Hydrogeological Assessment

FINAL REPORT

Amiraco Properties Inc.

Project Name:
Hydrogeological Assessment
Westwinds Lands
London, Ontario

Project Number:
LON-22020107-A0

Prepared By:
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Date Submitted:
May 25, 2023, Revised September 8, 2023

Hydrogeological Assessment

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Type of Document:

Final Report

Project Name:

Hydrogeological Investigation
Westwinds Lands
London, Ontario

Project Number:

LON-2202107-A0

Prepared and Reviewed By:

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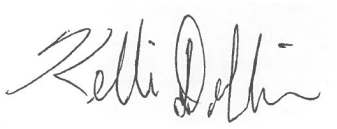

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Executive Summary

EXP Services Inc. (EXP) was retained by **Amiraco Properties Inc.** in **2018** to conduct a hydrogeological assessment on the proposed residential development in an area known as Westwinds Lands located at the southwest corner of Bostwick Road and Pack Road, in London, Ontario, hereinafter referred to as the 'Site'. The municipal address for the Site is 3563 Bostwick Road, Lot 75 East of Talbot Road, London, Ontario.

The objective of the hydrogeological study was to examine the hydrogeological characteristics of the Site by collecting soil and groundwater information provided from a series of sampled boreholes and monitoring wells, reviewing the Ministry of the Environment, Conservation and Parks (MECP) Water Well Records (WWR) to identify private water well users in the area, collecting multiple years of groundwater elevations to identify seasonal variations across the Site, installing surface water stations within the wetland feature on the Site, completing a monthly feature-based water balance and assessing the natural heritage features on the property. The assessment provides comments pertaining to potential impacts on hydrogeological conditions at the Site and provides recommendations and design/construction measures, where applicable, to mitigate this potential for impact.

It is understood that the hydrogeological assessment will be submitted for review and approval by the City of London and the Upper Thames River Conservation Authority (UTRCA).

Based on the results of the hydrogeological assessment, the following findings are presented:

- The Site is situated within the Dingman Creek sub-watershed;
- Two Unnamed ephemeral flow paths are present on the Site. One is identified flows from the southwest woodlot south through the adjacent property, and the other is regularly farmed through and leads southeast towards a drain which flows under Bostwick Road to the Thornicroft Drain;
- An EIS study completed by MTE identified two (2) wetland features on Site, the Mineral Meadow Marsh (MAM2) in the southwest corner of the Site, referred to as Community 2, and a Wetland Inclusion in the southeast corner of the Site, referred to as Community 3. The Community 2 feature will be maintained with appropriate buffers within the open space area proposed along the south edge of the Site, and the Community 3 inclusion will be removed;
- The northeast corner of the Site is mapped as encompassing regulated lands designated by the UTRCA. This area is a regulated buffer area for a feature located to the northeast of the Site boundary. There is no regulated feature on the Site in this area;
- Drainage from the Site is primarily through seepage into the shallow subsurface and overland flow. Runoff generally follows topography towards the woodlot in the southwest, towards Pack Road in the northeast and towards Bostwick Road in the southeast;
- The Site is covered with clayey silt till with a surficial sandy silt layer along the south edge of the Site. A deeper sand unit is also present within and underlying the till in the vicinity of the southwest woodlot;
- A total of twenty-three (23) well records are located within a 500 m radius of the Site. MECP WWR identify four (4) of these wells as water supply wells installed to depths ranging from 13.7 to 54.9 m bgs;

- Groundwater elevations within the monitoring wells were generally cyclical, showing similar seasonal variations and high elevations in the late fall to spring (up to 3 m bgs);

- Two surface water monitoring stations were installed in the southwest portion of the Site, in the vicinity of the Community 2 wetland, in August 2022. Since installation, surface water was observed at the surface water stations only in March 2023, which coincides with observations of Community 2 from the ecology study. Shallow groundwater was present in the piezometers from January to March 2023, ranging from 0.13 m above ground surface (m ags) to 0.33 m below ground surface (m bgs) at P1 and from 0.40 to 0.98 m bgs at P2. A surface water station referred to as P-1 (14456) was installed in October 2018 to the west of the current P1 as part of the hydrogeological investigation for the Site located to the south. This station was monitored until August 2020 and had shallow groundwater elevations ranging from 0.16 m ags to 0.46m bgs;

- Based on grain size analysis, the hydraulic conductivity of the dominant clayey silt till soils at the Site are less than 10^{-9} m/s. The estimated hydraulic conductivity for the interbedded silt based on a Single Well Response Test is approximately 4.4×10^{-7} m/s;

- A monthly feature-based water balance was completed for the Community 2 wetland in the southwest corner of the Site. Post-development conditions based on the current draft plan indicates that infiltration within the Community 2 catchment will be 41% of pre-development conditions without mitigation. A 10% reduction in runoff through LID or other measures will achieve the target runoff of 80% of pre-development conditions;

- The monitoring wells on Site have been maintained for ongoing study past the completion of this report. When the wells are no longer required, decommissioning should be completed by a licensed well contractor in accordance with O. Reg. 903; and,

- Shallow groundwater may be encountered when advancing excavations during construction, particularly in the areas surrounding the woodlot during seasonally wet months (winter – spring). Based on the low hydraulic conductivity of the shallow soils, it is not expected that a dewatering permit will be required as dewatering volumes area anticipated to be below 50,000 L/day. However, if multiple excavations occur simultaneously, a registration on the Environmental Activity and Sector Registry (EASR) may be necessary.