

Subject: Re: Strada - Geotechnical - Questions from HydroG Peer Reviewer

From: Garry Hunter <ghunter@hunter-gis.com>

Date: 2024-09-01, 4:53 p.m.

To: Alicia Kimberley <akimberley@tathameng.com>, "dirk@earthfx.com" <dirk@earthfx.com>, EJ Wexler <ejw@earthfx.com>, Gabriel Bacca Cortes <gabrielbc@earthfx.com>, Connor McCormick <connor.mccormick@gemtec.ca>, Graeme Skinner <graeme.skinner@gemtec.ca>, Natalie Kotyck <info@ndact.ca>, Brian Zeman <bzeman@mhbcpplan.com>, Kevin Powers <kevinp@campbellstrategies.com>

BCC: Carl Cosack <cosack@zing-net.ca>

Alicia,

In response to your two questions and additional geotechnical report and modeling comments following Friday's meeting.

Two Questions

1. Site data is always welcome. This should be incorporated into the GEMTEC update together with site locations and a further breakout of the silt vs clay content.
2. With regard to the Guelph Permeameter Tests, please also provide the results together with sample locations. However the site borehole and water level monitoring data indicate lower permeability overburden and underlying Eramosa Bedrock conditions. The Model Layer 6 vs Layer 4 site groundwater monitor data show upward gradients under at least part of the southern infiltration pond site (Peer Review Fig H.1 and H.2).

The Groundwater Model, if well calibrated, should provide the best indication of the infiltration capabilities of the proposed infiltration ponds. Even inadequately calibrated Model Scenario 1 Assessment demonstrates, depending on design details, that water pumped from the Pine River excavation will seep under, through or over the berm walls into the Boyne River headwater surrounding farm fields, residential lots, wetlands and tributaries.

We note there appears to be an error in the proposed design top water elevations in the sequential infiltration ponds as proposed.

Geotechnical Item Not Discussed on Friday

Model Scenario 1 assumes extraction to within two (2) m of the Top of the Gasport. Considering over drilling of blast holes, blast fracturing and fragmentation of the upper Guelph / Eramosa bedrock formations and the high pressure in the underlying aquifer, GEMTEC also needs to address how long and over what excavated area extent this remaining two m thickness will remain stable without uncontrolled quarry floor flooding (also see Peer Review Fig H.3 Schematic Cross Section).

Summary GEMTECH Geotechnical Report

The GEMTECH lower barrier edge berm as illustrated on its berm Stability Diagrams is not stable and will not contain the high pressures in the adjacent Gasport Aquifer as assumed in the Groundwater Model.

In the alternative during Friday's meeting, to make the Geotechnical feasibility (reality) consistent with the Groundwater Model assumptions, GEMTEC orally proposed a vertical hydraulic barrier wall connecting (welding) together the 10-9 Hydraulic Conductivity Cabot Head Shale and the 10-7 Goat Island Niagara Falls Unit to prevent uncontrolled groundwater inflow flooding the Quarry. The highest probability of this uncontrolled inflow appears to be along the 4th Line downgradient from the McTaggart Farm Infiltration Basin and within the interpreted Groundwater Model Zone of enhanced hydraulic conductivity. Scenario One Model hydraulic heads are an excessive at 60 m (200 ft) in this vicinity.

There are not adequate number of boreholes / nested multilevel groundwater monitors in the Prince Pit 4th Line area or mid Township Lot Con 3 Melancthon Pit areas to define the Earthfx 3D interpreted zone of enhanced hydraulic conductivity along one of a number of karstic bedrock lineament radial spokes extending into the Escarpment Tablelands from the Horning's Mills Pine River Valley headwaters.

If Vertical Barrier Wall Technology Model Scenario is going to be proposed by Strada as a fundamental Quarry water management strategy, then GEMTECH needs to further address with conceptual illustrations, the geotechnical feasibility of this Barrier Wall Concept including any supporting expert geotechnical investigations it considers advisable.

GEMTEC should also address if the Barrier Walls should be further extended vertically to the base of the Guelph Eramosa Unit and the base of the Upper Berm Barrier wedge (not questioned). In the Guelph area, there is a significant productive aquifer zone at the top of or within the Ancaster Chert zone. Strada has not reported presence or absence on this site.

A contingency Plan is required to address event (s) of uncontrolled quarry floor flooding. Where will the water be pumped to and discharged to allow Quarrying to resume? Constructability and adaptability including quarry rehabilitation barrier wall removal must also be addressed.

Groundwater Model Scenario One.

It appears from vertical cross sections provided by Earthfx to GEMTEC that equivalent vertical barrier walls have been incorporated to the top of the Gasport in selected parts of the Scenario One Groundwater model. However there is no detailed understandable phasing plan or 3D perspective visualization provided in the applicant's document stack. This visualization is required to explain the concepts to the NDACT community and likely to to Strada's multiple consultants as well.

This Peer Review has now initiated this visualization process in the absence of any effort by Strada. We require Strada's 'geological pick files' to efficiently complete this process. This is all part of the science.

Model Scenario One Not Acceptable

This Peer Review has previously concluded that the Impacts of the proposed Vertical Barrier Wall Model Scenario One Site Plan on the NDACT community at large are not acceptable. This Review continues to recommend developing additional improved calibration Quarry Model Scenarios rather than investing further in Model Scenario One.

This Peer Review on July 30, 2024 objectively and constructively suggested a possible alternative Scenario which no doubt now requires further fleshing out (Peer Review Fig H.3). There has been no follow up comment by Strada.

Comments on Scheduling Pressures to make Application Submission to MNRF

Top down imposed unrealistic submission deadlines for this proposed unprecedented 60 m (200 ft) deep dolostone quarry simply force illogical, premature poorly organized and duplicative reports increasing Strada's and this Peer Review costs.

This iterative Peer Review is following Strada's document production initiatives. New information and integration may result in further revisions to conclusions. A brief comprehensive summary will be provided at a later date.

I am available for future discussion.

Yours truly,

Garry T. Hunter M.A.Sc. P.Eng.
President

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On 2024-08-30 4:22 p.m., Alicia Kimberley wrote:

Thank you Garry.

With respect to your request for #5, we have gradation testing on the till in the southern portion of the site (suspected Tavistock Till).

It wasn't completed for geotechnical purposes but we had done some Guelph Permeameter testing in this area last year. There are 3 samples (the gradation testing itself was completed by GEMTEC too), attached is a site map of where the soil samples were taken and the results of the gradation testing. Would this satisfy your request?

Alicia



Alicia Kimberley P.Geo.
Group Leader - Hydrogeology

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From: Garry Hunter ghunter@hunter-gis.com

Sent: Friday, August 30, 2024 3:44 PM

To: Alicia Kimberley akimberley@tathameng.com; dirk@earthfx.com dirk@earthfx.com; EJ Wexler ejw@earthfx.com; Gabriel Bacca Cortes gabrielbc@earthfx.com; Connor McCormick connor.mccormick@gemtec.ca; Graeme Skinner graeme.skinner@gemtec.ca; Natalie Kotyck info@ndact.ca

Subject: Re: Strada - Geotechnical - Questions from HydroG Peer Reviewer

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To all,

To summarize our Teams Meeting today:

1. Earthfx confirmed the Layer 6 Model Water Potentials Rise at the 4th Line west of the Prince Property to be to about 500 m asl (no action required).
2. GEMTEC to update its report to summarize our discussion today and provide a conceptual detail section of the Gemtec proposed impermeable Lower Barrier (Dam) connecting (welding) the native Cabot Head Shales and the Goat Island Aquitard across the Gasport Aquifer.
3. Earthfx to update its report text (not this current model scenario) to accurately reflect GEMTEC observations and conclusions (Earthfx currently in conflict)
4. All to consider a contingency plan based on a Model Scenario for Lower Barrier Failure as result of preferential karstic fracture flow, in my independent terminology 'groundwater flow trough convergence zone' and in Earthfx terminology 'enhanced conductivity zone'.
I do note that my ongoing Peer Review analysis, of Strada site anomalous water level data, indicates likely hydraulic connection through the Goat Island Aquitard at OW19C at the 4th Line and Lot 13 / 14 boundary (Prince Pit) as well as at two or three other locations.
5. In addition, I also request that GEMTEC obtain a few representative on site Till grab samples at fresh exposures and undertake grain size and other analyses and classify these on site soils for purpose.

Thank you.

Yours truly,

Garry T. Hunter M.A.Sc. P.Eng.
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On 2024-08-29 12:47 p.m., Alicia Kimberley wrote:

- Geotechnical peer review comments

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Alicia Kimberley has invited you to Strada - Geotechnical - Questions from HydroG Peer Reviewer

Title: Strada - Geotechnical - Questions from HydroG Peer Reviewer

Location: Microsoft Teams Meeting

When: August 30, 2024 10:00 a.m. – 10:30 a.m.

Organizer: Alicia Kimberley <akimberley@tathameng.com>

Description: * Geotechnical peer review comments

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