



MTE Consultants

520 Bingham Centre Drive, Kitchener, Ontario N2B 3X9

May 18, 2021

MTE File No.: C43294-100

Mr. George Lourenco
Resources Manager
Capital Paving Inc.
P.O. Box 815
Guelph, ON N1H 6L8

Dear Mr. Lourenco:

RE: Response to Comments from Frind & Frind (Oct-12-20 and Nov-24-20) and Environmental Liability Management (Apr-6-21 and Apr-26-21) Level 1 and Level 2 Hydrogeological Investigation Report Proposed Shantz Station Pit

1.0 Introduction

MTE Consultants Inc. (MTE) has been retained by Capital Paving Inc. (Capital) to provide comment on reports prepared by Frind & Frind, and Environmental Liability Management (ELM) concerning their reviews of hydrogeological work completed by MTE at the Site referenced at the proposed Shantz Station Pit.

2.0 Background and Scope

MTE completed the following work for the proposed Shantz Station Pit:

- January 22, 2019 - Terms of Reference - Level 1 and 2 Hydrogeological Investigation;
- May 10, 2019 – “*Level 1 and Level 2 Hydrogeological Investigation*”;
- January 13, 2020 – “*Response to Grand River Conservation Authority Comments, August 16, 2019*”;
- April 28, 2020 – “*Response to Grand River Conservation Authority Comments, March 20, 2020*”;
- January 14, 2020 – “*Response to Ministry of Natural Resources and Forestry, August 7, 2019*”; and
- February 7, 2020 – “*Response to Region of Waterloo Peer Review Comments, January 7, 2020*”.

3.0 List of Documents Reviewed

MTE was provided with copies of the following documents related to the Site for review and comment:

1. Review of Capital Paving Inc. Shantz Station Pit (Maryhill, Ontario) Level 1 and Level 2 Hydrogeological Investigation, Proposed Category 3, Class “A” Above-Water-Table by MTE Consultants Inc., (MTE File 42394-100, dated May 10, 2019), *prepared by* Michael Frind, M.Sc., P.Eng., Emil Frind, Ph.D., P. Eng., dated October 12, 2020.
2. *Letter from* Emil Frind, Ph.D., P. Eng., and Michael Frind, M.Sc., P.Eng. to Mr. George Lourenco, P.Eng., Resource Manager, Capital Paving Inc., *regarding*: dated November 24, 2020.
3. *Letter from* Environmental Liability Management to Bonnie Bryant, Hopewell Creek Ratepayers Association, *regarding*: Technical Review of documents associated with Capital Paving’s proposed Shantz Station Gravel Pit, dated April 6, 2021.
4. *Letter from* Environmental Liability Management to Bonnie Bryant, Hopewell Creek Ratepayers Association, *regarding*: Proposed gravel pit activities along Shantz Station Road and potential for environmental and economic disruption of water resources in study area, dated April 26, 2021.

4.0 Review of Reports by Frind & Frind Dated October 12, 2020 and November 24, 2020.

The following section has been written to summarize and respond to the concerns raised in the above referenced documents.

4.1 Study Area

Frind & Frind questioned the extent of the study area chosen by MTE and suggested that the impact of the proposed pit should be assessed on a subwatershed scale rather than a 500m distance. A 500 m study area is commonly used in Level 1 and 2 Hydrogeological Investigations and was chosen based on a review of the Region of Waterloo and MECP guidelines (Regional Municipality of Waterloo, 2008) (Ministry of the Environment, Conservation and Parks, 2020). Additionally, the Region of Waterloo’s Peer Reviewer (BluMetric Environmental) agreed that a 500 m study area was sufficient given there is no potential to generate a zone of influence that may cause interference to nearby domestic wells.

The MTE report identified a portion of the Hopewell Creek and a portion of the Breslau Wetland Complex (“Wetland 1”) within the 500 m study area. Recognizing that these features do not end at a “a magic wall at the 500 m mark”, MTE mapped the sub-catchment of these features and completed a macro-drainage analysis¹.

In this way, a subwatershed scale was used to assess the impact of the proposed pit. The macro-drainage analysis addressed the impact that the proposed pit on land uses within the Hopewell Creek watershed, indicating that agricultural and gravel pit land-use would change by 0.9% respectively. Additionally, sub catchment area of Wetland 1 is approximately 245 ha of which the Site contributes 22 ha or 11%.

¹ (see Appendix F of the May 10, 2019 MTE report as well as the April 28, 2020 Response to Grand River Conservation Authority Comments)

4.2 Intrinsic Vulnerability and Wellhead Protection Areas

Frind & Frind accused MTE of dismissing the importance of Intrinsic Vulnerability. MTE reiterates that, based on Grand River Source Protection Mapping, the Site is considered to have a low vulnerability score and only 0.3% of the site is designated as Significant Groundwater Recharge Area.

Frind & Frind questioned whether or not the Well Head Protection Areas (WHPAs) are permanent. MTE recognizes that WHPAs may change based on increased demand for water supply (from development and/or increased agricultural irrigation) however the closest municipal well field is the Maryhill Well Field, which obtains water from a deep overburden aquifer that is hydraulically isolated from the overlying water table aquifer (Grand River Source Protection Area Approved Assessment Report, 2015). No extraction is proposed in the deep overburden aquifer. Moreover, the proposed pit will remain above the water table aquifer and no dewatering is proposed, thereby eliminating the potential to affect future water supply to the Maryhill Well Field.

MTE Notes no concerns regarding source water protection were raised by the review agencies (GRCA & Region of Waterloo).

4.3 Site Characterization, Climate Change and Monitoring

Frind & Frind claimed that the May 10, 2019 Level 1 and Level 2 Hydrogeological Investigation inadequately characterized the hydrogeology of the Site and did not take into account uncertainty due to Climate Change. The following sections address these comments.

Number of Years of Field Data

Frind & Frind claimed that “two years of field data is hardly sufficient to describe seasonal variations in the water cycle and proposed a 5-year predevelopment dataset. Water level data was gathered in agreement with the Provincial Reporting Standards², the Region of Waterloo Guidelines³ and the agreed Terms of Reference (January 22, 2019), which were submitted for approval to the Region of Waterloo, Township of Woolwich, and the GRCA during pre-consultation meetings.

Climate Change and Long-Term Monitoring

MTE acknowledges that Climate Change may affect the elevation of the water table with respect to the proposed pit floor. To account for this uncertainty, a long-term monitoring program has been included on the Site Plans which will span the life of the proposed pit. This long-term monitoring program will be used to ensure the pit floor remains 1.5 m above the maximum high water table elevation.

The long-term monitoring program includes manual water levels measured on a seasonal basis, three times per year (once each in the spring, summer and fall) at all on-site monitoring wells and participating domestic wells. Currently, all monitoring wells (MW1 through MW5) are instrumented with automated instruments (i.e. data loggers) so that a continuous dataset is developed.

The Site Plans show that the proposed pit will be extracted in phases. This phasing, coupled with the data collected through the long-term monitoring program, will allow for adaptations to be made during extraction thereby accounting for changes due to climate change.

² Aggregates Resources Act (ARA) Provincial Standards of Ontario for a Category 3 Class A Pit Above Water

³ Regional Municipality of Waterloo - Guidelines for Hydrogeological Assessments for Proposed Mineral Aggregate Resource Extraction Projects (Date of Issue: August 2008).

Climate Change and Extreme Weather Events

Frind & Frind suggests that MTE did not account for record-breaking extreme weather events when estimating the high water table across the due to the use of the 1981 to 2010 climate normals dataset, which is missing the last decade. The maximum water table elevation is based on up-to-date water level data that reflects current climate conditions.

Monitoring Well Depths

Frind & Frind stated that the depth of the boreholes is likely insufficient because they were drilled only to a depth of the first till layer underlying the sought-after sand-and-gravel layer. The depths of the boreholes were based on characterizing the unconfined water table aquifer not the underlying aquitards. From a design perspective, drilling deeper into confining layers or aquitards does not provide any more useful data for designing the proposed pit.

Number of Monitoring Wells

The Region of Waterloo Guidelines specify that a minimum of three monitoring wells are to be installed to determine geological and hydrogeological conditions. Based on a review of the Site, MTE choose five locations to install monitoring wells.

In addition, MTE included four domestic wells on or within close proximity of the Site and installed six mini-piezometers in wetlands around the Site to better characterize the hydrogeological conditions within and surrounding the Site. All of these locations combined there are 15 monitoring points, which is more than sufficient to estimate the maximum water table elevation for the purpose of designing the proposed pit.

4.4 Potential Impacts to Private Wells and Municipal Wells

Potential impacts to private wells were addressed in the May 10, 2019 Level 1 and Level 2 Hydrogeological Investigation with the results being peer reviewed by BluMetric Environmental in their letter dated April 7, 2020 on behalf of the Region of Waterloo. MTE recommended that domestic wells included in the Hydrogeological Investigation be included in the private well monitoring program for the proposed pit. Those domestic wells currently participating in the monitoring program include PW1 through PW4.

MTE has been made aware of some questions from local neighbours regarding whether their wells were assessed as part of the Hydrogeological Investigation. In particular, MTE was approached by the resident at 1057/1065 Foerster Road at the ARA Public Open House, which took place on June 26, 2019. The resident informed MTE that their well received water from a spring (MTE interprets their shallow dug well to intercept the water table). Given that the proposed pit is for an above water table application, there is no potential to generate a zone of influence that may cause interference to nearby wells including the water supply source at 1057/1065 Forester Road. As such, no impacts to private wells are anticipated (whether a drilled well, a dug well or a spring-fed well).

Based on the residents' concerns MTE offered to conduct a well inspection. Additionally, the resident had similar concerns regarding their parents shallow dug well located south of Foerster Road, to which MTE also offered to conduct a well inspection. The resident took a business card and indicated that they would contact MTE to schedule the inspection. MTE awaits confirmation from the resident to perform the well inspection. On completion of the inspection, their well can be added to the private well monitoring program.

As per the proposed ARA Site Plans, ongoing water monitoring will be required throughout the life of the pit operation to ensure there are no adverse impacts. Further, contingency plans have been developed and included on the ARA Site Plans (see notes 7 and 8 of the Hydrogeology Technical Recommendations on page 3 of 5 entitled Operational Notes).

5.0 Review of Environmental Liability Management Letters Dated April 6, 2021 and April 26, 2021

5.1 Baseline Study for Groundwater

As previously mentioned in Section 4.3, baseline groundwater data was completed based on Provincial Reporting Standards, the Region of Waterloo Guidelines and the agreed Terms of Reference (January 22, 2019), which were submitted for approval to the Region of Waterloo, Township of Woolwich, and the GRCA during pre-consultation meetings. Additionally, MTE has obtained sign off from these reviewing agencies. MTE is of the opinion that sufficient baseline data has been collected to adequately characterize the hydrogeology of the Site and the surrounding study area as confirmed by the expert reviewers.

5.2 Contingency Fund

Provincial Standards do not require establishing a Contingency Fund. Given the lack of impacts predicted for the proposed pit, MTE is of the opinion that a contingency fund is not required. Appropriate mitigation measures have been recommended in the Level 1 and 2 Hydrogeology Report and included on the Site Plans to ensure groundwater resources and their uses are protected.

5.3 Impacts to the PSW and Hopewell Creek

The sub catchment area of Wetland 1 (245 ha) represents 3% of the total catchment area of Hopewell Creek (7,800 ha), while the entire licensed area of the proposed pit (93.5 ha) represents only 1% of the catchment area of Hopewell Creek. Hydrologic impacts from the proposed Pit to surrounding PSW's and Hopewell Creek were addressed in MTE's Level 1 and Level 2 Hydrogeological report in Section 7.1 and Appendix F (Micro Drainage Analysis). The potential impacts to both PSW's and Hopewell Creek have been reviewed and signed off by the Grand River Conservation Authority, Ministry of Natural Resources and Region of Waterloo Peer Reviewer.

Yours Truly,

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