Addendum No 1:

HIGHLAND PIT MINERAL EXTRACTION SITE, TOWNSHIP OF LANARK HIGHLANDS, ONTARIO

This Addendum document is intended to supplement the

HIGHLAND PIT MINERAL EXTRACTION SITE, TOWNSHIP OF LANARK HIGHLANDS, ONTARIO TRAFFIC IMPACT STUDY (TIS)
[September 15, 2022]

This Addendum provides responses to the Technical Peer Review undertaken by D.M Wills Associates Limited dated March 18th, 2025

Castleglenn Consultants
Engineers, Project Managers & Planners

May 30, 2025

INTRODUCTION

Castleglenn Consultants Inc. produced its "*Highland Pit Mineral Extraction Site, Township of Lanark Highlands, Ontario Traffic Impact Study*" document in September 2022 which identified and evaluated the traffic related impacts of the proposed Thomas Cavanagh Construction Limited mineral extraction site on Highland Line. The proposed development is in the Lanark Highlands, approximately 3km west of County Road 12.

The purpose of this addendum document was to respond to comments provided by D.M Wills Associates Limited as part of a Technical Peer Review done on behalf of Lanark County on March 18th, 2025.

In the following sections, this addendum document will address the six comments that were provided.

RESPONSES TO PEER REVIEW COMMENTS

PR NO. 1: COVID AND SEASONAL TRAFFIC VOLUMES

"The traffic analysis used in this study is based on the counts that were collected in December 2021. Although our team acknowledges that the traffic volumes within the area are relatively low and generally accepts the results, two factors should be clearly presented and considered to follow the typical TIS format:

- *COVID impact since COVID restrictive measures were in place during the traffic data collection.*
- *Seasonal factor since the count was carried out in December."*

Response to PR No. 1: The TIS document, (Section 4.1, page 10) provided a summary of the assumptions adopted to estimate traffic growth. The document stated:

"*a 1 percent-per-year background growth rate was assumed to be applicable for the through movements along County Road 12. However, recognizing that the traffic count undertaken for this study took place during the Winter season (December 2021) when COVID restrictions were still in effect, and quarry operations along Highland Line would, during the slow period, a worst-case scenario was developed which included:*

- *Significant adjustments to the through-traffic along Highland Line to account for the effect of peak summer volumes and active quarry operations; and*
- *adoption of a 2.5% annual background traffic growth rate.*"

The "significant adjustment" refers to the section of Highland Line between County Road 12 to a point west of the two proposed extraction sites. Existing traffic that was counted in December 2021 was increased 10-fold to simulate summer seasonal volumes and account for COVID restrictions that were in place at the time of the traffic.

As well, despite historical traffic count information indicating an applicable 1% annual growth rate, a 2.5% "annual background traffic growth rate" was adopted and applied to the December 2021 traffic count over a 3-year period (2021-to-2024) representing a further 7.5% growth to the anticipated 2024 first year of operation.

These two applied factors provide a conservative forecast of the study area traffic volumes.

PR NO. 2: MTO TIS GUIDELINES

"According to the MTO TIS guidelines, the study horizon should consider the opening year of the development in addition to 5 and 10 years for the future. However, the Highland Pit TIS only discussed the 2024 scenario which was considered as the opening year, and no horizon years were discussed. Accordingly, the opening year should be revised to reflect a reasonable proposed opening year and 5- and 10-years scenarios as horizon years as per the MTO TIS guidelines."

Response to PR No. 2: As stated in the General Guidelines for the Preparation of Traffic Impact Studies document: *"A (TIS) is required in support of a Ministry of Transportation (MTO) permit application for access directly and/or indirectly to a provincial highway. Anyone planning to construct within the permit control area of a provincial highway may require a permit issued by the Ministry."*[1] The Ontario Highway Corridor Management website[2], has a mapping tool which illustrates MTO's permit control areas. The Highland Line Pit is not located within or anywhere

[1] *General Guidelines for the Preparation of Traffic Impact Studies*, Highway Operations Management, Ministry of Transportation (March 2023)
[2] https://www.hcms.mto.gov.on.ca/PermitsControlledArea

near an MTO controlled area. Each municipality is within its own jurisdiction within their rights to specify their individual TIS requirements. Although MTO indicates a 10-year horizon; this is generally appropriate for Highway/Freeway design given that bridges/interchanges involve major structures that will be in place for at least a century, and infrastructure modifications, given the significant cost, must meet at least a decade of forecast demand. The Institute of Transportation Engineers (ITE) on the other hand suggest within their guidelines a 5-year horizon which is acceptable to the majority of developments such as residential sub-divisions, retail and office outlets in urban areas. When it comes to rural areas, where less significant growth occurs and the scale of development is often smaller than urbanized areas, the more immediate traffic impacts are of greater concern and future growth is less influenced by the development of adjacent lands.

Moreover, from a traffic analyses perspective, the Highland site is located within a rural area, with low population density, and no plans for any major adjacent developments. Forecasting 10-years into the future after opening of the extraction sites using a conservative 2.5% growth rate (25% growth between 2024 and 2034) only results in an additional 15 vehicles during the peak hour of travel demand along the County Road 12 corridor. This would have a negligible impact on traffic operations.

A review of the 2024 operational analysis (See Table 4-2) indicated that the volume-to-capacity (v/c) ratios at the CR12/Highland Line intersection and the site accesses onto Highland Line were determined to be less than 0.1. By definition, a v/c value of 0.9 represents congested condions. Evaluating a 10-year horizon will not result in any measurable difference to traffic operations and congestion levels.

PR No. 3: Highland Pit Background Information

"The background info should provide the maximum annual tonnage extraction limit in addition to the type of trucks to be used to haul the material."

Response to PR No. 3: While the TIS document did not mention the maximum annual tonnage extraction limit, this maximum tonnage was presented as part of a larger submission package to Lanark County in 2022. At the time of submission, the extraction limit was 1M tonnes. The annual extraction limit has been reduced to 0.5M tonnes.

The 2022 study assumed that Cavanagh's typical hauling trucks would be used to process and transport materials at the Highland Line Pit. These vehicles include truck and trailer combos (with a 40 metric tonne capacity), and triaxle trucks (with a 20 metric tonne capacity).

PR No. 4: Truck Trip Generation

"The study should clearly discuss how the truck trip generation is calculated. The truck trips should be summarized during the peak hour and during the day, especially during the peak production season of the pit. The discussion should include the size of the fleet, vehicle types, and anticipated loads by each type."

Response to PR No. 4: Within the TIS document, section 4.3, page 10 summarizes the site trip generation assumptions. The Acoustic Assessment Report was used as the base reference for determining absolute worst-case maximum truck traffic generation scenario (as permitted by produced noise levels). It was found that 15 truck loads can be shipped out during the busiest hour of operations from each extraction area, for a total of 30 trucks (i.e. 15 empty trucks entering the site, and 15 full trucks leaving the site). It was conservatively assumed that the busiest hour of operations

would coincide with both the morning and afternoon peak hours of travel demand. However, the report also states that it is more likely that the traffic generated by the proposed extraction site during these periods would be significantly lower.

Due to changes to the annual tonnage limit (from 1,000,000 down to 500,000) the traffic generation rate requires reassessment. The number of trucks would decrease as the tonnage limit has been halved. To provide a more reasonable generation rate, it was recalculated based on first principles, as opposed to reliance on the noise study.

Table 1-4: Pit Characteristics and Truck Traffic Generation

Highland Line Pit		
Assumed Pit Traffic Characteristics (for analysis purposes)		
Annual Tonnage Limit	500,000 tonnes-per-year	
Operations	Year Round	
Hauling Hours	6AM-9PM (For analysis purposes only a conservative estimated 12-hour (7AM-7PM) operation was assumed)	
Truck Distribution	40% 20-tonne triaxle trucks 60% 40-tonne truck-and-trailers	
Hauling days	250 hauling days	
Truck Generation Calculations		
Tonnes / Day	2,000 Tonnes / Day	
Peak Hour Operations	**6 triaxles** = 20*6 = 120 tonnes **9 truck-and-trailers** = 9*40 = 360 tonnes 480 tonnes moved during AM peak hour 480 tonnes moved during PM peak hour	**Approximately 15 trucks-per-hour during the peak operational hours or 30 two-way trips (15 Inbound empty and 15 outbound full) on County Roadways**
Rest of the Day Operations	2,000 – 480 – 480 = 1,040 tonnes **12 triaxles** = 12*20 = 240 tonnes **20 truck-and-trailers** = 20*40 = 800 tonnes 32 trucks / 10 hours ~ **3 trucks / hour**	**Approximately 3 trucks-per-hour the rest of the day (3 Inbound empty and 3 outbound full) totals to 6 two-way trips on County Roadways.**

Table 1-4 above presents the assumptions and calculations used to determine a correlation between the maximum annual tonnage limit and heavy vehicle traffic.

- A total of 15 trucks (9 trailers, 6 triaxles) would be generated during the two (AM & PM) peak hours of operation, resulting in 30 trucks during the peak hours of travel demand.
- During the remaining 10 hours of a typical weekday a total of 32 trucks (20 trailers, 12 triaxles) would be generated, for an average of 3-4 trucks per hour.

This total to 62 trucks-per-day that would access, and leave, the extraction site.

This original worst possible case assumptions were adopted within the Acoustic Report and the TIS document where roughly 30 trucks were estimated to travel to and from the site, instead of the 15 noted above.

The above analysis assumes only 250[3] working days and excludes any weekend hauling. In addition, the analysis assumes a limited 12-hour workday in that no hauling would take place during the evening hours (i.e., night shifts). Expanded hours of operations would greatly reduce peak hour heavy vehicle volumes.

3. (365 days/year – 104 days (2 weekend days * 52 weeks) – 9 statutory holidays – 2 inclement weather days = 250 days/year)

PR NO. 5: HIGHLAND LINE ROADWAY ACCESSMENT

"The Highland Line should be assessed in terms of:

a. The pavement adequacy to accommodate traffic loads and the anticipated truck traffic based on the traffic updates in the previous comments. This should include an assessment of the existing condition of Highland and whether there will be any need for upgrades/maintenance due to the additional tuck traffic caused by the proposed development.

Response to PR No. 5: County Road 12 and Highland Line both are characterized by an approximate 7-metre-wide paved roadway surface. Roadway maintenance remains a municipal responsibility. Highland Line is a Township road that is an existing designated truck route. Regardless of this application, Highland Line will continue to be used by heavy trucks. The Township Asset Management Plan[4] (July, 2021) was referenced and indicates that Highland Line was resurfaced in 2017 and determined to be in "very good" condition in 2021.

Municipal roadways that are designated to accommodate heavy vehicle traffic independent of reduced load restrictions to address seasonal conditions, were presumably constructed to withstand the repeated heavy loads. Despite this, every roadway is subject to deterioration over time and regular municipal maintenance is required and anticipated. It is up to the municipality to determine the future maintenance/upgrade requirements through geotechnical studies to determine the necessary improvements to accommodate the heavy vehicle traffic that is permitted to use the designated truck routes. (i.e., The number of annual equivalent single axle loads (ESAL's) that the corridor is capable of accommodating before major maintenance is required.)

b. The sight distances adequacy at the proposed entrances"

Within the TIS document, (Section 5, pages 13-21) provides a review of the entrance locations for the proposed development.

A required sight distance was calculated to be 192 meters, based on a paved surface, a 3% grade, a 60 km/h operating speed along Highland Line, a truck driver view height of 2.33m at the access and a passenger vehicle approach height along Highland Line of 1.8m.

It was determined that the originally selected locations were deficient in terms of sight distance, and alternative accesses or solutions were provided to resolve this issue.

- The two accesses into Extraction Area 1 were relocated and subsequently the sight distances at the new locations were found to be adequate (i.e. equal-to-or-greater-than the necessary 192 meters).
- Access 1 into Extraction Area 2 requires regrading of an earth mound on the south side of the roadway (i.e. removal of dirt to be level with the roadway),
- Access 2 into Extraction Area 2 could not be relocated, and it was determined that heavy vehicles would not be permitted to use this access. Access 2 would be restricted to on site workers (using passenger vehicles, light trucks etc.).

In all cases the available SSD at each access were found to exceed the required SSD.

[4] *"Township of Lanark Highlands Asset Management Plan Draft",* R.V. Anderson Associates Limited, July 2021

PR NO. 6: TRUCK SWEPT ANALYSIS

"Truck swept analysis should be provided at the entrances of the development on Highland Line and at the intersection of CR 12 and Highland Line."

Response to PR No. 6:

Accesses: Truck swept analyses, also known as truck turning movements diagrams, are normally produced at the time of detailed design after approval of an aggregate application. It is agreed that such analyses and design should take place at each of the proposed access to the extraction sites based on the envisioned design vehicle requirements. This detailed design activity would take place upon approval of permit application.

Intersection: Highland Line is characterized by a 19.5m wide access width at the County Road 12 / Highland Line intersection. Aerial photography indicates the intersection was upgraded in 2010 and would appear to have been already designed to accommodate heavy vehicle traffic.

The Highland extraction site is located 3km east of the CR12/Highland Line intersection. The intersection serves existing aggregate operations and has been designed to accommodate heavy vehicle traffic. The Highland Line west leg of the intersection supports a 13m radius curve in the south-west quadrant of the intersection which accommodates heavy vehicle turning requirements to/from the south.

CONCLUSIONS

We trust the responses and TIS Addendum address the peer review comments. If you have any additional questions, please let us know.

Respectfully,

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