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## MEMORANDUM

March 27, 2023

**TO:** Gary Muloin  
Sr Environmental Officer  
Peterborough District Office  
Peterborough, Ontario  
Eastern Region

**FROM:** Dana Cruikshank  
Surface Water Specialist  
Water Resources Unit  
Eastern Region

**RE:** Leahy Excavations Inc  
Hydrogeological Assessment  
County Rd 4, Part Lot 3, Concession 9,  
Twp of Douro-Dummer, Peterborough County  
Echo Ref: 1-150179805

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I have reviewed the above report prepared by GHD Limited (GHD) dated January 2023 with respect to surface water concerns only.

### GED Reports;

- A Hydrogeological Assessment on behalf of Leahy Excavations Inc. was submitted as part of a proposed Environmental Compliance Approval (ECA) application to the Ministry of Environment, Conservation and Parks (MECP). The ECA is for a proposed soil bank and existing hydro-vac slurry receiving operation.
- Historically the Site was used as a wayside pit for construction of County Road 4 in the early to mid-1900's. Currently, the Site is used to receive topsoil and other soils excavated from construction projects as well as asphalt and concrete material. The topsoil is stockpiled, screened, and reused offsite. Granular materials are stockpiled, screened, and reused offsite or are used onsite for backfilling of the wayside pit area. Non-granular materials, generally described as higher in silt and clay content, are used for backfilling the wayside pit area. This soil is initially stockpiled in various locations on the east portion of the Site. Asphalt and concrete are crushed and sorted into piles and sold as recycled materials
- The Site also receives hydro-vac trucks with slurry material collected primarily from daylighting of underground utilities. The slurry from the hydro-vac trucks is

deposited in the receiving pond where settling of material occurs. The receiving pond has been constructed out of the non-granular materials. Water from the slurry generally evaporates off or infiltrates into the ground. The pond is dredged on an approximate weekly basis and the material is piled and dried on the north side of the pond.

- The Site is within a drumlin feature, a drumlinized till plain and an esker. The operational portion of the Site is located within the esker
- Based on the information reviewed GED indicates the Site is partially within a SGRA (Significant Groundwater Recharge Area) along County Road 4. From the middle of the Site toward the south, a SGRA exists with a vulnerability score of 4 or moderate. There are several smaller areas in the northern portion of the Site with a vulnerability score of 6. The northeast portion of the Site is also within an HVA (Highly Vulnerable Aquifer). These areas are shown in Figure 7 of the report. The subsurface investigation by GHD encountered glacial till that is expected to exhibit relatively low hydraulic conductivity suggesting that infiltration contributions to the underlying aquifer complexes will be relatively minor. The majority of active potable groundwater wells in the area of the Site draw water from a bedrock aquifer. Some protection of the underlying aquifers is expected from the overlying till.
- The groundwater levels range from 1.15 to 3.75 mbgs. The shallow groundwater flow is in an east to southeast direction toward Meade Creek.
- Groundwater samples were collected from monitoring wells MW2-22 and MW6-22) on August 17, 2022. The results meet the MECP Table 2 standards. The results generally meet the ODWQS with the exception of hardness and turbidity.
- Surface water samples, Creek #1 and Creek #2, were collected from Meade Creek on August 17, 2022. Creek #1 represents a sample obtained upgradient of the Site, while Creek #2 is downgradient at Douro 9<sup>th</sup> Line. The results meet the PWQOs with the exception of iron in the sample from Creek #2. The exceedance for iron is attributed to organic material within the sample.
- One (1) soil sample was collected from the area of the Site immediately downgradient of the receiving pond. The sample was collected on September 12, 2022. The results meet the Table 1 Standards for residential / parkland / institutional / industrial / commercial / community (RPIICC) types of property uses.
- The construction of a soil berm at the north and west portions of the Site, along County Road 4, is proposed for the purposes of noise and dust reduction.
- GED concludes that the Site is suitable for use as a Soil Bank facility and the continued use as a Hydro-Vac Receiving site from a hydrogeological perspective. It is our opinion that the operations will continue to have minimal impact on the

surrounding surface water and groundwater regimes provided the Site continues to operate in an environmentally responsible manner.

- GED recommends a monitoring program be implemented at the Site to compare future analytical data with the baseline data and assess any trends or changes in the data. The monitoring is recommended for evaluating the surface water and groundwater quality. GHD recommends the following annual sampling program be conducted on a quarterly basis for the parameters tested for and documented in this report: Surface water sampling to be conducted at the locations Creek #1 and Creek #2. Groundwater sampling at each of the monitoring well locations. Water levels should be obtained to assess seasonal fluctuations and to assess any trends over time. The sampling events are to be summarized in an annual report with a review by a qualified person along with interpretation of the data and recommendations.

### **Reviewer's Comments.**

It is my understanding that an application is being made for a Class 1 Soil Management Site Approval as a Soil Bank. If this the case, then this type of facility accepts soil from more than one project. Soils received at this site must have documentation showing the soil has been tested. The quality of soil allowed to be received at a Class 1 soil management site would be defined in the conditions in the ECA. The hydrogeological report indicates that soil received at the site will be sorted, screened and stockpiled. It is my understanding that screening is considered a type of processing. I am therefore unclear if this meets the definition of a Class 1 soil processing site and therefore more information is required if processing is conducted at the site to reduce contaminants. Either way the site requires a waste site ECA.

Meade Creek traverses the site along the eastern portion and flows southwest to the Otonabee River. A tributary of Meade Creek traverses the western side of the site paralleling County Road 4 and flows south. Figure 9 of the above report shows the proposed final contours. Runoff direction arrows show that runoff will be to the west to Meade Creek and to the tributary in the southwest. There is also runoff north of the entrance way to CR4. It is unknown where this runoff goes because of the proposed berm or if it enters the ditch along CR4. There is also runoff from the north portion of the site into the wetland area. There is no stormwater management plan submitted as part of the hydrogeological study.

The sources of excess soils being received by the site are unknown at this time but may contain contaminated materials. The protocols for how the site operates haven't been presented and these conditions may be dictated in the ECA. Soils from commercial or industrial sources current or historical, likely have some contaminants. The Excess Soils ECA will require analysis of soil received at the site as part of the requirements in O. Reg 406/19. If sources of excess soils have all be determined to be "clean" by meeting regulatory standards then potential off-site impacts are significantly reduced.

The report mentions that asphalt and concrete will be received at the site, crushed and sorted into piles. PAHs and PHCs are known to be found in runoff from these piles and therefore could impact on water quality in the PSW, Meade Creek and/or its tributary.

Depending on how stormwater is managed the proposed surface water monitoring program may need to be flexible in order to accommodate monitoring for other contaminants found in the soils received at the site.

The soils at the site appear to allow for rapid infiltration and therefore runoff might be minimal. The groundwater reviewer can speak to this more fully. Options for stormwater runoff can vary from a site wide collection system to a stormwater management pond or if infiltration rates are high enough then individual swales around each storage area could be installed to collect water in those areas until it evaporates or infiltrates. If a stormwater pond with discharge is the chosen option, then a Stormwater Management (SWM) ECA would also be required. If the swales option is chosen, then Approvals should be consulted as to the need for a SWM ECA. Of course, other options exist, and the proponent and their consultant can propose other ideas. If stormwater infiltrates quickly then it also likely moves quickly through the overburden to low lying areas such as the wetland and creeks. Again, the groundwater reviewer can assess whether this can become a surface water issue or not.

Figure 2 in the above report shows five groundwater wells along the east side of the site. From a surface water perspective, I would view these wells as sentinel wells for groundwater entering the wetland and Meade Creek. There are no wells on the west side of the site (therefore no early warning sentinel well). Water quality samples were taken from two wells, MW2 and MW6. Based on the site diagram it would appear that MW6 is supposed to be a background well. MW2 is in the northern portion of the site. Two wells (MW1 and MW4 were dry). It isn't clear why samples weren't taken from the remaining wells especially MW5, which is downgradient of the receiving pond. Assuming that MW6 is background, the water quality results show elevated concentrations of chloride, nitrate, sulphate, turbidity, TP and most metals at MW2. Again, the groundwater reviewer can comment on the placement of the wells and what the water quality results may mean.

Two surface water stations were sampled in August 2022. Creek 1 is on Meade Creek upstream of the site and Creek 2 downstream at Douro 9<sup>th</sup> Line. The report indicates that both were sampled on August 17<sup>th</sup>, but the lab certificates indicates that Creek 1 was collected on the 17<sup>th</sup> and Creek 2 on the 18<sup>th</sup>. This discrepancy is noted because the water quality data shows that turbidity, TP, ammonia and TOC were elevated at Creek 2. Environment Canada records show that a significant amount of rain (~40 mm) fell in Peterborough between August 16<sup>th</sup> and 19<sup>th</sup>. The elevated concentrations at Creek 2 may have been a result of more turbid water coming through the Creek throughout the rain event with water sampled on the 18<sup>th</sup> being more likely to represent water quality from the wetland area due to the 25 mm event on the 16<sup>th</sup> and not related to the site. None of the elevated concentrations would be a concern as they all met PWQO or CWQG guidelines. In any case, more background monitoring is required in order to provide a background water quality database to compare to when the site becomes fully operational.

The site receives liquid soil which is stored in an on-site receiving pond that has been constructed out of non-granular materials. GHD reports that the slurry generally evaporates off or infiltrates into the pond. The pond is dredged weekly, and material piled and dried on north side of the pond. The report doesn't mention the fate of these

soils. It is my understanding that conditions relating to the handling and operation of the receiver pond will be in the ECA.

In the Pre-submission Consultation meeting March 22, 2023, there was mention of a Meade Creek PSW. Neither Ontario Geohub nor the MECP Environmental Atlas shows a PSW near this site. A request was made to Otonabee River Conservation Authority (ORCA) to provide additional information including mapping in this regard. ORCA has responded that the wetland area along Meade Creek was recently evaluated as a PSW. There was also some discussion regarding an Environmental Information Study (EIS). When this information becomes available, I will provide you with an updated assessment if required.

### **Recommendations**

1. The proposed surface water monitoring plan of quarterly sampling for the same parameters reported in the report is acceptable at this time. However, the parameter list may require modification as more information is made available.
2. Water quality in Meade Creek and the on-site tributary needs to be characterized better before operations begin with more frequent monitoring throughout the year. Wetland chemistry can be extremely variable and therefore a more robust background (pre-operation) database would provide a better screening tool to assess if changes in downstream water quality are associated with the site or natural wetland processes.
3. A stormwater management plan is required for the site that demonstrates that pre and post development runoff is the same so that the areas water balance is maintained. This is important especially for the PSW. The site must be developed so that it is capable of handling 100-year storm events. Based on the site pictures and description it would seem the site may be prone to rapid runoff in some areas that may result in erosion and therefore affect water quality in localized watercourses. The site appears to have little vegetative cover, so TSS and turbidity are a concern that needs to be addressed.

The above comments are preliminary and as more information becomes available additional recommendations may be required. If you have any questions regarding the above comments or recommendations, I would be pleased to discuss them with you.



Dana Cruikshank (Surface Water Specialist)

cc: Victor Castro (WRU Supervisor)  
Courtney Redmond (Peterborough District Supervisor)  
Eric Martin (Groundwater Reviewer)