

5. Conclusions

This hydrogeologic investigation provides details of geology, groundwater flow patterns and groundwater elevations for the proposed White Tail Crossing development located on Wideman Road. The data collected provided additional information to further characterize subsurface stratigraphy at the site. The following conclusions are based on the findings of the hydrogeologic investigation:

- Groundwater at the site generally flows to the west, towards Monastery Creek and its tributary located adjacent to the site. Hydraulic conductivity values estimated from single well response tests within the silt/sand unit range from 4.1×10^{-6} to 5.4×10^{-7} m/s. A single well response test conducted in the silt/clay unit (Maryhill Till) indicated a hydraulic conductivity of 7.2×10^{-8} m/s. Calculated groundwater velocities range between 1.5 and 7 m/year.
- The silt/clay unit underlying the surficial silt/sand is interpreted as the Maryhill Till unit and appears continuous across the site. At the location of MW-06-5 and BH-06-14 a drift sequence is evident consisting of fine sand with interbedded clay and silt. This drift sequence is considered to be part of the Maryhill Till unit. At the location of BH-06-13 the thickness of the silt/clay unit was observed to be 4 metres at a depth ranging from 353 and 349 m AMSL. Information from nearby water supply wells indicate the silt/clay unit is on the order of 18 m thick.
- The continuous silt/clay unit provides protection for the underlying regional aquifer. Downward migration of potential contaminants such as road salt is limited due to the low permeability unit that extends across the site.
- The Owen Property represents a very small portion of the Waterloo Moraine. The Waterloo Moraine extends over about 350 square kilometres (35,000 ha) and in contrast, the Owen property covers 9 ha. The Owen Property represents only 0.02% of the total area of the Waterloo Moraine. Beneath the Owen Property is a continuous silt/clay unit that protects the underlying regional aquifer. Therefore, while the Owen Property is located on the Waterloo Moraine, it is insignificant in size and is not considered a significant recharge area for the water supply aquifer associated with the Waterloo Moraine.
- The Owen Property is not located in an area identified as a Regional Recharge Area by the Region of Waterloo. Region mapping shows the Property is located in a Sensitivity 4 planning area; the lowest sensitivity on the Region's ranking scale. There are no development restrictions in the Regional Office Policies Plan for Sensitivity 4 lands.
- The geology of the site and information provided in water well records suggests that the potential for impacts to the nearby private water supply wells due to development of the subject site is considered to be low.

- Presuming that the road in the development is salted in the winter, the estimated maximum concentration for chloride in groundwater is approximately 111 mg/L and the Reasonable Use criterion for chloride in groundwater is 127.5 mg/L.

6. Limitations

This hydrogeologic investigation was completed using standard engineering and scientific judgment, principles, and practices. It is based on observations and findings recorded by CH2M HILL personnel during field sampling, and investigation activities. Except as provided in this report, CH2M HILL has made no independent investigation as to the accuracy or completeness of the information obtained from secondary sources.

Sampling locations were chosen to fill data gaps and provide both lateral coverage and depth information across the site. Soil conditions described in this report are those observed at the time of the investigation. Subsurface conditions between sampling locations have been inferred and may vary significantly from conditions encountered at those locations.

All findings and conclusions stated in this report are based on information and circumstances as they existed during the time period of this report preparation. Any change in information or circumstance upon which this report is based may change the expressed findings and conclusions of this report.

Any reliance on this report or decisions made based on this report by third parties is the responsibility of such third parties. CH2M HILL accepts no responsibility for damages, if any incurred by any third party as a result of decisions made or actions taken based on this report. Subject to the Limitations noted above, The City of Waterloo, The Regional Municipality of Waterloo, and the Grand River Conservation Authority may rely on the report as accurately representing conditions as the subject property at the time of the investigations.

7. References

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