source protection technical work, which includes the delineation of a new Wellhead Protection Area for the deeper wells using 3D numerical groundwater modelling. Source protection technical studies commenced in August 2023 with a project initiation meeting with the Technical Advisory Team. A conceptual model and numerical model development were discussed with the Technical Advisory team during several meetings and communicated through memorandum during Q4 2023. Preliminary model results will be presented in winter 2024, and it is anticipated the source protection technical work will be completed in the first half of 2024.

3. Addition of third well to Source Protection Plan for the Richmond West well system:  
The Richmond West well system consists of three wells, yet only two wells have been used as production wells to date and are included in the Mississippi-Rideau Source Protection Plan. The third well will be added to production to help support the increasing demand. Prior to the provision of water to the public, the well must be included in the local Source Protection Plan. An assessment was completed in 2023 and determined that new wellhead modelling did not need to be completed, however the well location needs to be added to Figures in the Source Protection Plan and text needs to be updated. This update will be included in the Source Protection Plan amendments that the Mississippi-Rideau Source Protection Region is undertaking under Section 36 of the *Clean Water Act (2006)*, which will be sent to the Ministry of the Environment, Conservation and Parks for approval in late 2024.
  
4. Zoning By-Law Conformity: The City's new Official Plan was adopted by Council in October 2021 and approved by the Ministry of Municipal Affairs and Housing in November 2022. Source protection policies in the Official Plan conform to local Source Protection Plans, see Section 4.9.5 of under the heading, "[Implement the policies of the Mississippi-Rideau Source Protection Plan and the Source Protection Plan for the Raisin-South Nation Source Protection Region](#)". Source protection policies were developed in consultation with local Source Protection Regions.

In 2023, the City initiated the process of developing new Zoning By-laws to implement the policies in the new Official Plan, including implementing new zone provisions to conform to source protection policies. New Zoning By-laws related to the source protection policy conformity will be drafted in 2024 in consultation with Source Protection Regions.

In addition to the legally-binding policies, there are several non-legally binding source protection policies that the City plans implement to protect municipal drinking water sources, such as updating emergency response plans, installing signage on municipal roads and waterways, and oversight of geothermal systems near municipal supply wells. The City is developing workplans to implement non-legally binding policies, where feasible, and will provide an update in the 2024 Annual Report.

More information about Drinking Water Source Protection and the City's Source Protection Program can be found at: [www.Ottawa.ca/SourceProtection](http://www.Ottawa.ca/SourceProtection)

## **2023 ANNUAL REPORTS**

In accordance with the regulations of the *Clean Water Act (2006)*, the City is required to provide an annual report to local Source Protection Authorities describing Source Protection Plan implementation. More specifically the reports must include updates of the following:

- 1) Activities performed by the City's Risk Management Official, which include screening development applications for potential significant threat activities or working with landowners to develop risk management plans for existing significant threat activities, for example fuel storage.
- 2) Implementation of Source Protection Plan policies that include actions directed at municipalities; this includes activities the City must undertake at its physical plants and sanitary sewer infrastructure, operational practices as well as outreach and education efforts.

As required, attached are the Risk Management Official's Reports and Municipal Implementation Reports for the 2023 reporting period, to be submitted to the Source Protection Authorities by the reporting deadline of February 1, 2024.

**Overview of Reports:**

The implementation of activities by the Risk Management Official as well as municipal activities is ongoing and the City is compliant with Source Protection Plan policies, as outlined in the attached 2023 source protection annual reports (See appending documents).

The Ministry of the Environment, Conservation and Parks transitioned to an optional electronic reporting format last year (2023) for source protection annual reports, as such, source protection program updates for the City have been entered into Ministry of the Environment, Conservation and Parks's electronic forms and print-outs of the reports are attached for reference (Documents 2 and 3). The Raisin-South Nation Source Protection region provided an electronic template for annual reporting, which is attached (Document 6).

Should you require further information, please contact Susan Johns, Director, Asset Management at 613-580-2424, extension 16003.

*Original signed by Tammy Rose*

GM, Infrastructure and Water Services Department

CC: Senior Leadership Team

## SUPPORTING DOCUMENTATION

Document 1 Map of Drinking Water Protection Zones in the City of Ottawa

Document 2 Mississippi-Rideau Source Protection 2023 Electronic Annual Report 1 –  
Municipal Report

Document 3 Mississippi-Rideau Source Protection 2023 Electronic Annual Report 2 –  
Policy Implementation

Document 4 RMO Annual Report for 2023 – Mississippi Valley Source Protection Area

Document 5 RMO Annual Report for 2023 – Rideau Valley Source Protection Area

Document 6 RMO and Source Protection Municipal Implementation Annual Report for  
2023 South Nation Source Protection Area