April 17, 2025 Project No. CA0034901.4676

North Dufferin Agricultural and Community Taskforce (NDACT)
30 Floral Parkway
Concord, ON L4K 4R1

Mayor Darren White
Township of Melancthon
157101 Hwy 10
Melancthon, ON

RE: ASSESSMENT OF EARTHFX TECHNICAL REPORT, ENTITLED 'RESPONSE TO MEDIATION QUESTIONS, PROPOSED SHELBURNE PIT/QUARRY'

Dear NDACT Board and Mayor White,

I am writing to provide my professional assessment of the EarthFx technical report to Strada Aggregates entitled Response to Mediation Questions, Proposed Shelburne Pit/Quarry, April 11, 2025, which addresses the six remaining hydrogeology issues raised by Garry Hunter of Hunter and Associates (Hunter) on behalf of NDACT.

Since January 2025, I have engaged with Mr. Hunter and Strada's consultants through multiple channels: an in-person meeting on January 24, 2025, a virtual meeting on March 6, 2025, as well as numerous phone calls and email exchanges. These interactions gave me a comprehensive understanding of Hunter's technical concerns, which spanned groundwater modeling accuracy, stream flow impacts, water quantity and quality management, geotechnical risks, and long-term monitoring.

I have reviewed the EarthFx responses to the six remaining Hunter issues in the document entitled *Response to Mediation Questions Proposed Sheburne Pit/Quarry*, dated April 11, 2025. The results of my review, including my opinion of whether these issues have been addressed, is provided in the attached Table 1. My review confirms that, in my opinion, Strada's hydrogeology team has thoroughly and adequately addressed these concerns.

The April 2025 EarthFx report directly addresses each issue with detailed evidence and analysis, as follows:

- Groundwater Model Fitness (Issue 1): Hunter questioned the model's predictive reliability. Strada demonstrates updates with new drilling data, reducing mean error from 1.31 m to -0.97 m (Appendix D, Table 4.4), and validates flows against 2024 Tatham measurements—except at SW6, where a fish hatchery's unmodeled discharge explains the discrepancy. This meets scientific rigor through calibration and field data alignment.

- Pine-to-Boyne Diversion (Issue 2): Concerns about flow reductions at Horning's Mills (max 37%, not 50%) are countered with data showing a negligible 2.3% downstream impact at Pine River (Appendix E, Section 3.9.6), considered not ecologically significant by NRSI—protecting community water resources.
- Water Quantity Management (Issue 3): Hunter flagged operational gaps. Strada's plan ensures flow maintenance for Horning's Mills, with permits pending to enforce compliance (Tatham updates), aligning with regulatory standards.
- Water Quality Standards (Issue 4): Hunter noted missing quality criteria. Strada details nitrate and sodium monitoring (Appendix B, Section 8.7), with treatment options under an ECA, safeguarding drinking water per provincial guidelines.
- Geotechnical Contingencies (Issue 5): Risks of quarry floor rupture are mitigated with a 2 m rock buffer and uplift monitoring (Appendix E, Page 234), meeting safety and operational criteria and a note on the Site Plans.
- Monitoring Network (Issue 6): Hunter's concerns about efficiency are addressed with an expanded, approved network, set for optimization with MECP and MNR (Appendix A, Page A-9), ensuring long-term oversight.

The EarthFx report builds on three years of rigorous peer review by Hunter and Associates, ensuring community concerns shaped the process. In my opinion, Strada's investment in studies, iterative modeling, and field validations reflects a commitment to both scientific integrity and community protection. I am confident the six remaining hydrogeology issues have been addressed, allowing NDACT and the Township to proceed with assurance in the project's hydrogeological safeguards.

I am available at sean.mcfarland@wsp.com for any questions or further discussion.

WSP Canada Inc.

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Senior Principal, Fellow, Senior Hydrogeologist

SM/PM/rk

Attachments: Table 1 – Comment-Response Matrix: EarthFX Responses to Hunter Comments

Table 1: Comment-Response Matrix: EarthFX Responses to Hunter Comments

Hunter Issue	EarthFX Response Discussion	Issue Addressed (Yes/No) and Rationale
1.1 Is the current Oct 2024 Groundwater Model Fit for Predictive Purposes?		
Hunter Comment 1.1 *The current model, despite the four cycles of Peer Review comments, have not incorporated any change in Model Layer Aquifer Parameters since the 2022 Shelburne Report or any change in Calibration statistics since my first cycle Peer Review.*	The Hunter document indicated that the current model, despite the four cycles of Peer Review comments, have not incorporated any change in Model Layer Aquifer Parameters since the 2022 Shelburne Report or any change in Calibration statistics since my first cycle Peer Review. The Earth Fx Response indicate that the model surfaces and layer parameters were updated multiple times during the course of this study as new drilling, coring results, and water level data were collected and that. • The groundwater and surface water calibration updates are documented in detail in Appendix D Sections 3.6 and 4.10. • Compared to the Shelburne WHPA model, the Strada model Mean Error (average difference between observed was reduced from -1.31 m to -0.97 m). ▪ See Shelburne Report Table 5.5, Page 142 ▪ See Strada Report, Appendix D, Table 4.4 Page D-109	**Yes.** **Rationale: This issue is addressed since it clarifies that the layers and model surfaces were updated multiple times throughout the process as new information became available and indicates specifically where this information can be found.**
Hunter Comment 1.2 *The current model underestimates dry weather groundwater and stream flows by two to three times where direct comparison of Model STR virtual and actual dry weather stream flows are available.*	The EarthFx response discusses how the Hunter document indicates that the current model underestimates dry weather groundwater and stream flows by two to three times where direct comparison of Model STR virtual and actual dry weather stream flows are available. The comparative analysis between observed streamflow measurements and simulated streamflow shown at the presentation by EarthFX at the March 6, 2025 meeting, which provided a comparative analysis between observed streamflow measurements and simulated streamflow, showed that this discrepancy does not exist based on the monitoring completed to date. The slides presented by Earth demonstrated that both historic and recent 2024 measurements are in agreement with simulated streamflows. The EarthFX response and indicates that the only station that was significantly underestimated was	**Yes.** **Rationale: This issue is addressed since the EarthFx presentation indicates that the model results were in the range of measured values and one stream where there was a higher discrepancy between the model and monitoring results was**

Hunter Issue	EarthFX Response Discussion	Issue Addressed (Yes/No) and Rationale
	Tatham's SW6 which was identified by Hunter as being located downstream from a MNR fishery hatchery operation that discharges groundwater flow through three connected lakes, which was discussed during the March 6 meeting. EarthFx provides an explanation in their response that the details of this fish farm operation are unknown, and it was not simulated in the model henceforth the streamflow at this station was underestimated.	**because the feature (fish hatchery) was not simulated in the model.**
Hunter Comment 1.3 *No confirming on site pump tests have been provided.*	The EarthFX response clarified that onsite pumping test have been conducted and indicates where this information can be found (data compilation in Appendix Page A-13) and introduces the two on-site pumping tests (Goffco, 2005 and Goffco, 2007), plus the long-term pumping and observation data at Well PW1. The Earth FX response also indicates that Appendix Page C-99 of the report presents the on-site pumping test data and a discussion of three additional off-site pumping tests at the Bonnefield Property, Shelburne Municipal Wellfield, and the Highland transient test data.	**Yes.** **Rationale: This issue is considered to be addressed since it clarifies that onsite pumping test were completed and where this information can be found as well as a discussion of the offsite pumping tests.**
Hunter Comment 1.4 *My Dec. 10 request to Strada sought to systematically compare the Strada Model dry weather STRs [streamflows] to observed dry weather flows at Mega Quarry (Genivar), NVCA and Strada stream gauging sites.*	As noted in the EarthFX response this question was addressed in detail at the meeting held on March 6th, 2025 which was mediated by WSP. Additional streamflow information was provided by Hunter after the March 6th meeting for three Pine River stations that were part of the Niagara Escarpment Baseflow Study (NVCA, 2009) and WSP requested that EarthFX review this information and provide a response as to the implications for this to the model. The Earth Fx response indicated stations are located between Tatham monitoring station SW25 and the long-term Water Survey of Canada (WSC) gauge at Everett. The NVCA stations contain only three months of measurements collected (between July 10th, 2008 to October 13th, 2008). As further noted in the EarthFX response, calibration to SW25 was discussed on March 6th meeting that was mediated by WSP. The EarthFX response indicates that a detailed calibration to the long-term WSC Everett gauge is discussed on Appendix Page D-58. The EarthFX response	**Yes.** **Rationale: This detailed response by EarthFX addresses the request by WSP to determine the implications of the additional data provided by Hunter on the model streamflow calibration.**

Hunter Issue	EarthFX Response Discussion	Issue Addressed (Yes/No) and Rationale
	provides a discussion on the implications of the new data on the groundwater modeling calibration which is centered around four figures. A comparison is provided in the EarthFX response between observed streamflow at the Pine 1 NVCA station is provided (Figure 4 of response) and simulated streamflow at the same location (Figure 4 of response). Like the results at SW14 and SW25 discussed on March 6th, the Pine 1 simulated streamflow falls within the range of measured values reported by NVCA at this station. The EarthFX response indicates that this demonstrates that the model simulation at Pine 1 is consistent with the limited Pine 1 observation data. The EarthFX NVCA Pine River stations 2 and 3 are further downstream and nearer the long-term WSC Station at Everett. The EarthFX response concludes that given their proximity to the extensive calibration analysis at Everett (page D-58), they provide limited additional value for assessing the quality of the model calibration.	
Hunter Comment 1.5 *The current model underestimate of groundwater flows likely means that the Oct 2024 Site Plan Infiltration Capacity is undersized and the Impact Assessments compromised.*	The EarthFX response indicated at the March 6th meeting, simulated flows at numerous gauges in the study area were discussed in detail and fall well within the range of observed measurements. The EarthFX response indicates that the Hunter conclusion that the model underestimates flow is not substantiated by these observations.	**Yes.** **Rationale: WSP agrees with the EarthFx response based on the presentation at the March 6 meeting this adequately addressed the Hunter issue.**
1.1 Is Quarry Diversion of Pine River groundwater headwater tributary stream flows to the Boyne River tributaries acceptable?		
	The EarthFx response indicates that surface water basin delineations are based on topography which controls surface drainage, while local and regional groundwater patterns control the direction of groundwater flow and groundwater basins cannot be delineated by topography alone. The EarthFx response indicates that evaluating groundwater flow patterns from a surface watershed boundary perspective is of limited value but note that this was outlined in detail in their report as follows.	**Yes.** **Rationale: The EarthFX response does not state whether the groundwater headwater tributary stream flows to the Boyne River**

Hunter Issue	EarthFX Response Discussion	Issue Addressed (Yes/No) and Rationale
	• "Appendix E Section 3.9.6 addresses the effects of the proposed quarry on the Boyne Watershed, and concludes: • The simulated change in flow in a headwater tributary near the Strada site at location STR14 (See Appendix E, Figure 2.11) under Phase 2C will temporarily reach 4.2%. • Under the Rehabilitation scenario, the simulated long-term change in flow at that location will be 0.4% of baseline • Neither of these changes in headwater flows have been deemed significant by NRSI. At the watershed scale, the changes in flow are negligible at the downstream Boyne River gauge at Earl Rowe Park as follows. Under Phase 2C, the simulated 1.1 L/s (litres per second) increase in flow at STR14 will increase flow at Earl Rowe Park by 0.05%. Under the Rehabilitation scenario, the simulated 0.1 L/s increase in flow at STR14 will increase flow at Earl Rowe Park by 0.0045%.	**are acceptable or not. The response does however provide detailed references to the report with data indicating that the changes in flow are very small and this response therefore addresses the Hunter issue.**
Hunter Comment 2.2 *Strada's current Oct 2024 Groundwater Model (at face value) and Oct 2024 Site Plan Infiltration Design reduces groundwater and stream flows at Horning's Mills Main Street by as much as 50% for some extraction phases. This reduction has adverse implications for dilution of village effluents and for maintenance of Brook Trout Habitat. Corresponding measurable decreasing flow reductions may be anticipated as **far** downstream as the Pine River Provincial Fishing Area.*	The EarthFX response indicates that at the March 6 meeting EarthFX indicated that recent Tatham flow measurements and comments indicate that inflows into the Horning's Mills Pond are likely greater from the south, where a newly identified MNR fish farm operation is/was located (and provide a figure showing the location of STR10 (Figure 5 in EarthFX response). The EarthFX response further notes new 2024 Tatham measured stream flows upstream of STR9 are negligible, indicating that any future drawdowns in that area, and corresponding decreases in flow at STR9, would have limited impact in terms of total inflow to the Horning's Mills pond. The EarthFX response indicates that the Hunter quoted 50% change in flow is incorrect and provide the following rationale in the response. The largest change in streamflow is not 50% as stated by Hunter, but 37%, at STR9. This station is on a small tributary upstream of Horning's Mills Pond (referencing Figure 5 of response). The EarthFX response indicates that the model estimates limited flow at this location and that recent 2024 field measurements by Tatham report negligible flow at this location. The EarthFX response	**Yes.** **Rationale: The Hunter issue was discussed at the March meeting and EarthFx has provided additional detailed discussion with a supporting figure and table addressed this issue. This Hunter issue has therefore been addressed in the EarthFx response.**

Hunter Issue	EarthFX Response Discussion	Issue Addressed (Yes/No) and Rationale
	further indicates that Table 1 in the EarthFx response to this issue notes that average flow reduction at STR8 is 21% of average flow and 10% at STR7. The impact on flows at Pine River Fishing Area can be evaluated by comparing the change in flow at STR7 (0.014 m^3/s from Table) to average baseflow at the newly identified NVCA Pine 1 station has been discussed (referencing Figure 2 of EarthFx response). The average measured baseflow at the Pine 1 station is approximately 0.6 m^3/s (Figure of EarthFx response), so the average change in flow at the Pine 1 station would be 2.3%. It would be impossible to measure a 2.3% change in streamflow the field or distinguish that from natural variation. The Hunter conclusion that there would be an impact at the Fishing Area is not supported by the detailed flow analyses conducted with the Earthfx integrated groundwater/surface water model.	
Hunter Comment 2.3 *Corresponding flow increases and water table rises may be anticipated in the Boyne River headwater and tributaries and wetlands with adverse implications for residential lots, lots of record, and contiguous agricultural fields and tile drainage outlets.*	The Earthfx response discusses how their analyses indicates that the changes induced by the infiltration sites on the surrounding areas was limited to the southeast and south areas of the Strada Property. The response notes that this was discussed in detail in Appendix E Section 3.9.4 through 3.9.6 (page E145).	**Yes. Rationale: The response is considered to address the issue since it indicates that that the changes in infiltration will be limited to the south and southeast of the Strada property and provides a reference of where this is discussed in the report.**
Hunter Comment 2.4 *Strada may not have even modelled the critical groundwater and stream flow reduction scenario. My Dec 10 request for supplemental Model Runs included a contingency for Lift*	As noted in the EarthFx response, this issue was addressed in the January, 24, 2025 meeting. As was noted during this meeting, Strada will continue to manage the site and operate the dewatering systems as appropriate until rehabilitation is deemed complete by MNR. The Earth FX confirms that there will be no interim period of site abandonment or unattended operation.	**Yes.** **Rationale: This issue of Strada abandoning the site was addressed at the January 2025 meeting where an assurance was**

Hunter Issue	EarthFX Response Discussion	Issue Addressed (Yes/No) and Rationale
2 Quarry floor rupture (analogy Woods Quarry west of Kingston) and for the period immediately following Quarry Closure when the Site Plans contemplate Strada's ill-advised complete, withdrawal from Infiltration compensation for Horning's Mills community and Pine River headwater streams.		**provided that Strada will continue to be responsible for the site and monitor it following completion of extraction operations and during the flooding of the quarry.** **In addition, there will be Site Plan notes that require analysis by a geotechnical consultant to minimize the potential of stress relief buckling of the floor to address the issue regarding the concern for floor rupture.**
Hunter Comment 2.5 *Optimal Site Plan relocation of Infiltration infrastructure would significantly reduce the hydrogeological impacts and improve the acceptability of this Quarry Site Plan proposal.*	The Earthfx response indicated that Hunter's suggestions for modification to site operations as suggested in his July, 2024 memo were considered. Tens of model runs were conducted with the objective to find the optimal size and location of the proposed infiltration system. Model results were evaluated in order to arrive at a configuration that provided the most effective reduction of impacts to surrounding streams and properties. Other site constraints relating to blasting and air quality were also taken into consideration.	**Yes.** **Rationale: This issue has been addressed in the response by clarifying that tens of model runs were completed to optimize the size and location of the proposed infiltration system.**

Hunter Issue	EarthFX Response Discussion	Issue Addressed (Yes/No) and Rationale
1.3 Do the October 2024 Site Plans incorporate appropriate Water Quantity Management and Operational Performance Criteria?		
Hunter Comment 3.1 *The October 2024 Site Plans are based on 'Run of the Quarry' water management. Quarry sump contact water pumped to infiltration infrastructure facilities as required* ***to keep the operating*** *quarry floor dry and intercepted 4th line upper aquifer water as available passively by gravity flow to injection wells. No consideration in Site Plan notes to the 24/7/365 need for infiltration compensation as required to maintain existing groundwater flows to the Horning's Mills community and Pine River headwater streams for the life of the Quarry and beyond.*	The EarthFX response discusses how Strada model was developed to address the needs of the Quarry/Pit license application and to provide an effective plan to contain and manage all the incoming water during its entire operation. The proposed water management system was specifically designed to address the maintenance of groundwater and surface water flows at and near the Horning's Mills community, while preventing impacts on nearby properties. While the EarthFx response does not specifically address the Hunter issue that there are no Site Plan notes for infiltration compensation to maintain existing groundwater flows to the Horning's Mill's community. This EarthFx response also provides a discussion indicating surface water and ground flows will be balanced at Horning's Mills to prevent impacts on nearby properties.	**Yes.** **Rationale: The response provides a general discussion of maintenance of groundwater and surface water flows at Horning's Mills, in response to the general issue.**
Hunter Comment 3.2 *No operational quantity performance criteria and infraction penalties are proposed by the Oct 2024 Site Plan notes.*	The EarthFX response indicates that this issue and others related to site plan conditions have been addressed by Tatham and will, if necessary, be finalized with the regulatory agencies. The response further indicates that the updated Permit to Take Water and Environmental Compliance Approval (ECA) applications will address other operational issues related to water quality and quantity.	**Yes.** **Rationale: The issue is addressed by explaining this will be addressed by another party (Tatham) and the issues regarding infractions is addressed by the reference that this will be reference to an updated**

Hunter Issue	EarthFX Response Discussion	Issue Addressed (Yes/No) and Rationale
		Permit to Take Water (PTTW) and Environmental Compliance Approval (ECA) applications.
1.4 Do the October 2024 Site Plans incorporate appropriate Drinking Water Aquifer and Protection of Aquatic Life Water Quality Infiltration / Injection Operational Performance Criteria?		
Hunter Comment 4.1 *Strada's October 2024 Level 1 and 2 Hydrogeological Assessment is devoid of water quality data and analysis despite the collection of considerable data during Pit Compliance Monitoring and in September 2024.*	The EarthFx response provides a detailed discussion on water quality data, The response indicates that groundwater geochemistry is discussed in detail in their report (Appendix B Section 8.7 of EarthFX report); and that this analysis, based on available water quality data, identified the local groundwater as calcium bicarbonate water, except for OW28C (deep well), which was classified as sodium bicarbonate water. The response further notes that historically elevated concentrations of nitrate, attributed to legacy farming operations, are discussed on Page B-39. The response further discussed how there are many years of on-site water quality monitoring. Recent monitoring, as reported in the draft 2024 Compliance Report (Tatham, March 2025), notes that observation wells OW4A/B, OW5A, OW6A, and OW8A did not meet the Ontario Drinking Water Standards (ODWS) limit of 10 milligrams per litre (mg/L) for nitrate (measured as nitrogen). The EarthFx response indicates that this suggests that nitrate in the shallow aquifer may be migrating from the southwest to the southeast direction, as OW5A and OW6A were not previously identified in older compliance reports. The options for nitrate treatment, if necessary and required by the ECA, were discussed at the January 2025 mediation meeting. The EarthFx response indicates that in addition to nitrate, elevated sodium concentrations have been noted in the shallow sand and gravel and till units at OW5A/B and OW4B, and in 2024 in OW28C. The response discusses how OWDS aesthetic objective for sodium in	**Yes.** **Rationale: The EarthFx response provides a comprehensive discussion that addresses the issue including reference to recent monitoring and where parameters did not meet applicable guidelines, and that water quality will continue to be monitored and treated, if necessary and required by the ECA.**

Hunter Issue	EarthFX Response Discussion	Issue Addressed (Yes/No) and Rationale
	drinking water is 200 mg/L, and concentrations exceeding 20 mg/L must be reported to the Medical Officer of Health. The response also indicates that elevated sodium concentrations are likely associated with local road salt applications along County Road 17, or possibly a more regional source. In addition, the response indicates that water quality will continue to be monitored and managed under an ECA license issued by the regulatory agency.	
Hunter Comment 4.2 *The October 2024 Site Plans do not include any Drinking Water Quality performance criteria for proposed infiltration/ injection of Quarry contact and non contact agriculturally contaminated water into the community Drinking Water Aquifers via the 4th Line Interceptor Drain. No water treatment has been proposed.*	The EarthFx response indicates that water quality monitoring and treatment was discussed at the Project Mediation Meeting on January 24, 2025. The response further notes that water quality will be monitored and managed under an Environmental Compliance Approval (ECA) license issued by the regulatory agency.	**Yes.** **Rationale: This issue was addressed and the January, 2025 Mediation Meeting, as noted in response, and provides an additional that water quality will continue to be monitored under an ECA permit.**
Hunter Comment 4.3 *Strada might also consider the alternative use of SCADA controlled extraction (Pressure Relief in Geotechnical vernacular) Wells to bypass the high quality Gasport Aquifer flows through the proposed Quarry. This would reduce the need for Vertical Hydraulic Barriers.* *My Dec 10 request for additional deep aquifer water quality*	As noted in the EarthFX response, water quality monitoring and treatment was discussed at the Project Mediation Meeting in January, 24, 2025. As noted by the mediation expert, treatments options can, if necessary, be implemented at the operational design phase to meet ECA requirements. The EarthFx response indicates that their model analysis has indicated that hydraulic barriers offer improved water management with significantly reduced requirements for pumping and injection. This response indicates that barriers will also be incorporated into the process of progressive quarry rehabilitation. Supervisory Control and Data Acquisition (SCADA) monitor and control systems can be designed and implemented, as necessary, at the site operational design phase to monitor and regulate the proposed infiltration sites and wells.	**Yes. Rationale: The water quality monitoring and treatment issue was discussed at the Project Mediation Meeting in January, 24, 2025, mediation meeting as noted in the response. The response clarifies that the EarthFx response indicates that their model analysis has indicated that**

Hunter Issue	EarthFX Response Discussion	Issue Addressed (Yes/No) and Rationale
information was intended to further evaluate Strada's single Sept 2024 water quality sample analyses on the 4th Line deep aquifer monitors as well as complete deep aquifer natural water quality analyses in the southeast corner of Melancthon Pit No 2 area.		**hydraulic barriers offer improved water management with significantly reduced requirements for pumping and injection.**
1.5 Do the October 2024 Site Plan Notes Adequately incorporate the Geotechnical Consultant Contingencies?		
Hunter Comment 5.1 *The Site Plan notes do not incorporate the full range of Geotechnical Consultant contingencies with respect to the proposed vertical Hydraulic Barrier wedges and the potential for Lift 2 Quarry Floor rupture (analogy Woods Quarry west of Kingston).* *The variable conditions described by the Geotechnical Consultant are unlikely to have been captured by Strada's groundwater model which contemplates uniform underground conditions not affected by blasting events.*	The EarthFX response indicates that the Geotechnical Consultants reviewed the proposed quarry design and provided recommendations which were incorporated into the model simulations and analysis (see Appendix E, Page 234). The EarthFX response further notes that to ensure ongoing geotechnical review during quarry operations, the following text will be added to the Site Plan Conditions: *In Phase Two, at least 2.0 m of the Ancaster/Niagara Formation is to remain above the Gasport unit as shown on the maximum depth of extraction on the operational plan. The effects of groundwater uplift are to be confirmed in Phase Two when final depths of extraction are reached. If groundwater uplift is anticipated, the thickness of the Ancaster/Niagara Formation in the remaining phases shall be increased based on the assessment or pressure relief sumps may need to be constructed within the extraction area. The assessment of groundwater uplift shall be provided to MNR and, if required, a site plan amendment will be submitted to MNR to implement the recommendations of the assessment.*	**Yes. The response addresses the issue since it explains how the proposed quarry design was incorporated in the model simulation and provides additional text that will be added to the site plan notes to address this issue. The response also recommends that as part of the Site Plan condition related to geotechnical analysis, an update of the groundwater model be competed in Phase 1 of the quarry development. It would be**

Hunter Issue	EarthFX Response Discussion	Issue Addressed (Yes/No) and Rationale
	In Phase Four, uplift potential within the Cabot Head Formation is not anticipated. However, if fractures or bulging due to groundwater uplift are observed, depressurization sumps or drainage galleries should be constructed within the extraction area. The EarthFX responses all indicate that to support the geotechnical assessment noted in the Site Plan Condition above, they recommend an update of the groundwater model be completed prior to the proposed geotechnical review. As noted in the report that update will be able to include additional monitoring data and insights from the Phase 1 rock extraction.	**preferred if the modeling was to occur during the later stages of the Phase 1 excvation. This will also further address the Hunter concerns related to model calibration since this will allow for calibration to the actual quarry excavation. In this way an improved model calibration may be conducted, if required, in the early stages of quarry that would allow any required modification of the monitoring program or mitigation plan prior to deepening of the quarry to the lower levels.**
1.6 Does the Quarry Groundwater Monitoring Network meet the requirements for Efficient Long Term water level (potentials) monitoring requirements?		
Hunter Comment 6.1 *The Site Plan groundwater monitoring network has not been rationalized to long term efficient Quarry needs. Many monitors are located in areas not protected from future quarry activities including a*	The EarthFx response notes that the current network was approved for monitoring gravel extraction operations and also provides significant insight into long-term site conditions. This network has been expanded to include deeper formation monitoring around the perimeter of the site, as well as off-site private well monitoring. Further, the Wellness Program for monitoring conditions at private wells in the surrounding area is being implemented.	**Yes.** **Rationale: The response provides a table listing all wells and their corresponding units, and three maps indicating the spatial distribution of the**

Hunter Issue	EarthFX Response Discussion	Issue Addressed (Yes/No) and Rationale
number of deep recently constructed expensive multi-level monitors. There are a number of redundant legacy pit monitors which may be eliminated.	The EarthFX response notes that the monitoring program will be reviewed and optimized with the MECP as part of the Permit to Take Water application and further refined with MNR as part of the development of an Adaptive Management Plan. The response further indicates that it is expected that monitors in the centre of the site will be replaced as deeper extraction progresses, however those monitors continue to provide useful data at this time and should not be rationalized (i.e., made more efficient by removing monitors). The response further notes that the Wellness Program for monitoring conditions at private wells in the surrounding area is being implemented (for well locations, See Strada Level 2 report Figure A.6). The expanded monitoring network, including the hydrostratigraphic layers and unit names, is listed in Table 2 of the EarthFx response. The EarthFx response notes that Table 2, in the response is the same as Table A1 in the Strada Level 2 application with the addition of the layer numbers. The response indicates that this shows that all of the hydrostratigraphic aquifer units are monitored, except for Layer 5, the Ancaster/Niagara Falls aquitard, which would not provide any useful hydrologic response. Figure 7 and Figure 8 of the EarthFx response illustrate that the monitoring network spatially covers the entire site for each aquifer layer. The figures indicated that the majority of the monitors in all layers are located in the peripheral area outside of the proposed extraction area and will provide long term information.	**monitoring network in each of the aquifers. The response indicates that this shows that all of the hydrostratigraphic aquifer units are monitored (except for Layer 5, the Ancaster/Niagara Falls aquitard, which would not provide any useful hydrologic response since it is an aquitard). The response illustrates that the monitoring network spatially covers the entire site for each aquifer layer. The figures presented in the response indicate that the majority of the monitors in all layers are located in the peripheral area outside of the proposed extraction area and as such will provide long term information. The Wellness program is also considered to be a highly beneficial component of the license application.**

Hunter Issue	EarthFX Response Discussion	Issue Addressed (Yes/No) and Rationale
Hunter Comment 6.2 *Legacy pit monitor nomenclature is confusing and does not reflect the now accepted geological formation / model layer nomenclature.*	The EarthFX response indicates that a monitoring network at the site is the result of a 20-year history of various monitoring programs and managers and that the current monitor nomenclature is the result of trying to preserve some of the original identifiers and, at the same time, simplify the original naming convention to one consistent with current needs and recent network expansion. The response further indicates a comprehensive monitoring detailed table was included in Appendix A, Page A-9, and includes current names, old well names, and legacy wells, along with their current status (active/inactive). In addition, the response indicates that a comprehensive database was built to organize all well construction, geologic information, and monitoring data for the site, and that this database will aid in the ongoing and future monitoring of the site.	**Yes.** **Rationale: The response discusses the reason for the nomenclature and provides a reference in the report for understanding this nomenclature.**
Hunter Comment 6.3 *There are significant monitor screen network gaps within the Model Aquifer Layers, especially in the underground stream area.*	EarthFX response indicates that the coring program, and subsequent installation of multi-level monitors has provided a comprehensive network of monitoring wells across all aquifer layers. The response further notes that cored well OW25, and long-term operational pumping at PW1 and monitoring at OW1, along with the neighbouring monitoring wells provided extensive information in the central portion of the site.	**Yes.** **Rationale. EarthFx provides a general response indicates that the network of wells across all aquifer layers. The table and figures addressing this are discussed in Section 6.1.**
Hunter Comment 6.4 *Monitor screen vertical and horizontal location needs to be rationalized by Model Layer to provide full site coverage while at the same time reducing Strada's monitoring and agency review efforts.*	The EarthFX response refers to responses to the preceding comments 6.2 and 6.3.	**Yes.** **Rationale: The response refers to other responses that address this issue.**

Note: WSP Comment Response is based on the document entitle Response to Mediation Questions, Proposed Shelburne Pit/Quarry dated April 11, 2025