

Geotechnical

**Building Sciences** 

Construction Testing & Inspections

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#### Locations

Peterborough Kingston Barrie Ottawa Whitby

**Laboratory** Peterborough



November 27, 2025

537090 Main Street, Horning's Mills Township of Melancthon, Ontario, L0N 1S6

Attn: Angelo Carnevale

Re: Response to Review Comments, Hydrogeology Consultant Services

Inc. & NVCA, 537090 Main Street, Horning's Mills

Cambium Reference: 17217-001

Dear Angelo Carnevale,

Hydrogeology Consultant Services Inc (HCS) has the provided review comments on behalf of the Corporation of the Township of Melancthon, dated March 3, 2025, regarding Cambium's Hydrogeological Assessment report prepared for your proposed subdivision development located at 537090 Main Street, Horning's Mills, Township of Melancthon, Ontario (Figure 1; Figure 2; Site). Additionally, Nottawasaga Valley Conservation Authority (NVCA) has provided review comments on behalf of the Province of Ontario under authority of O.Reg. 41/24, dated May 28, 2025. The objective of this letter is to provide a summary and Cambium's responses to the HCS and NVCA comments.

It should be noted that the proposed site plan has been revised and now includes only 21 proposed dwellings, instead of the previous plan which included 26 lots. This would further reduce the nitrate loading at the property boundary as well as reduce the demand on the water supply aquifer.

The conclusions of Cambium's Hydrogeological Assessment remain the same; that the proposed development is feasible from a hydrogeological standpoint and impacts to adjacent water resources and well users are not anticipated as a result of the development.

### HCS PEER REVIEW COMMENTS AND RESPONSES

The following comments were provided in the HCS letter report. Cambium's follow up response to each comment in the HCS report was included below.



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### HCS comment #1:

"Performance of a door to door well survey of properties within a 500 m radius of the Site (reasonably measured from the perimeter of the Site) to identify and refine locations and construction details for nearby water supplies; and specifically, to provide a more detailed assessment of the potential for shallow water supplies to the north of the Site."

Cambium will complete a well survey to inventory the water supply wells within a 500 m radius of the Site. Cambium will provide a letter addendum to the Hydrogeological Assessment presenting the results of the survey.

### HCS comment #2:

"Assessment of the potential reason(s) for the significant difference in well performance and well capacity of TW103-24, and the potential impacts of multiple water supply wells servicing the proposed lots having similar performance and well capacity."

Test well's logs and Lidar elevation data were used to compile the test well construction details in Table 1 attached. As provided in Table 1, test well TW103-24 was drilled to a more shallow depth at 20.0 mbgs compared to TW101-24 and TW102-24 at 24.4 and 29.9 mbgs, respectively. All the wells were advanced into limestone bedrock however. While TW103-24 has encountered only one water bearing fracture at a shallower depth of 15.8 mbgs (451.9 masl), the other two test wells encountered water bearing fractures at deeper depths. In test well TW101-24, water bearing fractures were identified at 19.8 mbgs (457.7 masl) and 21.6 mbgs (455.8 masl). While in test well TW101-24, water bearing fractures were identified at 19.8 mbgs (455.8 masl).

Considering TW101-24 and TW102-24 have two deeper fractures contributing to water supply, it is inferred that this is the reason for the lower yield at TW103-24. TW103-24 was still able to perform at minimum pumping rate of 15 L/min which is within the >13.7 L/min threshold of Procedure D-5-5. If other future wells drilled



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for the proposed lots have a similar performance to TW103-24, they will still adhere to the capacity requirement of Procedure D-5-5.

The static water level prior to the May 9, 2024 pumping test in TW103-24 was 8.64 mbtop. The pump was installed at a depth of approximately 20 mbtop. The available drawdown in the well was therefore approximately 10.4 m (height of static water level above the pump). The water level at the end of the 6 hours of continuous pumping was 16.72 mbgs meaning that the well still had about 3.3 m of available drawdown. In Cambium's professional opinion, the residential wells will not be pumped for 6 hours continuously in typical daily usage and that there would be sufficient available drawdown for other wells that have similar performance as TW103-24.

## HCS comment #3:

"Discussion of the potential for mutual interference between wells located at distances of 30 m or less from each other throughout the proposed subdivision, and particularly where some of those wells may have similar performance and well capacity to TW103-24."

Cambium assumes that the 30 m distance HCS referred to is based the proposed lot areas and the likely separation between any two contiguous wells. The closest wells TW101-24 and TW102-24 were 180 m apart and no mutual interference was noted between them based on the pumping test results as discussed in Section 4.1.4 of the hydrogeological assessment report. Based on the available drawdowns, intermittent pumping of the wells and the depth of the wells that will be installed in future, it is very unlikely to have a mutual interference between the wells that will be installed within 30 m distance.

Also, per the Section 4.2 of MECP Procedure D-5-5, three test wells were required per 15 ha and that the wells should be spatially distributed. Accordingly, the test wells were distributed spatially across the Site satisfying the above requirement.



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As noted in the response to comment 2, test well TW103-24 had about 3.3 m remaining of available drawdown at the end of the pumping test and the average household water use is not typically for a duration of 6 continuous hours and will vary throughout the day not stressing the aquifer in the same way as the pumping test. Furthermore, recovery events will occur between usage events mitigating the drawdown events. Therefore, mutual interference between the wells that have similar performance as TW103-24 would be deemed to be negligible.

### HCS comment #4:

"Confirmation regarding the potential future need to multi-well pumping tests to assess the potential for mutual interference, and to assess cumulative drawdown impacts of multiple wells operating simultaneously throughout the proposed subdivision.

This is not a requirement of Procedure D-5-5. The drawdown measurements within the available observation wells were completed at an appropriate frequency throughout the pumping tests as per the requirement in Procedure D-5-5 and no interference was noted during entire period of pumping. As such, Cambium is not recommending additional multi-well pumping tests at this time.

### HCS comment #5:

"Confirmation regarding the potential future need to include off-site water supply wells in any future pumping tests conducted in support of the proposed subdivision."

Future pumping tests are not recommended by Cambium at this time as mutual interference was not observed during the on-site testing program. However, Cambium will conduct a well survey within 500 m of the Site to catalogue the baseline conditions of the nearby residential wells.

### HCS comment #6:

"Confirmation regarding the potential for the application of more conservative variables (e.g. lower soil infiltration rate per MECP, higher daily sewage flow



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volume for each lot per OBC) to the Procedure D-5-4 calculations, and the resulting potential need for advanced sewage treatment to meet the ODWQS criteria limit."

The daily sewage flow volume of 1,000 L/day used in the calculations, is the daily average sewage effluent flow volume outlined in Procedures D-5-4 which was followed in the preparing the calculations. The higher sewage flow volume HCS referred to of 2,000 L/day in the Ontario Building Code (OBC) is the <u>peak</u> daily sewage effluent flow volume for which septic systems need to be designed for. For the sub-division developments, the average sewage flow is more representative of the typical daily flow for the subdivision lots. However, the septic systems will be required to be designed based on the maximum daily sewage flows referenced in Part 8 of the Ontario Building Code.

Regarding the variable infiltration rates, the HCS peer review mentions that the infiltration factor used initially appear reasonable. Per HCSs comment, using lower infiltration rates would result in a higher boundary nitrate concentrations forcing the use of advanced sewage treatment systems for the proposed subdivision. However, the soil infiltration rates used in the current nitrate impact assessment is reasonable for the soil type encountered at the Site, which is a fine to medium sand with some gravel component contributing to the greater infiltration rates.

### HCS comment #7:

"Confirmation regarding the proposed stormwater management (STM) facility(ies) and roadside ditches to infiltrate water they receive; and, of the potential need to revise the daily/annual dilution volume used in Procedure D-5-4 calculations in the event of the SWM Facility(ies) and/or roadside ditches cannot infiltrate water they receive."

Cambium has confirmed with Pearson Engineering that the roadside ditches will be open bottom ditches thus contributing to infiltration as Pearson has not been



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instructed to provide lined ditches. As such, there would be no changes to the provided water balance.

HCS comment #8:

"Confirmation regarding the potential need to provide lot-level Procedure D-5-4 nitrate impact assessment calculations to contemplate the significant portions of the property that are not included in the lot areas."

The nitrate boundary concentration for a subdivision following Procedure D-5-4 of 10 mg/L is required at the site boundary, not at each lot boundary. This is typically done for lot severances, not subdivisions. Typically the development area (including parks or SWM blocks) are included as part of the property as they are included as features required for the proposed development and would not be subject to future development (i.e. additional severances or subdivision). Considering that the subdivided lots consist of the development area, the use of these lands is warranted for the development area and therefore nitrate dilution area.







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### **NVCA PEER REVIEW COMMENTS RESPONSE**

The following comments were provided in the HCS letter report. Cambium's follow up response to each comment in the HCS report was included below.

NCVA comment #2:

"The review of the water wells within 500m of the proposed development site is satisfactory."

Noted. No further action is required.

NCVA comment #3:

"The water level measurements in the three monitoring wells were completed on June 6, 2023, August 8, 2023, and May 8, 2024. The May 8, 2024, reading captures the seasonally high-water table elevation. Recognizing the depth of the water table elevation during the three sampling periods, no additional manual water level monitoring is requested for the purpose of this review."

Noted. No further action is required.

NCVA comment #4:

"As the approval of septic systems are the responsibility of the municipality, the review of the D-5-4 calculations related to the nitrate loading will be deferred to the municipality, e.g., Dufferin County."

HCS has provided peer review comments on behalf of the Corporation of the Township of Melancthon which have been addressed in this response letter.







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November 27, 2025

### **CLOSING**

We trust that the information in this submission meets your current requirements. If you have any questions regarding the contents of this report, please contact the undersigned.

Respectfully submitted,

### Cambium Inc.

DocuSigned by:

Warren Young, P.Eng.,

Coordinator - Hydrogeologist

DocuSigned by:

Kevin Warner, M.Sc., P.Geo (Itd), BCIN

Technical Lead – Hydrogeology

DS



2025-11-27

WY/KW

Encl. Cambium Qualifications & Limitations

Figure 1 Site Location Plan

Figure 2 Site Plan

Table 1 Test Well Construction Details

Updated Development Plan

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#### Site Assessments

A site assessment is created using data and information collected during the investigation of a site and based on conditions encountered at the time and particular locations at which fieldwork is conducted. The information, sample results and data collected represent the conditions only at the specific times at which and at those specific locations from which the information, samples and data were obtained and the information, sample results and data may vary at other locations and times. To the extent that Cambium's work or report considers any locations or times other than those from which information, sample results and data was specifically received, the work or report is based on a reasonable extrapolation from such information, sample results and data but the actual conditions encountered may vary from those extrapolations.

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### Reliance

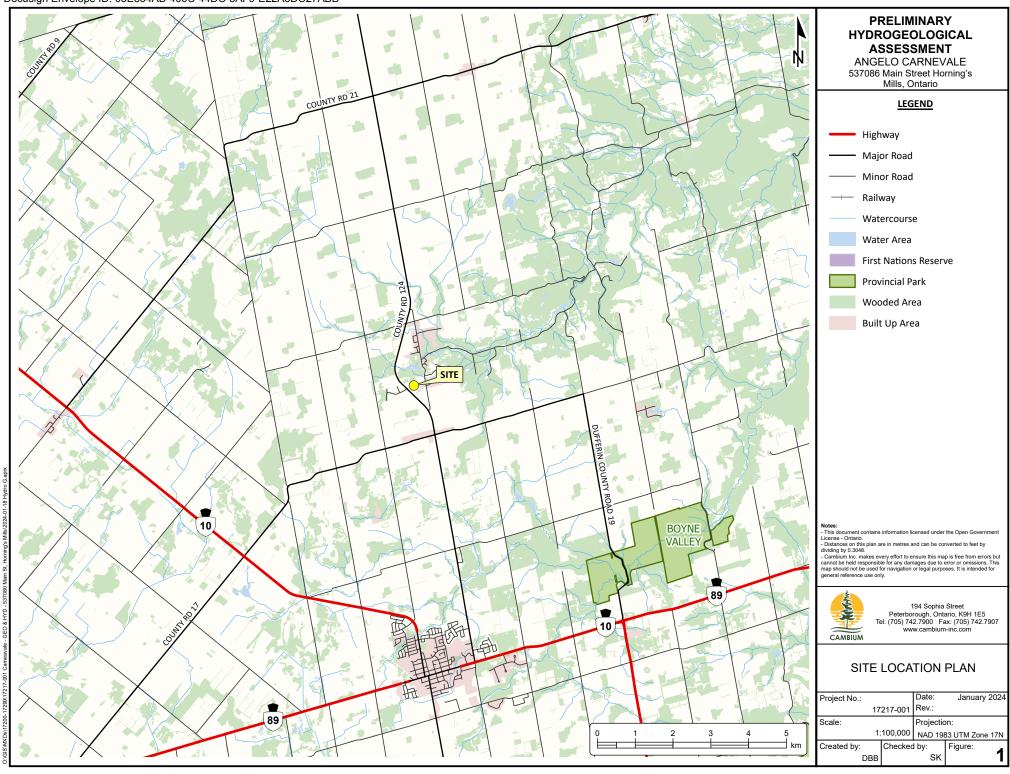
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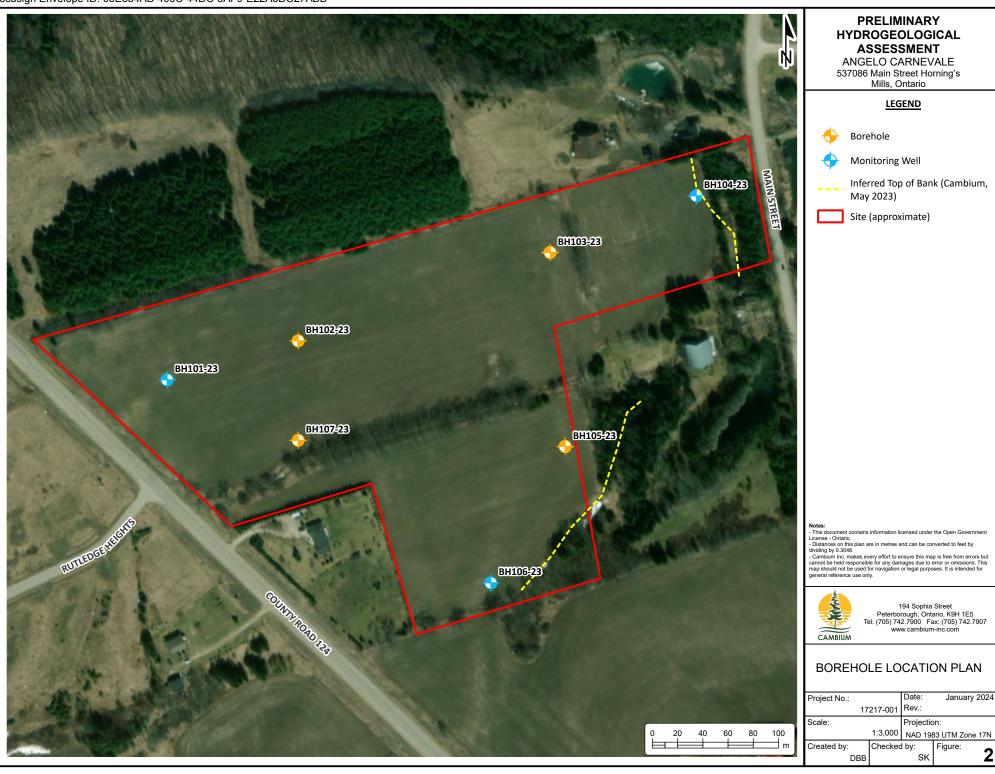
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Cambium Reference: 17217-001



# **Table 1: Test Well Construction Details**

Test Well	Ground Surface Elevation <sup>(1)</sup>	Well Depth		Fracture Depth 1		Fracture Depth 2		Overburden / Bedrock Contact Depth		Open Hole Start		Open Hole End		Recommended Pumping Rate
	(masl)	(mbgs) <sup>(2)</sup>	(masl)	(mbgs) <sup>(2)</sup>	(masl)	(mbgs) <sup>(2)</sup>	(masl)	(mbgs) <sup>(2)</sup>	(masl)	(mbgs) <sup>(2)</sup>	(masl)	(mbgs) <sup>(2)</sup>	(masl)	(L/min)
TW101-24	477.47	24.4	453.1	19.8	457.7	21.6	455.8	17.4	460.1	18.3	459.2	24.4	453.1	37.9
TW102-24	477.55	29.9	447.7	19.8	457.7	27.1	450.4	14.0	463.5	15.8	461.7	29.9	447.7	37.9
Tw103-24	467.72	20.0	447.8	15.8	451.9	N/A	N/A	8.8	458.9	10.8	456.9	20.0	447.8	11.4

<sup>(1) -</sup> Ground surface elevation dirived from available lidar dataset

<sup>(2) -</sup> MECP well records used to determine depths

