



December 16, 2021

Via: Email

Mayor Cornell and Members of Council
c/o Sue Walton,
Director of Legislative Services/Clerk
Township of Tiny
130 Balm Street West
Tiny ON N0L 2J0

Dear Mayor Cornell and Members of Council:

**Re: Sarjeant Waverly Pit No.2
OWRA S53 Environmental Compliance Application
Township of Tiny, County of Simcoe, Ontario
Project No.: MCG102990 2021**

1.0 Introduction

R.J. Burnside & Associates Limited (Burnside) was retained by the Township of Tiny (Township) to complete a peer review of the documentation prepared in support of a Ministry of Environment Conservation and Parks (MECP) Environmental Compliance Approval (ECA) application. The application is for the wash water facility at the Waverly pit No. 2, which is owned by The Sarjeant Company Ltd (Sarjeant). The documents reviewed included:

- “Waverly Pit No.2 ECA Application-Industrial Sewage Works-Closed Loop Aggregate Wash Plant”, prepared by Harden Environmental Services Ltd (Harden), dated July 8, 2021(Report)
- Environmental Registry of Ontario Number 019-4550 posted November 1, 2021

The ECA application was submitted by Harden to the MECP in July 2021. The proposal details on the Ministry’s website indicates *the proposal is for a new Environmental Compliance Approval for The Sarjeant Company Limited for industrial sewage treatment works serving the Waverley Pit No. 2, located at 1379 Baseline Road South in the Township of Tiny, County of Simcoe, Ontario. The industrial sewage treatment works comprise of:*

- *A closed loop aggregate wash plant (sorting and screening which is facilitated by passing water and aggregate through a series of screens and agitators)*
- *Two source ponds*
- *A series of lined sedimentation ponds*

The 45-day comment period closes on December 16, 2021.

The July 2021 Harden letter report provides documentation in support of the ECA application. The information below was obtained from the Harden report and provides a general overview of the ECA application.

1.1 Background

A PTTW application was submitted on February 9, 2021 (MECP Ref. 7577-BY4LDA) as required to pump greater than 50,000 litres per day from the proposed source ponds. The PTTW application (which is currently under review by the MECP) requests pumping from Pond A at a maximum rate of 1,140 liters per minute and a maximum of 1,641,600 liters per day for up to 180 days per year. The same rate and volume are requested for Pond B.

Limited operational flexibility is requested for the wash plant and sedimentation pond locations. Due to the nature of the aggregate mining process, phases of extraction occur in different areas of the site and as such the wash plant and sedimentation ponds must be moved as the mining progresses.



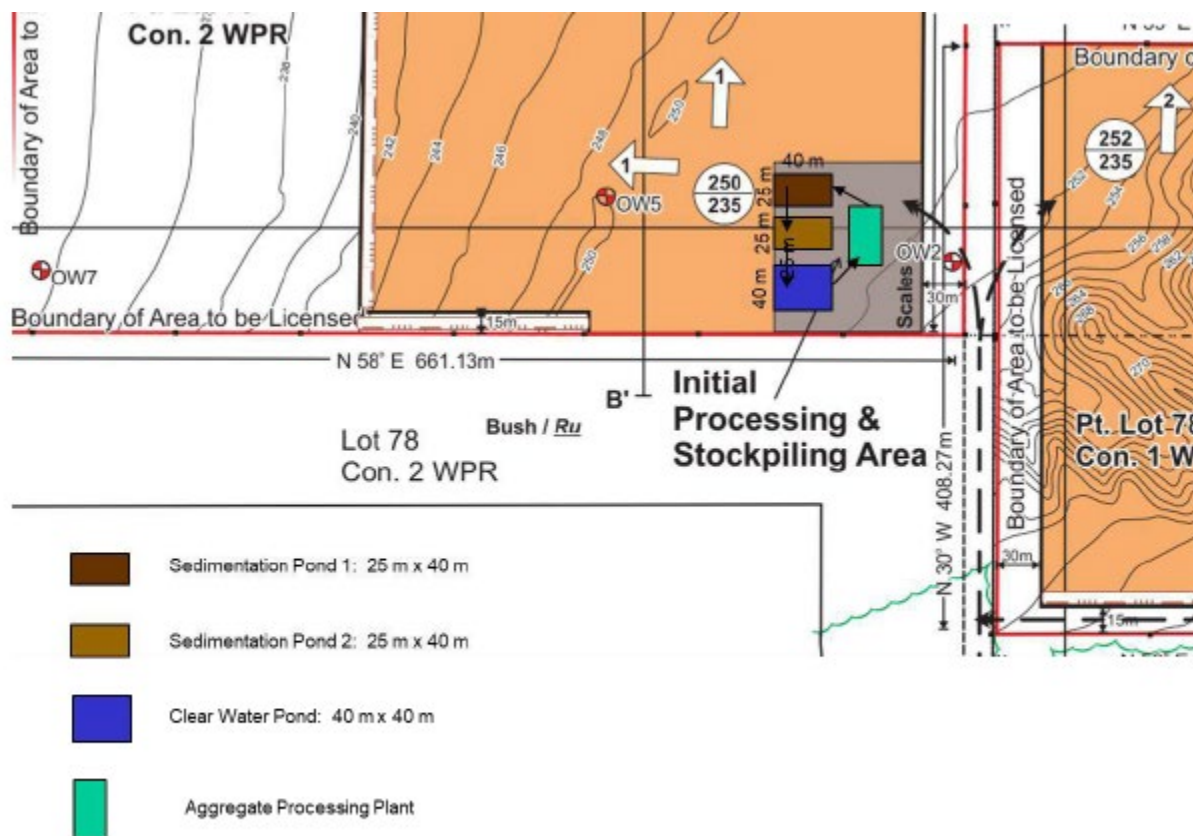
1.2 Process Description

The aggregate washing operation involves washing of the aggregate after extraction to remove fine soil particles from the sand and gravel for the preparation of high-quality aggregate products.

This application is for a 100% recycled water aggregate wash plant. The plant uses water to separate fine grained sediments from the coarse-grained aggregate. The source ponds (A and B) will be used for the initial filling and topping up of a series of lined sedimentation ponds. The sedimentation ponds are physically and hydraulically separate from the source ponds and from the water table aquifer. The fine-grained sediments are Removed from the wash plant in a water / sediment slurry that is to be discharged to a series of lined settling ponds. The heavier than water sediment falls out of the water column and settles on the

pond floor. The clean water then moves by gravity into a “fresh water” pond for re-use by the wash plant.

Water used for the recirculating aggregate washing system is obtained from source Ponds A and B, used in the Wash Plant and discharged to the sedimentation ponds prior to recirculation into the Freshwater Pond.



since these ponds will be constructed below the water table. Water will be taken from

Pond A or Pond B to fill the sedimentation ponds and clear water pond and the filling operation will take less than one week if ponds are entirely empty. Once the ponds are filled, water taking from the Source Ponds will only be required periodically (2-3 times per week). The Source ponds have significant storage volumes and to fill the sedimentation ponds and clear water ponds a drawdown of less than 0.7 m is required.

There will be no off-site discharge of water as a result of this water taking. The only removal of water will occur as a result of evaporation and entrainment in the shipped aggregate products.

The sewage will have extremely high total suspended solids (TSS) to the point of TSS being several percent of total volume of the sewage. The fine-grained sediment produced from the washing operation is chemically benign.

The ponds used for recirculation will not be in contact with the aquifer and will be lined with natural silt and clay rich materials found on-site. Harden provides recommendations for the

hydraulic conductivity and thickness of the material to be used for the liner. Fine sand, silt and clay particles contained in the wash plant effluent will settle out or be trapped in the settling ponds. Some water leakage from the sedimentation ponds can be expected to occur initially, and then decrease as a layer of fine-grained sediment covers the pond bottom. The aggregate processing does not create any smaller particles than already occur in the aquifer. Quantity of sewage produced is dependent on market demand.

The intention of the site owner is to dig a pond into the water table at the location identified as Pond A, on Figure 15. Aggregate extraction will commence at the southeast corner of the western portion of the pit as shown on the site plans in Figure 14. Water will be removed from Source A and pumped into the clear water pond in the processing area on the site. As the excavation progresses from east to west, the pit floor will become closer to the water table and Pond B will be dug on the southeastern corner of western portion of the pit where groundwater will be more accessible to the processing area. Aggregate extraction will commence on the higher, eastern side of the road allowance after the development of Pond B and water will be pumped from Pond B to processing areas on the eastern portion of the Pit or the gravel will be transferred to an existing processing area west of the road allowance. The measured water table varies from 235.5 m amsl at the east part of the site to 228 metres at the west part of the site. The source ponds will be excavated approximately three metres into the water table to allow the shallow groundwater to be taken for aggregate processing.

1.3 Environmental Impact Analysis

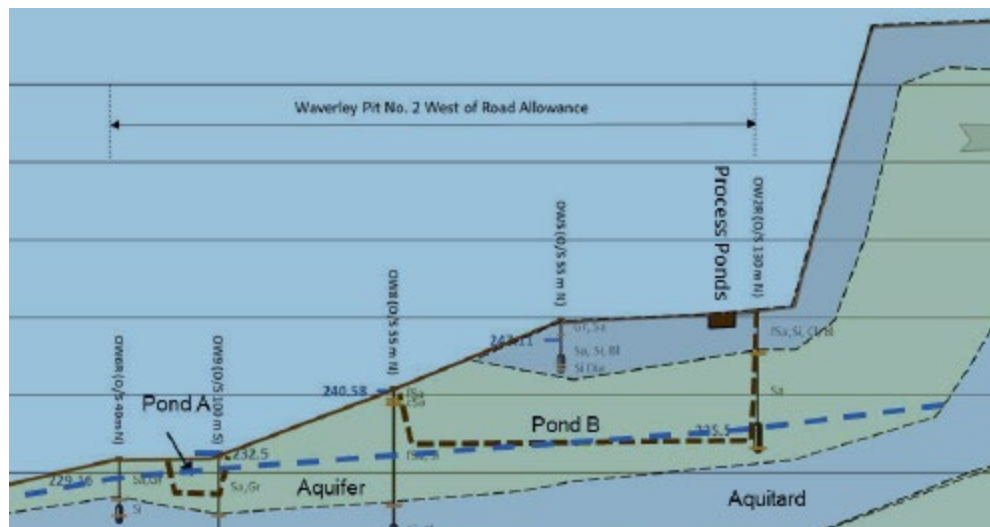
Some water leakage from the sedimentation ponds can be expected to occur initially, and then decrease as a layer of fine-grained sediment covers the pond bottom. The aggregate processing does not create any smaller particles than already occur in the aquifer. Harden provides a detailed explanation and concludes "Our observation of the aquifer material, our evaluation of the depositional environment creating the aquifers (and aquitards) and our review of geological reports and water well records allow us to conclude that there will be no off-site migration of clay, silt or fine sand in the shallow groundwater system."

2.0 Burnside Comments

2.1 Source Ponds

Source Pond A is outside of the licensed area so it is not clear how it will be regulated as there does not appear to be any information on the site plans on the long-term use of the pond once the Pit is no longer in use. Pond A is fairly large, and a significant amount of material will be removed during its construction. The proponent should indicate what this material will be used for since it is outside the licensed area.

The Operational Plan (Page 2 of 3) of the site plans submitted to the Ministry of Natural Resources and Forestry (MNR) indicates that the washing operation will be located within the processing area. Since the only use for Pond A is a source of wash water used as part of the site operations, it is not clear why the pond is located outside of the licensed area. The proponent should confirm with the MNR that the location of the pond has been approved. The pond is much smaller than Source B, however there is no rationale given for the size of the ponds. Similarly, there is no data to support the need for two ponds. As can be seen on Figure 10 below, most of Pond B is above the water table so it is not clear how the pond will support the proposed water taking.



2.2 Sedimentation Ponds

Burnside supports the lining of the sedimentation and clean water ponds. However, since the ponds are lined, the statement “Some water leakage from the sedimentation ponds can be expected to occur initially, and then decrease as a layer of fine-grained sediment covers the pond bottom” should be clarified. The Harden report provides a detailed rationale explaining why off-site movement of fine-grained particles will not occur and indicates “Limited operational flexibility is requested for the wash plant and sedimentation pond locations. Due to the nature of the aggregate mining process, phases of extraction occur in different areas of the site and as such the wash plant and sedimentation ponds must be moved as the mining progresses.” The proponent should provide more detail on how often and where the ponds / wash plant will be moved. They should also confirm that there will be sufficient silt / clay on site to line the ponds (particularly if the location is to be moved several times) to the specifications indicated in the July report.

The proponent should retain a geotechnical engineer to document the construction of the ponds (at both the original and any subsequent locations). A letter confirming that the thickness and hydraulic conductivity of the liner conforms with the design specifications should be provided. The use of a geosynthetic liner is encouraged to reduce the potential for leaks. The proposed liner will be constructed from on-site silt and clay, and it is anticipated that the material that settles out in the wash ponds will be comprised of similar material. As a result, the use of a geosynthetic liner will make it easier to differentiate the material to be removed during pond maintenance.

Also, since a significant portion of the site is intended to have below water table extraction, these areas will not be suitable for the ponds which are specified to be at least 1.5 m above the water table. The proponent should provide additional detail on future locations of the wash plant and associated ponds.

2.3 Maintenance

The Report does not indicate the frequency that the settled material will be excavated from the silt ponds and where the anticipated volume of material (dredgeate) will be stockpiled. In addition, how will the integrity of the liner be maintained during dredging operations?

The material will be saturated and will need to drain before it can be used on-site or removed and there is no indication in the report on how the effluent from the dredged silt will be managed.

Additional detail needs to be provided on the frequency of dredging material from the sedimentation ponds, where the dredgeate will be stored and what its future use will be.

The use of a geosynthetic liner is recommended as it will provide an obvious differentiator between the material to be removed by dredging and the base of the pond. No water quality sampling program has been proposed in support of the ECA. However, since the ponds will be lined and there is no opportunity for off-site impacts, water quality monitoring is not necessary. However, the ponds are to be lined with natural material which will be very similar in appearance and composition to the material returned to the sedimentation ponds after the washing process. As a result, the proponent should indicate what safeguards will be in place to ensure the liner is not breached during dredging and what actions will occur if the liner is compromised.

3.0 Recommendations

The Report provides a general description of the wash water treatment in support of the ECA application for the aggregate washing operation at Sarjeant Pit No.2. Silt contained in the wash water is expected to settle out in the sedimentation ponds before entering the clean water pond and is not anticipated to leave the site.

Burnside concurs that any permanent or temporary silt or sump pond(s) constructed on the site be lined to prevent water loss. Documentation prepared by a geotechnical engineer should be provided to confirm that the hydraulic conductivity and thickness of the liner conforms with the specifications provided in the ECA application. This requirement should be added to the Operational Plan(s). The use of a geosynthetic liner is encouraged to reduce the potential for leaks. The use of a geosynthetic liner will also make it easier to differentiate the material to be removed during pond maintenance.

In addition, Burnside recommends that the Proponent provide:

1. A finalized design including proposed base elevation of the source, sedimentation and clean water ponds.
2. Confirmation that inadvertent discharge from the ponds will not adversely impact off site surface and groundwater resources.
3. A detailed maintenance plan and associated figures describing:
 - a) Elevation of bottom of sedimentation and clean water ponds;
 - b) Maintenance tasks and methods for cleaning out (dredging) the ponds;
 - c) How the integrity of the liner will be ensured during dredging activities;
 - d) The thickness of silt that will trigger dredging activities;
 - e) Estimated volume of silt to be removed annually (dredgeate);

- f) Silt stockpile dewatering method;
- g) The storage location of dredgeate;
- h) The proposed use of dredgeate for site restoration; and
- i) The proposed testing required before dredgeate material can be sold for off-site use.

We trust that you will find the above to be of assistance.

Yours truly,

R.J. Burnside & Associates Limited



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Senior Hydrogeologist
DH:js

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