



Region of Waterloo

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File: C14-60/7/08014

May 11, 2010

Jeremy Vink  
Senior Planner  
Township of Woolwich  
24 Church St. West, P.O. Box 158  
Elmira, ON N3B 2Z6

Dear Mr. Vink:

**Re: Zone Change Application 014/2008  
Wilber Martin and George Israel (Capital Paving Inc.)  
1420 & 1433 Letson Drive  
TOWNSHIP OF WOOLWICH**

**Hydrogeology**

WESA Inc. (WESA) was retained by the Regional Municipality of Waterloo (RMOW) to conduct a technical review of the hydrogeological aspects of the Montrose Pit Scoped Subwatershed Study near West Montrose, Ontario, within the Township of Woolwich. It is our understanding that Capital Paving Inc. has submitted an application for a Class 'A' Licence for a 41.72 ha sand and gravel pit with a proposed 500,000 tonnes per year removal rate. The proponent is proposing to excavate below the water table over 1.8% of the extraction area and to within 0.5 m of the water table over the remainder of the extraction. The following documents were reviewed by WESA:

- Monitoring Recommendations Update, Proposed Capital Paving Inc., Montrose Pit. Letter prepared by Groundwater Science Corp. dated March 12, 2010.
- Capital Paving Inc., Proposed Montrose Pit, Response to Comments from Township of Woolwich, Soil Capability and Potential for Rehabilitation to Agriculture. Letter prepared by Stantec Consulting Ltd., dated January 8, 2010.
- Details of water taking associated with proposed washing operations. Letter prepared by Capital Paving, dated December 18, 2009.
- Revised site plans, prepared by Harrington and Hoyle Ltd. Drawings 1-6 dated December, 2009.
- Capital Paving Inc. Proposed Montrose Pit Scoped Subwatershed Study, prepared by Stantec Consulting Ltd. in association with Groundwater Science Corp. dated September, 2009.
- Letter dated September 14, 2009 from Capital Paving Inc. to Brenna MacKinnon (RMOW) re: Montrose Pit Scoped Subwatershed Study (MPSSS).
- Letter dated July 22, 2009 from Sylvia Rafalski-Misch (RMOW) to Capital Paving Inc. re: Montrose Pit Scoped Subwatershed Study Terms of Reference.
- Hydrogeological Assessment, Capital Paving Inc. Proposed Montrose Pit Part Lots 74 & 75, Concession CGT, Township of Woolwich prepared by Groundwater Science Corp. dated March, 2008.

## **Information Review:**

The Groundwater Science Corp (GSC) documents, the updated/expanded hydrogeological sections of the Stantec/GSC reports and the update monitoring program recommendations are, overall, well done. The reports generally meet the study requirements of the Aggregate Resources Act and essentially all of the Region's Guidelines for Hydrogeological Studies for Proposed Mineral Aggregate Resource Extraction Projects. The overall conclusions from the reports include:

- No subwatershed scale impacts to water resources are expected.
- The proposed pit development will not negatively impact the quantity or quality of groundwater resources either locally or on the subwatershed scale.

## **Surface Water**

The Tributary East of Letson Road drains areas east of the proposed pit. Portions of the Tributary flow along the northeast property boundary. Although flow can be intermittent, the Tributary should be maintained throughout the life of site operations to ensure that area east of the site can continue to drain to the Grand River. The culvert that is to be removed under the existing road as shown on the Operational Plan Phase A, B and C may need to remain in place. The details of road works, site grading and culvert moving should be reviewed with the MNR, the Township and the GRCA prior to any field work being conducted.

The Stantec report identifies two seeps west of the property (Seep Area and Slope Seep) as well as a surface water swale from the livestock pond to the Grand River. The GSC report suggests that there will no impacts to the wetland in the seeps/swale area. The proponent has stated (Capital's Water Taking details letter) that there will be off-site surface drainage from Area 1.

The proponent should determine if the wetlands are maintained by a component of groundwater and/or surface water flow from the site and then confirm that these components will not be impacted by site operations. For example, would the construction of the berm along the north side of Area 1 reduce the amount of surface water flow to the existing pond that drains to the river along the swale? The proposed monitoring point DP7 will aid in this determination. Inspections of the seeps and the drainage swale should be included in the monitoring plan and undertaken concurrently with the well water level monitoring. DP7 should be installed as soon as possible with data collected for a minimum of two years prior to any aggregate extraction in Area 2.

The monitoring program, with the additions noted below, should be sufficient to determine the potential for any off-site surface water impacts by monitoring conditions up gradient of those surface waters.

## **Monitoring Program**

WESA is in agreement that no negative impacts on water or groundwater resources are expected on the subwatershed scale. If there are no impacts on the local scale then there should be no impacts on the subwatershed scale. WESA is also in general agreement that local impacts will be minimal, but the key will be the monitoring program. The original monitoring program has been revised to include the installation of more monitoring points, increased frequency of monitoring, a complete groundwater quality monitoring program, the establishment of trigger levels and a more detailed contingency plan.

The low response rate to the water well survey (18 of 31 did not respond) is not unexpected given the public's feelings with respect to the proposed pit. With the limited data available, there may be more shallow wells that utilize the shallow sand and gravel unit where extraction will take place. With the possibility of more shallow wells, it is essential that the proponent's modified monitoring program ensure no lowering of the water table that could potentially affect these wells.

## **Cumulative Impacts**

The proponent has conducted a preliminary cumulative impacts assessment of aggregate operations within the study area. All the existing operations appear to be limited to above the water table with only two sites that have active extraction within the esker deposit. Determining cumulative impacts for above water table operations is very difficult, however, the proponent should determine if any of the closed or operational pits have any sort of groundwater or surface water monitoring program.

Any potential cumulative impacts would only be recognized if these other sites have monitors and the monitoring programs are synchronized with respect to timing, frequency and any chemical parameters to be analyzed. However, the existing operations in the esker deposit are physically separated from the outwash deposits along the Grand River. Potential cumulative impacts from the esker and the outwash deposits are therefore independent of each other. We are in agreement that the esker operations could result in a slight increase to flow to the Grand River. No temperature changes in groundwater discharge to the River would be expected from the esker operation. If the esker operations were to extend to below the water table then the monitoring requirements noted above would be essential to determine potential cumulative impacts.

The proponent has also conducted a preliminary cumulative impact assessment for the outwash deposits. Since no other active sites are currently in the outwash deposits within the study area, it is premature at this point to speculate on potential cumulative impacts. Future applicants for operations within the outwash deposits would be responsible for addressing any overlapping effects of their proposal with any existing pits that may be present at that time.

## **Soil Capability and Return to Agriculture**

WESA has reviewed the questions proposed by the Township of Woolwich and the response from Stantec with respect to the site's soil capability and the potential for rehabilitation to agriculture. The hydrogeological aspects of the review are presented along with the original questions from the Township.

- 1. The implications of the 1.0 metre restoration depth and potential impacts of the farming operations afterwards where the normal farming applications of fertilizers etc would drain into the soils and potentially into the water table and to the surrounding environmental features. Specifically address whether the levels of nitrates etc would increase and negatively impact these environmental features.*

Stantec has indicated that the rehabilitated soils will have similar characteristics as the existing soils. Fertility and drainage patterns may be significantly different following rehabilitation and more time may be required to establish ideal cropping conditions and nutrient application rates. The compaction of the soil or how it is placed back after removing cobbles could greatly affect the drainage capability. However, with the proposed rehabilitation plan, grasses and legumes will be planted progressively. This will be critical to minimize the expected initial higher flux of nutrients when the crops are first planted.

- 2. ...the ability to farm the slopes that will be created from the rehabilitation (i.e., can they still be farmed, can farm equipment still operate on the slopes)?*

The Stantec response appears reasonable as long as the berms do not cause any surface water ponding.

- 3. ...comment on that during a storm event, that where the surface water flow will be impeded/alterd by the slopes created by the extraction, will ponding result on the fields and will*

*there be an impact to the farm operations as a result? We are in agreement that any ponding will be limited to the edges of the field.*

*4. The response to the pond question below focuses mainly on the need for the pond in the aggregate extraction. Justify the need for the pond as part of rehabilitation (not why it is being retained, but first explain if it is necessary, then if needed, justify the required size), specifically answer if the pond is necessary post extraction, and how the pond will be used for livestock watering purposes and will it be appropriately designed.*

Using ponds or other surface water features for livestock watering is not a best management practice. For dairy farms potable water is a requirement for the Grade a dairy herd. Restricting cattle access or ensuring that there is no surface water outlet from the pond to the river.

*5. In the Harrington Hoyle report, the proposed restoration depth of the topsoil is +/-200mm is proposed to evenly distribute the existing topsoil. Explain why this depth is appropriate for farming purposes.*

We are in agreement with the Stantec response.

*6. The letter from Stantec, dated October 2009, comments that the restoration to 1.0 metre has been reviewed by an agricultural expert. Who is the expert, where is the experts comments and detailed report, and what are this experts credentials?*

No comment required.

*7. In the same letter from Stantec, it speaks to growth but in dry periods and the growing season. Explain the impact of the proposed rehabilitation in periods where it is not as dry such as spring and fall, when planting and harvesting is taking place (i.e., will the proposed depth impact the ability of farm equipment to access the site during those time periods when under current circumstances they would not be impacted)?*

We are in agreement with the Stantec response.

*8. Comment on whether the restoration depth will alter the type of farming that can take place today versus in the future and how?*

It is not known what crops are currently, or historically, farmed on the site. Class 1 soils have no limitations but Class 2 soils have moderate limitations. The portion of the site where the class of soils will change will therefore have more potential limitations than is currently present. It is not known if these limitations are significant enough to result in a change in crops in the future from what is currently present.

*9. Explain why restoration to 1.0 metres for rehabilitation is appropriate, where in typical aggregate extractions back to agricultural production must be over 1.5 metres (where the extraction goes to no less than 1.5 metres and the restoration of topsoil etc would be beyond that level)? In the same context, respond to all of the comments raised in the letter from the Ontario Farmland (January 15, 2009).*

The key issue will be if the 'new' drainage of the soils will be adequate given a 0.5 to 1 m rehabilitation grade. The bottom of the root zone can vary from about 0.3 to 1.0 m. This would mean that the root zone could potentially be 'in' water which does not improve crop production. What was previously

classified as well drained soil may only be moderate to poor which will in fact change the agricultural characteristics of the soil.

10. *The Harrington Hoyle report, page 19 or 33 states that "rehabilitation ... to an agricultural use and another use complies with Section 2.5.4.1" of PPS. This paragraph does not explain how the application complies, please comment and provide an explanation of how it complies. Secondly, what is meant by "an agricultural use and another use" as in what is the other use?*

We are in agreement with the Stantec reply. Our comments on other questions are applicable to this general question raised by the Township.

11. *Page 18 of 33 of the Harrington Hoyle report notes that the pond area below water table is about 20,000 tonnes of the 2.6 million tones on site, which is considered minimal. Explain how this is a significant amount under 2.5.4.1a) to warrant the extraction.*

WESA has no comment since the question is not hydrogeologically related.

12. *Explain how the proposed pond required/necessary for agricultural proposes, will be designed for agricultural purposes, that the size is necessary, and how this conforms to 2.5.4.1 where "rehabilitation of the site will be carried out so that substantially the same areas and same average soil quality for agriculture are restored.*

Using ponds or other surface water features for livestock watering is not a best management practice. If you have any questions concerning this review, please contact the undersigned at your convenience.

Sincerely,



Laurel Gibson, M.PL  
Planner

cc: Diane Schwier, MNR  
cc: George Lurenco, Capital Paving