AZIMUTH ENVIRONMENTAL CONSULTING, INC.
Environmental Assessments & Approvals

April 10, 2019 AEC 11-237

Orangeville Highlands Limited c/o
Ventawood Management Inc.
2458 Dundas Street W
Mississauga ON
L5K 1R8

Attention: Carmen Jandu, MCIP RPP

Re: **Orangeville Highlands Phase 2: Response to Agency Comments**
Part of Lot 2, Concession 3 WHS
Town of Orangeville

Dear Ms. Jandu:

The purpose of this letter is to provide a response to comments circulated by the Town of Orangeville within their November 29, 2018 letter. This response addresses issues raised by the Town of Orangeville, public comments obtained through written submission to the Town and the September 10, 2018 public meeting, Town of Mono including a letter from several residents (July 23, 2018) and Credit Valley Conservation (CVC) related to environmental matters associated with the proposed development for the abovementioned property. This response addresses issues related to the Hydrogeological Addendum Report for the East Half of Lot 3, Concession 2, Orangeville, ON completed by Azimuth Environmental Consulting, Inc (Azimuth, April and May 2018). For your convenience, the original comments are provided in italics and Azimuth's response is provided below.

TOWN OF ORANGEVILLE

9.3 Planning Division

Comment 8. *The water balance assessment contained within the Hydrogeological Addendum report (Azimuth Environmental Consultants Inc., May 2018) indicates there will be loss of approximately 46% in groundwater infiltration between pre-development and post development conditions. With informal mitigation strategies, the loss of infiltration between pre to*

post-development conditions decreases to a 38% loss. The Town requires a more appropriate water balance assessment and mitigation strategy to ensure that predevelopment volumes are maintained or enhanced as much as possible pursuant to the water resources policies of section E5.3.21 of the Official Plan. Satisfactory comments from Credit Valley Conservation are required to confirm that the Hydrogeology report and water balance are appropriate in determining wither the applicable policies of the Official Plan have been satisfied.

Azimuth Response: In order to address the requirements of the Official Plan Policy (ES3.21), which states:

> *"Council will require that all new development will ensure that pre-development infiltration volumes are maintained or enhanced, as much as possible, having due regard to also maintaining water quality."*

as well as comments from the CVC, a revised Feature Based Water Balance has been provided in the Revised Hydrogeological Addendum Report (April, 2019). This revised water balance includes a Feature Based Assessment as required by the CVC. The features, which were agreed upon with the CVC included the WHPA Q1/Q2 area, catchment that flows north towards Middle Monora Creek and the remaining tableland area which has been interpreted to have an easterly ground water flow path. This revised water balance also incorporated LID's presented in the Urbantech FSR, which have provided further reduction in the ground water infiltration deficit. Given the overall ground water infiltration reduction is limited to just 5% in post development, an overall balance is likely achieved when taking into account snowmelt, which has not been considered in the water balance as the values are difficult to quantify. However, given snow represents 31% of total annual precipitation, it represents contribution which will likely overcome the stated deficit.

PUBLIC COMMENTS

Point # 2. *Concerns raised regarding water quality and quantity impacts to groundwater resources and seeking clarification on whether any low-impact development measures will be included in the development.*

Azimuth Response: Azimuth's Revised Hydrogeological Addendum Report (April, 2019) has included additional information regarding low-impact development (LID's) measures, which are now formally proposed as part of the development plan. The details

of these are provided in Urbantech's Functional Servicing Report (FSR), while they have also been incorporated into the water balance assessment to reduce the overall ground water infiltration deficit. Given the overall ground water infiltration reduction is limited to just 5% in post development, an overall balance is likely achieved when taking into account snowmelt, which has not been considered in the water balance as the values are difficult to quantify. However, given snow represents 31% of total annual precipitation, it represents contribution which will likely overcome the stated deficit.

Finally, additional discussion has also been included in the revised Azimuth report to address water quality impacts, which have been found to provide limited influence relative to the entire watershed.

Point #3. *Concerns raised regarding the amount of impermeable area being introduced as a result of the proposed development and resulting reduction in groundwater recharge. These concerns relate potential impacts to the groundwater table and implications for surrounding residential lands to the north of the site in the Town of Mono who rely on private wells.*

Azimuth Response: Azimuth's Revised Hydrogeological Addendum Report (April, 2019) has included additional information regarding potential impacts to the surrounding residential properties where private wells are located. Given the overall ground water infiltration reduction is limited to just 5% in post development, an overall balance is likely achieved when taking into account snowmelt, which has not been considered in the water balance as the values are difficult to quantify. However, given snow represents 31% of total annual precipitation, it represents contribution which will likely overcome the stated deficit. The revised report also has included more discussion relating to the adjacent private wells with respect to the potential for impact. Overall, it has been determined there would be limited potential for impact to either ground water quantity or quality due to the maintenance of ground water recharge and diversion of the majority of road runoff into the lined storm water management pond opposed to ground water infiltration facilities. There would be similar protection to the private wells to the north due to the hydraulic separation / ground water divide created by Middle Monora Creek, which would place the private wells upslope / upgradient of the creek. This would create limited opportunity for the Site development to influence ground water conditions on the opposite side of Middle Monora Creek.

TOWN OF MONO

Memorandum (August 10, 2018): Resident of Mono (Karen Morrison) letter [July 23, 2018]

A letter was submitted to Council which was subsequently forwarded to the Town of Orangeville. The letter highlighted several concerns of a group of Mono residents including:

Comment 2. *Water – Starview area residents depend on well water for drinking and this development in Orangeville will draw from the same aquifer. The impact of this amount of density and size of this built development will affect our water quantity and water quality.*

Azimuth Response: The development will be municipally serviced such that water supply will be derived from the Town of Orangeville's municipal water supply. As such no ground water withdrawal from the property for water supply will occur. A revised water balance assessment and further discussion regarding water quality impacts have been included in a Revised Hydrogeological Addendum Report (April, 2019) prepared by Azimuth. Given the overall ground water infiltration reduction is limited to just 5% in post development, an overall balance is likely achieved when taking into account snowmelt, which has not been considered in the water balance as the values are difficult to quantify. However, given snow represents 31% of total annual precipitation, it represents contribution which will likely overcome the stated deficit.

Finally, additional discussion has also been included in the revised Azimuth report to address water quality impacts, which have been found to provide limited influence relative to the entire watershed.

Comment 3. *Watershed – Credit Valley Conservation's watershed report card downgraded the Orangeville watershed health from B to C due to high levels of sodium and chloride and nitrates. The subdivision will pose a threat to our water quality and quantity.*

Azimuth Response: The Revised Hydrogeological Addendum Report (April, 2019) prepared by Azimuth has provided a revised water balance including further discussion regarding water quality impacts. As indicated in the report, there will be an additional contribution from road salt; however, this is considered negligible relative to the contributions from the entire watershed (40 times larger), where more major arterial

roads (i.e. Highway 10) provide more significant inputs. It is noted that the storm water management design as presented in the Urbantech FSR, directs all surface runoff from the roadways servicing the development into the storm water management pond diverting the majority of road salt impacted water from infiltrating in the on-site LID's. Despite this, the application of road salt is sourced to municipal applications such that these practices and potential threat are more a function of the Town's operations of the municipal roads servicing the Site.

It is noted that nitrate contributions are predominantly an agricultural source such that the proposed development would not contribute to elevated nitrate concentrations.

Comment 5. *Environment – We have reduced snow pack and rain due to climate change affect. We know that Dufferin County is dependent on groundwater for its drinking water and recharge is essential to the health of the aquifers. What is the plan to deal with less recharge but more demand for water?*

Azimuth Response: The Revised Hydrogeological Addendum Report (April, 2019) prepared by Azimuth was a site level hydrogeological assessment, such that it did not take into the municipal water demand. However, climate change influences have been accounted for in water balance, as the average climate data used in the assessment covered a 46 year period, such that longer term trending is accounted for. Regardless, the revised water balance included in the report promotes ground water recharge through the inclusion of LID's to promote ground water infiltration post development so as long as the water is available; the LID's will provide this function.

TOWN OF MONO (AUGUST 30, 2018)

Comment 1. *We would request that the matters identified in Ms. Morrison's letter are satisfactorily addressed as part of your municipal planning review process for this proposal.*

Azimuth Response: Ms. Morrison's issues related to water, watershed and environment are addressed above.

Comment 2. *We would request that the matters identified in the above excerpt from Town of Mono Council meeting July 24, 2018 be considered.*

Excerpt from meeting: Council discussed what action the Town could take to further comment on the application as it could impact Mono residents. Deputy Mayor McGhee queried what impact the development could have on water levels of Island Lake and if that was being assessed.

Azimuth Response: The water levels of Island Lake were not considered as part of this site level assessment. However, given the contributions derived from the Site are being maintained either through ground water recharge or surface water discharge through Middle Monora Creek, the proposed development is not anticipated to create any impacts to the water levels in Island Lake.

CREDIT VALLEY CONSERVATION (NOVEMBER 1, 2018)

Hydrogeology

Comment 1. *The information from the additional monitoring wells installed across the site in 2013 provides a good understanding of the high seasonal groundwater elevations and groundwater flow mapping. However, the addendum study offered no assessment or review with respect to the preservation of hydro-periods / high seasonal groundwater linkages with terrestrial features and Middle Monora Creek in the post-development phase. Given the creek's significance as a habitat for cold water fisheries, best efforts must be implemented to identify and preserve existing groundwater support (base flow) to the creek, irrespective of the estimated volume contribution to the overall flow. This assessment is outstanding and must be completed through a Feature Based Water Balance (FBWB) assessment.*

Azimuth Response: The Revised Hydrogeological Addendum Report (April, 2019) prepared by Azimuth includes a Feature Based Water Balance. The features, which were agreed upon with the CVC included the WHPA Q1/Q2 area, catchment that flows north towards Middle Monora Creek and the remaining tableland area which has been interpreted to have an easterly ground water flow path. The results indicated limited reductions in ground water infiltration post development ranging from 0 to 12%. Given these limited reductions, an overall balance is likely achieved when taking into account snowmelt, which has not been considered in the water balance as the values are difficult to quantify. However, given snow represents 31% of total annual precipitation, it represents contribution which will likely overcome the stated deficit.

Comment 2. *A groundwater/base flow monitoring program is to be implemented prior to, during and for a defined period after the developmental activities have ceased, in order to maintain a current database and to allow for a periodic check on groundwater conditions/base flow contributions to the creek over time. Please provide an outline*

Azimuth Response: The Revised Hydrogeological Addendum Report (April, 2019) prepared by Azimuth includes a proposed monitoring program, which will is scheduled to be implemented ahead of construction.

Construction

Comment 3. *Updated high groundwater elevation data across the site is to be compared to: site grading, subsurface infrastructure, retaining wall depths, SWM pond and outlet inverts; basement depths; etc. As such the updated FSR should identify where infrastructure is below the high groundwater level and where trench plugs would be required.*

Azimuth Response: This information is being provided in the Urbantech FSR.

Site Level Water Balance

Comment 4. *The analysis was completed in an appropriate manner and produced a credible evaluation of the pre- to post- variation of the relevant components of the water cycle (precipitation, evaporation, runoff and recharge). However, there is much concern in that the water balance concludes that there will likely be a post- development drop in infiltration of approximately 46% across the site, when compared to the existing (pre-development) condition. This shortfall is substantive and must be fully mitigated against. Please see comments under Mitigation provided below for additional information.*

Azimuth Response: A revised water balance has been provided in the Revised Hydrogeological Addendum Report (April, 2019). This revised water balance includes a feature based assessment as required by the CVC. This revised water balance also incorporated LID's presented in the Urbantech FSR, which have provided further reduction in the ground water infiltration deficit. Although minor deficits remain, additional contributions such as snow melt, which were not considered in the water

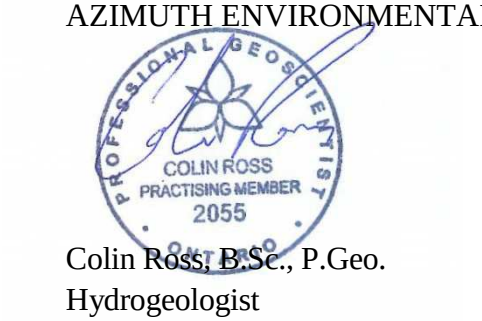
balance as the values are difficult to quantify, would provide additional contributions. This would likely bring within a pre and post development ground water infiltration match. As well, the expected change should be considered in terms of its magnitude, not simply the percentages. The expected change in water table is less than a few centimetres, so will not be discernible within the seasonal variations.

Mitigation

Comment 5. *The water balance calculations show that without mitigation, there will likely be a loss of infiltration of about 46% created from the footprint of the propose development. In respect of this, roof-top runoff is being proposed as an additional source of water to mitigate against this loss of infiltration. However, even with such mitigation, the water balance calculations still conclude that there will be an infiltration shortfall of approximately 38% in the post-development phase. This is not an acceptable solution; the groundwater infiltration post-development must be mitigated for as to preserve the infiltration of the existing condition (pre- development). Please provide an updated water balance with proposed mitigation that demonstrates this.*

Azimuth Response: The Revised Hydrogeological Addendum Report (April, 2019) prepared by Azimuth includes a revised feature based water balance that has included LID mitigation measures to further reduce the ground water infiltration deficits. Given the overall ground water infiltration reduction is limited to just 5% in post development, an overall balance is likely achieved when taking into account snowmelt, which has not been considered in the water balance as the values are difficult to quantify. However, given snow represents 31% of total annual precipitation, it represents contribution which will likely overcome the stated deficit.

Yours truly,
AZIMUTH ENVIRONMENTAL CONSULTING, INC.



Colin Ross, B.Sc., P.Geo.
Hydrogeologist