

**MEMORANDUM**

**To:** Mayor White and Members of Council  
**Copy:** Ms. Denise Holmes, CAO  
**From:** Chris Jones MCIP, RPP  
**Date:** November 9, 2017  
**Re:** Application for Official Plan and Zoning By-law Amendment (Strada)

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**1.0 BACKGROUND**

On June 21, 2017, the Township received an application from Strada Aggregates to redesignate and rezone lands located in Part of the West Half of Lots 12 and 14, Concession 3 O.S. for the purpose of establishing/expanding new mineral aggregate operations.

On July 20, 2017, Council declared the applications complete and directed the CAO and Planner to circulate a notice of complete application and to coordinate peer reviews of certain studies.

The purpose of this report is to provide Council with an update on the information that has been compiled as a result of the ARA consultation and peer reviews of the environmental and noise studies.

**2.0 STATUS OF LICENCE APPLICATION REQUIRED BY THE AGGREGATE RESOURCE ACT**

According to documentation provided by the applicant, the application for an ARA license was declared complete by the MNRF on June 6, 2017. In accordance with the Aggregate Resources Act (ARA) public consultation requirements, the applicant also conducted a 45-day public consultation period, which included a public open house held at the Hornings Mills Community Centre on August 24, 2017.

**3.0 SUMMARY OF COMMENTS COMPILED TO DATE**

To date the Township has received comments from the following agencies and/or peer reviewers:

1. Letter from MNRF dated September 8, 2017;
2. Letter from Bluewater Geoscience dated August 31, 2017;
3. Updated Archaeological Reports dated September 15 & 21, 2017;
4. Letter from Whitewater Hydrogeology Ltd. dated September 26, 2017;

5. Letter from NVCA dated October 4, 2017;
6. Letter from Whitewater Hydrogeology dated October 24, 2017; and,
7. Letter from HGC Engineering dated October 26, 2017.

In addition, it is noted that the Township has retained Cansult-Tatham to prepare a road state/maintenance assessment of Line 4, however, at the time this report was prepared Cansult-Tatham had not finalized this assessment.

The comment letters generally focus upon the technical areas of noise, hydrogeology and the natural environment. These letters have been summarized in this section of the report and have also been appended to this report for Council's review and consideration, with the exception of the supplemental archeological studies, which are available at the Township office for review.

### **3.1 Natural Environment Comments**

#### **NVCA**

- Supports collaboration with MNRF to address Species at Risk (SAR), which include Bobolink, Meadowlark and Barn Swallow;
- Concurs with proponent finding that MNRF mapped, unevaluated wetlands are not wetlands;
- Support protection of small marsh on Bonnefield site as well as wetland water level monitoring and amphibian monitoring;
- Concur that the white pine plantation on the Prince site is not part of a significant woodland and can be removed; and,
- Proposed mitigation is well thought out.

#### **MNRF**

- Would have been helpful to have species observations referenced to the Ecological Land Classifications (ELC);
- SAR impacts to habitat have been addressed but not impacts to individual species;
- Existing structures should be assessed for presence of SAR bat species;
- Further evaluation is required to address the potential impacts to the hydroperiod of the wetland and potential impacts to amphibian breeding function; and,
- Additional information is required on how the existing monitoring programs will be integrated with the expansion sites.

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**Chris D. Jones BES, MCIP, RPP**  
**51 Churchill Drive**  
**Barrie, Ontario**  
**(705) 725-8133**

### 3.2 Hydrogeological Comments

#### **MNRF**

- Confirmation of updated of the proposed final pit floor elevations should be provided based on updated groundwater monitoring data.

#### **Bluewater Geoscience (Township Peer Review Consultant)**

- Additional well monitors (10 in total) provides for an adequate and thorough groundwater monitoring network for on-going groundwater monitoring and sampling;
- The proponent has adequately characterized the hydrogeological setting of the proposed pits so that overburden and bedrock regimes are understood; and,
- A reasonable groundwater sampling program has been proposed that will allow confirmation that pit operations will not negatively impact groundwater quantity or quality.

#### **NVCA**

- Potential for karst features and potential impacts on groundwater flow towards nearby stream systems should be considered;
- An east-west geological cross-section is encouraged for the Bonnefield pit;
- Recommended that fuel and chemical storage be situated away from areas identified as a Highly Vulnerable Aquifer;
- Encourage updating Table 2 to reflect 2017 values for the high water table and evaluate against 2016 values;
- Advise if there is seasonal variation in the groundwater flow/direction;
- Advise if there is any issue with groundwater mounding on-site;
- NVCA supports the perched aquifer conclusion related to the proximal wetland feature; and,
- NVCA supports the recommended compliance monitoring program.

#### **Whitewater Hydrogeology Ltd. (Proponent Consultant)**

- Site conditions are not suitable for significant karstification processes;
- Above-water extraction will have no measurable response to groundwater flow conditions or stream flow;
- An east-west cross section through the Bonnefield pit was provided;

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- No on-site fuel storage is proposed at the Bonnefield pit. Fuel storage is currently permitted at Pit #2 in accordance with Provincial laws and regulations;
- Updated monitoring data was provided to allow understanding and analysis of data from January 2015 to September 2017;
- Water table mounding beneath above water table pits is anticipated due to the shallow overburden, however, mounding at the Melancthon pits is not significant enough to alter the easterly groundwater flow direction; and,
- The water balance calculation presented in the report was conservative, it is anticipated that the surface water catchment area for the wetland and vernal pools will be unaffected by the proposed extraction.

### **3.3 Noise Impact Comments**

#### ***HGC Engineering (Township Peer Review Consultant)***

- It should be confirmed that the haul route prohibition on travel to the north is included as a condition in the operational plans;
- Provide annual tonnage limits and the corresponding number of trucks used in the worst case hour operational analysis;
- Confirm that all potential points of reception have been considered, including any vacant parcels of land;
- Provide Cadna analysis model (computer model);
- The ARA Operations Plan needs to have all recommendations with respect to noise barriers and operational restrictions listed/identified so MNRF can verify during inspection;
- Clarify sound emission data for trucks; and,
- Municipality may consider requiring acoustical audits using methods contained in MOECC Guideline NPC-233.

### **3.4 Supplemental Archeological Reports**

#### ***ASI Archaeological and Cultural Heritage Services (Proponent Consultant)***

- With respect to the Prince site, 85% of the site was assessed in accordance with Stage 2 methodology and was cleared as not requiring further assessment or investigation prior to site alteration or resource extraction;
- The remaining 15% of the Prince site that remains unevaluated will be located outside of the licensed (extraction) boundary and will not be disturbed or altered;
- Prior to clearance by the Ministry of Tourism, Culture and Sport, the Ministry will require clearance from the approval authority that this area will be protected by virtue of a site plan condition, zoning by-law or easement agreement;

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- With respect to the Bonnefield site, the supplemental report indicates that a small portion of the site requires a Stage 4 assessment on the basis of field research which suggests that occupation of this site pre-dated the original Crown patent date of 1872; and,
- Given that the Bonnefield lands described above are located within the licensed area, no excavation or site alteration may be undertaken until the Stage 4 work is completed and has resulted in a Ministry supported clearance that extraction may be undertaken on the subject lands.

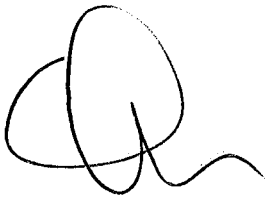
#### 4.0 NEXT STEPS

A substantial body of preliminary and supplemental technical material has been compiled as a result of the original proponent submission and agency/peer review consultation. Although the Township is still awaiting further input with respect to hydrogeological comments, noise impacts and impacts to Line 4, in my opinion, the time is appropriate in the application process for Council to schedule a public meeting to allow members of the public to review the information compiled to date and ask questions or provide comments for Council's consideration.

#### 5.0 RECOMMENDATION

If Council concurs that sufficient technical information has been compiled to facilitate public consultation under the Planning Act, the following recommendation is provided:

1. *That the application for Official Plan and Zoning By-law Amendment submitted by Strada Aggregates be scheduled for a public meeting in accordance with Sections 17, 22 and 34 of the Planning Act.*



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Chris Jones MCIP, RPP

# **BLUEWATER GEOSCIENCE CONSULTANTS INC.**

42 Shadyridge Place  
Kitchener, Ontario  
N2N 3J1

Tel: (519) 744-4123  
Fax: (519) 744-1863  
E-mail: blemieux@rogers.com

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August 31, 2017

The Township of Melancthon  
R.R. #6  
Shelburne, Ontario  
L0N 1S9

Attn.: Ms. Denise Holmes, A.M.C.T., Clerk-Treasurer

**Re: Review of report entitled Combined Level 1 and 2 Hydrogeological Assessment, Proposed Bonnefield and Prince Pits, Melancthon Township, prepared by Whitewater Hydrogeology Ltd. on behalf of Strada Aggregates, May 2017**

Denise:

Bluewater Geoscience Consultants Inc. (Bluewater) was retained by the Township of Melancthon to review and provide comment on the above-captioned report. The report was prepared by Whitewater Hydrogeology Ltd. (Whitewater) on behalf of Strada Aggregates (Strada, the proponent). The proponent proposes to establish two new gravel pits in Melancthon Township. The two new pits will join with two existing parcels of land already in aggregate extraction use and currently operated by Strada to form one larger overall gravel extraction area. The report provides details of the proposed operations as well as actions taken to meet the requirements of the Aggregate Resources Act (ARA) and previously-agreed upon requests by the Township for on-going groundwater monitoring and sampling.

The proposal is for a Category 3, Class A Pit above water on the two new properties. The northern property, known as the Prince Pit, lies immediately north of the current Melancthon Pit #1 and is 40.41 hectares (ha) in area. The southern proposed pit, known as the Bonnefield Pit, lies between the current Melancthon Pit #1 and Pit #2 and occupies an area of 20.25 ha. When these two pits come on stream, the four pits will be merged into one larger overall operation.

In order to assess the hydrogeological characteristics of these two parcels, and integrate this information with details from the existing Melancthon Pits #1 and #2, Whitewater has installed additional investigation/groundwater monitoring wells to the existing network. This included four additional groundwater monitoring wells (OW-17A, OW-17B, OW-18A and OW-18B) consisting of two shallow monitors within the overburden (OW-17A and OW-18A) and two deeper monitors within the bedrock aquifer (OW-17B and OW-18B) on the Bonnefield property. On the proposed Prince Pit property 10 additional monitoring points were added consisting of five shallow monitors (OW-19A, OW-20A, OW-21A, OW-22A and OW-23A) and five bedrock monitors (OW-19B, OW-20B, OW-21B, OW-22B and OW-23B). The additional monitors installed to assess these properties are consistent with the previously-discussed and agreed upon scope of work and provides an adequate and thorough groundwater monitoring network covering the entire proposed pit area for on-going groundwater monitoring and sampling.

After installation of the new groundwater monitors described above, Whitewater completed initial groundwater monitoring. In general, shallow groundwater beneath the pits was determined to flow in a north-easterly direction with localized variation. The potentiometric surface for water levels within the bedrock aquifer has been established from several monitoring locations. Based on the determined shallow groundwater

# **BLUEWATER GEOSCIENCE**

elevations from the April 2016 monitoring event, and the requirement that aggregate extraction remain 1.5 m above the water table, Whitewater has established the preliminary proposed pit floor elevations for each of the two proposed pits. These elevations are shown on Figure 12 of the report. Whitewater further proposes to integrate groundwater elevation data from the spring 2017 monitoring event to produce final pit floor elevations.

Whitewater has completed a "water balance" calculation to assess any potential impact of the proposed pit operations of the groundwater regime and has determined that development of these pits will maintain or slightly enhance groundwater recharge across the pit floor and will have a negligible impact on either groundwater or surface water features in the area of the pits.

Whitewater has proposed a modified on-going groundwater monitoring and sampling program incorporating 31 monitoring points consisting of 14 shallow monitors and 17 bedrock monitors. All 31 locations will be monitored monthly for water levels (selected locations will be monitored continuously). Semi-annual groundwater sampling and laboratory analysis for general chemistry parameters will be completed at 27 of the 31 selected monitoring points and annual groundwater sampling for Petroleum Hydrocarbon (PHC) related compounds will be completed at 13 monitoring locations. A comprehensive annual report detailing the results of the groundwater monitoring and sampling activities for the new larger pit area (Melancthon #1 and #2, Prince and Bonnefield) will be compiled and submitted to MNRF and the Township prior to March 31<sup>st</sup> of the following year.

Based on the details provided within the report reviewed herein, it is our opinion that the proponent has adequately characterized the hydrogeological setting of the proposed pits so that both overburden and bedrock regimes are understood. The top of the shallow groundwater aquifer has been established so that aggregate extraction within 1.5 m of the water table will not be undertaken. A comprehensive groundwater monitoring network consisting of both overburden and bedrock monitoring locations has now been established across the four pits. This will allow for on-going assessment of groundwater levels and flow. A reasonable groundwater sampling program has been proposed that will allow confirmation that pit operations are not negatively impacting groundwater quantity or quality.

We trust this review is suitable for your requirements however, if you have questions or require further information, please contact the undersigned

Sincerely,  
**BLUEWATER GEOSCIENCE CONSULTANTS INC.**



Breton J. Lemieux, M.Sc., P.Geo., QP  
President, Senior Geoscientist

**Ministry of Natural  
Resources and Forestry**

Midhurst District Office  
2284 Nursery Road  
Midhurst, ON, L9X 1N8  
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**Ministère des Richesses  
naturelles et des Forêts**

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Télé: 705-725-7584



September 8, 2017

Strada Aggregates  
30 Floral Parkway  
Concord, ON  
L4K 4R1

**ATTENTION: Grant Horan**

Dear Mr. Horan:

**SUBJECT: Application for a Category 3, Class A Licence under the Aggregate  
Resources Act  
Melancthon Pit Extension  
Part of West Half of Lots 12 and 14, Concession 3 O.S.  
Township of Melancthon, County of Dufferin**

The Ministry of Natural Resources and Forestry, Midhurst District has reviewed the site plans and the following technical reports in support of the above noted application:

- Prince and Bonnefield Properties, 4<sup>th</sup> Line, Melancthon Township – Level 1&2 Natural Environment Assessment and Environmental Impact Study for Strada Aggregates Inc. (Natural Resources Solutions Inc., May 2017); and
- Combined Level 1 and 2 Hydrogeological Assessment, Proposed Bonnefield and Prince Pits, Strada Aggregates Ltd. (Whitewater Hydrogeology Ltd., May 2017).

We offer the following comments for your consideration:

- In the Natural Environment Assessment and Environmental Impact Study (NETR), the data collected from plant and wildlife surveys are presented in species lists segregated by the property where they were observed. A better approach would be to relate the observations to natural heritage features and functions present. It would be helpful to have species observations broken down, at a minimum, to the specific Ecological Land Classification (ELC) community within which they were observed and the results presented in a format appropriate to the survey. For example, the report concluded that extraction could occur within the White Pine Coniferous Plantation on the Prince property as the area does not represent ecologically sensitive or significant natural features, and does not contain federally, provincially or regionally significant vegetation species. This may be correct, however, this assertion cannot be verified by the present data presentation.



- Bobolink and Eastern meadowlark are listed as threatened species under the *Endangered Species Act, 2007* (ESA). The NETR addresses Section 10 of the ESA with respect to mitigation of potential habitat impacts; however, potential impacts to individuals of the species (Section 9) were not specifically addressed. While Section 4.1.3.3 of the NETR speaks to the General Habitat Descriptions (GDH) and habitat categories for these species under the ESA, the report does not map approximate nest locations or defended territories and the habitat categories of the GDHs relative to survey results. Consideration of the proximity of pit operation activities (e.g. extraction, haul route traffic, aggregate processing) to the general habitat categories for mapped nest/territories should be documented to demonstrate that operations adjacent to these features will not impact the species thereby potentially contravening Section 9 of the ESA.
- We have similar concerns for barn swallow, a threatened species under the ESA, which were identified in the mapping of the NETR. The proximity of pit operation activities (e.g. extraction, haul route traffic, aggregate processing) to the general habitat categories for mapped nest/territories of barn swallow should be documented as operations adjacent to these features could impact the species thereby potentially contravening Section 9 of the ESA.
- The NETR addresses Species at Risk (SAR) bat habitats within the forested features on the properties (e.g. woodlots and hedgerows). Although the report notes that bats could colonize anthropogenic structures for daily and maternity roosts functions, there is no indication the structures targeted for removal (e.g. Prince property barn; Bonnefield property house and shed) were assessed for the presence of SAR bat species and maternity roost function.
- The last paragraph of Section 3.1 in the NETR restates a recommendation from the Hydrogeological Assessment prepared by Whitewater Hydrogeology Ltd. (Whitewater) that, "Additional groundwater level monitoring is required to confirm the spring-based seasonally high water table level on the subject properties." The Whitewater report discusses an overburden groundwater elevation and a bedrock groundwater elevation. Whitewater notes that the Site Plan must define the pit floor for the proposed pit in order to meet the provincial requirements. On page 21, Whitewater acknowledges that new groundwater monitoring wells have not captured the seasonally (spring) high water levels, recommending 2017 monitoring be evaluated to test the estimated water levels and projected final pit floor elevation. Confirmation of the proposed final pit floor elevations should be provided based on updated groundwater monitoring data.
- The report concludes in Section 5.4.4.2 - Impacts to Wetland and Vernal Pool, based on information in Whitewater's Hydrogeological Assessment, that no impacts to the wetland or vernal pool are expected from the proposed pits. The report, however, does not address the potential for impacts to the wetland and breeding amphibian habitat function based on the specifics in the Whitewater report. Further

evaluation and/or explanation is required to address the potential impacts to the hydroperiod of the wetland and potential impacts to amphibian breeding function given that Whitewater's report indicates that extraction activity would reduce the localized catchment for the wetland/vernal pool area to 92% of the pre-extraction condition, resulting in a net reduction in the wetland water balance by 1014 m<sup>3</sup>. This translated into an 11cm reduction in the water depth for the 0.9ha wetland.

- It is acknowledged in the NETR that site alteration could be years away from implementation. Monitoring and summary recommendations identify the following:

- Wetland water levels and hydroperiod monitoring should be integrated into the monitoring programs existing for Melancthon Pits #1 and #2.

This point is not connected with the impact assessment concerns that we described in the above bullet discussion. Further, the existing monitoring programs for the two pits are not provided nor a summary of recommended mitigations or contingencies should an impact to the wetland or ecological functions be tied to extraction activities. Our ministry requests additional information on how the existing monitoring programs will be integrated with the Melancthon Pit Extension properties.

- Updated habitat surveys will be conducted for barn swallow, bobolink and eastern meadowlark.

Assessments of the structures for potential SAR bat habitat function should be added to the monitoring recommendation.

As a point for clarification, the 3<sup>rd</sup> bullet on page 44 of the NETR regarding bobolink and eastern meadowlark habitat states that "MNR is provided a written undertaking which allows the MNR to continue management of created/enhanced habitat over a period of up to 20 years..." This statement is incorrect. The responsibility to manage the created/enhanced habitat lies with the person who carries on an activity as per O. Reg. 242/08 Section 23.6 under the ESA.

- We have a concern with the notes on the Site Plan related to Natural Environment. The 2<sup>nd</sup> bullet requiring updated surveys and registration for impacts to identified barn swallow, bobolink and meadowlark habitats should be replaced with a general note requiring that, prior to any site alteration (including the existing buildings targeted for removal), it is the licensee's responsibility to meet all requirements under the ESA.

Based on our review, our ministry must object to this application until the above noted information has been addressed and we are satisfied that appropriate measures will be undertaken for the protection of natural heritage features and functions in relation to the proposed aggregate extraction.

If you have any questions or concerns with the above, please do not hesitate to call or e-mail me.

Yours truly,



**Kim Benner**  
District Planner  
Midhurst District  
(705) 725-7534  
[kim.benner@ontario.ca](mailto:kim.benner@ontario.ca)

c.c. Seana Richardson, Aggregate Technical Specialist, Midhurst District, MNRF  
David Barrett, MHBC Planning

October 24, 2017

Nottawasaga Valley Conservation Authority  
8195 8th Line  
Utopia, ON  
L0M 1T0

**Subject: Aggregate Resources Act Proposal – Strada Aggregates  
Part of West ½ Lots 12 and 14, Concession 3 O.S.  
Township of Melancthon**

**Attention: Mr. Salkeld, Resource Planner**

Dear Mr. Salkeld:

Whitewater Hydrogeology Ltd (Whitewater) is pleased to present our response to the technical hydrogeological review completed by the Nottawasaga Valley Conservation Authority (NVCA) on the Level 1 and 2 Hydrogeological Assessment for the Proposed Bonnefield and Prince Pits (letter dated October 4<sup>th</sup>, 2017). This response has been formatted by presenting the NVCA's comment in bold followed by Whitewater's response in italics.

- 1. Please comment on the potential existence of karst features and the potential impacts on groundwater flow towards nearby stream systems.**

*The study area has been mapped by the province as a potential area of karst based only on the bedrock composition (carbonate). The mapping also identifies that the subject lands are under significant drift cover. There are no none karst features identified on this mapping.*

*Soluble rocks such as carbonates and evaporites are deposited by precipitation processes and eroded principally by dissolution processes. At shallow depths below the surface, most of the permeability in these rocks are created by dissolution or karstification. Conditions that promote karst development are well-jointed, dense limestone near the surface; a moderate to heavy rainfall; and good groundwater circulation.*

*The composition and permeability of the overburden vary considerably, from high permeability sands and gravels to low permeability tills that are generally between 14 and 26 m in thickness. These conditions are not suitable for significant karstification processes.*

*The above water extraction will have no measurable response to the groundwater flow conditions or stream flow.*

- 2. The nomenclature used for the monitoring wells in figure 6 is not consistent with the rest of the report. Please consider revising. Furthermore, based on the new monitoring wells, an east-west geological cross section is encouraged for the proposed Bonnefield pit.**

*The nomenclature is discussed in Section 4.1 and corresponds to Figure 6 and Table 1. For example, in Figure 2, there are labels for the observation wells (OW). At each of these monitoring locations, there is a well nest with a deep and shallow well. Groundwater wells that are identified as monitors "A" are constructed in the overburden aquifer. Monitoring wells constructed in the upper bedrock aquifer system are identified as monitors "B". Figure 6 has the monitoring well nest location identified (eg.OW2) and Table 1 (and rest of report), provides details of the discrete monitors (OW2-A and OW2-B).*

*An East-West geological cross section through the Bonnefield Pit is appended.*

- 3. The Highly Vulnerable Aquifer mapping indicates that portions of the Bonnefield and Melancthon #2 pits are situated in a highly vulnerable aquifer. It is recommended that fuel and chemical storage, filling locations be situated away from these areas.**

*Fuel Storage is permitted at Melancthon Pit #2. As per the Site Plans (Note 1.2.12) Fuel storage on-site will in above ground tanks adjacent to the scale house and by the Technical Standards and Safety Act, 2000, Liquid Fuels Regulation O.Reg. 217/01 and the Liquid Fuels Handling Code 2001, as may be amended. Onsite refueling of non-mobile equipment in the pit will be by the Prescribed Conditions that apply to all Category 3 licenses.*

*There is no on-site fuel storage proposed at the Bonnefield Pit.*

- 4. Consider revising table 2 for wells where multi-year data is available to evaluate the fluctuation/change in the high-water level elevation. Further, we encourage updating table 2 to reflect 2017 values for the high-water table and evaluate against 2016 values.**

*Whitewater updated the groundwater monitoring data and presented the findings in the letter report dated September 26<sup>th</sup>, 2017. The updated information provides water levels from January 2015 to September 2017.*

- 5. Please advise if there is any seasonal variation in the groundwater flow direction/water table elevation. Advise if there is any issue with groundwater mounding at the site.**

*Under wet and dry conditions, the water table aquifer flows from a high of approximately 500 masl in the west towards the buried bedrock valley in the east. As discussed in Section 4.1.1., Based on the continuous and manual water level measurements at the 11 overburden monitoring wells, the water table ranges between a high of 501 masl to a low of 491 masl during the spring season. Over the following months, the water levels drop approximately 2m, except OW2-A and OW10-A where water levels drop approximately 4 m.*

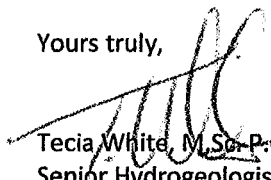
*Water table mounding beneath above water pits is anticipated due to the shallow overburden conditions. However, the mounding at the Melancthon pits is not significant enough to alter the easterly groundwater flow direction.*

**6. Please outline the anticipated hydroperiod impacts to the reduction on water contribution to the proximal wetland as outlined in section 6.1.**

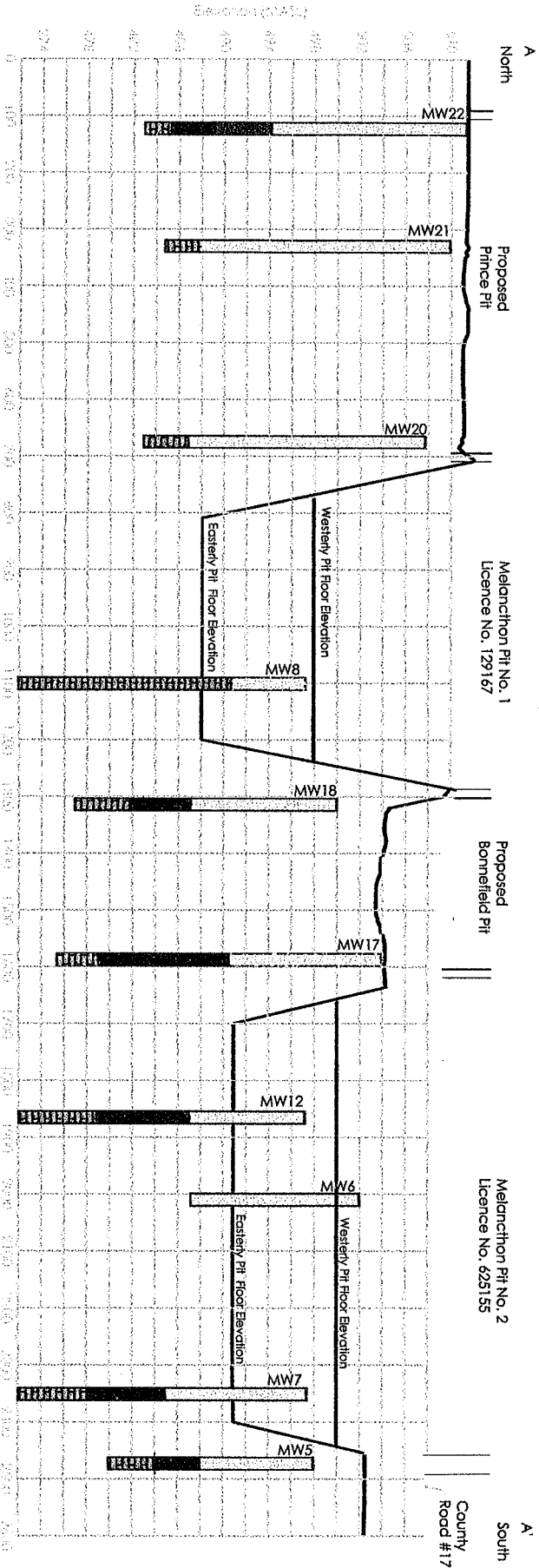
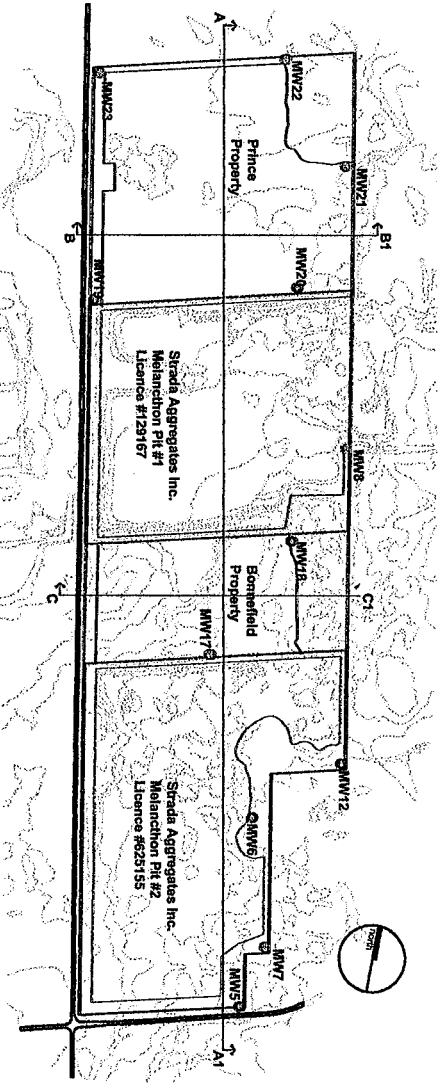
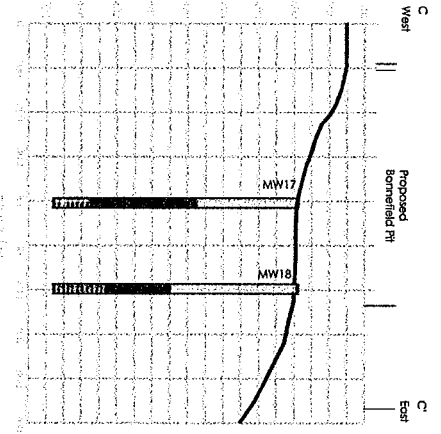
*On September 27, 2017, Whitewater completed a visual inspection of the wetland and sub-catchment area. This sub-catchment area (Figure 13; Whitewater 2017) was originally mapped based on the digital elevation model (i.e., regional 1m contour data). However, based on the visual inspection it is evident that the wetland basin contains several closed areas that drain internally, limiting surface water run-off from entering the wetland. This would include the areas of the wetland basin that fall within the proposed extraction area. Therefore, the water balance calculation presented in Section 6.1 of the Whitewater report are conservative. It is anticipated that the surface water catchment area for the wetland and vernal pools will be unaffected by the proposed extraction.*

If you have any questions or concerns, please do not hesitate to call at any time.

Yours truly,



Tacia White, M.Sc., P. Geo.  
Senior Hydrogeologist  
Whitewater Hydrogeology Ltd



- Legend**
- Boundary of Area to be Licensed
  - Existing Licensed Boundary
  - Maximum Depth of Extraction
  - Groundwater Monitoring Well
  - Sand and Gravel
  - Tavistock Till
  - Silt and Clay
  - Bedrock

BOUNDARY FOR M.P. 1 & 2 (OWNED BY STRADA)

September 26, 2017

Strada Aggregates Inc.  
30 Floral Parkway  
Concord, Ontario  
L4K 4R1

Attention: Mr. Grant Horan  
Controller

**Re: Proposed Bonnefield/Prince Pits: Updated Water Table Elevations**

Dear Sir:

The proposed Bonnefield and Prince Pits will be a Class A Pit Above Water, which will restrict the extracting of aggregate material to no closer than 1.5 m above the established (seasonal high) groundwater table. Under the Aggregate Resources Act, the final floor elevation of the proposed pit must be defined and shows that the final depth of extraction complies with the above water requirements.

The Combined Level 1 and 2 Hydrogeological Assessment (Whitewater, 2017) presented a proposed pit floor elevation. This proposed pit floor was based on:

1. True seasonal high water level elevation data collected from monitoring wells located on Melancthon Pit #1 and Pit #2: and
2. Estimated seasonal high-water level elevations from the newly constructed wells on the Bonnefield and Prince properties (OW17-A, OW18-A, OW22-A, and OW23-A). A 2 m head was added to the water levels collected in February 2017 (conservative approach to determining seasonal high water levels).

Whitewater (2017) recommended that the 2017 spring monitoring results be evaluated to confirm (or refute) the estimated high water levels for the new groundwater monitoring wells and the proposed final pit floor elevations. The updated water level data is presented in Table 1 and Figure 1.

Water level trends in the unconfined overburden aquifer are seasonal, with water levels peaking in the spring and decreasing over the warmer and drier summer months. In 2016, the seasonal trend showed this characteristic trend where groundwater levels peaked in April after the spring freshet, then slowly declined through the summer months. In contrast, the water levels in 2017 continued to rise in increments (three notable peaks) into May and remained relatively high for the summer months. This response is a result of the significant amount of precipitation that has fallen in 2017 (Figure 1).

Of particular interest to this assessment are the peak water level elevations reported over the monitoring period. In 2017, the highest manual water level elevations were reported on May 23<sup>rd</sup>. These values have been compared to April 2, 2016, values (true and estimated) to ensure that the proposed floor elevations presented in the Level 1 and 2 Hydrogeological Report comply with the requirement to remain 1.5 m above the established water table.



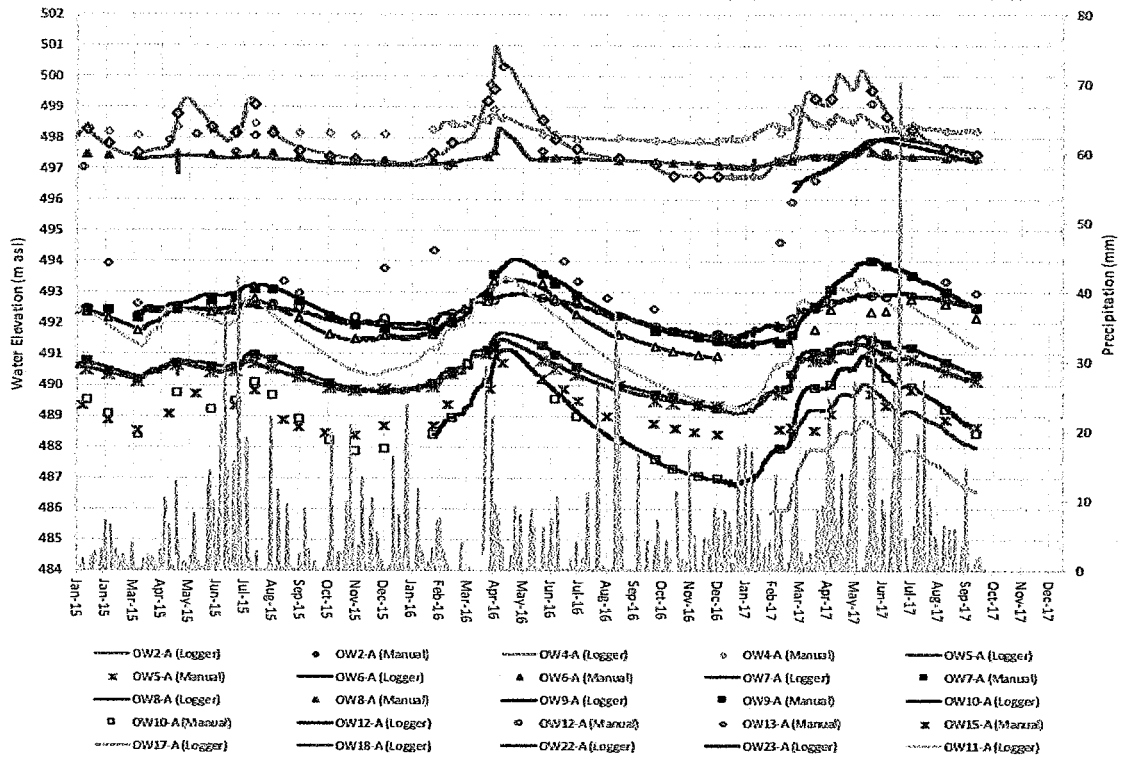


FIGURE 1: OVERBURDEN HYDROGRAPH

TABLE 1: 2017 GROUNDWATER ELEVATIONS

Well ID	2017										2016 Max WL (April 2)	Difference (m)
	12-Feb	24-Feb	22-Mar	08-Apr	23-May	10-Jun	06-Jul	13-Aug	15-Sept			
OW2-A	496.24	496.08	499.29	499.26	499.53	498.72	498.29	497.68	497.47	<b>500.22</b>	-0.69	
OW4-A	498.16	498.83	498.48	498.55	498.48	498.33	498.42	498.25	498.26	<b>498.93</b>	-0.45	
OW5-A	490.49	491.48	490.80	490.91	<b>491.18</b>	490.96	490.83	490.43	490.15	491.13	<b>0.05</b>	
OW6-A	NA	492.02	491.77	492.43	492.38	492.42	492.79	492.62	492.16	<b>493.36</b>	-0.98	
OW7-A	NA	490.38	491.06	491.10	<b>491.48</b>	491.32	491.21	490.74	490.33	491.30	<b>0.18</b>	
OW8-A	497.25	497.30	497.41	497.41	497.55	497.43	497.39	497.36	497.35	<b>497.57</b>	-0.02	
OW9-A	491.35	491.62	492.55	493.11	<b>494.01</b>	493.86	493.55	493.02	492.53	493.59	<b>0.42</b>	
OW10-A	487.93	488.60	489.91	490.02	490.75	490.25	489.94	489.22	488.46	<b>490.97</b>	-0.22	
OW11-A*	490.65	491.71	492.51	492.79	493.17	492.72	492.58	491.86	491.21	<b>493.90</b>	-0.73	
OW12-A	491.88	492.17	492.49	492.69	<b>492.92</b>	492.88	492.90	492.74	492.48	492.73	<b>0.19</b>	
OW13-A	494.64	495.95	496.64	498.53	499.13	497.55	498.1	493.36	492.98	<b>500.31</b>	-1.18	
OW15-A	488.55	488.65	488.52	489.06	489.72	489.32	489.82	488.86	488.62	<b>490.73</b>	-1.01	
OW17-A	486.12	486.64	487.90	488.02	488.65	488.19	487.89	487.18	486.54	<b>~489.1</b>	-0.45	
OW18-A	487.56	487.60	489.19	489.29	<b>489.88</b>	489.43	489.15	488.52	487.96	<b>~489.5</b>	<b>0.38</b>	
OW22-A	NA	496.57	496.80	497.07	497.87	498.01	497.94	497.73	497.51	<b>~498.5</b>	-0.63	
OW23-A	NA	496.26	496.83	497.07	497.96	497.92	497.76	497.50	497.22	<b>~498.3</b>	-0.34	
<b>Average Change</b>												<b>-0.34</b>

Note: All measurements in meters above sea level unless otherwise noted

\* Estimated measuring point elevation

Red highlighted value represents the higher water level elevation

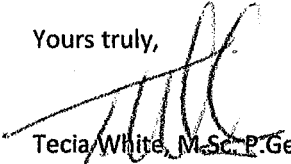
The results indicate that 5 of the 16 water levels were higher in 2017. Only 1 of the five higher water levels was collected from the expansion lands (OW18-A). The remaining four were water levels collected from monitoring wells located on Melancthon Pit #2 where increased groundwater recharge is expected (increased infiltration across the pit floor). On average, the water table was 0.34 m lower in 2017 than in 2016.

The varying magnitude in water level peaks at individual monitoring locations are not unexpected in heterogeneous and anisotropic aquifers (water table is found within sand and gravel or till units). To under the implications that these fluctuations have on the findings presented in the Whitewater report (2017), the groundwater elevation and flow conditions in the unconfined overburden aquifer have been reviewed.

**Figure 2** plots the water levels and corresponding groundwater contours for April 2, 2016 and May 23, 2017. It is evident that the relatively small variations in seasonally high water levels in 2016 and 2017 have not significantly changed the local water table elevations and resulting groundwater flow conditions (contours remain the same). Therefore, the proposed pit floor elevations presented in the 2017 Whitewater report remain in compliance with the provincial requirements.

If you have any questions or concerns, please do not hesitate to call at any time.

Yours truly,



Tacia White, M.Sc., P. Geo.  
Senior Hydrogeologist  
Whitewater Hydrogeology Ltd.

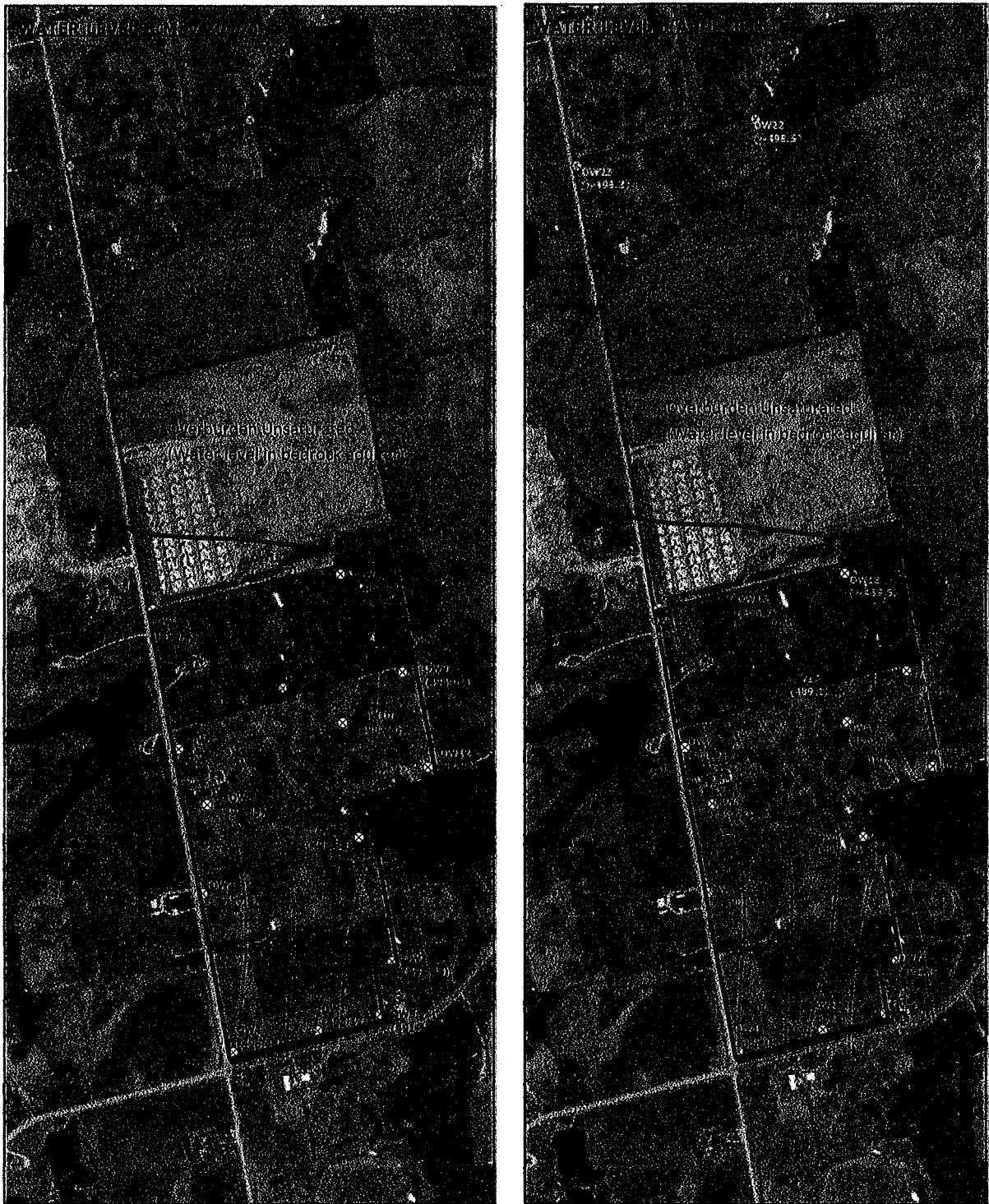


FIGURE 2: 2016 AND 2017 GROUNDWATER ELEVATION MAPPING



**Nottawasaga Valley  
Conservation Authority**

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October 4, 2017

Seana Richardson, Aggregate Technical Specialist  
Ministry of Natural Resources, Guelph District  
1 Stone Road West  
Guelph, Ontario  
N1G 4Y2

Dear Ms. Richardson;

Re: Aggregate Resources Act Proposal - Strada Aggregates  
Part of West ½ Lots 12 and 14, Concession 3 O.S.  
Township of Melancthon

The Nottawasaga Valley Conservation Authority (NVCA) has reviewed the Natural Environmental Report and the Hydrogeological Report in support of this proposal for an Aggregate Resources Act (ARA) Class A Licence, Category 3 (pit above the water table). We offer the following comments in accordance with Natural Heritage and Water policies established under the *Provincial Policy Statement* and our mandate for the conservation, restoration, development and management of natural resources established under the Conservation Authorities Act.

**Level 1 & 2 Natural Environment Report and Environmental Impact Study**

The NVCA has reviewed the Natural Environment Report and Environmental Impact Study (EIS) prepared by Natural Resource Solutions Inc. (NRSI) dated May 2017 in support of above water table aggregate pits which are adjacent to existing pit operations in this area. NVCA staff also completed a site walk site on September 21, 2017.

The EIS work scope is consistent with earlier discussions with NRSI staff and has been carried out to NVCA satisfaction. The NVCA accepts the conclusions of the report and we provide the following comments.

Woodlots on the properties are identified as part of Dufferin County's Preliminary Natural Heritage System and as significant woodlands in the Township Official Plan. We understand that the forest portion east of the Prince property (north property/forest) is under license and will be removed as part of the St. Mary's Kasaks Pit.

Bobolink, meadowlark and barn swallow (Threatened species) and bat (Species at Risk/SAR) habitat are present on the property. The report notes that NRSI and Strada will

continue to work with Ministry of Natural Resources and Forestry (MNRF) to address Species at Risk (SAR) issues which we support.

Based upon our review and site visit on September 21<sup>st</sup>, the NVCA concurs with NRSI that the two mapped MNRF unevaluated wetlands are NOT wetlands.

A small (0.13 ha approx.) marsh lies centrally within the south woodlot (Bonniefield property). Significant amphibian breeding was recorded by NRSI staff. The protection of associated forest cover on the property will protect this feature and its functions, including upland dispersal habitat for amphibians.

NRSI impact assessment suggests that the marsh is surface water-fed – slightly less than 10% of the catchment will be removed via proposed pit operations. The report also notes that significant infiltration likely limits contributions from the proposed pit area to the marsh and that localized catchments within the forest are likely of far greater importance. There was some evidence of “lows” within the forest that lead directly to the marsh which gives some credence to report analysis. The proposed extension of the Melancthon Pit #2 wetland water level monitoring program and amphibian monitoring program is an excellent recommendation. Mechanisms to address any observed impacts associated with pit activities should accompany this monitoring.

The NVCA agrees with NRSI's description of the white pine plantation (CUP3-2) on the Prince property. This is a young plantation with negligible understory and is actively used by pasturing cattle. Significant woodland/wildlife habitat functions associated with sugar maple forests are not present. Particularly with the future loss of forest cover to the east (St. Mary's pit) which will fragment the CUP from the adjacent sugar maple forest on the property, we concur that this plantation is not part of significant woodland and can be removed as part of proposed pit operations.

The NRSI report provides strong support, from a non-SAR natural heritage perspective, for the proposed pit operations on the Prince and Bonniefield properties. Mature sugar maple forests and their associated features and functions will be retained in their entirety. Connectivity southward from the Bonniefield forest to the retained/restored features on the Strada pit to the south will be retained (and, ultimately, enhanced through pit rehabilitation to the south). The proposed enhancement of the 10 m dripline setback from the sugar maple forests (generally in agricultural use, at present) will promote edge habitat and enhance edge transition into mature forest habitat. Potential restoration of pit side slopes using native species will assist with building core and connecting habitats in the long-term.

All proposed mitigation (Section 5.4) is well thought-out and should be carried through and implemented during the remainder of the planning/operations stages of this project.

This review does not address SAR (Threatened/Endangered) issues on the property (MNRF mandate). We encourage the dialogue to continue between NRSI/Strada and the MNRF in this regard.

**Level 1 and 2 Hydrogeological Assessment, Proposed Bonnefield and Prince Pits**

The Nottawasaga Valley Conservation Authority has completed a review of the Hydrogeological Assessment by Whitewater Hydrogeology Ltd. dated May, 2017. The proposed aggregate pits consist of the Bonnefield Pit (20.25 ha) and Prince Pit (40.41 ha) which are located adjacent to the existing Melancthon 1 and 2 pit. Both proposed pits will be above water table extractions. It is noted that Melancthon pits 1 and 2 are both licenced above water table extractions. In regards to the hydrogeology report, the NVCA has the following comments:

- Although it is noted that there are no surface water systems in the proposed aggregation areas, the report is silent on potential karst features which could be present given the relatively shallow, coarse grain overburden and proximity to the Niagara Escarpment front. Please comment on the potential existence of karst features and the potential impacts on groundwater flow towards nearby stream systems.
- The nomenclature used for the monitoring wells in figure 6 is not consistent with the rest of the report. Please consider revising. Furthermore, based on the new monitoring wells, an east-west geological cross section is encouraged for the proposed Bonnefield pit.
- The Highly Vulnerable Aquifer mapping indicates that portions of the Bonnefield and Melancthon #2 pits are situated in a highly vulnerable aquifer based on the approved assessment report mapping (available online at <https://maps.simcoe.ca/NVCA/>), therefore it is recommended that fuel and chemical storage, filling locations be situated away from these areas.
- It is noted that given the proposed aggregate extraction facility is located outside of a wellhead protection area, no section 59 notice to proceed is required under the *Clean Water Act* from the risk management office.
- Table 2 outlines the water level elevations for 2016 and 2017. However, it is stated that compliance groundwater monitoring has been occurring at both Melancthon 1 and 2 since 2001 and 2007 respectively. Therefore, consider revising table 2 for wells where multi-year data is available in order to evaluate the fluctuation/change in the high water level elevation. Further, we encourage updating table 2 to reflect 2017 values for the high water table and evaluate against 2016 values. From this, review

the high water table elevation in the overburden aquifer in order to have a known elevation instead of the "added 2 m listed in section 5.1 pit floor elevation".

- Please advise if there is any seasonal variation in the groundwater flow direction/water table elevation.
- Advise if there is any issue with groundwater mounding at the site. Further, please outline the anticipated hydroperiod impacts to the reduction on water contribution to the proximal wetland as outlined in section 6.1.
- We support the perched aquifer conclusions noted for the proximal wetland feature.
- We support the recommended compliance monitoring program and the proposed locations.
- We request that the annual monitoring reports be submitted to the NVCA in addition to the MNRF.

**Summary**

The NVCA is in acceptance of the natural heritage information presented in the Natural Environment Assessment and Environmental Impact Statement.

The NVCA respectfully requests additional information relating to our comments on the Hydrogeological Assessment.

We advise the review of this application is subject to NVCA plan review fees.

Please contact the undersigned should you have any questions.

Sincerely;



**Tim Salkeld  
Resource Planner**

E-mail Copy: Denise Holmes, Township of Melancthon  
Chris Jones, Planner, Township of Melancthon  
Grant Horan, Strada Aggregates  
Dave Barrett, MHBC Planning



Howe Gastmeier Chapnik Limited  
2000 Argenta Road, Plaza One, Suite 203  
Mississauga, Ontario, Canada L5N 1P7  
t: 905.826.4044

October 26, 2017

**Denise B. Holmes, CAO/Clerk**  
**Township of Melancthon**  
157101 Highway 10  
Melancthon, ON, L9V 2E6

Via Email: [dholmes@melancthontownship.ca](mailto:dholmes@melancthontownship.ca)

**Ref: Peer Review, Aercoustics Engineering Limited Noise Report Entitled "Melancthon Pits Extension Noise Study, Part of West Half of Lots 12 and 14, Concession 3 O.S. Township of Melancthon, County of Dufferin" May 25, 2017**

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Dear Ms. Holmes,

As requested, we have completed a peer review of the above referenced Noise Study, prepared by Aercoustics Engineering Limited (AEL) for proposed gravel pit extensions in Melancthon Township, Ontario. As part of our review, we visited the site on October 6, 2017.

In summary, the AEL Noise Study has been completed using the appropriate Ministry of the Environment and Climate Change (MOECC) Guidelines and criteria. It identifies that excessive levels of noise could be caused by some operations in the pit and identifies means of mitigation to maintain those noise emissions within acceptable limits at neighbouring residential receptors.

We generally agree with the methodology used in the report and confirm that the recommended physical control noise measures are typical of those generally used in the aggregate industry. We have the following comments, requests for clarification and recommendations. The opinions expressed in this peer review may be supplemented, reconsidered or otherwise revised by the author due to new or previously unknown information.

1. The report indicates that the anticipated shipping activities will not change and as such an analysis of off-site haul route noise is not provided. We note from the site visit that signs have been posted that haul trucks are not allowed to travel to the north of the north pit on 4<sup>th</sup> Line. It should be confirmed that this restriction is included as a condition in the operational plans.
2. The number of shipping trucks visiting the site and accounted for in the worst case hour operational scenario is not stated in the report, nor is the maximum annual tonnage of the current licenses. Please provide the annual tonnage limits and the corresponding number of trucks used in the worst case hour operational analysis.



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3. The report considers a number of noise sensitive receptors (existing homes) in the vicinity of the pits and extension areas. Please provide confirmation that all potential points of reception have been considered, including any vacant parcels of land which may permit a future residential use.
4. The topography in the vicinity of the extension areas is complicated, particularly to the west and south. The figures in the report do not show legible topographical contours, although the elevations of the sources and receivers are provided in the sample calculations. This makes it difficult with the information presented to check the calculations and results. Please provide the CADNA analysis model to allow us to confirm the results.
5. The noise study states that operations can occur concurrently (simultaneously) in the existing pits and the proposed extension areas with some restrictions in terms of locations and number of pieces of equipment. It is not clear from the Sample calculations provided in the Appendices that concurrent operations have been included in the modelling and that MOECC sound level limits will be met during concurrent operations in the existing pits and extension areas. Please provide the CADNA analysis model to allow us to confirm the results.
6. The noise study contains a large number of recommendations with regard to noise barriers and operational restrictions. To ensure that the future operations in the extension areas are conducted in conformance with these recommendations, the operational plans used to apply for the extension licenses should state these recommendations as provided in Appendix A in their entirety, and clearly show the operating areas and noise barriers as indicated in Figures 3 to 7, so that an MNRF Officer can verify that those features are in place during their regular inspections.
7. Item 5 of Appendix A contains sound emission data for various pieces of equipment to be used in the existing pits and the extension areas. The sound emission data in this table is appropriate in our experience, but it seems that the sound emission data provided for trucks in the sample calculations may not be consistent with the sound emission data contained in the Item 5 of Appendix A. Clarification is requested.
8. The report does not recommend any means of verifying the compliance of the sound emission levels of the equipment operating in the extension areas with the Reference Sound Pressure contained in Table B of Section 5.3. It also does not recommend any means of verifying that the overall sound emissions from the facility are in compliance with MOECC limits once operation begins in the extension areas. In this case, the Municipality or MNRF may consider requiring that acoustical audits be conducted utilizing the methods contained in MOECC Guideline NPC-233.
9. A common source of complaint with respect to aggregate operations is auditory warning devices such as back-up beepers. There is no mention of back up beepers in the study. While back up beepers are excluded from assessment since they are auditory warning devices required or authorized by law or in accordance with good safety practices, the study should discuss their use and indicate how they will be managed. Sometimes operations can be staged



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to minimize reverse operations, for example. We also recommend that alternative warning technologies, such as back up alarms utilizing broadband noise, rather than tones, be investigated.

Thank you for the opportunity to provide this information. We trust it is sufficient for the present purposes. Please call if you have any questions.

Yours truly,  
**Howe Gastmeier Chapnik Limited**

*Wm. J. Gastmeier* 

**Bill Gastmeier, MASc, Peng  
Principal**



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