DRAFT MEMO

To:	Mayor Darren White and Council, Township of Melancthon Denise Holmes, CAO
Cc:	Undisclosed
From:	Garry T. Hunter, M.A.Sc., P.Eng.
Date:	July 8, 2025
File:	21-407
Subject:	**Strada Proposed Quarry** **Response to NDACT Arbitration Review June 24, 2025**

This memo responds to the Hydrogeology Arbitration Review – Peer Review of Six Key Hydrogeology Issues related to the proposed Strada Aggregates Melancthon Quarry as released by NDACT on June 24, 2005.

Proposed Major Quarry issues

These Six Key Hydrogeology Issues were identified by Hunter on January 10, 2025 and characterized as a Proposed Quarry Major Issues List. Hunter, subsequently to January 10, submitted additional communications related to both these major and additional minor issues. The January 10, 2025 list and justification was not static and stand-alone apparently as assumed by NDACT and Strada. A selected list of my Peer Review communications is enclosed.

Harden (Mr. Stan Denhoed)

My understanding is that the initial author of this NDACT June 24 document was Mr. Stan Denhoed (Harden) who released his report on June 3, 2025. Mr. Denhoed is a long time Pit and Quarry Hydrogeology consultant to the James Dick Group of companies. His work includes the Rockwood Hidden Quarry (Township of Guelph / Eramosa) where underwater extraction is proposed for the locally 30+ m thick Gasport Formation and the Reid Road Reservoir Quarry (Milton) where he is (or was) on the Consultant Team with Earthfx for a proposal to extract the much thinner Gasport under a former pit.

Hunter Ongoing Peer Review Communications

Mr. Denhoed contacted me on May 14, 2025 for preliminary discussions. I subsequently forwarded him selected related communications including my March 7 and 10 responses to the March 6 meeting with

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Earthfx and WSP. There was no further contact. However I have not seen references anywhere in the Harden June 3 or NDACT June 24, 2025 document that these communications especially my December 10, January 10 (4), 27, February 7 (3), March 7, March 10 (4), May 14, May 30, and June 5 (3) communications have been considered.

These communications contained alternative quarry footprints, alternative phasing, adaptive management plan components, off-site groundwater and streamflow sentry monitoring, a suite of proposed independent performance criteria and other relevant Site Plan application criteria. (See also enclosed my Quarry Adaptive Operational Principals, February 7, 2025). I must assume these ongoing communications have been ignored by Strada consultants, WSP and Harden.

I expect to consolidate these comments in due course at the appropriate time.

Harden Unresolved and Resolved Issues

I understand that Mr. Denhoed on June 4, 2025 concluded that nine (9) of Hunter's Major Issue items were 'Unresolved'. I have questions on a number of other Harden items reported (second hand) as 'Resolved' in the NDACT June 24 document. On a positive note, the Harden Report did focus on the very important omission of 'performance criteria' on the Strada Site Plans.

However NDACT has not released the Harden June 3 Report. In fairness, I cannot further comment until I have access to the Harden Report for detailed review. Furthermore, the NDACT June 24 document again references Strada consultant's field data that I have previously requested on a number of occasions, but has never been disclosed.

The Harden observations are helpful and further discussion with Mr. Denhoed are likely to lead towards further shared conclusions. In contrast, the WSP conclusions just appear to repeat Earthfx oral statements at meetings and are not very helpful.

Strada Arbitrary Proposal of Site Plan Notes

My understanding is that Strada and its consultants proposed Site Plan notes in response to Harden's 'Unresolved' items and subsequently arbitrarily pronounced my January 10, 2025 Major Issues as 'Resolved'. In other words, Strada is inappropriately setting its own performance criteria (fox in the hen house analogy).

Furthermore, Site Plan notes originating from Tatham primarily propose monitoring as a solution to issues and do not reflect the precautionary principle.

Modification of the January 31, 2025 Site Plan footprints, infiltration locations and phasing is required to protect the neighbours from adverse quarry environmental impacts, not just new Site Plan monitoring notes.

NDACT Endorsement

My understanding is that NDACT then further clarified and endorsed Strada's unilateral declaration of the January 10, 2025 Major Issues as Resolved and also endorsed the Strada proposed Performance Criteria without further input from Mr. Denhoed or Hunter.

Community Trusted Peer Reviewer

Without the Community Trusted Peer Reviewer (Hunter) involvement as designated in the Community Engagement Agreement of June 16, 2023, the NDACT/Strada process is arbitrary, no matter how well intended, and cannot pass reasonable objectivity criteria as a fair and equitable mediation process.

New Content NDACT June 24, 2025 Document

I do not intend to repeat the content of my prior communications but I do offer some specific clarifying comments on new content in the NDACT June 24, 2025 document.

- This Peer Reviewer places little weight on ad hoc discussions and promises made in consultant meetings as referenced by WSP in the NDACT June 24, 2025 document.
- Strada (Earthfx) have continued to 'stonewall' all requests (Hunter, WSP and Harden) for audit of the fundamental May 2024 groundwater model calibration input data. The model is opaque. What is Strada hiding?
- The Strada (Earthfx) Groundwater Model has not been recalibrated since May 2024 after repurposing the prior Shelburne Wellhead Protection Groundwater Model.
- This May 2024 groundwater model, although it may calibrate regionally to Everett, is poorly calibrated to the local Pine River groundwater dependent headwater streams and the important dry weather groundwater flows.
- Strada (page 21 of 25 June 24 NDACT document) now propose to update (recalibrate) the groundwater model during the later stages of Phase 1 extraction. This update is required now to inform the Site Plans and Notes.
- The reference to 'tens of model runs' (pg 14 of 25 of June 24 NDACT document) is understood to be in reference to the original May 2024 regional calibration and a Strada mandated inflexible quarry foot print and phasing as described on the successive Site Plans and more clearly articulated in the Noise Report.
- These model runs are non-documented except for an early run which raised the water table levels in the Duivnenvoorden Pit expansion area and northwestern farm fields.
- These model runs are understood to have focused on minimizing groundwater flow into the Strada mandated quarry footprint with infiltration at default sub-optimal sites outside the Strada mandated quarry footprint area.

- The model process is based on the Strada/Earthfx aggregate industry value system, not a community environmental protection value system.
- These model-runs did not include: no mitigation, sudden Lift 2 quarry floor rupture with contingency disposal of flood waters and immediate post quarry closure conditions.
- The Hunter revised alternative modified Site Plan with an Adaptive Management eastern infiltration corridor, the Hunter alternative Gasport Aquifer pressure relief or a possible alternative underwater extraction model for the 10 m thick on site Gasport Formation were apparently not considered in Strada's modelling efforts.
- Reference to a legacy fish hatchery (Earthfx, WSP and now Harden) and effects on the groundwater model is a 'red herring'. This Main Street fish hatchery was abandoned in the 1950s long before the model simulation period.
- This reference to a 'fish hatchery' simply demonstrates that the Strada/NDACT 'technical stranger's from away' are still not familiar with the 2 km quarry site and downstream influence area.
- This Peer Reviewer previously requested that all Applications including Site Plan elevations be standardized in a common Canadian Geodetic Vertical Datum preferably (CGVD2013) to match the available LiDAR data (pg 6 of 25 June 24, 2025 NDACT document). My understanding is that Strada's land surveyors converted all borehole elevations to CGVD2013.
- Strada consultants in this NDACT June 24, 2025 document do not seem to even understand that the North American Datum (NAD83) is a horizontal not a vertical datum.
- Both NRSI and Earthfx formally report flow reductions of up to 50%, not 37% at Horning's Mills (see Hunter June 5, 2025 NRSI and Earthfx Report Extracts).
- The Tatham additional Site Plan notes (on pg 13 of 25 June 24, 2025 NDACT document) include at least four (4) dry wells (see enclosed Hunter Amended Earthfx Table 2, June 5, 2025). Other 'long term' monitor wells are within the quarry extraction footprint. This June 24, 2025 proposal varies from the Earthfx April 14, 2025 monitoring proposal.
- The monitoring wells in amended Earthfx Table 2, useful for quarry purposes, are mostly Layer 3/4 which are more or less hydraulically equivalent and Layer 6 which are hydraulically independent from Layer 3/4. Most Layer 1 and 2 monitors will likely be 'dry' once overburden extraction is completed. Therefore, there are currently 17 Active Monitor Wells in Layer 3/4 and 7 Active Monitor Wells in Layer 6. Not all wells are suitable as long-term monitors. Layer 6 has 'sparse' coverage.

Unacceptable Conclusions

Under the circumstances, due to the non-disclosure of fundamental information, as the designated Community Trusted Peer Reviewer in the Community Engagement Agreement (Schedule B), I do not accept the conclusions of NDACT and Strada that the January 10, 2025 identified Major Issues and other

Issues identified in subsequent Hunter communications to June 5, 2025 have been adequately and reasonably resolved in the favour of the Horning's Mills community.

Summary

The Site Plans and Conditions are the operational legal instruments that are intended to protect the community, to the greatest extent possible, from the adverse effects and impacts of Quarrying.

The Strada submissions and Peer Reviews are now going into a ridiculous duplicit and expensive 6th cycle. Data disclosure, new field work and new modelling efforts are still required. This will not be solved by a Strada/ NDACT driven single-sided unilateral mediation process.

By comparison the CBM Caledon Quarry Site Plan application is only now at its third cycle and each cycle update contains considerable new relevant information. This CBM third cycle has already included a model recalibration.

This Peer Reviewer continues to have little confidence in Strada's current May 2024 regionally 'calibrated' ground water model, the January 31, 2025 Site Plans and Condition Notes or the proposed Site Plan addenda notes in the NDACT June 24, 2025 document to protect the Horning's Mills residential community, farm lands and headwater tributary streams.

Further objective dialogue between this Peer Reviewer and Harden may be productive in further resolution of the outstanding issues.

I seriously question whether any of Strada's consultants understand the totality of their assembled data and Site Plan community impact implications.

We look forward to expediently receiving the non-disclosed modelling, site data and reports for audit.

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Garry T. Hunter, M.A.Sc., P.Eng.
Civil Engineer, Hydrogeologist and Environmental Systems Planner
Hunter and Associates

Enclosures:
1) Index of Peer Review Technical Submissions to June 5, 2025
2) Quarry Adaptive Operational Principles, February 7, 2025
3) Peer Review Amended Earthfx Table 2 - Groundwater Monitoring June 3, 2025

HUNTER and ASSOCIATES
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35 Years of Service

STRADA
Proposed Melancthon Quarry

Peer Review
Technical Submissions
(Selected)

April 25, 2024 to June 5, 2025

2024:		
Apr 25	(Email + 4 Figures)	Email to A. Kimberley (Tatham Engineering) re: Groundwater Quality - Nitrates and Sodium 2019 to 2023
Oct 4	(Memo + Fig H.29)	Proposed Strada Quarry - Deep Gasport Aquifer Water Quality Sampling - Sept 11, 2024
Dec 10	(Memo)	Strada Peer Review Supplemental Hydrogeological Information Requests
Dec 20	(Email)	Email C. Cosack and N. Kotyck re: Options to deal with Strada's refusal to respond to G. Hunter's requests for supplemental information
January 2025:		
Jan 10	(Email + Issues List)	Strada Proposed Quarry Major Issues List
Jan 10	(Email + Memo)	Strada - Level 1 and Level 2 Hydrogeological Assessment Summary including Appendices A to E
Jan 10	(Memo)	Strada October 2024 Proposed Quarry Site Plans and Impact Assessment
Jan 10	(Email + Draft Letter)	Strada 4th Release Peer Review - Overview Summary January 10, 2025
Jan 21	(Email + Memo + Photos)	Dec 10, 2024 Strada Peer Review Supplemental Hydrogeological Information Request
Jan 22	(Email + Fig H.3 + Memo)	Preliminary Phasing Extraction Plan - Possible Alternative for Consideration
Jan 23	(Email Chain)	Potential Presentation - DRAFT3 - up to 50% flow reduction
Jan 27	(Memo)	Strada January 24, 2025 Meeting - Continuing Discussion
February 2025:		
Feb 7	(Email + Draft Memo + 7 Figures)	Strada Proposed Quarry Alternative Site Plan / Water Management Concept and Supporting Figures
Feb 7	(Email)	CBM Quarry - Blast Impact Assessment Report (revised July 2023)
Feb 7	(Email Chain)	Strada Proposed Quarry Site Plan Concept - Support Figures
March 2025:		
Mar 7	(Email + Attachments)	Pine River Baseflows - Meeting Follow-up
Mar 10	(Email + 2 Memos)	CBM Quarry - FOI - MECP /MNRF Memos - with NDACT Peer Reviewer Annotations
Mar 10	(Email + Memo + 4 Figs)	Proposed Strada Model Calibration Improvements
Mar 10	(Email)	Model Layer 4 and 6 High Quality Hydraulic Surfaces (Potentials) and Subtraction - Offset Model Inferred Zones of Increased Flow
Mar 10	(Email)	Pine River - Headwater Streams Aquitard Support
May 2025:		
May 14	(Email)	Request to Strada for clarifications
May 30	(Email)	Vulnerable Water Wells with less than 10 m drawdown
June 2025:		
June 5	(Email + Memo)	Strada Proposed Quarry Fifth Cycle Peer Review January 13 to April 17, 2025
June 5	(Email + Memo)	Strada Proposed Quarry ARA Site Plans January 31, 2025
June 5	(Emails + Memo)	Strada Proposed Quarry Related Exhibits to May 30 and June 3, 2025 communications

June 5, 2025

February 7, 2025
QUARRY ADAPTIVE OPERATIONAL PRINCIPLES
(Preliminary - Evolving)

The following Mandatory and Adaptive Discretional Quarry operation principles are proposed.

Mandatory Principles

The Mandatory Operational Principles are:

1. Implementation of an Adaptive Management Plan.
2. Performance Criteria to protect Horning's Mills Community and Pine River headwaters from water quantity and quality degradation.
3. No diversion of surface or groundwater flows from the Pine River headwaters to the Boyne River headwaters.
4. No raising of water tables on Duivenwoorden Pit lands or in NAT-01 Wetland.
5. No root zone flooding of agricultural fields.
6. Removal of Deep (Gasport) Aquifer Hydraulic Barriers prior to closure.
7. Termination of quarry and / or groundwater extraction if Performance Criteria are breached by Quarry operations.

Operational Discretionary – Design Principles

The following discretionary solutions may be implemented based on operational experience for conditions 'as found' or reasonably anticipated and as determined by Strada to be necessary to meet Performance criteria. Typical Design Details to be shown on the Site Plans.

8. Provision for separation (or merging) of Upper Aquifer (Guelph), Deep Aquifer Non- Contact Water and Quarry Sump Contact Water based on operating conditions as found or as anticipated.
9. Ground Water Extraction and Infiltration Infrastructure and transmission components to be implemented when there are excess quantity and/or adverse quality inflows into the Quarry excavation or as anticipated.
10. Implementation of Pressure Relief Wells as required to facilitate Lift 2 / Lift 3 extraction and construct Lift 3 Hydraulic Barriers if deemed necessary.
11. Implementation of vertical Hydraulic Barrier Walls for Lift 1 or Lift 3 (High or Low Pressure) if deemed necessary.
12. Provision of stormwater quality treatment (denitrification) riparian wetland storage pond for Quarry contact water and contaminated Upper Aquifer non-contact water as may be required.
13. Provision of surface pond and/or aquifer storage to support continuous 24/7/365 groundwater infiltration to Pine River headwaters.
14. Implementation of pathogenic treatment of surface water discharge to Infiltration media as required.
15. Implementation of SCADA and hydraulic controls for water management and maintenance of downgradient dry weather flows to the Pine River headwaters and Horning's Mills community.

Amended Earthfx Table 2
Strada Aggregate Proposed Melancthon Pit/Quarry
Proposed Site Monitors

Model Layer	Monitor ID	Active	Dry	Inactive	Destroyed	Source
Layer 1 Overburden Shallow	OW6-A	OW6-A				Fig 6
	OW7-A	OW7-A				Fig 6
	OW8-A	OW8-A				Fig 6
	OW11-A				OW11-A	Fig 6
	OW15-A				OW15-A	Fig 6
	OW14-A		OW14-A			Fig 6
	OW21-A		OW21-A			Fig 6
Layer 2 Glacial Till	OW3B-08	OW3B-08				Fig 6
	OW4B-08	OW4B-08				Fig 6
	OW5B-08	OW5B-08				Fig 6
	OW9B-08	OW9B-08				Fig 6
	OW10B-08	OW10B-08				Fig 6
	OW12B-08	OW12B-08				Fig 6
	OW13-A	OW13-A				Fig 6
	OW18-A	OW18-A				Fig 6
	OW19-A	OW19-A				Fig 6
	OW2B-08				OW2B-08	Fig 6
	OW17B-08				OW17B-08	Fig 6
	OW20-A		OW20-A			Fig 6
	OW22-A		OW22-A			Fig 6
	OW23-A		OW23-A			Fig 6
Layer 3 Weathered Bedrock (Epikarst)	OW29-A	OW29-A				Fig 7
	OW3C-07	OW3C-07				Fig 7
	OW4C-07	OW4C-07				Fig 7
	OW5-C	OW5-C				Fig 7
	OW13-C	OW13-C				Fig 7
	OW14-C	OW14-C				Fig 7
	OW18-C	OW18-C				Fig 7
	OW19-C	OW19-C				Fig 7
	OW20-C	OW20-C				Fig 7
	OW22-C	OW22-C				Fig 7
	OW24-A	OW24-A				Fig 7
	OW11-C				OW11-C	Fig 7
	OW15-C				OW15-C	Fig 7
	OW17-C				OW17-C	Fig 7
Layer 4 Guelph Formation	OW7-C	OW7-C				Fig 7
	OW16-C	OW16-C				Fig 7
	OW23-C	OW23-C				Fig 7
	OW25-A	OW25-A				Fig 7
	OW26-A	OW26-A				Fig 7
	OW28-A	OW28-A				Fig 7
Layer 6 Gasport Formation	OW24-C	OW24-C				Fig 8
	OW25-C	OW25-C				Fig 8
	OW26-C	OW26-C				Fig 8
	OW27-C	OW27-C				Fig 8
	OW28-C	OW28-C				Fig 8
	OW29-C	OW29-C				Fig 8
	OW30-C	OW30-C				Fig 8
	OW2C-07				OW2C-07	Fig 8
	OW1			OW1		Fig 8
	PW1			PW1		Fig 8
Total	***51***	*36*	*5*	*2*	*8*	

Data Sources:
Response to Mediation Questions, Proposed Shelburne Pit/Quarry, by Earthfx Inc. April 14, 2025
Fig 6 Site Monitors Layer 1 Shallow Overburden and Layer 2 Till
Fig 7 Site Monitors Layer 3 Weathered Bedrock and Layer 4 Guelph
Fig 8 Site Monitors: Layer 6 Gasport
Table 2 Monitoring Network including Hydrostratigraphic Layers and Units