



Project Name: Hydrogeological Investigation

MTE File No.: C42063-104

To: City of Guelph
Planning and Building Services

Date: January 9, 2020

From: MTE Consultants Inc.

RE: Update to Hydrogeological Investigation Report as per City of Guelph Comments

Background Information

MTE was retained by Crescent Homes to complete a Hydrogeological Investigation for the properties located at 190, 202, 210, and 216 Arkell Road in Guelph, Ontario (hereafter referred to as the 'Subject Lands'). These properties comprise one contiguous parcel of land located along the north side of Arkell Road.

A Hydrogeological Investigation Report was completed by MTE for the Subject Lands, dated October 5, 2018. MTE has since received comments from the City of Guelph's Planning and Building Services Department, dated April 17, 2019, and the City of Guelph's Engineering and Transportation Services Department, dated April 25, 2019, relating to the Hydrogeological Investigation Report. The objective of this Technical Memorandum is to provide a response to comment 27 received from the City of Guelph's Planning and Building Services Department and to outline the intended next steps in addressing this comment.

Comment 27 from the City of Guelph's Planning and Services Department requests that a vertical groundwater gradient be provided as it aids in determining the function of the provincially significant wetland (PSW) as it relates to groundwater/surface water interaction.

Field Activities

In order to address this comment, MTE installed a mini-piezometer (labelled MP1-19) in the wetland complex located in the north portion of the Subject Lands, in the vicinity of monitoring well location MW4, in order to allow for an assessment of the vertical hydraulic gradient between these two locations. The existing site features, including the mini-piezometer and monitoring well locations are shown on the attached map (**Attachment 1**). The mini-piezometer was installed on October 8, 2019, to a depth of 1.05 meters below ground surface (mbgs). At the time of installation there was no standing water observed in the area of the wetland complex located within the Subject Lands and the ground surface appeared damp.

Following installation, MTE fitted the mini-piezometer with an electronic pressure transducer (data logger) in order to collect continuous water level information within the mini-piezometer. Data loggers measure the pressure (in centimeters of water) above the logger at a predetermined time interval, which can then be used to calculate a groundwater level and elevation once compensated for atmospheric pressure. The data logger installed in the mini-piezometer was set to record a pressure at a time interval of every 1 hour. At the time of the mini-piezometer and data logger install, no water was measured within the mini-piezometer.

In addition to the continuous groundwater level monitoring, MTE collected three manual measurements from the mini-piezometer on October 29, November 12, and December 6, 2019. The data logger was



removed from the mini-piezometer during the November 12, 2019, monitoring event in order to prevent the logger from damage due to exposure to extended temperatures below freezing.

During these three monitoring events the mini-piezometer was observed to be dry and there was no standing water observed in the vicinity of the mini-piezometer. In addition, a hydrograph generated from the continuous water level monitoring (provided in **Attachment 2**) also shows the mini-piezometer to be dry throughout the monitoring period.

As outlined in the Hydrogeological Investigation Report, the groundwater flow direction across the Subject Lands was inferred as southwesterly, with the wetland along the north property boundary representing an expression of the groundwater table at ground surface. Therefore, the dry conditions observed at the mini-piezometer during the monitoring period is interpreted to result from a depressed groundwater table resulting from seasonal lows typical during the summer and fall months. It is therefore anticipated that water would be present within the wetland and mini-piezometer in the spring as the spring thaw typically contributes to groundwater recharge and highs.

Conclusions and Next Steps

The observations outlined above are consistent with the findings of the Hydrogeological Investigation Report which states that the wetland along the north property boundary represents an expression of the groundwater table at ground surface and that the wetland contributes to the southwesterly direction of the shallow groundwater flow. In addition, based on the observed dry conditions within the mini-piezometer and wetland, it can be inferred that the gradient within the wetland is downward, despite being unable to quantify the gradient at this time.

Since it is anticipated that the spring melt would result in elevated groundwater levels, MTE will be collecting groundwater level measurements within the mini-piezometer and monitoring well location MW4 in the spring in order to quantify the vertical groundwater gradient between these locations. The Hydrogeological Investigation Report would be updated with this information at that time.

Should you have any questions or concerns, please contact the undersigned.

Yours Truly,

MTE Consultants Inc.

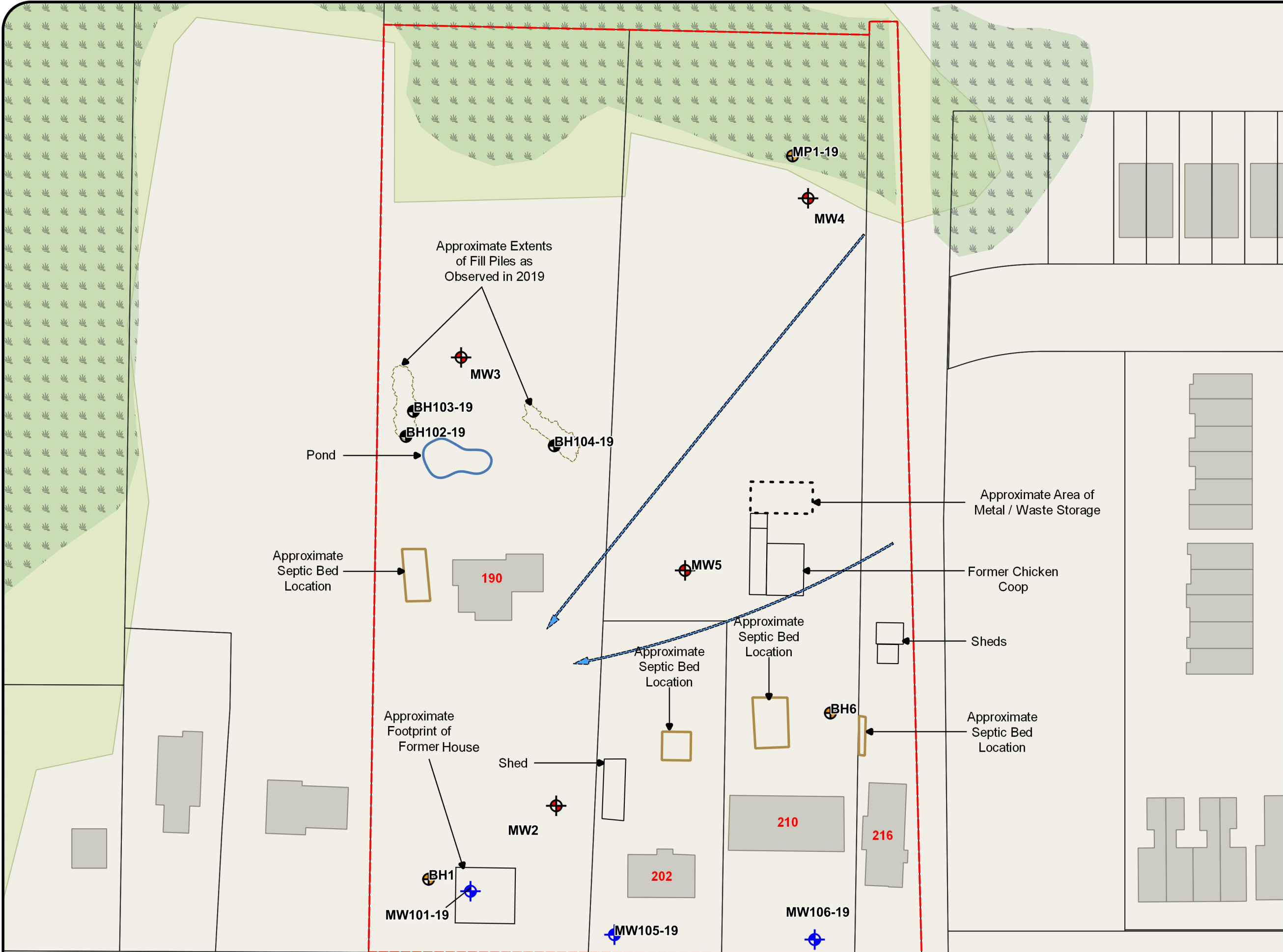
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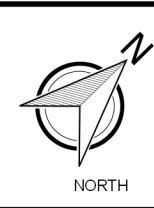
for **Peter A. Gray, P. Geo., QP_{ESA}**
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KLW:apm
Attach.


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Attachments





NORTH



PROJECT NORTH

Legend

- Property Boundary
- Study Area
- Wooded Area
- Provincial Significant Wetlands
- Interpreted Groundwater Flow Direction - Oct. 12/19

Investigative Locations

- Monitoring Well - ESA
- Monitoring Well - GI
- Borehole - ESA
- Borehole - GI
- Minipiezometer


Data Sources:

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0 8 16 24 32 40 m

Scale (11x17): 1:850

Project CRS: NAD83 / UTM zone 17N



MTE
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Client

Crescent Homes Ltd.

Project

Hydrogeological Investigation

Site

190-216 Arkell Road, Guelph

Title

Site Features & Monitoring Locations

Reviewed By	PAG		
Prepared By	KLW	Project No	42063-200
Drawn By	KLW	Figure No	1
Date	Jan. 2020		

Hydrograph 1: Groundwater Elevations (mAMSL) - MP1-19

