

**CORPORATION OF THE COUNTY OF DUFFERIN**

**BY-LAW NUMBER 2010-29**

**A BY-LAW TO EMPOWER THE COUNTY OF DUFFERIN TO ASSUME AUTHORITY FOR THE ESTABLISHMENT, OPERATION AND DELIVERY OF WASTE COLLECTION AND TREATMENT PROGRAMS AND SERVICES FOR THE COUNTY OF DUFFERIN AND ALL ITS CONSTITUENT LOWER-TIER MUNICIPALITIES.**

WHEREAS authority for waste management in the Corporation of the County of Dufferin (the "County") rests exclusively with the lower-tier municipalities, as set out in Section 11 of the *Municipal Act, 2001, S.O. 2001, c. 25* (the "*Act*"), with the exception of composting, household hazardous waste and e-waste;

AND WHEREAS Section 189(1) and (2) of the *Act* sets out the authority and conditions for the transfer of power to an upper-tier municipality;

WHEREAS the County owns 200 acres of an Environmental Assessment approved landfill site (the "Dufferin Eco Energy Park");

AND WHEREAS the County is looking for alternative methods of solid waste treatment;

AND WHEREAS the County has identified composting of Source Separated Organics ("SSO") and gasification as two alternative methods of waste treatment;

AND WHEREAS the County currently has authority to collect and treat SSO and Household Hazardous Waste pursuant to By-law 2000-32 and By-law 2007-17;

AND WHEREAS the County is developing the Dufferin Eco Energy Park site to utilize these methods of treatment;

AND WHEREAS the County has identified the need to control the waste stream to secure tipping fees that will be competitive with current commercial rates;

AND WHEREAS a coordinated waste system in the County will allow for a greater opportunity for effective promotion/education, diversion and cost savings;

NOW THEREFORE, subject to the conditions set out in Section 189(2) of the *Act*, the municipal council of the County enacts as follows:

Assumption of Power

1. The County hereby assumes from all the lower-tier municipalities forming part of the County, the power to establish, operate and deliver household waste collection and treatment programs and services.

2. Without limiting the generality of Section 1 above, “the power to establish, operate and deliver waste collection and treatment programs and services” shall include, but not be limited to, the following elements:
  - (a) the power to carry out, or to commission, research, studies, and analyses of waste collection and treatment programs and services;
  - (b) the power to enter into agreements and contracts with lower-tier municipalities and other parties for the provision of waste collection and treatment programs and services, including the continuation of existing programs and services;
  - (c) the power to construct, own, and operate a waste facility or facilities;
  - (d) the power to implement a waste collection system or systems that may be required to support such a waste facility or facilities;
  - (e) the power to enter into agreements and contracts for the sale or other disposition of the products of any waste collection and treatment programs;
  - (f) the power to conduct public education programs and otherwise promote waste programs and services;
  - (g) the power to require the separation of waste at the point of collection consistent with continuation of existing programs and services; and
  - (h) the power to:
    - (i) establish incentives to encourage the use of waste programs and services;
    - (ii) establish different classes of waste;
    - (iii) establish fees and incentives that vary based on the volume, weight or class of waste, or on any other basis the Council of the County of Dufferin considers appropriate.
3. Notwithstanding Section 1, the assumption of waste does not include the assumption of any landfill site open or closed and owned by a lower-tier municipality.
4. The tipping fees paid by the County must be competitive with commercial rates at the time of commission.

Transitional Provisions

- 5. The County shall assume all authority granted herein by December 31, 2012 or the latest expiry date of the existing lower-tier collection contracts.
- 6. Until the assumption identified in Section 5 of this by-law, the County will work with the lower-tier municipalities, at the request of the individual lower-tier municipalities, to administer the waste collection process. The cost of any existing contracts will be borne by the lower-tier municipality until assumption by the County pursuant to this by-law.
- 7. The County will maintain the current curb-side collection programs offered by the lower-tier municipalities. Melancthon Township Council will have the option of requesting that the County provide curb-side pick up of household waste.
- 8. In accordance with the provisions of the *Act*, this by-law shall not come into effect unless,
  - (a) a majority of all votes on the County Council are cast in its favour;
  - (b) a majority of the Councils of all the lower-tier municipalities within the County have passed resolutions consenting to the by-law; and
  - (c) the total number of electors in the lower-tier municipalities that have passed resolutions under clause (b) form a majority of all the electors in the County;
- 5. This by-law will come into effect upon third reading.

READ a first and second time this 10th day of June, 2010.

\_\_\_\_\_  
Allen Taylor, Warden

\_\_\_\_\_  
Pam Hillock, Clerk

PURSUANT TO SECTION 189(2) OF THE MUNICIPAL ACT, 2001, S.O. 2001, c. 25  
TRIPLE MAJORITY ACHIEVED ON THIS \_\_\_ day of \_\_\_\_\_, 2010.

\_\_\_\_\_  
Allen Taylor, Warden

\_\_\_\_\_  
Pam Hillock, Clerk

READ a third time and finally passed this      day of      , 2010.

\_\_\_\_\_  
Allen Taylor, Warden

\_\_\_\_\_  
Pam Hillock, Clerk

# **BLUEWATER GEOSCIENCE CONSULTANTS INC.**

42 Shadyridge Place  
Kitchener, Ontario  
N2N 3J1

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

---

August 17, 2010

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

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

**Re: Review of Strada Aggregates Shelburne Pit: Proposed 2010 Groundwater Monitoring Program, Whitewater Hydrogeology Ltd. Letters dated August 6 and August 16, 2010**

Denise:

Bluewater Geoscience Consultants Inc. (Bluewater) was retained to review the contents of the above-captioned letter. The letter results from on-going discussions/reviews with Strada and Whitewater.

Regarding the Whitewater letter dated August 6, 2010, we agree that the cause of the groundwater extraction exceedences during 2009 was likely a pump calibration error and not intentional. It is Strada's sole responsibility to ensure compliance in this regard. This must include accounting for all potential factors that affect measurement of required water taking totals. Given this incident, we now see no reason for further extraction exceedences.

We also agree that the finding of detectable concentrations of toluene at two monitoring locations during 2008 was likely a result of laboratory false positives. This is not only as a result of the nature (toluene alone and not with its usual associated parameters) and distribution (at 2 wells widely separated and not directly downgradient of potential sources) of the findings but because it has been agreed that the existing monitoring network is most likely inadequate to detect toluene impacts if they were present. Strada has agreed to immediately re-sample any well that is found to contain detectable concentrations of any VOC or PHC parameter in the future. The other issues raised in the August 6, 2010 letter are addressed below.

During a meeting with Bluewater, Strada and Whitewater held on August 11, 2010 it was agreed that the existing groundwater monitoring network was inadequate to effectively monitor for the potential presence of Petroleum Hydrocarbon (PHC) impacts in groundwater at the site. At that time, Strada/Whitewater agreed to provide the Township with an action plan to upgrade the monitoring network to provide adequate monitoring for potential PHC impacts. The Whitewater letter of August 16, 2010 forms the basis of this action plan.

# **BLUEWATER GEOSCIENCE**

SEP - 9 2010

The August 16, 2010 letter provides for the installation of additional groundwater monitors at three (3) locations, described as MW-8, MW-9 and MW-10. Details of what we deem to be required at each location are provided below:

MW-8 – Wells currently installed at this location (MW3-04A and MW3-04 B) are consistently dry. Although MW3-04A does not extend the full depth of the overburden at this location, the lack of a measurable water level within the upper portions of the bedrock aquifer at MW3-04B would support the contention that the overburden is dry at this location. Based on this information, MW-8 should be installed within the bedrock aquifer and should provide a screened section that adequately monitors the top of groundwater and allows for variations of the groundwater level over time (making it available for sampling each year). This new well should be added to the yearly monitoring including groundwater elevation determination and sampling for current parameter list.

MW-9 – The existing shallow well (MW2-04A) does not extend the full depth of the overburden at this location. Groundwater elevations (max 483.5 m in 2009) determined for the deep well (MW2-04B) suggests that groundwater may be present in the area just above the bedrock (at least at certain times of the year). Based on this information, the additional wells should include a shallow well (MW-9A) effectively installed to the top of bedrock elevation and a deep well (MW-9B) that effectively monitors the top of groundwater within the bedrock aquifer (current deep well is screened well below this level). Both wells should be added to the monitoring/sampling program.

MW-10 – The current shallow wells installed at this location (MW-5A, MW7-07A and MW7-07B) do not adequately monitor for PHC impacts. MW-5A does not extend the full depth of overburden and is consistently dry. MW7-07A is too shallow and does not intercept groundwater. MW7-07B extends the full depth of overburden, intercepts shallow groundwater but the screened section of the well is too far below the top of groundwater to effectively monitor for PHC impacts. MW5-04B is installed within the shallow part of the bedrock aquifer. Although the measured groundwater levels at MW5-04B do rise above the screened section of the well, they appear to frequently lie near the contact of overburden and bedrock. Based on this condition, we feel that MW5-04B can be utilized as on-going bedrock monitor. Based on this information, the proposed additional well should consist of a well that can effectively monitor shallow groundwater within the overburden. Both this additional well and MW5-04B should be included in the on-going monitoring.

Further to the points detailed above, we offer the following considerations to ensure adequate monitoring and sampling. All monitoring wells that are to be sampled as part of the program must be purged of a minimum of three (3) casing volumes of water (consistent with MOE protocols) prior to obtaining samples. This may be completed using any device suitable (including Waterra's) to purge the well adequately and prevent any potential for cross-contamination between wells. The samples obtained for VOC/PHC analyses must be obtained from the top of the water column within the well utilizing dedicated or disposable bailers made of material suited to VOC/PHC sampling,

Although not agreed to previously, the detection of any VOC/PHC parameter in any of the groundwater monitoring wells should trigger immediate re-sampling to confirm or refute the finding. The Township should be notified immediately of any detection and the results of the follow-up sampling. Further, the Township should be notified immediately of any release or spill within the Pit property regardless of whether or not it is of a quantity which triggers Regulatory notification.

We trust this information is adequate to allow Strada and Whitewater to implement the required upgrades to their groundwater monitoring network so that it provides adequate monitoring of potential threats to groundwater quality.

Sincerely,

**BLUEWATER GEOSCIENCE CONSULTANTS INC.**

A handwritten signature in black ink, appearing to read "B. Lemieux". The signature is written in a cursive, flowing style.

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

Date: August 17, 2010

# **BLUEWATER GEOSCIENCE CONSULTANTS INC.**

42 Shadyridge Place  
Kitchener, Ontario  
N2N 3J1

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

---

August 17, 2010

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

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

**Re: Review of Strada Aggregates Proposed Melancthon Pit Level 2 Hydrogeological Assessment, Whitewater Hydrogeology Ltd. Letter dated August 16, 2010**

Denise:

Bluewater Geoscience Consultants Inc. (Bluewater) was retained to review the contents of the above-captioned letter. The letter results from on-going discussions/reviews with Strada and Whitewater.

During a meeting with Bluewater, Strada and Whitewater held on August 11, 2010 it was agreed that the subsurface investigations completed to date are adequate to characterize the geologic and hydrogeological conditions on the property as required under the ARA. It was further agreed that the existing groundwater monitoring network installed for site characterization was inadequate to effectively monitor for the potential presence of Petroleum Hydrocarbon (PHC) impacts in groundwater at the site on an on-going basis. At that time, Strada/Whitewater agreed to provide the Township with an action plan to upgrade the monitoring network to provide adequate monitoring for potential PHC impacts. The Whitewater letter of August 16, 2010 forms the basis of this action plan.

The August 16, 2010 letter provides for the installation of additional groundwater monitors at four (4) locations, described as OW6-10, OW7-10, OW11-10 and OW12-10. Details of what we deem to be required at each location are provided below:

OW6-10 – This is a new location that currently does not have any installed wells. Given a southeast flow direction, this proposed well will be an integral monitoring location that will monitor a large portion of the proposed pit. Currently, there is likely shallow groundwater contained within the overburden materials and this forms the most likely spot to detect VOC/PHC impacts. Given that Strada proposes to extract shallow groundwater from areas of the proposed Pit nearby, there is potential for drawdown of the shallow groundwater and entry into the bedrock. If on-going monitoring indicates the potential for drawdown to within the bedrock, an additional bedrock well may become necessary in the future.

OW7-10 – The existing shallow well (OW7-08) is sealed within the Till layer above bedrock. The groundwater elevation determined through the monitoring completed to date suggests shallow

# **BLUEWATER GEOSCIENCE**

groundwater levels well above the Till layer. Strada has proposed installing two additional monitors at this location(OW7-10A and OW7-10C). We agree with this proposal and suggest that the proposed shallow well should be installed within the Sand and Gravel and should be properly screened across the water table elevation. The second proposed monitor should be installed within the upper section of the bedrock aquifer with an appropriately screened interval for PHC detection.

OW11-10 – This is a new location without any current monitoring wells. This is a good location for additional wells given a suspected southeast flow direction as it provides monitoring of a sizeable portion of the Pit. Strada has proposed installing two additional monitors at this location(OW11-10A and OW11-10C). We agree with this proposal and suggest that the proposed shallow well should be installed within the Sand and Gravel and should be properly screened across the water table elevation. The second proposed monitor should be installed within the upper section of the bedrock aquifer with an appropriate screened interval for PHC detection.

OW12-10A – This is an additional well installed in the area of existing well OW-8. Given a southeast flow direction, this location will be an integral monitoring location that will monitor the northern portion of the proposed pit. Information available to date suggests that shallow groundwater is contained within the overburden materials and this forms the most likely spot to detect VOC/PHC impacts. The proposed well should be installed within the Sand and Gravel layer and should be properly screened across the water table elevation. Given that Strada proposes to extract shallow groundwater from areas of the proposed Pit nearby, there is potential for drawdown of the shallow groundwater and entry into the bedrock. If on-going monitoring indicates the potential for drawdown to within the bedrock, an additional bedrock well may become necessary in the future.

Further to the points detailed above, we offer the following recommendations to ensure adequate monitoring and sampling. All monitoring wells that are to be sampled as part of the program must be purged of a minimum of three (3) casing volumes of water (consistent with MOE protocols) prior to obtaining samples. This may be completed using any device suitable (including Waterra's) to purge the well adequately and prevent any potential for cross-contamination between wells. The samples obtained for VOC/PHC analyses must be obtained from the top of the water column within the well utilizing dedicated or disposable bailers made of material suited to VOC/PHC sampling,

As stated in the letter, the detection of any VOC/PHC parameter in any of the groundwater monitoring wells should trigger immediate re-sampling to confirm or refute the finding. The Township should be notified immediately of any detection and the results of the follow-up sampling. Further, the Township should be notified immediately of any release or spill within the Pit property regardless of whether or not it is of a quantity which triggers Regulatory notification.

Sincerely,  
**BLUEWATER GEOSCIENCE CONSULTANTS INC.**



Breton J. Lemieux, M.Sc., P.Geo., QP

Date: August 17, 2010

# Whitewater Hydrogeology, Ltd.

20 Strabane Avenue  
Barrie, ON  
L4M 1Z6  
Phone: 705.791.1988  
Email: tecia@white-water.ca

August 30, 2010

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

Attention: Denise Holmes,  
AMCT CAO/Clerk-Treasurer

**Re: Strada Aggregates: Resolution of Monitoring Programs**

Dear Ms Holmes:

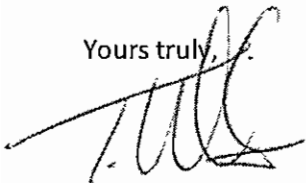
Whitewater Hydrogeology Ltd (Whitewater) Whitewater has completed their review of the Bluewater Geoscience Consultants Inc. (Bluewater) correspondence dated August 13, 2010 and two letters dated August 17, 2010. Whitewater acknowledges the agreement that Strada Aggregates (Strada) has been operating in compliance with the current monitoring requirements and appreciates the clarifications provided in the Bluewater correspondence from August 13, 2010.

Whitewater confirms that Strada has agreed to augment the monitoring programs at the existing Shelburne and the proposed Melancthon pit as outlined in the August 17 letters from Bluewater. Whitewater would like to clarify that they maintain the monitoring previously required at the existing pit and proposed at the Melancthon pit was appropriate for the particular circumstances at these sites. However, any differences of professional opinion regarding the adequacy of the monitoring program has been resolved as the result of Strada's agreement to augment the programs as agreed to at the August 11, 2010 meeting and set out in the August 17, 2010 letters from Bluewater.

Whitewater appreciates the opportunity to discuss the issues, which has lead to resolution.

If you have any questions, please do not hesitate to contact the undersigned.

Yours truly,



Tecia White, M.Sc., P.Geo.  
Whitewater Hydrogeology Ltd.

SEP - 9 2010

# Whitewater Hydrogeology, Ltd.

20 Strabane Avenue  
Barrie, ON  
L4M 1Z6  
Phone: 705.791.1988  
Email: tecia@white-water.ca

August 16, 2010

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

Attention: Denise Holmes, AMCT CAO/Clerk-Treasurer

**Re: Strada Aggregates: Shelburne Pit: Proposed 2010 Groundwater Monitoring Program**

Dear Ms Holmes:

A technical hydrogeological meeting was held at the Township of Melancthon's (Township) office on August 11, 2010. This meeting was held to discuss the groundwater monitoring program at the existing Shelburne Pit, which is owned and operated by Strada Aggregates Inc. (Strada). The following individuals were in attendance:

1. representing the Township:
  - a. Mr. Breton Lemieux (Bluewater Geoscience Consultants Inc.[Bluewater])
  - b. Mr. Jerry Jorden (G.W. Jorden Planning Consultants Limited)
2. representing Strada:
  - a. Ms. Tecia White (Whitewater Hydrogeology Ltd.[Whitewater])
  - b. Mr. Grant Horan (Strada Aggregates Inc.)

The purpose of the meeting was to allow the Township to express their opinion of the groundwater monitoring program at the Shelburne Pit. Of particular importance was that the Township provided clarification on the technical hydrogeological comments received to date. Specifically, that it has been recognized by the Township that Strada remains in compliance with the Ontario Water Resources Act and the Aggregate Resources Act. Specifically, it was acknowledged by Bluewater that the water taking exceedences reported in 2009 are likely a calibration error and Strada should have the water taking system inspected to confirm this understanding.

With the understanding that the current groundwater monitoring program complies with the site regulations, the Township was able to clearly explain that they have additional concerns that are not currently covered by the regulatory requirements. In order to satisfy the Township that the site is effectively monitored, it was recommended that three additional wells be drilled and constructed to allow for the detection of petroleum hydrocarbons, if present. These wells would be added to the current compliance monitoring program. The locations of the proposed groundwater monitoring wells are provided on Figure 1.

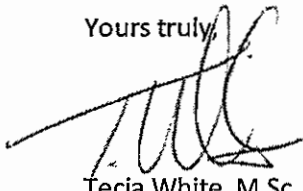
# Whitewater Hydrogeology, Ltd.

20 Strabane Avenue  
Barrie, ON  
L4M 1Z6  
Phone: 705.791.1988  
Email: [tecia@white-water.ca](mailto:tecia@white-water.ca)

Strada agreed to the recommended changes at the August 11<sup>th</sup> meeting and Whitewater has been given permission to proceed with the work program, once final approval from the Township has been given writing. The new wells will be drilled and constructed to meet the Townships requirements in 2010 and will be added to the compliance groundwater quality sampling program in the spring of 2011. It should be noted that the compliance monitoring for 2010 has been completed and no detections of hydrocarbons were reported.

If you have any questions, please do not hesitate to contact the undersigned.

Yours truly,



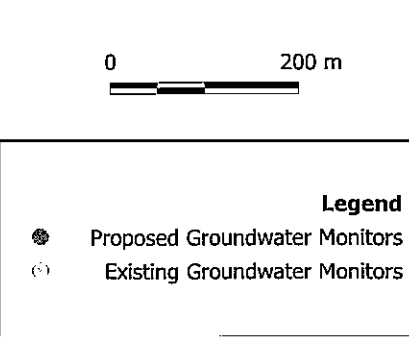
Tecia White, M.Sc., P.Geo.  
Senior Hydrogeologist  
Whitewater Hydrogeology Ltd.

Cc: Mr. Breton Lemieux (Bluewater Geoscience Consultants Inc.)  
Mr. Jerry Jorden (G.W. Jorden Planning Consultants Limited)  
Mr. Mario Pietrolungo (Strada Aggregates Inc.)  
Mr. David R. Barrett (MHBC Planning)



Prepared By: **Whitewater Hydrogeology, Ltd.**

Prepared For: **STRADA**  
AGGREGATES



**Figure 1**  
**Groundwater**  
**Monitoring Program**

Shelburne Pit  
Lot 13, Con 3 Township of Melancthon,  
Dufferin County

# Whitewater Hydrogeology, Ltd.

20 Strabane Avenue  
Barrie, ON  
L4M 1Z6  
Phone: 705.791.1988  
Email: [tecia@white-water.ca](mailto:tecia@white-water.ca)

August 16, 2010

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

Attention: Denise Holmes,  
AMCT CAO/Clerk-Treasurer

**Re: Strada Aggregates: Proposed Melancthon Pit Level 2 Hydrogeological Assessment  
Response to the Township of Melancthon's Peer Review Comments (Response #2)**

Dear Ms Holmes:

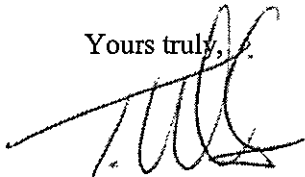
Whitewater Hydrogeology Ltd (Whitewater) is please to present additional information to allow the Township of Melancthon's (Township) technical peer reviewer, Bluewater Geoscience Consulting Inc. (Bluewater), to complete their review of the Level 2 Hydrogeological Assessment (Whitewater, March 2010). On July 12, 2010, Bluewater provided a letter of the unresolved items on the hydrogeological assessment. It was noted that a majority of these items were formed on the basis of previous reviews completed on the existing Shelburne Pit. As a result, these items have been addressed by Whitewater under a separate cover (letter dated August 6, 2010).

In order to avoid duplication in the correspondences, Whitewater has identified the remaining outstanding items in Bluewater response dated July 12, 2010, which include:

1. Cumulative impacts of the water takings from the two washing facilities;
2. Quantify water losses due to the operation of the proposed washing facility; and
3. Revise the groundwater monitoring program to incorporate additional deep and downgradient monitoring locations.

If you have any questions, please do not hesitate to contact the undersigned.

Yours truly,



Tecia White, M.Sc., P.Geo.  
Whitewater Hydrogeology Ltd.

**TECHNICAL RESPONSE TO BLUEWATER LETTER DATED JUNE 10, 2010**

**1. Cumulative Impact Assessment**

As stated in Section 1.4 of the Level 2 Hydrogeological Assessment (2010), Whitewater took into consideration the Cumulative Effects Assessment Best Practices Paper for Below Water Table Aggregate Operations within the Grand River Watershed plan (GRCA, May 2009). The document presents the principles developed for addressing aggregate extraction below the water table in the Grand River watershed. The Nottawasaga Valley Conservation Authority (NVCA) has adopted the principles of the document for proposed aggregate operations within the NVCA watershed area. Hydrogeological studies are required to incorporate a cumulative effects assessment in priority subwatersheds where two or more **below** water pits are operating in close proximity, or where it has been determined that there may be broader cumulative effects at a watershed scale.

The proposed Melancthon Pit is located in proximity to the Nelson-Arnold Pit, CBM Pit, and Strada's Shelburne Pit, both of which are licensed to extract aggregate from **above** the water table. On-going monitoring from the existing Shelburne Pit indicates that there are no impacts associated with the operation of the two sites (Azimuth, 2008). Furthermore, the proposed Melancthon Pit is located within the Boyne River sub-watershed (Section 2.2), which did not show signs of stress in the recent Source Water Protection water budget assessments. In this regard, it was concluded in the Level 2 Hydrogeological that the principals outlined in the Cumulative Effects Assessment Best Practices Paper did not apply to the proposed Melancthon Pit application. The NVCA supported this conclusion.

Bluewater has specifically requested that a cumulative impact assessment be completed for the water takings from the existing Shelburne Pit (PW1) and the proposed washing facility at the Melancthon Pit. Cumulative impacts are those impacts that result from the incremental impact of an action added to other past action. To create a cumulative impact from multiple above water pits and their associated water use, you must first have a measureable existing influence on the groundwater regime.

Whitewater (2009) concluded that the operations at the existing Shelburne Pit are having no measurable impact on the shallow and/or deep groundwater regimes. This includes the taking from PW1. The proposed Melancthon Pit will be operating a "closed-loop" washing facility in which the water taking from the shallow groundwater system will be returned. Whitewater (2010) concluded that there will be no adverse impacts associated with the proposed operations at the Melancthon Pit. It is therefore, Whitewater's professional opinion that the issue of cumulative impacts is not a concern for Strada's existing Shelburne Pit or proposed Melancthon Pit.

**2. Quantification of Water Losses**

Water losses from above water pit operations are considered to be primarily from evaporation from the wash pond and from retention of water to the washed aggregate material (in addition to water used for dust control). It is generally accepted that the average annual losses to evaporation from open water is

# Whitewater Hydrogeology, Ltd.

500 mm to 800 mm, depending on the environmental setting. The maximum surface area of the pond that is permitted under the ARA is 0.25 ha (2500 m<sup>2</sup>). Assuming that 800 mm of water is lost from the 0.25 ha pond per year, the total losses from open water evaporation would equate to 200,000 L (or 550 L/day). To put this into perspective, the estimated water losses due to evaporation are less than the average household use in a single day (i.e., 780 L/day for a three person home).

The second source of water loss during aggregate processing is water retention to the product. After the aggregate material is washed, it is stock-piled. The water retained to the product is eventually either lost to evaporation or re-infiltrated to the groundwater system. This is a difficult parameter to estimate, however standard practice is to assume that between 10 L of water is retained on every one tonne of washed material. Strada estimates that up to 300,000 tonnes of material will be washed each year. Therefore, approximately 3,000,000 L/year will be lost to evaporation.

Based on these calculations, only a small portion (8%) of the handled water is consumed and that the bulk of the handled water is returned to the groundwater or surface water system, which concurs with the Water Consumption Study completed by Golder (2006).

It should be noted that the entire change in the water budget must be considered. The water balance was presented in the Level 2 Hydrogeological Assessment (2010). It was concluded that the change in the pre- and post-water balance conditions would be a net increase in groundwater recharge due to the changes in soil cover and topography. It was concluded that the infiltration across the Melancthon Pit will increase by approximately 10%. Furthermore, it was recognized that the water losses due to evapotranspiration would be lost as evaporation during the extraction phases.

The net change in the water balance is estimated to be an approximate increase of 2% in groundwater recharge. With water losses estimated to 8% to evaporation and water inputs to be approximately 10% from enhanced recharge, the overall impact on the water balance for the property will be limited.

### 3. Revised Groundwater Monitoring Program

On August 11, 2010 a technical hydrogeological meeting was held between Bluewater and Whitewater at the Township's office to discuss the revisions to the groundwater monitoring network. It was acknowledged by Bluewater that the groundwater monitoring program presented in the Level 2 report (Whitewater, 2010) meets the application standards for a Category 3: Class "A" Aggregate Resources Act (ARA) license. However, similar to their concerns on the Shelburne Pit, the Township recommended that additional monitoring wells be drilled and constructed to allow for the detection of petroleum hydrocarbons, if present.

During the August 11<sup>th</sup> meeting, Strada agreed to drill and construct four (4) additional wells upon licensing of the Melancthon Pit (Figure 1). It was agreed upon by Bluewater that the additional drilling would not provide any addition geological or hydrogeological information for the support of the application with the Ministry of Natural Resources. However, once the Melancthon Pit is operational,

the supplemental monitoring locations would provide the re-assurance the Township requires when reviewing the compliance hydrogeological monitoring reports.

Strada has agreed to the proposed groundwater and surface water monitoring program provided in Table 1.

**Table 1: Revised Groundwater and Surface Water Monitoring Program**

Well No.	Water Level Elevations		Water Quality		Water Quality Monitoring Location Rationale
	Continuous Datalogger	Quarterly Manuals	General Parameters	Petroleum Hydrocarbons	
OW2-07C	X	X	X		Up-gradient / Background Water Quality
OW2-08A	X	X	X	X	
OW2-08B	X	X	X	X	
OW3-08A	X	X	X		
OW3-08B	X	X			
OW4-07C	X	X	X		
OW4-08A	X	X	X	X	Up-gradient / Background Water Quality
OW4-08B	X	X	X	X	
OW5-07C	X	X			Down-gradient / Water Quality
OW5-08A	X	X	X	X	
OW5-08B	X	X	X	X	
OW8-08A	X	X	X	X	
OW8-08B	X	X			
OW9-08A	X	X			
OW10-08A	X	X	X		
OW10-08B	X	X			
South Pond	X	X	X	X	Surface Water Quality
Wash Pond	X	X	X	X	
OW6-10A(R)	X	X	X	X	Down-gradient / Water Quality
OW7-10A(R)	X	X	X	X	
OW7-10C(R)	X	X	X	X	
OW11-10A	X	X	X	X	
OW11-10C	X	X	X	X	
OW12-10A	X	X	X	X	

**Note:**

1. Highlighted (red) item represents added location and/or parameters
2. A detection of a petroleum hydrocarbon will result in an immediate re-sample to confirm results.
3. R = replacement well
4. Wells are represented on Figure 1 as Well Nest Locations (i.e., OW8). Proposed wells are identified as OW11-10 (for the year 2010)



Prepared By:

**Whitewater**  
Hydrogeology, Ltd.

0 200 m

**Figure 1**  
**Revised Monitoring Program**

Prepared For:

**STRADA**  
AGGREGATES

- Legend**
- ⊗ Existing Monitoring Well Location
  - ⊙ Proposed Monitoring Location
  - Property Boundary
  - - - Proposed Extraction Boundary

Proposed Melancthon Pit  
West Half of Lots 11 and 12, Con 3 O.S.  
Township of Melancthon, Dufferin County

# **BLUEWATER GEOSCIENCE CONSULTANTS INC.**

42 Shadyridge Place  
Kitchener, Ontario  
N2N 3J1

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

---

August 13, 2010

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

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

**Re: Whitewater/Strada Response Letter dated August 6, 2010 and Meeting with Whitewater/Strada on August 11, 2010 – Strada Shelburne and proposed Melancthon Pits**

Denise:

It has come to our attention that some of the comments in our letter dated May 17, 2010 may have been poorly worded leading some to believe that Strada was not in compliance with the requirements of the ARA or the OWRA with respect to the Shelburne Pit groundwater monitoring. Since the only real requirements for the groundwater monitoring, as contained in Section 15 of the agreement between Strada and the Township, are:

“The Owner (Strada) will prepare an annual report on groundwater monitoring as required by its operational plan filed with the Ministry of Natural Resources. Copies of all annual reports will be provided to the Township”

we would have to agree that in a technical sense Strada is in compliance with those requirements. This being said we maintain that the groundwater monitoring and sampling completed to date is inadequate to detect potential Petroleum Hydrocarbon (PHC) contamination that could originate from within the pit operations. Up until August 11, 2010 Strada and their consultants have disagreed with this contention.

Based on our letter of May 17, 2010 Strada and Whitewater prepared a response letter dated August 6, 2010. In the letter they continued to maintain that the groundwater monitoring was adequate to complete the goals it was intended for, namely detecting the potential presence of PHC impacts to groundwater at the downgradient property line. In order to fully discuss this issue, Bluewater requested a meeting at the Township offices with Strada and their hydrogeology consultant Whitewater.

The meeting was held at the Township office on August 11, 2010 and included Bluewater (Bret Lemieux), Mr. Jerry Jordan (Township Planner), Ms. Tecia White (Whitewater) and a representative from Strada. At the beginning of the meeting Bluewater related to Strada that the Council and residents of Melancthon are very concerned about groundwater issues with the Township and require companies operating within the Township who may have impacts on groundwater quality/quantity to

## **BLUEWATER GEOSCIENCE**

SEP - 9 2010

adequately monitor in order to prove that their operations are not having impact on the groundwater. Bluewater stated that it was our opinion that the presence of fuel storage tanks (at least 1 tank of ~500 gallon capacity) plus the various fuel-driven equipment that operate within the pit create a potential to create PHC impacts to groundwater. Strada and their consultant agreed that this was true.

After this brief introduction the attendees completed an in-depth review of the stratigraphy (geologic conditions) and groundwater conditions at the Shelburne Pit as well as the construction details of the available groundwater-monitoring wells. Based on the review of these conditions presented by Bluewater the following points were agreed to:

1. Given a determined southeast groundwater flow direction and the fact that the monitoring wells (both overburden and bedrock) at the location referred to as MW-3 were continuously dry, the northeastern half of the Strada property is essentially unmonitored with respect to detecting the potential presence of PHC impacts to groundwater;
2. Given the construction details of groundwater monitoring wells at MW-2, MW-5 and MW-7, the southwestern half of the Strada site is inadequately monitored for the potential presence of PHC impacts and most likely could not detect such impacts if present;
3. In summary, as has been stated by Bluewater in our reviews for the last several years, the groundwater monitoring program for the Shelburne Pit is inadequate to fulfill the goals for which it was designed;
4. Given the conclusions agreed to in Point 3, Strada has agreed to upgrade the monitoring well network to make it adequate. This is to include the installation of additional monitoring wells. Bluewater provided input into what would be required to achieve this goal and it was agreed that Strada/Whitewater would put together a proposal to install the additional groundwater monitors at selected locations and submit to the Township/Bluewater for review.

Upon completion of the review of conditions at the existing Shelburne Pit the attendees completed a detailed review of the hydrogeological work completed to date for the proposed Melancthon Pit. After an in-depth review of the stratigraphy, groundwater conditions and the groundwater-monitoring wells completed to date the following conclusions were made:

1. The geologic/hydrogeological investigations completed to date are adequate to characterize the site geology and groundwater conditions for the proposed Pit. These geologic/groundwater conditions are different than the conditions at the Shelburne Pit, despite their close proximity;
2. The groundwater monitoring wells installed to date, while adequate to determine geological/groundwater conditions, are not adequate to provide meaningful on-going groundwater monitoring and sampling to determine the potential presence of PHC impacts in groundwater;

3. Additional groundwater monitors are required to complete an adequate groundwater monitoring network for the property;
4. Bluewater and Strada/Whitewater completed an in-depth review of the monitoring network and agreed on what would be required in terms of the number of additional wells and construction details of those wells to provide adequate monitoring for the potential presence of PHC in groundwater;
5. Whitewater is to prepare and submit to The Township a Scope of Work to complete the additional well installations agreed to in point 4 above.

We hope this letter clarifies any misunderstandings that may have originated from our letter of May 17, 2010 and provides the Township with an up-to-date synopsis of where consultations are regarding hydrogeological conditions and monitoring for both the Shelburne and Melancthon pits. If there are any further questions regarding these issues we would be willing to address them as required,

Sincerely,  
**BLUEWATER GEOSCIENCE CONSULTANTS INC.**



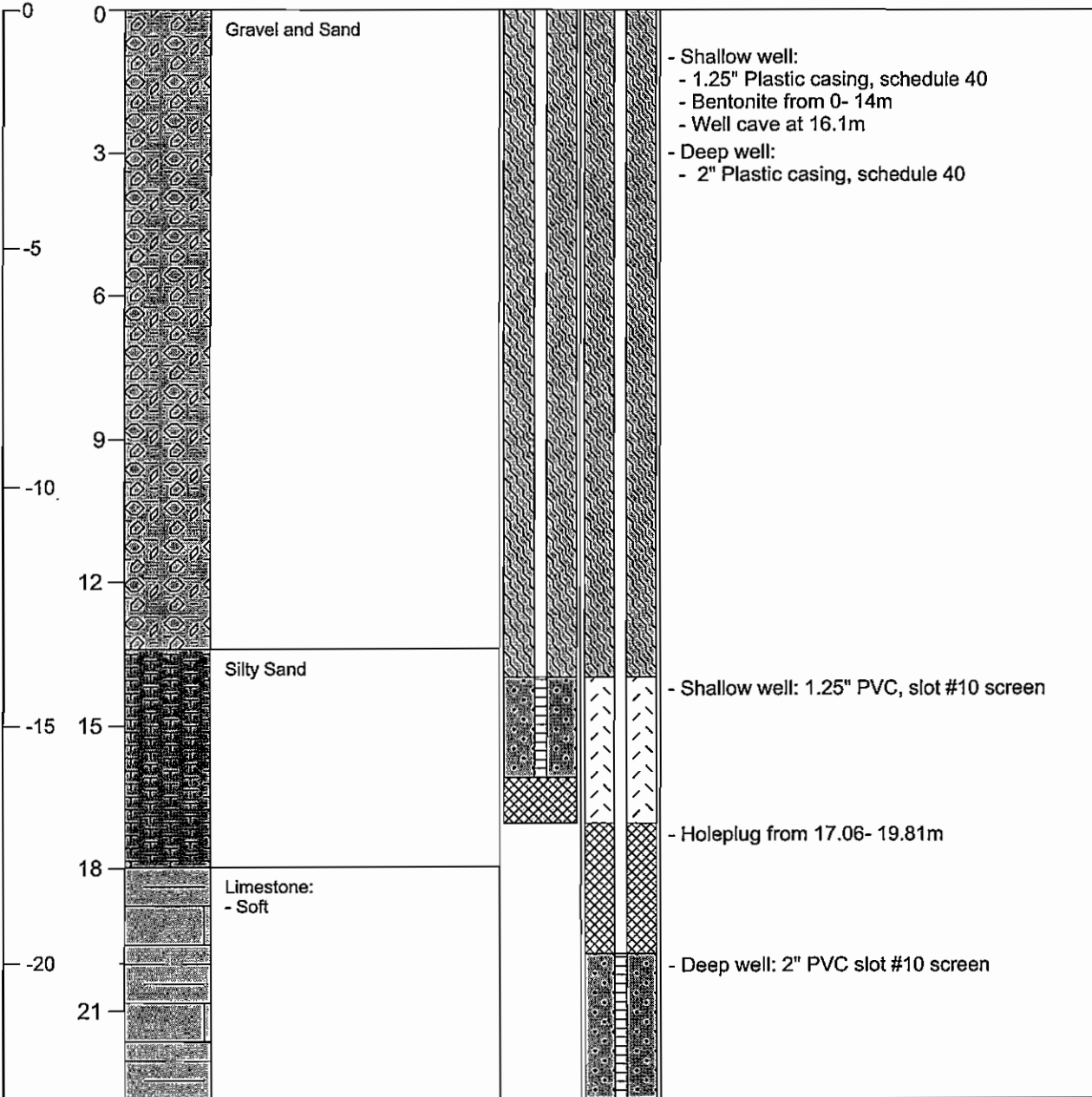
Breton J. Lemieux, M.Sc., P.Geo., QP  
President, Senior Geoscientist

Date: August 13, 2010

## Well Name: MW3-04

<b>Project No:</b> 07-253p <b>Date:</b> June 10, 2004	<b>Location:</b> Lot 12, Con 3, Twp. of Melancthon Shelbourne
<b>Logged By:</b> Keith Lang	<b>Total Depth:</b> 22.86m <b>Ground Elevation:</b> 508.7 (masl) <b>Top of Casing:</b> 509.4 (masl)
<b>Drilled by:</b> Keith Lang Well Drilling	<b>UTM:</b> Northing: 4887867 Easting: 561740
<b>MOE Well Tag I.D.</b> A 006796	

Depth (m) Elev. (masl)	Stratigraphic Description	Monitor Details
---------------------------	---------------------------	-----------------



<b>Prepared By:</b> Goffco Limited
<b>Prepared For:</b> STRADA AGGREGATES





# Whitewater Hydrogeology, Ltd.

20 Strabane Avenue  
Barrie, ON  
L4M 1Z6  
Phone: 705.791.1988  
Email: tecia@white-water.ca

March 31, 2010

Ministry of the Environment  
12th Floor  
119 King St W  
Hamilton ON L8P 4Y7  
Fax: (905)521-7820

Attention: Carl Slater  
Director, Section 34  
Ontario Water Resources Act, R.S.O. 1990

**Re: Shelburne Pit: Permit to Take Water No. 0580-78PPS2**

Dear Sir:

The Ministry of the Environment issued a PTTW to Strada Aggregates Inc. for the taking of water at the Shelburne Pit located at Lot 13, Concession 3, Township of Melancthon, County of Dufferin. Water taking is permitted from one bedrock well (PW1) and one closed loop washing facility (Wash Pond).

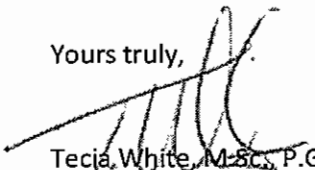
As stated in the 2009 Annual Groundwater Monitoring Report (Whitewater, 2010), there were several occurrences of exceedences of the daily permissible rate from PW1. The maximum daily water taking is 164,000 L at 227 L/min (50 IGPM) for 12 hours. In November and December 2009, there were several days in which the taking ranged between 167,000 and 171,000 L. This is equivalent to taking 232 and 237 L/min for 12 hours, a difference of between 5 and 10 L/min (1 and 2 IGPM).

In 2007 Strada installed and utilized a timing system on the pumping equipment. This system limits the pumping duration to a maximum of 12 hours for every 24 hour period. In addition, the pump installed in PW1 has been rated at a maximum pumping rate of 227 L/min. As a result, Strada cannot exceed either their pumping duration or volume limits as stipulated in the PTTW. This system proved successful in 2008 when no water taking exceedences occurred (Azimuth, 2009). Therefore, the most plausible answer to the slightly elevated water taking values is a result of metre or pump calibration error.

A copy of the water taking records is appended for your review and has been faxed to the MOE to be entered into the Water Taking Reporting System.

If you have any questions, please do not hesitate to contact the undersigned.

Yours truly,



Tecia White, M.Sc., P.Geo.  
Whitewater Hydrogeology, Ltd.

**Table 1: Strada Aggregates Shelburne Pit - 2009 Water Taking Volumes**

Strada Pumping records (PW-1)			Strada Pumping records (PW-1)		
Date	Litres	Exceedence (L/min)	Date	Litres	Exceedence (L/min)
January 26, 2009	10,300	0	July 13, 2009	134,000	0
January 27, 2009	15,400	0	July 14, 2009	134,000	0
January 28, 2009	14,600	0	July 15, 2009	134,000	0
January 29, 2009	10,400	0	July 16, 2009	132,000	0
January 30, 2009	19,500	0	July 17, 2009	134,000	0
February 2, 2009	9,500	0	July 20, 2009	135,000	0
February 3, 2009	9,500	0	July 21, 2009	135,000	0
February 4, 2009	10,500	0	July 22, 2009	134,000	0
February 5, 2009	10,500	0	July 23, 2009	134,000	0
February 9, 2009	9,500	0	September 21, 2009	146,000	0
February 10, 2009	9,500	0	September 22, 2009	146,000	0
February 17, 2009	15,000	0	September 23, 2009	146,000	0
February 18, 2009	9,000	0	September 24, 2009	146,000	0
February 19, 2009	10,000	0	September 25, 2009	146,000	0
February 20, 2009	5,000	0	October 19, 2009	95,000	0
February 24, 2009	10,000	0	November 2, 2009	37,000	0
February 25, 2009	14,000	0	November 3, 2009	<b>169,000</b>	<b>6</b>
February 26, 2009	5,000	0	November 4, 2009	<b>168,000</b>	<b>5</b>
May 25, 2009	135,000	0	November 5, 2009	<b>167,000</b>	<b>4</b>
May 26, 2009	134,000	0	November 6, 2009	<b>168,000</b>	<b>5</b>
May 27, 2009	221,000	0	November 9, 2009	<b>167,000</b>	<b>4</b>
May 28, 2009	138,000	0	November 10, 2009	147,000	0
May 29, 2009	136,000	0	November 11, 2009	147,000	0
June 1, 2009	139,000	0	November 12, 2009	147,000	0
June 2, 2009	137,000	0	November 15, 2009	158,000	0
June 3, 2009	138,000	0	November 16, 2009	158,000	0
June 4, 2009	137,000	0	November 18, 2009	131,000	0
June 5, 2009	138,000	0	November 19, 2009	<b>171,000</b>	<b>8</b>
June 8, 2009	135,000	0	November 20, 2009	<b>170,000</b>	<b>7</b>
June 9, 2009	138,000	0	November 23, 2009	<b>168,000</b>	<b>5</b>
June 10, 2009	137,000	0	November 24, 2009	<b>171,000</b>	<b>8</b>
June 11, 2009	137,000	0	November 25, 2009	<b>169,000</b>	<b>6</b>
June 15, 2009	137,000	0	November 26, 2009	<b>170,000</b>	<b>7</b>
June 16, 2009	137,000	0	November 27, 2009	<b>169,000</b>	<b>6</b>
June 18, 2009	136,000	0	November 30, 2009	<b>169,000</b>	<b>6</b>
June 23, 2009	136,000	0	December 1, 2009	<b>169,000</b>	<b>6</b>
June 24, 2009	136,000	0	December 2, 2009	<b>168,000</b>	<b>5</b>
June 25, 2009	136,000	0	December 3, 2009	<b>166,000</b>	<b>2</b>
June 26, 2009	136,000	0	December 4, 2009	2,000	0
June 29, 2009	134,000	0	December 7, 2009	<b>168,000</b>	<b>5</b>
June 30, 2009	137,000	0	December 8, 2009	<b>170,000</b>	<b>7</b>
July 6, 2009	136,000	0	December 10, 2009	<b>168,000</b>	<b>5</b>
July 7, 2009	136,000	0	December 14, 2009	<b>169,000</b>	<b>6</b>
July 8, 2009	134,000	0	December 15, 2009	<b>170,000</b>	<b>7</b>
July 9, 2009	134,000	0			



---

Environmental Assessments & Approvals

December 17, 2007

AEC 07-235

Strada Aggregates,  
36 Briar Road,  
Barrie, ON  
L4N 5H3

Attention: Mr. Tom Newson  
Manager, Sand and Gravel Division

**RE: Response to Review of Strata Aggregates 2005 and 2006 Melancthon Pit Ground  
Water Monitoring Reports**

Dear Sir:

Azimuth Environmental Consulting, Inc. (Azimuth) is pleased to present our response to the Township of Melancthon's (Township) technical review of the Strada Aggregates (Strada) 2005 and 2006 Melancthon Pit Ground Water Monitoring reports. It is our understanding Bluewater Geoscience Consultants, Inc. (Bluewater) was retained on behalf of the Township to complete this review of the abovementioned reports. Bluewater's technical review was summarized in a letter to the Township dated September 5, 2007.

In order to provide a comprehensive response to the concerns of the Township, Azimuth has reviewed the Ground Water Monitoring reports for the Melancthon Pit (Goffco Limited and Long Environmental Consultants, Inc; 2004, 2005, and 2006). The concerns of the Township are:

1. limitations of the existing monitoring program to adequately monitor the presence / absence of the ground water table;
2. ground water wells are stated to be consistently dry which contradicts water level data; and
3. inadequate well construction and sampling techniques to properly detect potential hydrocarbons.



### **Inadequate Ground Water Monitoring Program**

In general, we are in agreement with the concerns over the existing monitoring program and the caveat that the monitoring well should be constructed with the base of the well (i.e., well screen) at the base of the unconfined aquifer. However, it is recognized that in order to effectively monitor for the presence / absence of a water table in the overburden materials, as required by the Provincial Standards, one must fully understand the geological conditions. The Provincial Standards states that for unconsolidated surficial deposits, the ground water table is the surface of an unconfined water-bearing zone at which the fluid pressure is atmospheric. In the absence of ground water in an unconfined aquifer, the Provincial Standards adopts the potentiometric surface as the ground water table.

To add complexity, in glacial deposits, specifically till, perched water table conditions are common. Under the Revision of Policies and Procedures Manual for the Administration of the Aggregate Resources Act (May 2005) a perched ground water table is considered a local zone of saturation above the water table where a relatively impervious stratum within the zone of aeration interrupts/intercepts percolation and causes ground water to accumulate in a limited area. A perched ground water table is not usually considered the water table for the purpose of establishing the on-site ground water conditions.

The overburden in the study area consists of pockets of glaciofluvial ice contact and outwash deposits as well as glaciolacustrine deposits that are incised into the underlying fine grained Tavistock Till. To assist Azimuth in the review process, Goffco has prepared borehole logs, which provides a detailed description of the well construction details relative to the geological formations beneath the site. The borehole logs for the existing monitoring network identify a till-like material described as a silty sand to gravelly silt (i.e., Tavistock Till). This till unit provides a relatively thin confining unit between the sand and gravel unconfined aquifer and the underlying confined bedrock aquifer.

The confining nature of the Tavistock Till is confirmed by the presence of a downward hydraulic gradient across the till unit as measured between the potentiometric surface in the till and bedrock aquifer. If the two geological units were hydraulically connected, the hydraulic heads measured in the shallow overburden and deep bedrock monitoring wells would be equivalent. However, this is not the case as presented in the ground water elevation data (Goffco Limited and Long Environmental Consultants, Inc; 2006). At monitoring locations that report both a shallow and deep water level, the hydraulic gradients can up to seven metres (MW4-04). Based on this data, the Tavistock Till is characterized as an aquitard.



To adequately establish the water table, monitoring wells should be constructed at the base of the sand and gravel (water table) and in the bedrock aquifer (potentiometric surface).

Perched ground water is anticipated across the study area as a result the stratigraphic nature of the deposits. Locally and intermittently, there are indications of a perched (shallow) ground water flow system through the permeable sand found above the Tavistock Till and as anticipated, within the till unit itself. It is known that a till sheet was deposited and then likely eroded to some degree by fluvial processes, which also deposited the overlying sands and gravel. Such fluvial processes can create local depressions that become water filled on occasion. These discrete water-filled depressions account for the apparent discontinuity in the water level data. In some instances this situation would be termed a “perched” water table, but it is uncertain whether a “pocket” of water in a localize depression warrants this classification.

Based on the review of the monitoring program, it is our understanding that the wells of concern are MW2A-04, M3A-04, and MW5A-04. Table 1 provides a summary of the well construction details in relation to the aquifer units. Specifically, the screened interval is compared to the base of the sand and gravel aquifer.

Table 1: Summary of Well Construction and Aquifer Monitoring Zone

Monitoring Well	Screen Interval (mbgl)	Base of Sand and Gravel (mbgl)
MW2A	12.8 – 9.7	11.0
MW3A	16.2-13.2	13.4
MW5A	23.8-20.7* 20.4-17.4**	23.1

Notes:

- \*Screen interval reported on water well record.
- \*\*total depth measured in field.

Based on the information provided in Table 1, the following assessment can be made:

1. MW2A is constructed appropriately to effectively monitoring the water table conditions;
2. MW3A is monitoring the water levels in the Tavistock Till;
3. MW5A is constructed 3 m above the base of the sand and gravel aquifer. Based on the information provided on the water well record, the well was to be constructed at the base of the sand and gravel unit. However, it is anticipated that the well collapsed during well construction, backfilling the borehole prior to the installation of the well screen, raising the base of the well by 3 m. This is common in unconsolidated materials.



Water level data presented in Table 4 of the 2005 ground water monitoring report presents the data for the abovementioned wells. Bluewater indicates that although the text states that the wells are consistently dry, the data presented suggests otherwise. It is unclear when these measureable water levels were obtained. Table 4 does present an elevation on the dates the manual readings were obtained, but they are the same depths as the total depth of the well (i.e., confirming that a measurement was taken). In most cases, where the elevation is reported, the table indicates that the well is dry or muck. As well drillers do not always slit the end cap of the well screen, condensation and/or drilling fluid can sit in the base of the well. This “muck” clings to the water level tape and typically confirms the well is dry.

The presence of “dry” wells raises the question of the hydraulic significance of the water levels reported in the remaining overburden wells. Of specific interest is the difference in the depth to the water table across the site. At MW1A-01 the water level is reported to be approximately 499 masl (screened between 492-495 masl) while MW2A-04 is reported to be dry (screened between 484-487 masl). As the presence of ground water in the overburden is not laterally continuous at the site, the ground water monitored in MW1A-01 and MW4-04 is considered to represent “perched” conditions.

Based on this evaluation, the true potentiometric surface beneath the site is considered to be within the confined bedrock aquifer. However, it is required that the presence / absence of a water table in the overburden material be confirmed. To support the current understanding of the ground water regime beneath the site, Azimuth recommends the following work program to be completed prior to the submission of the 2007 Annual Ground Water Monitoring Report:

1. replacement of MW5-04, which will be constructed to adequately monitor the presence / absence ground water within the overburden materials;
2. a single monitoring be constructed to monitor the presence / absence of the water table beneath the existing pit floor; and
3. a detailed geological evaluation of the exposed pit faces to provide a three-dimensional understanding of the geological conditions.

The 2007 Annual Ground Water Monitoring Report will provide a detailed description of the site conceptual model. The water level data will be evaluated to provide a clear understanding of the ground water flow regime beneath the site, including the presence / absence of a water table in the unconfined sand and gravel unit, perched conditions within the Tavistock Till, and the potentiometric surface within the bedrock aquifer. It is believed that this approach to the on-going evaluation of the pit will satisfy all outstanding concerns with the ground water monitoring program.



### **Inadequate Well Construction and Sampling Techniques**

Bluewater is indicating that hydrocarbon sampling is best performed across the water table interface. Furthermore, Bluewater is suggesting that any ground water sample for hydrocarbon detection should be taken at this interface and not at the bottom of the monitoring well (unless the interface is located at this location). This is suggested because hydrocarbons tend not to readily dissolve in water and can form a separate immiscible phase on the top of the water table since given that these products tend to be lighter than water (i.e., oil floating on water).

In the absence of a water table condition in the sand and gravel, released hydrocarbons could drop to the till unit and coalesce in the depressions noted above. Alternatively, these products could also migrate through vertical fractures in the till to the bedrock contact and then into the rock if this also is partially unsaturated. The details to this transport situation and the ramifications to monitoring will not be presented other than to state that the detection of hydrocarbon contamination in fractured media is a much more daunting challenge (Pankow and Cherry, 1996).

In a fluctuating water table condition, a “smear zone” can be created because of the season variation in the water table. Thus, the detection of the contaminant source can become somewhat easier to detect across this “smear” zone. However, reliance on this situation is not ideal unless a sound historic database is present to substantiate the seasonal variation(s).

In the absence of a water table, sampling at or near the till contact may provide the best possible alternative because the till should readily sorb some of the hydrocarbon contamination and could prevent or slow further vertical hydrocarbon migration. It is agreed that detection of hydrocarbon contamination is improved when the water table crosses the screened portion of the well at some point during the monitoring year since this would then facilitate the invasion of this contamination at the water table into the monitoring well and hence its subsequent detection (assuming the well is sampled properly).

Environment Canada has prepared an online Technical Assistance Bulletin (TAB#5)<sup>1</sup>, which is intended to outline proper procedures for sampling and analysis of hydrocarbon contaminated ground water. This national protocol indicates that representative samples of ground water can be collected without well purging if

---

<sup>1</sup> <http://www.on.ec.gc.ca/pollution/ecnpd/tabs/tab05-e.html>



devices such as submersible bladder or inertial pumps (Watterra) are used. This assumes that the interface is sampled as opposed to some other depth.

As discussed, additional drilling within the current extraction area and around the perimeter of the property will be completed in January 2008 to provide an improved understanding of the site conditions. This information will be incorporated into the 2007 Ground Water Monitoring report.

If you have any questions or comments, please do not hesitate to call.

Yours truly,

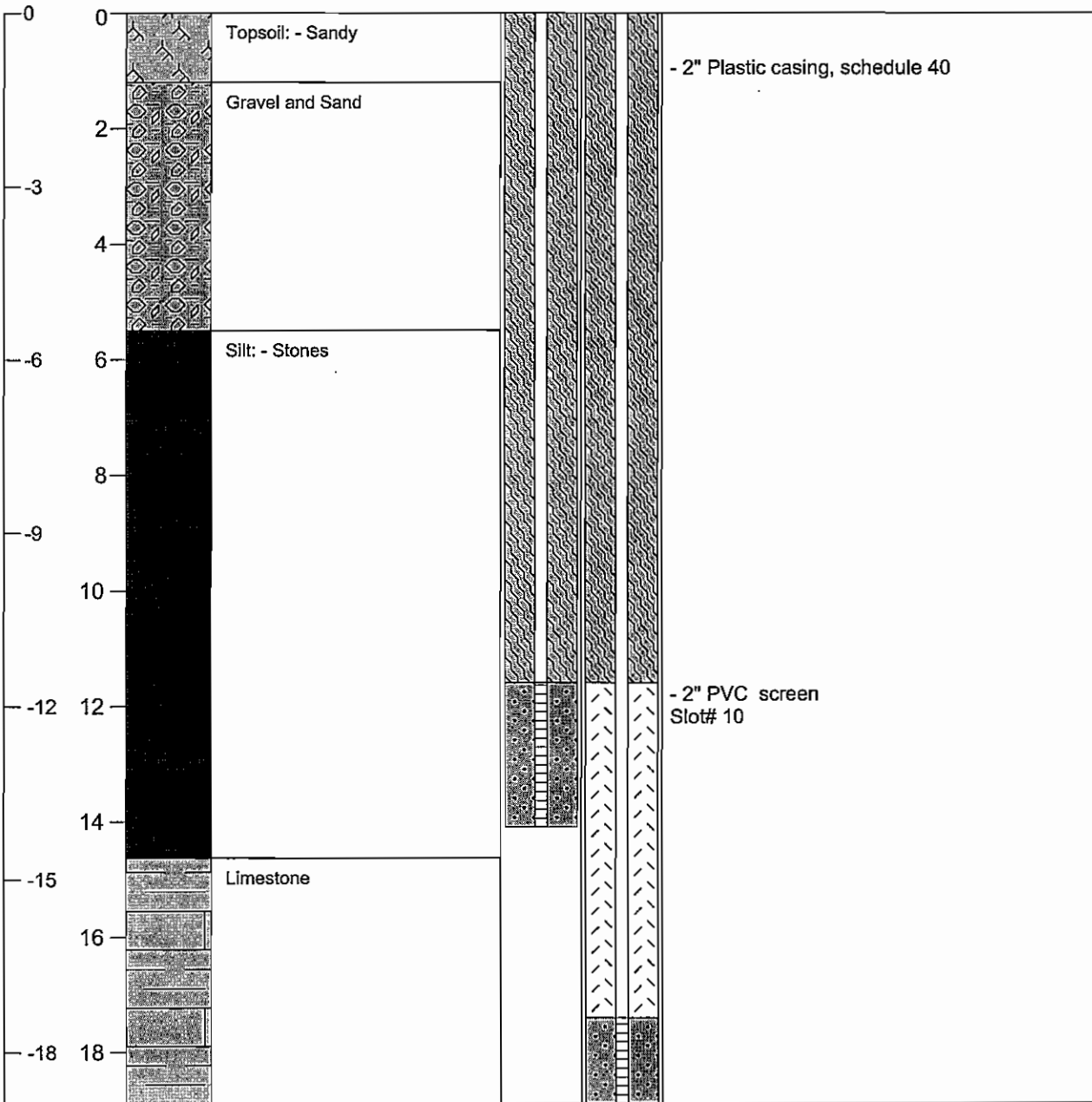
**AZIMUTH ENVIRONMENTAL CONSULTING, INC.**

Tecia White, M.Sc., P.Geo.  
Senior Hydrogeologist

## Well Name: MW1-01

<b>Project No:</b> 07-253p <b>Date:</b> December 1, 2001	<b>Location:</b> Lot 12, Con 3, Twp. of Melancthon Shelbourne
<b>Logged By:</b> Keith Lang	<b>Total Depth:</b> 18.9m <b>Ground Elevation:</b> 507 (masl) <b>Top of Casing:</b> (masl)
<b>Drilled by:</b> Keith Lang Well Drilling	<b>UTM:</b> Northing: 4887604 Easting: 561145
<b>MOE Well Tag I.D.</b> MW1-01	

Depth (m) Elev. (masl)	Stratigraphic Description	Monitor Details
---------------------------	---------------------------	-----------------



Prepared By: Goffco Limited

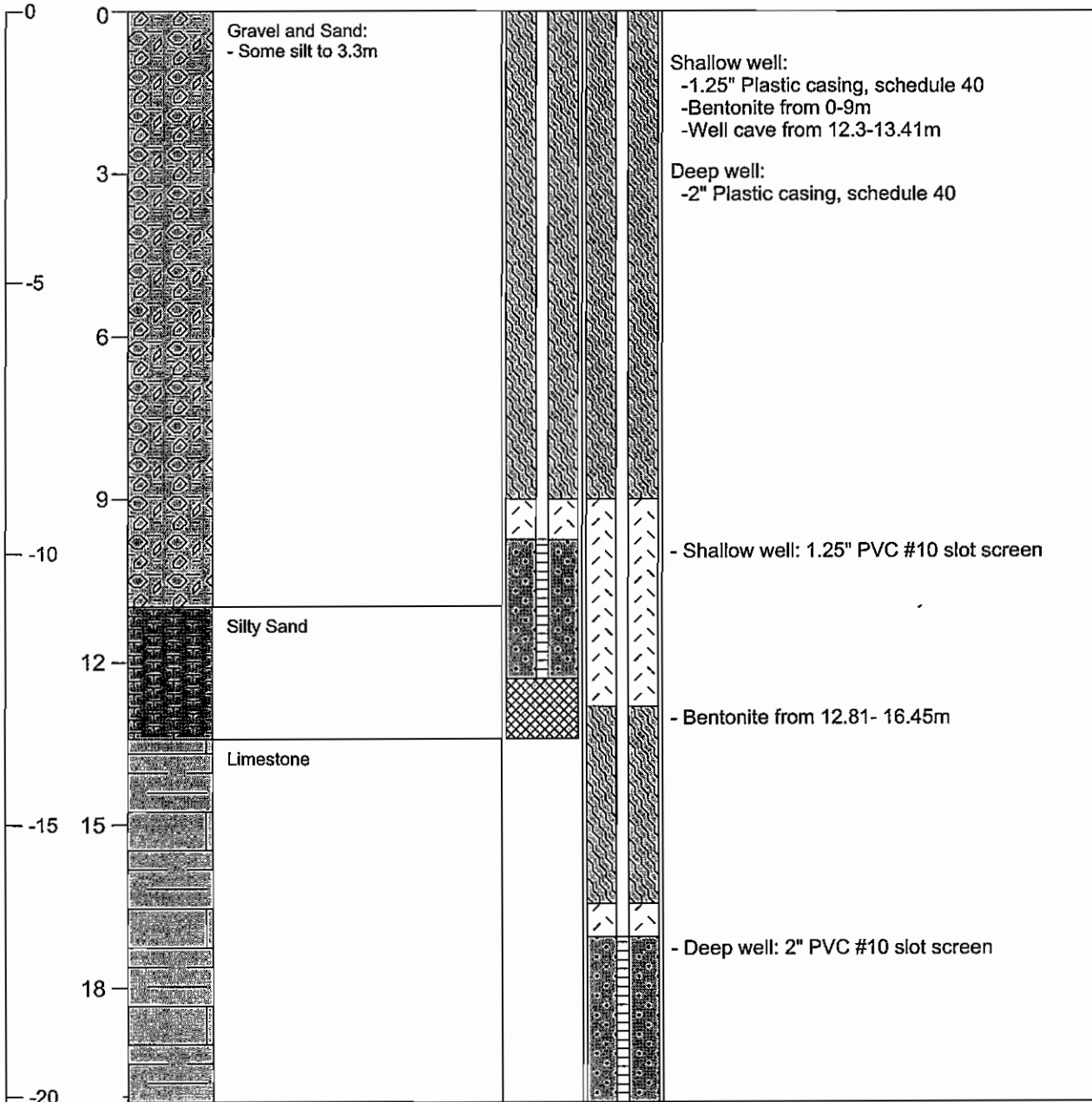
Prepared For:



# Well Name: MW2-04

<b>Project No:</b> 07-253p <b>Date:</b> August 1, 2004	<b>Location:</b> Lot 12, Con 3, Twp. of Melancthon Shelbourne
<b>Logged By:</b> Keith Lang	<b>Total Depth:</b> 20.11m <b>Ground Elevation:</b> 496.32 (masl) <b>Top of Casing:</b> 497.36 (masl)
<b>Drilled by:</b> Keith Lang Well Drilling	<b>UTM:</b> Northing: 4887847 Easting: 561769
<b>MOE Well Tag I.D.</b> A 006815	

Depth (m) Elev. (masl)	Stratigraphic Description	Monitor Details
---------------------------	---------------------------	-----------------



Prepared By: Goffco Limited

Prepared For:



# Whitewater Hydrogeology, Ltd.

20 Strabane Avenue  
Barrie, ON  
L4M 1Z6  
Phone: 705.791.1988  
Email: tecia@white-water.ca

August 6, 2010

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

Attention: Denise Holmes, AMCT CAO/Clerk-Treasurer

**Re: Strada Aggregates: Shelburne Pit  
Peer Review Response - 2008 and 2009 Groundwater Compliance Reports**

Dear Ms Holmes:

Whitewater Hydrogeology Ltd. (Whitewater) is pleased to present a technical response to the Township of Melancthon peer review comments prepared by Bluewater Geoscience Consulting Inc. (Bluewater). This response has been prepared to address the concerns raised in the review of the 2008 and 2009 Groundwater Monitoring reports for the Strada Aggregates Inc. (Strada) Shelburne Pit. It has been organized to follow the sequence of questions provided in the May 17, 2010 letter prepared by Bluewater and includes the enquiries of Councillor White.

In summary;

1. The water taking exceedances are negligible and likely a result of calibration error.
2. The detection of toluene is likely anomalous. Subsequent testing has confirmed no hydrocarbon contamination. It is agreed that, in the future, any detection should result in a second confirmatory sample.
3. The recommended improvements to the ground water monitoring program have been implemented as explained in the attached technical response.
4. The ground water monitoring network is adequate to assess the water table and water quality at the Strada site.
5. Annual monitoring reports have been provided to the Township as required by the agreement. The monitoring at the Shelburne pit exceeds the OWRA and ARA requirements.

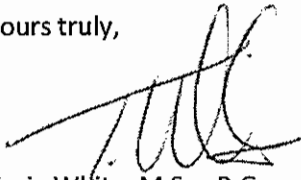
To provide the required background information to support the information presented in this letter report, please refer to the appended documents, which include:

# Whitewater Hydrogeology, Ltd.

1. Response to Review of Strata Aggregates 2005 and 2006 Melancthon Pit Ground (Azimuth, December 17, 2007);
2. Strada Aggregates: Water Taking Submission for Water Takings at the Shelburne Pit (April 8, 2010); and
3. Water Quality Summary (Petroleum Hydrocarbon): Shelburne Pit (June 14, 2010)

If you have any questions, please do not hesitate to contact the undersigned.

Yours truly,



Tecia White, M.Sc., P.Geo.  
Senior Hydrogeologist / Owner  
Whitewater Hydrogeology Ltd.

Cc: Mr. Breton Lemieux (Bluewater Geoscience Consultants Inc.)  
Mr. Jerry Jordan (G.W. Jordan Planning Consultants Limited)  
Mr. Mario Pietrolungo (Strada Aggregates Inc.)  
Mr. David R. Barrett (MHBC Planning)

# Whitewater Hydrogeology, Ltd.

## TECHNICAL RESPONSE TO BLUEWATER LETTER DATED MAY 17, 2010

### Questions Raised by Councillor White

- 1. The exceedance of permitted water taking allowances by 3000-7000 l/day on several in 2009. That's a lot of water lost to a "pump calibration error". Also what are they considering as "several days"?*

As stated in the Whitewater 2009 report, the exceedences were reported as follows:

"The maximum daily water taking is 164,000 L at 227 L/min (50 IGPM) for 12 hours. In 2009, there were several days in which the taking ranged between 167,000 and 171,000 L. This is equivalent to taking 232 and 237 L/min for 12 hours, a difference of between 5 and 10 L/min (1 and 2 IGPM). This exceedence is considered to be negligible and likely represents calibration error in the water metre."

To provide further evidence to support this opinion, in 2007 Strada installed and utilized a timing system on the pumping equipment. This system limits the pumping duration to a maximum of 12 hours for every 24 hour period. In addition, the pump installed in PW1 has been rated at a maximum pumping rate of 227 L/min. As a result, Strada cannot exceed either their pumping duration or volume limits as stipulated in the Permit to Take Water (PTTW). This system proved successful in 2008 when no water taking exceedences occurred (Azimuth, 2009). Therefore, the most plausible answer to the slightly elevated water taking values is a result of metre or pump calibration error.

To support Whitewaters conclusion that the exceedence (5 and 10 L/min) is considered to be negligible. The volume of water that represents the amount exceeded has been translated into laymen's terms. An average domestic garden hose runs at approximately 23 L/min. The increased taking from PW1 would be equivalent to having your garden hose running between 20% and 40% of its maximum instantaneous rate (23 L/min). This additional 5 to 10 L/min represents 2-4% of the permitted taking and is considered within the margin of error. Whitewater stands by the recommendation to have the water taking system calibrated in 2010.

The total water taking from PW in 2009 was 10,464,200 L over 90 days. Strada's PTTW permits a total of 40,860,000 L from PW over a 250 day period. The taking from 2009 only represents approximately 25% of the total permitted taking.

For the Municipality's reference, Whitewater has appended the letter provided to the Ministry of the Environment (MOE) which provides the data on the volume of water taken daily at the Shelburne Pit. This information was faxed on April 8, 2010 after several discussions with the MOE. Faxed information is then entered into Water Taking Reporting System by Ministry staff.

# Whitewater Hydrogeology, Ltd.

- 2. The detection of petroleum hydrocarbons present in the well in 2008 is noted as anomalous as they were not detected in the 2009 readings. Does the level detected in 2008 indicate a past spill and is there a possibility of migration of the hydrocarbons to an area not tested?*

Two hits of toluene were reported as potentially anomalous in 2008 by Azimuth Environmental Consulting, Inc. This was confirmed by Whitewater in 2009 and 2010. To provide clarification to the agencies, Whitewater circulated a letter dated June 14, 2010 to Strada and the Ministry of Natural Resources explaining the circumstances (appended). However, based on the Bluewater comments, further explanation is required to support this opinion.

Benzene, toluene, ethylbenzene and the three xylene isomers, m-, p- and o-xylene (collectively termed BTEX) and can cause contamination in groundwater from various sources (i.e., gasoline). Although the aggregate industry has not been identified as a threat to groundwater, precautionary monitoring of hydrocarbons is performed at the Shelburne Pit. To understand the fate and transport of BTEX in overburden and bedrock aquifers at a site, a sound conceptual understanding of the flow system must be developed.

At the Shelburne Pit, groundwater in the overburden aquifer is typically perched and laterally discontinuous based on the long-term groundwater monitoring program. Therefore, groundwater recharge percolates through the overburden materials (sand and gravel and till units) to the bedrock aquifer. The direction of groundwater flow in the bedrock aquifer is from the west and north at MW1-B and MW4-B (494.5 and 496.6 masl, respectively) toward the southeast, where water levels decrease to 481.3 masl at MW2-B (Whitewater, 2009). Therefore, if a BTEX plume were to exist as a result of the Shelburne Pit operations, it would be sourced from within the extraction area and would follow the groundwater flow path downgradient from the source location.

However, this is not the case. The distribution pattern of the Toluene hits does not match with the anticipated flow path. The detected toluene was reported to occur at the Arnold Well, which is located off-site and up-gradient of the Shelburne Pit. If this toluene hit is not anomalous, the source could not be the Shelburne Pit.

The second location of the toluene detection was at MW2B; the furthest and deepest well downgradient of the extraction area. If this detection were real, it would have been anticipated that other downgradient wells would have reported a detection of the contaminant (i.e., MW3B and MW5B). Furthermore, as reported by Azimuth (2009), no other associated parameters were detected (i.e., benzene, ethylbenzene and the three xylene isomers, m-, p- and o-xylene). Therefore, Whitewater remains of the opinion that this is a valid assessment of the data. It is not uncommon for groundwater samples to report 'false-positive' analytical results.

Whitewater agrees with the recommendation that immediately upon review of the results a second confirmatory sample for BTEX should be collected and analyzed (although not a requirement under the ARA or PTTW). Strada recognizes the importance of confirming results and has agreed to exceed their

# Whitewater Hydrogeology, Ltd.

regulatory requirements and complete confirmatory sampling based on recommendation of the hydrogeologists (Bluewater and Whitewater). The immediate response and confirmatory sampling of any hydrocarbon detections will be incorporated into the proposed monitoring program (outlined in the letter dated August 6, 2010 by Whitewater regarding the Melancthon Pit peer review).

## Questions Raised by Bluewater

In order to address the on-going concerns, Whitewater has identified the key items from the Bluewater response dated (May 17, 2010). Bluewater has raised four additional matters, which include:

1. Have the four recommendations by Azimuth to improve the monitoring been completed (Azimuth recommendations were made in 2007).
2. Shallow monitoring wells still do not reach the bedrock – overburden contact. The wells are inadequate to detect the presence of both groundwater and potential hydrocarbons
3. Inadequacy of monitoring network and attempts to supplement the groundwater monitoring network appears to have been unsuccessful; and
4. Strata's track record of inadequate compliance monitoring

Whitewater's response to these items has been prepared to provide a straightforward explanation, which can be understood by the technical reviewer, general public, and members of Council. Several of the Townships concerns raised by Bluewater have been responded to by Azimuth Environmental consulting, Inc (Azimuth, 2008). The Azimuth 2008 response was prepared to address these issues subsequent to the technical review completed by Bluewater on the 2007 Annual Groundwater Compliance Monitoring report. It is hoped that this additional information will allow for Bluewater to further understand the hydrogeological assessments completed in 2008 and 2009.

1. In the 2007 groundwater monitoring report, Azimuth Environmental Consulting, Inc. provided four recommendations to improve the groundwater monitoring program at the Shelburne Pit. These recommendations included:
  - a. ***MW5-04 is replaced, which will be constructed to adequately monitor the presence (or absence) of groundwater within the overburden sediments.***

The well has been replaced as recommended. MW7-07 was drilled in the spring of 2007 to replace MW5-04. Due to the presence of the berm and the property boundary, the only location to construct this well was between the inside edge of the berm and the extraction limits. As extraction preceded westward, the accessibility of the well became unsafe due to its proximity to the vertical pit face. However, as extraction in that area was cleared in 2010, Strada made the well safely accessible by re-grading the face to a safe angle.

# Whitewater Hydrogeology, Ltd.

It was clearly stated in the 2007 monitoring report that this well supports the professional opinion of all hydrogeological consulting firms (Goffco, Azimuth, and Whitewater) in that the overburden at this location is unsaturated.

A recommendation to install dataloggers in MW7-07 was made in the 2008 groundwater monitoring report (to further confirm the findings). It was further recommended that if the well remains throughout 2008 that the monitoring of the shallow system be discontinued at this location.

In the summer of 2010 when the well was made accessible, the dataloggers were retrieved and downloaded. The datalogger installed at the base of the well screen in MW7A reported values that were equivalent to the barometer. After barometric correction, the resulting pressure of water above the base of the well was zero. This was confirmed by the manual water level measurement taken for calibration purposes. The continuous water level in the bedrock aquifer at MW7B was ranged between 292 masl and 293 masl. Therefore the water levels from the MW7-07 well nest are representative of the groundwater conditions beneath the Shelburne Pit.

***b. A single monitor be constructed to monitor the presence (or absence) of the water table beneath the existing pit floor***

This was completed. During the same drilling program as MW7-07, attempts were made to install a shallow monitoring well beneath the pit floor. Drilling confirmed that the lowest portion of the pit floor was comprised on till (sand and gravel had been removed entirely). This drilling program confirmed that the overburden material is unsaturated as the pit floor remains dry. The hole was abandoned to limit obstructions on the pit floor.

***c. A detailed geological evaluation of the exposed pit faces to provide a three dimensional understanding of the conditions should be completed***

This evaluation was initiated in the 2007 and is on-going. During each monitoring event the pit face is examined to identify the depositional environments, which resulted in the unconsolidated materials beneath the subject lands. Representative photographs taken from the Shelburne Pit are available if required. However, the stratigraphy exposed along the faces indicates that the geologic setting is complex as a result of the transition between glaciofluvial ice contact and outwash deposits and glaciolacustrine environments. Understanding the complexity of the depositional environment was the objective of the subsurface investigation (i.e., geological evaluation of the pit face). Interpretation and correlation of the entire stratigraphic profile across the site is not considered to provide any additional insight to the groundwater conditions at the Shelburne Pit.

# Whitewater Hydrogeology, Ltd.

## d. *Transient testing on all existing and proposed monitoring wells.*

Some testing has been completed in the vicinity of the Shelburne Pit. The results of this testing and understanding of the site conditions indicated that further testing would not provide additional useful information.

To support this opinion, transient testing was completed on an adjacent Strada property by Azimuth in 2008. Thirteen slugs test were completed in the overburden sediments to assist in the characterization of the hydraulic properties. Due to the high permeability of the sand and gravel unit ("A" monitors), the testing method could only provide a lower bound hydraulic conductivity ( $>1 \times 10^{-4}$  m/sec). The sand and gravel formation was able to take the slug of water as fast as it was injected. Since it is well understood that these deposits have a high permeability, it was felt that further testing was not required.

It is well understood that the overburden were deposited in a complex ice marginal setting and variability is expected. The coarse nature of the deposits is indicative of a very transmissive hydrostratigraphic unit, although unsaturated.

2. Bluewater has continued to raise the issue that the groundwater monitoring network is inadequate to detect the presence of the water table and potential hydrocarbons since 2006. However, this issues was addressed by Azimuth on December 17, 2007 (copy of response appended). In March 2008, the 2007 annual monitoring report was submitted by Azimuth.

On July 14, 2008 Bluewater completed the Technical review of the 2007 Groundwater Monitoring Report in which they agreed with the four recommendations provided by Azimuth in the 2007 groundwater monitoring report (as discussed above).

The technical review by Bluewater concluded with the statement that:

**It is our opinion that the operation remains in compliance with its requirements.**

Based on the timing of these reports, it is suggestive that as of July 14, 2008 the issues raised have been resolved. Particularly since the requirements to replace MW5-04 with MW7-07 was successful.

An additional comment is required to address Bluewaters concern with that installed bedrock monitors cannot adequately be used to determine the potential presence of petroleum hydrocarbon contamination. The bedrock aquifer (i.e., Amabel Formation) is considered to represent the discrete fracture flow system that is confined. Therefore, the water level is defined as the potentiometric surface (i.e. under pressure). Based on this understanding, the resulting hydraulic head in the monitored fracture zone will rise in the well column under aquifer pressure, unless the aquifer has been depressurized. Technically, to meet Bluewaters

# Whitewater Hydrogeology, Ltd.

request to install a well screen that intersects both the confined aquifer zone and the potentiometric surface may result in screening multiple aquifer zones (if the head is higher than the top of the confined system). This would be in contravention of Ontario Regulation 903.

In addition, the one of the anomalous toluene hits was reported in MN2B (i.e., a bedrock well). Therefore, if Bluewater was correct in their opinion that the current bedrock groundwater monitoring cannot adequately detect hydrocarbons, this would support Whitewaters opinion that the toluene hit was anomalous. However, the difficulty of monitoring hydrocarbons in fractured bedrock environments is far more complex as outlined in the Azimuth response in 2008 (appended).

3. Bluewater is of the opinion that attempts to supplement the groundwater monitoring network appears to have been unsuccessful. It is hoped that with the retrieval of the MW7-07 monitoring data, this has been rectified. In addition, Whitewater is unclear as to why Bluewater is under the impression MW6 is a new monitoring location. This is not a new well and has been reported on since the pit began its operation. In the 2005 Groundwater Monitoring report, it was noted that the former "Banks" well is now the Scale House well and has been re-named MW6, in accordance with Site Plan Note G3. This note has been repeated in the 2006, 2007, 2008, and 2009 reports. The well log for this well is not available from the MOE.
4. Whitewater disagrees with the opinion of Bluewater, which is that Strada's track record of compliance monitoring is inadequate. Based on Bluewaters comments in 2008, Strada was in compliance. Furthermore, no technical input was provided to Strada again until June 4, 2010.

It was brought to Stradas attention in April 2010 that the Township did not have record of the 2009 Groundwater Monitoring report. It has been confirmed by Azimuth that all the agencies were circulated with a copy on March 2, 2009. Regardless, Strada immediately arranged for two additional copies to be couriered to the Township. Strada/Whitewater will ensure a copy of the Groundwater Monitoring report is provided to the Township each year. It is hoped that if a Groundwater Monitoring report is not provided to the Township by March 31 of any given year, that they notify Strada immediately.

Table 1 provides a summary of the monitoring program conducted at the Shelburne Pit. With the installation of dataloggers in the monitoring wells, the monitoring at the Shelburne Pit exceeds the requirements under both the OWRA and the ARA.

# Whitewater Hydrogeology, Ltd.

**Table 1: 2008 and 2009 Compliance Monitoring Program**

Regulation	Requirement	Regulatory Monitoring Frequency	2008 and 2009 Monitoring Frequency	Compliance Status for 2008 and 2009
<b>Ontario Water Resources Act</b>				
PTTW No. 0580-78PPS2				
Condition 4.2	Monitor groundwater levels in PW1 and OW1 when PW1 is in use	Twice per day	Continuous	Exceeds Requirements
Condition 4.3	Manual water level readings in all on-site monitoring wells	Monthly	Continuous	Exceeds Requirements
<b>Aggregate Resources Act</b>				
Operations Plan				
G.1	A monitoring well shall be installed midway between MW1 and MW2	once	MW5-05 installed and later replaced with MW7-07	Meets Requirements
G.2	Monitoring wells MW1 to MW5 will be equipped with piezometers to measure the groundwater levels in the overburden and bedrock, where they exist	During well construction		Exceeds Requirements
G.3	Groundwater levels of all on-site monitoring wells and domestic wells (Nelson/Arnold, Banks, Garner)	Quarterly	Continuous in on-site wells: quarterly for off-site wells	Exceeds Requirements
G.4	Groundwater quality sampling	Annually	Annually	Meets Requirements
G.5	The licensee will prepare an annual report on groundwater monitoring. Copies will be supplied to the MNR and the Township, for public record	Annually	Annually	Meets Requirements
G.6	The licensee will take immediate action in the event of a spill, in accordance with the spills contingency program. Post spill monitoring in down-gradient wells will be completed as warranted	As required	No spills have occurred	Meets Requirements
G.7	The licensee will implement the well interference protocol upon the report of a written complaint from a neighbouring property owner	As required	No complaints have occurred	Meets Requirements

# Whitewater Hydrogeology, Ltd.

20 Strabane Ave  
Barrie, ON  
L4M 1Z6  
Phone: 705-791-1988  
Email: tecia@white-water.ca

June 14, 2010

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

Attention: Mr. Mario Pietrolungo

**Re: Water Quality Summary (Petroleum Hydrocarbon): Shelburne Pit**

Dear Sir:

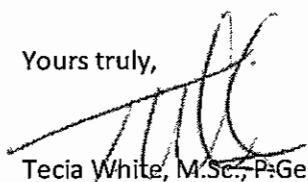
Whitewater Hydrogeology Ltd is please to present this letter report, which has been prepared to provide Strada Aggregates Inc. (Strada) with a summary of the petroleum hydrocarbon sampling program at the Shelburne Pit, located on Lot 13, Concession 3, Township of Melancthon, Dufferin County.

The inclusion of petroleum hydrocarbons to the compliance groundwater monitoring program at the Shelburne pit occurred in 2007 and is regulated under both the Aggregate Resources Act (Aggregate License) and the Ontario Water Resources Act (PTTW). Petroleum hydrocarbons are evaluated because of the use of this product at the site and the presence of a fuel storage vessel.

Since 2007, there have been no detections for any petroleum hydrocarbon parameter analysed, with the exception of two trace detections for toluene in 2008. These two detections of 0.27 µg/L and 0.21 µg/L were only slightly above the Ontario Drinking Water Standards of 0.2 µg/L. In the 2008 Annual Monitoring Report (Azimuth, 2009), it was concluded that these detections were likely anomalous since no other associated detections were noted (i.e., benzene). It was recommended that close attention should be paid to be future sampling results. Subsequent results for the 2009 and 2010 groundwater monitoring program reported no detections of hydrocarbons. This confirms that the trace concentrations detected in 2008 were anomalous.

If you have any further questions or concerns on this issue, please do not hesitate to call the undersigned at any time.

Yours truly,



Tecia White, M.Sc., P:Geo  
Whitewater Hydrogeology Ltd.

THIS AGREEMENT made in duplicate this \_\_\_\_\_ day of \_\_\_\_\_, 2010

BETWEEN:

**THE CORPORATION OF THE  
TOWNSHIP OF SOUTHGATE**

hereinafter called "Southgate" of the First Part;

And

**THE CORPORATION OF THE  
TOWNSHIP OF MELANCTHON**

hereinafter called "Melancthon" of the Second Part;

WHEREAS each of the Parties hereto wishes to clarify its obligations to the other Party with respect to the Southgate Recreation Services in Dundalk providing access to the residents of Melancthon in the Dundalk services area. These services include access to the Dundalk Arena & Community Centre facilities, Dundalk Swimming Pool, Baseball diamonds, soccer fields, parks, playgrounds and other recreation infrastructure in the Village of Dundalk;

NOW THEREFORE THIS AGREEMENT WITNESSETH that in consideration of the mutual covenants of each Party, the one with the other, the Parties hereto covenant and agree as follows:

1. The Dundalk Recreation services and facilities shall be used jointly by the parties hereto with all parties to have equal rights, and shall be under the management and control of the Recreation Department of the Township of Southgate and will report to the Southgate Recreation Advisory Board (Board) or its future committee structure and the Township of Southgate Council.
2. It is agreed that the Board or committee shall be appointed every four years by resolution, by the Council of Southgate, and shall be composed of membership of the Township of Southgate and qualify to be elected as members of the Council of Southgate, and one (1) of whom shall be from Melancthon Council.
3. The Council members that act as committee members at recreation committee level take part in the budget discussions. Discussions and proposals will be communicated through meeting minutes and council representatives to both municipal councils. Concerns from Melancthon Council on recreation budget concerns should be sent in writing to Southgate Council prior to the 15<sup>th</sup> day of April in every year.
4. It is agreed that subject to the provisions of Section 5 of the Act, the Board shall formulate policies, rules and regulations for and relating to the administration and the use of the Dundalk Community Recreation facilities with Southgate Council approval.

5. It is agreed that the operating and capital cost deficits for the operating of the facilities shall be split by the municipalities as follows:

Southgate	90%
Melancthon	10%

Further Melancthon's deficit contributions are capped and will not exceed \$8,000.00 for operating and \$6,000.00 for capital per year.

6. It is in Southgate councils best interest seeing as 90% of all recreation deficits in Dundalk is the burden of Southgate tax payers to manage these costs, which ultimately Melancthon council benefits from as well. However large capital requirements are necessary from time to time. In light of this capital costs will be managed as low as possible. However the replacement of high cost infrastructure and unforeseen failures periodically cause larger than normal capital costs. Some are budgeted and predictable and some are not. Southgate maintains reserve accounts for higher than normal and these unforeseen expenses. A Dundalk-Melancthon Recreation reserve account will be set up for any unused contributions of the capital cap each year in order to fund large capital purchases in future years where capital costs or failures of the single purchase exceeds \$50,000.00. Melancthon will not be indebted to Southgate for more than the annual capital and the balance of the reserve account at that point in time. The Melancthon reserve is capped at a total contribution level of \$10,000.00 for emergency or higher than normal capital costs.
7. It is further agreed that Capital costs shall be shared by the participating municipalities in the same proportions as set out in Clause 6 providing that a five year capital plan be presented to the Councils for approval and that they are kept current.
8. It is agreed that this agreement shall be for a period of 2 years starting January 1, 2011 and expire December 31, 2012. At that time the agreement will be reviewed and may be extended by agreement of both parties.
9. The parties hereto shall execute such further assurance as may be reasonably required to carry out the terms hereof.
10. It is further agreed that these presents and everything herein shall respectively ensure to the benefit of and be binding upon the parties hereto and their respective successors and assigns.
11. The parties agree that this agreement may be amended at any time by the mutual consent of the parties, after the party desiring the amendment(s) gives the other party a minimum of thirty (30) days written notice of the proposed amendment(s).
12. The previous agreement dated September 5, 2007 shall be in effect until December 31, 2010.

In WITNESS WHEREOF each of the parties hereto has affixed its corporate seal attested to by the proper officers duly authorized in that behalf;

SIGNED, SEALED AND DELIVERED  
in the presence of:

THE CORPORATION OF THE  
TOWNSHIP OF SOUTHGATE

\_\_\_\_\_  
Mayor

\_\_\_\_\_  
Clerk

THE CORPORATION OF THE  
TOWNSHIP OF MELANCTHON

\_\_\_\_\_  
Mayor

\_\_\_\_\_  
CAO/Clerk – Treasurer