

Appendix E:

Groundwater Memorandum

To: David Kielstra
Stantec – Stoney Creek

From: Rachel Baker / Lesley Veale
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Project/File: 1650-01381
Date: October 1, 2025

**Reference: Groundwater Assessment
West 5th Street Corridor Improvements from Stone Church Road West to
Rymal Road West, Hamilton, Ontario**

Stantec Consulting Ltd. (Stantec) was retained by the City of Hamilton (City) to complete a Municipal Class Environmental Assessment (EA) to develop and assess alternative solutions to improve transportation along West 5th Street (from Stone Church Road West to Rymal Road West) (Study Area) in the City of Hamilton. Stantec has prepared the following groundwater assessment for the Study Area to assist with completion of the Environmental Study Report (ESR). The assessment was completed based on a review of the available desktop groundwater information for the area.

The proposed road upgrades include widening of West 5th Street, a centre two-way left turn lane, boulevard space between the cycle track and roadway, and the addition of sidewalks and cycle lanes. No grade changes are expected as part of these upgrades; however, below ground excavation will be required as part of the proposed storm sewer replacement / installation along West 5th Street. Stantec (2025¹) detailed the proposed sewer upgrades in support of the Class EA:

- At the southern extent of the Study Area, a total of about 280 m of 375 mm to 600 mm diameter storm sewer is proposed at an elevation of about 226.5 m to 225 m above mean sea level (AMSL). Proposed installation is typically 2 m to 3.5 m below ground surface (BGS).
- Within the central portion of the Study Area, a total of about 310 m of 450 mm to 675 mm diameter storm sewer is proposed at an elevation of about 220.5 m to 223 m AMSL. Proposed installation is typically 2 m to 3 m BGS.

The results of the hydrogeological assessment are documented in this technical memorandum, which is organized into five sections, including a summary of hydrogeologic conditions (Section 1), water management during construction (Section 2), source water review (Section 3) and a private well review (Section 4) and summary (Section 5). References are provided at the end of the memorandum.

1 Hydrogeologic Conditions

The Study Area is located within the physiographic region defined by Chapman and Putnam (2007) as the Haldimand Clay plains, which is characterized by clay plains and till moraines. This is consistent with the surficial geology mapping by the Ontario Geological Survey (OGS 2010) which characterizes the area as

¹ Stantec, 2025. DRAFT - West 5th Street from Stone Church Road West to Rymal Road West Municipal Class Environmental Assessment – Preliminary Stormwater Management Assessment. Prepared for City of Hamilton, August 22, 2025.

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fine-textured glaciolacustrine deposits consisting of silt and clay with minor sand. Bedrock near the Study Area is described by Armstrong and Dodge (2007) as Lockport dolostone.

A review of the Ministry of the Environment, Conservation and Parks (MECP) Water Well Records (WWRs) (MECP 2024) indicated about 24 WWRs within 100 m of the Study Area. Based on review of the WWR, the overburden ranges from about 2.4 m to 15.2 m thick, predominately consisting of clay with some occurrences of silty material and underlain by limestone and dolostone bedrock.

Water level data is available for most WWRs with groundwater levels in bedrock typically ranged from 2 m to 11 m BGS, averaging 6 m BGS. These water levels are representative of conditions within the bedrock aquifer but suggest that groundwater dewatering during shallow construction may not be required.

2 Water Management During Construction

Depending on final storm sewer design including installation depth and installation methods, the proposed construction activities may require groundwater dewatering. Based on the fine-grained material and expected groundwater levels, groundwater management is anticipated to be minimal. Further review of the potential extent of groundwater dewatering and the potential need for an Environmental Activity and Sector Registry (EASR) should be reviewed as part of detailed design.

Depending on conditions, the Contractor may not encounter groundwater dewatering, but may need to manage precipitation or surface water runoff. Stormwater is not considered in the total volume of water pumped under an EASR and can be managed by the Contractor without needing an MECP dewatering permit. Under EASR regulations, the Contractor must keep a record of precipitation events at the Site including the date and approximate amount.

For storm water management during construction, the Contractor must follow regulations for storm water management and complete an inspection of any storm water before discharging to the environment or storm sewers. The water being discharged shall not contain any oil or any other substances in amounts sufficient to create a visible film, sheen, foam, or discoloration in the discharge water. Additionally, turbidity of the discharge shall not exceed eight Nephelometric Turbidity Units above background levels and/or shall not exceed the Hamilton Storm Sewer criteria. In the event of a large storm event, work may be delayed allowing the Contractor to mitigate the run-off, surface water, flooding and/or sediment loading around the work area.

3 Source Water Review

A review of the MECP Source Protection Information Atlas (2025) indicated the Site is located within a Highly Vulnerable Aquifer (HVA) with a vulnerability score of 6. Based on this vulnerability score, under the *Clean Water Act* (2006) list of prescribed drinking water threats, there are no activities that would result in a significant chemical and/or pathogen threat at the proposed work area. Therefore, the Site is not considered a threat to drinking water supply systems.

There are no Wellhead Protection Areas (WHPAs) or Intake Protection Zones (IPZs) delineated in the vicinity of the Study Area. The nearest WHPA is 10.5 km northwest of the Study Area. The nearest IPZ is located approximately 12 km southeast of the work area.

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4 Private Water Supply

Based on review of nearby properties and the City's water supply details, the majority of adjacent properties are supplied by municipal water supply and no longer rely on private water supply wells. This is consistent with the MECP WWR which indicated wells completed from 1949 to 1961, with no recent supply wells in the last 50+ years.

A review of the City's water supply details indicated 2 properties with occupied residences without a known water supply (1043 West 5th St. and 1172 West 5th St.). This could be an error in the dataset as provided to Stantec; however, it is recommended that for these two locations, a notification letter be delivered prior to construction to inform the landowner of the proposed work and request details of their water supply.

5 Summary

Based on the above groundwater assessment, the following summary and recommendations are provided:

- Given the location, no significant source water threats were highlighted based on the proposed construction or long-term use.
- Minimal groundwater dewatering is anticipated during construction activities based on assumed groundwater level and fine-grained material. However, additional review of the proposed sewer design and construction methods should be completed as part of detailed design to further evaluate dewatering rates and the need for an EASR.
- Prior to construction, a notification letter should be delivered to the two occupied residences with an unknown water supply to provide details of the proposed work and request details of their water supply. In the event that there is an active private well on the property, a qualified professional should review the well location and construction details to recommend construction mitigation measures as needed.

Sincerely,

STANTEC CONSULTING LTD.



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References

Armstrong, D. K. and Dodge, J. E. P. 2007. Paleozoic geology of southern Ontario. Ontario Geological Survey, Miscellaneous Release—Data 219.

Chapman, L. J. and Putnam, D. F. 2007. The Physiography of Southern Ontario. Ontario Geological Survey, Miscellaneous Release--Data 228.

Ontario Clean Water Act. 2006 (S.O. 2006, Chapter 22). ON, Canada, 2006.

Ontario Geological Survey (OGS). 2010. Surficial Geology of Southern Ontario. Ontario Geological Survey, Miscellaneous Release—Data 128—Revised.

Ontario Ministry of the Environment, Conservation and Parks (MECP). 2024. Water Well Records, Ontario Water Well Information System. Accessed July 2025. www.ontario.ca/environment-and-energy/map-well-records.

Ontario Ministry of the Environment, Conservation and Parks (MECP). 2025. Source Protection Information Atlas. Accessed July 2025. www.gisapplication.lrc.gov.on.ca/SourceWaterProtection/Index.html?site=SourceWaterProtection&viewer=SWPViewer&locale=en-US