

October 27, 2025

Our File: 2506144

VIA EMAIL: bmi.derick@gmail.com

**Re: Floodplain Assessment and Safe Access
South Part Lots 9 & 10, Concession 10 Kinloss**

Derik:

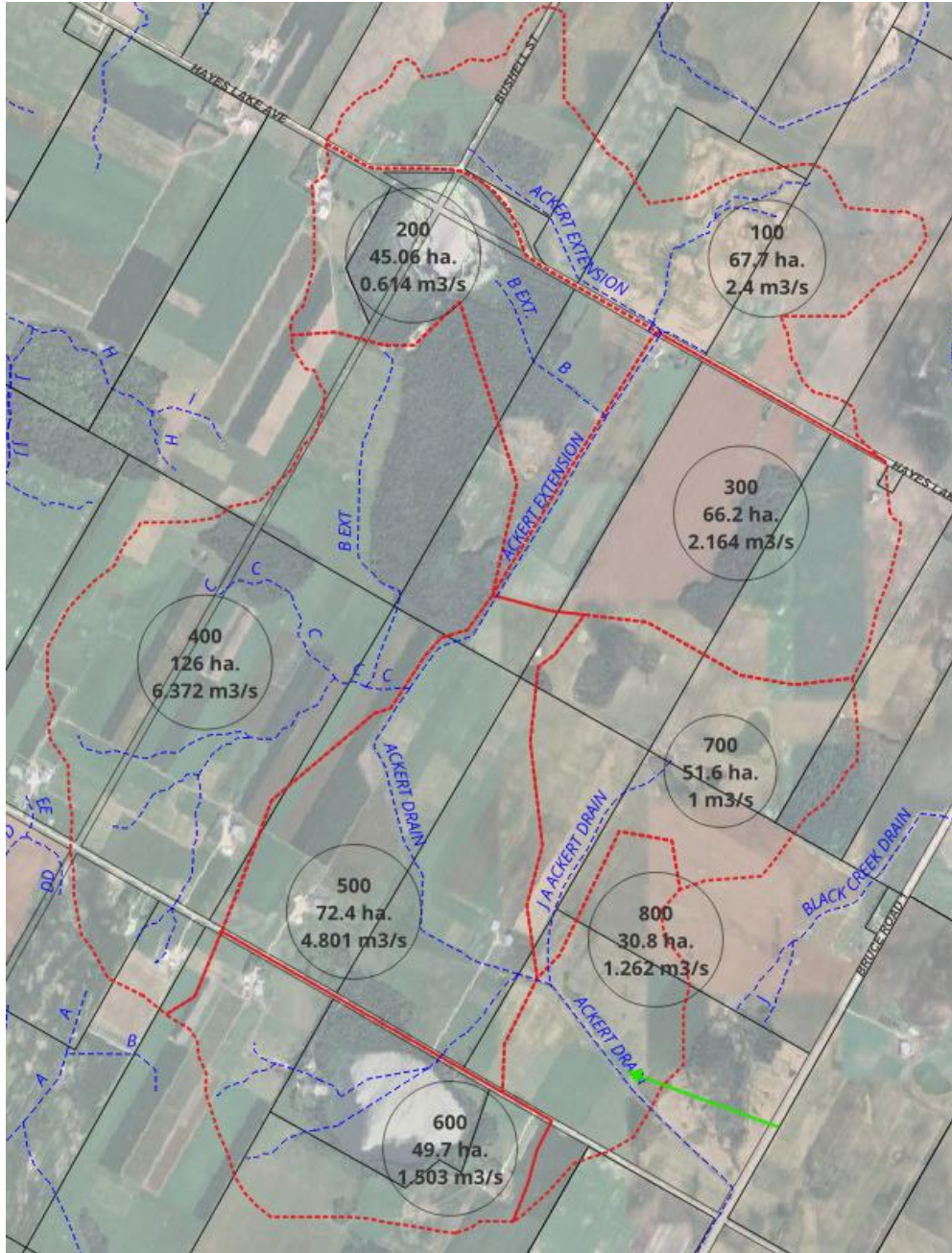
As per your instructions, we have completed a floodplain and safe access assessment of the above noted property. It is understood you wish to use the property for the construction of an abattoir, to be located on high ground in the back of the property (north end). This location will require a new crossing of a watercourse that bisects the property, known as the Ackert Municipal Drain.

Parameters to be used for the study were provided by the Maitland Valley Conservation Authority. The flood elevation to be examined is the 100-year return period design storm. As per MVCA direction, the culvert to be installed must not cause undue impact to properties upstream of the crossing under flood conditions.

Hydrology

The upstream catchment of the Ackert Drain was determined using the Ontario Watershed Information Tool and was determined to be approximately 505 hectares in area. Topography in the catchment area was determined using the LIDAR-derived Digital Terrain Model (DTM) from Land Information Ontario (LIO). According to published LIO information, the DTM has a vertical accuracy of +/- 9.8cm at 95% confidence level. The DTM was used to split the catchment into 8 separate sub-catchments, largely centred around the various branches and tributaries of the Ackert Drain. Catchment parameters such as flow length and slope were derived from the DTM, and Soil Conservation (SCS) infiltration parameters were determined based on the Ontario Geological Survey Mapping aerial photography. The 100-year return period design storm was determined using the MTO IDF look-up tool for Holyrood.

The hydrologic model MIDUSS was used to determine the peak runoff rate from all sub-catchments to be used in the study. The following schematic provides the sub-catchments as well as their calculated peak runoff rates to be used in the hydraulic model. The schematic shows, in descending vertical order, catchment name, catchment size in hectares, and peak runoff rate in m3/s.



Hydraulic

The hydraulic model HEC-RAS was used to determine water surface elevations at the proposed access point, shown as a green area on the above sketch. The river profiles and cross sections were drawn in RAS Mapper using the provided DTM, and flows were provided by MIDUSS as above. It is noted that there is an existing farm crossing approximately 210m upstream of the proposed new crossing location. The landowner provided information noting this culvert is 5' in diameter, and this was also included in the hydraulic model.

For the purposes of this study, the proposed crossing location is at river station 118 and the upstream property boundary is at river station 549. The river was modelled under both existing conditions, and with a new laneway and

culvert crossing for the proposed abattoir included. It was determined that twin 1.8m diameter concrete culverts would be required to pass sufficient flow, and the top of laneway elevation was set to 0.6m above the top of the culverts, equivalent to 283.60 masl in the model.

Water surface elevation at river station 549 during the 100-year event, under current conditions, was calculated by the model to be 283.44 metres above sea level (masl). After including the proposed laneway and crossing for the new abattoir, the water surface elevation at river station 549 was calculated to be 283.50 masl. This is within the margin of error for the digital terrain model and is therefore considered to be equivalent to no change. Water surface elevation immediately upstream of the proposed crossing was calculated to be 283.46 masl, or 0.14m below the laneway elevation, therefore providing for safe access under flood flow conditions.

Profile plots of the water surface elevation under “before” and “after” conditions are attached to this letter.

Summary

In summary, we find that:

1. The installation of twin 1.8m concrete culverts at the proposed crossing location will pass sufficient flow so as to limit the change in upstream water surface elevation under flood flow conditions to less than the margin of error for the digital terrain model.
2. Installation of a laneway with a surface elevation 0.6m higher than the top of the culvert pipes will provide for safe access during flood flow conditions.

Disclaimer

It should be noted that all elevations given are derived from the available digital terrain model and cannot be guaranteed to be absolutely accurate. A topographic survey should be undertaken prior to construction to determine the actual elevation of the municipal drain at the location of the crossing, and the final laneway elevation should be set based on the topographic survey.

We hope this meets your satisfaction. Should you have any questions or comments regarding this, please let us know.

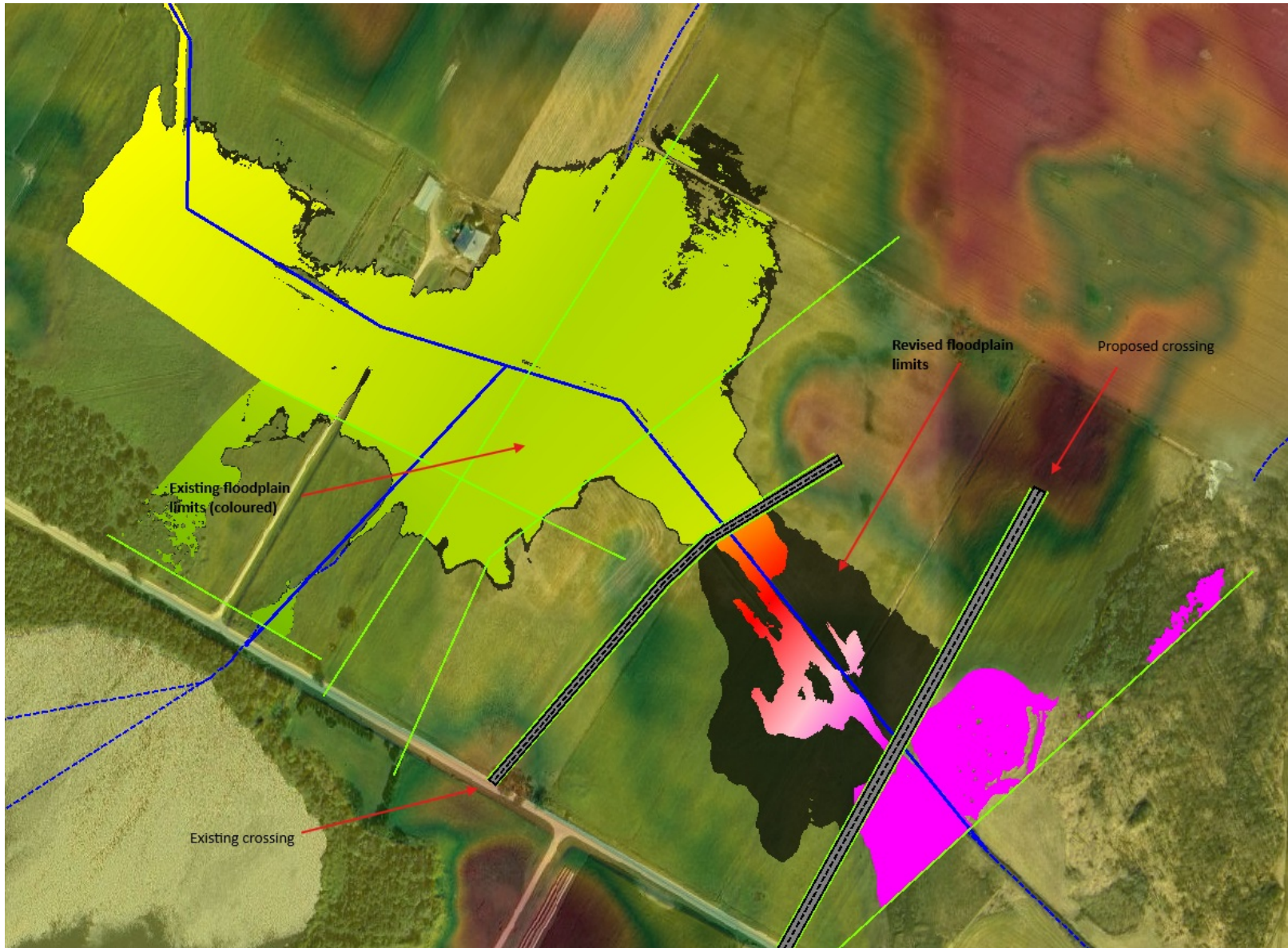
Yours truly,

GEI Consultants Canada Ltd.

Per:

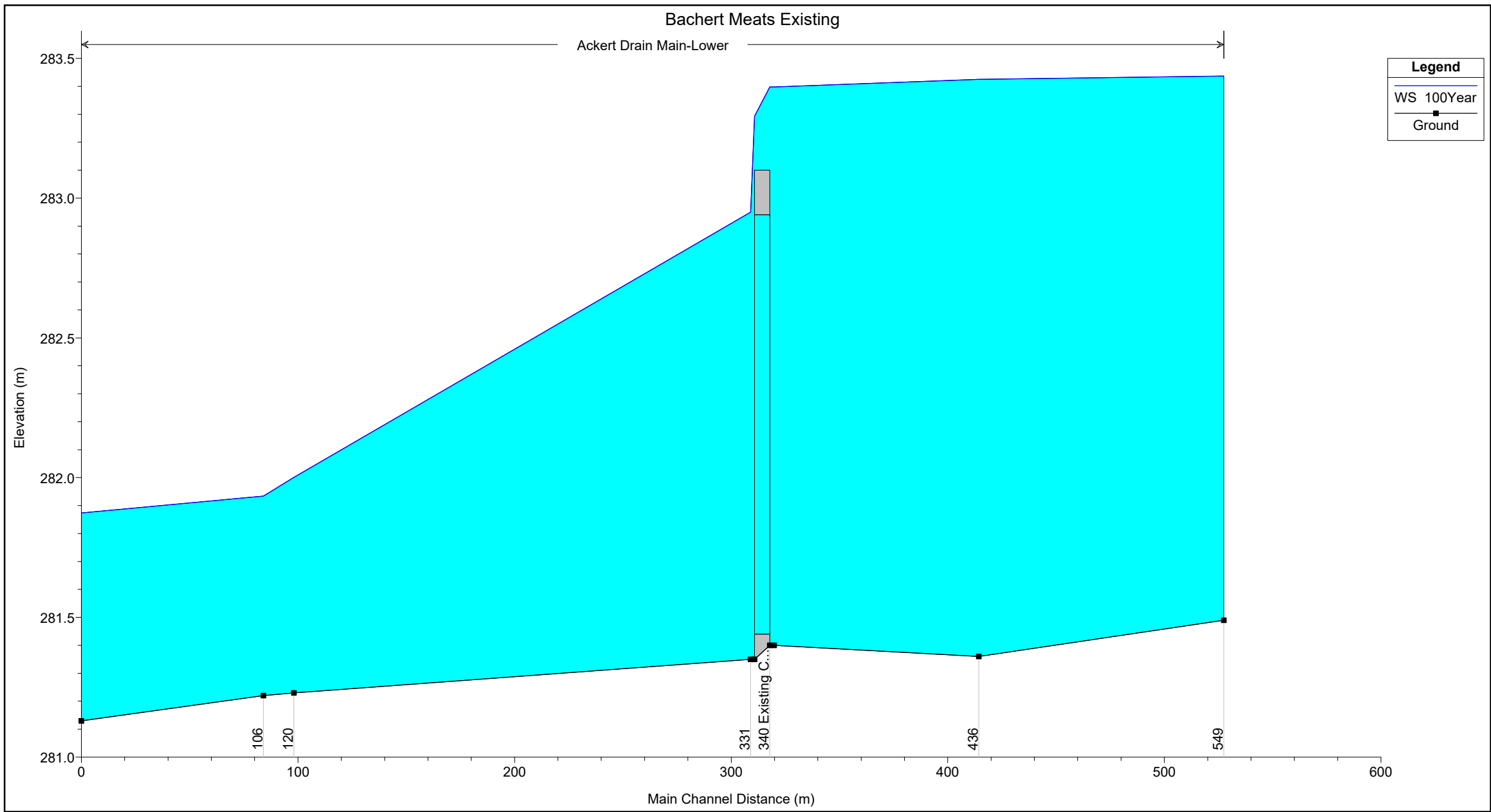
Matt Ash, C.E.T.

FLOODPLAIN LIMITS



Bachert Meats Existing

Ackert Drain Main-Lower



Bachert Meats Proposed

Ackert Drain Main-Lower

