

April 30, 2008

Stan Holiday
Senior Planner – Legislative Approvals
City of Hamilton
71 Main Street West
7th Floor
HAMILTON, Ontario
L8P 4Y5



Re: Hydrogeology Work Plan March 2008 - St Marys CBM aggregate development application
OPA-04-17 and ZAC-04-89

Dear Stan,

Please find herein, and in the attached enclosure, comments regarding the March 2008 Hydrogeology Work Plan (HWP) prepared for St Marys CBM by Gartner Lee Limited from Friends of Rural Communities and the Environment (FORCE), on behalf of our communities. The comments are provided as feedback to both the Peer Review and Combined Aggregate Review Team (CART) processes for the proposed St Marys CBM aggregate development application OPA-04-17 and ZAC-04-89.

It remains the position of our communities that we are opposed to the proposed quarry development in this location and its OPA and zoning by-law application. We understand that as part of the current land use planning and future *Aggregate Resource Act* (ARA) decision making processes, government and related agencies may see the need for further hydrogeologic and related information gathering, including testing of the proposed mitigation system(s). As such, there remains a pending PTTW application.

As a community, we believe, however, that permission for the pilot GRS test and associated PTTW remain premature and that source protection planning work and refinement of the HWP and any PTTW are required. We advance this position on the basis of:

1. **There is substantial outstanding work required to understand this watershed, its vulnerabilities and risks, and implications for source water protection planning.** The Halton/Hamilton Source Protection Committee has just begun its work on a Terms of Reference. Work on the Assessment Report and subsequent Source Protection Plan remains months and years away. Halton Conservation has just received another \$959,000 to further undertake the technical studies required to support that work. Existing draft water budget and mapping work document significant data gaps and outdated data. Further stress assessment and sub-watershed analysis have been called for in the area which includes the Carlisle Wellhead Protection Area and the proposed quarry. We are also dismayed by the lack of policy and guidelines through MOE regarding the engagement of Source Protection Committees on matters of PTTW and other development applications. **We believe that the Source Protection Agency and its Source Protection Committee should complete their work first.** And, we say this cognizant that the proponent has representation on that Committee when our community does not.

2. **Permitting the test in light of outstanding work in this watershed would not respect the duty to protect groundwater and evaluate risks first** – duties spelled out as Director's considerations in O. Reg. 387/04 pertaining to permits to take water and in the new *Ontario Clean Water Act*. **The policy framework for the McGuinty government is now broader than simply answering if it is safe to conduct a test.**
3. **The GRS being proposed for the Flamborough Quarry is still unproven technology without any precedent in the world.** No evidence or long-term operating and performance data has been shared with the community regarding a GRS design such as this in an identical geologic setting. In fact, no evidence or long-term operating and performance data has been shared with the community regarding a similar GRS design in a similar geologic setting. Examples are floated, like Kirkfield, but never substantiated. Permitting a pilot test of this scale under these circumstances, and in the absence of more complete understanding of the watershed, would be using our community as a laboratory experiment. That is not acceptable.
4. **There are a range of technical content and process issues which are still not fully addressed in the revised HWP.** They require consideration for improvement of the proposed testing framework and should inform terms and conditions that may be attached to approval of a PTTW permit.

In our view, the March 2008 HWP does not represent a full hydrogeology work plan for the application at large as was originally contemplated by CART, per the nature of the Transportation Study and related Terms of Reference. Rather, even in this latest iteration, the HWP is a combination of review/status report and a work plan for hydrogeology work already completed and proposed for characterization of the aquifer and more so for testing the groundwater recirculation system (GRS) on a limited pilot scale.

Detailed comments regarding the HWP are included in the attached April 30, 2008 correspondence from Kenneth Raven, PEng, PGeo, Principal, INTERA Engineering Ltd. **The correspondence further documents Raven's opinions of the great difficulty and potential risks of undertaking the pilot scale GRS and of implementing such a scheme to full quarry scale.** In particular, he speaks to:

- the likelihood that the GRS trench will probably not function given the variability of permeable zones
- the challenges of achieving the 30 m drawdown in the GRS pumping wells
- the potential for re-injected water to escape
- the need to confirm how the proposed drawdowns will be attained and sustained under the proposed pumping rates
- discharge of groundwater that exceeds Provincial Water Quality Objectives (PWQO), notably zinc, and the use of dissolved versus total concentrations
- limitations of the Zhang MODFLOW modeling and the need for monitoring of the drawdowns, data and report scrutiny and, importantly
- the need for a clearer set of conditions that determine when and how the different response actions would be selected and under what conditions the pilot test should be terminated.

Raven also documents that it is important to remember that the proposed pilot scale GRS will only provide information on the practicality and performance of a short term GRS system in the immediate vicinity of the test area (less than 5% of the proposed quarry perimeter). Such a pilot test will not demonstrate the practicality and performance of a long-term, full scale GRS for the proposed quarry.

We also offer the following observations:

- The rationale for pushing for development of a more detailed, integrated and comprehensive HWP was to “reach a common understanding” and to “establish a basis for technical review of submissions”. We are concerned that the details of the pumping test, including the addition of boreholes and the potential for fracturing, have been relegated to archived documents on the HWP CD. We believe that the full extent of the proposed testing should be fully documented in the current version of the plan so that the full plan is readily accessible.
- There are significant limitations with groundwater modeling using MODFLOW, a finite difference model. Raven has documented this and his concerns with GLL’s underestimations. MOE correspondence on this application dated below notes that the model does not have the ability to accurately model groundwater systems on a local scale in fractured rock environments, especially where the fracture network (size, connectivity, orientation) is complex and not well known. MODFLOW generally oversimplifies these complex networks on the local scale. It is not appropriate to have a heavy reliance on data extrapolation and third party monitoring of data and conclusions drawn is important.
- It remains critical therefore that stakeholders other than the proponent be allowed to monitor the field implementation of the proposed GRS and that the data from any test that may be authorized be made available for review by third parties. FORCE should be included in the circulation of all reports both during and after the testing and should have access to the data generated during the test.
- Reference is made to a list of wells with the potential for drawdown impacts (greater than 0.1 meter). This list should be available to the participating agencies and to FORCE, particularly in light of comments by GLL and St Marys CBM representatives at the April 16, 2008 public meeting which claimed that they did not expect any drawdown impacts off site.
- In light of potential drawdown impacts, we are concerned about any attempt to determine what constitutes an “unacceptable impact” until in the field “on the fly” during a possible test. In section 2a, page 3, Hamilton Public Health Services (PHS) has commented that a description/definition of “unacceptable impacts” should be included in the HWP or PTTW so that all parties are clear on what impacts upon pre-existing groundwater users are not acceptable. St Marys CBM has written that the decision of what constitutes “unacceptable impacts” will be made in consultation with the participating agency staff based on a review of the data collected as the test proceeds. The PHS requirement should be honoured.
- Similarly, we are concerned about the lack of certainty around the issue of turbidity. Turbidity has been defined as a “health related parameter” by PHS.
- We note that discussion of potential effects of flow reversals is limited with resulting limited attention to dislodging of ground contaminants.
- Earlier agency comments, by MOE (January 19, 2005; July 27, 2005, and August 31, 2005), by MNR (September 30, 2005), and submissions by INTERA Engineering Ltd., documented concerns regarding the potential for a thermal plume and the associated potential for bacteriological impacts. Both had potential for impact on wetland, creek, and groundwater users. There is limited reference to the impact of temperature changes in the aquifer in the HWP and little attempt to address/respond to the concerns raised.
- The HWP and comments by representatives of GLL and St Marys CBM at the April 16, 2008 public meeting acknowledged that there will be water discharged into Mountsberg Creek during each phase of the test. This represents a net loss of water with potential for impact on water users and the Provincially Significant Wetlands.
- The interference/response protocol is backwards from the perspective of existing residents and other water users. The proposed test and its protocol allow interference and prioritize

supply replacement over reductions in volumes pumped. Termination of the proposed test is not a priority despite interference.

- “Success” measures have also received little attention. While there has been acknowledged work on triggers and conditions for “failure” scenarios, that work is still wanting, it is equally important that the participating agencies have a common understanding as to what constitutes “success” or “required progress” to move to subsequent phases of the test. This is particularly relevant given that the data may not represent a “clear” success or failure.

FORCE appreciates the ongoing opportunity to participate afforded by the City of Hamilton. As noted above, this cover letter and the enclosure constitute our most recent feedback on the proponent’s hydro-geological work plan related to the proposed GRS. This response will be supplemented, as necessary, during the course of the broader application review period and as the proponent amends its application. We also expect to comment further to MOE regarding the PTTW application. We have provided the material electronically in pdf form and ask that this material be provided to the City’s Peer Review Team and CART members to be considered as an input to the application review process for the proposed St Marys CBM aggregate development application OPA-04-17 and ZAC-04-89.

Respectfully submitted,

A handwritten signature in black ink that reads "G. Flint". The signature is written in a cursive style with a horizontal line underneath the name.

Graham Flint BAsC, P. Eng
Chair & Spokesperson

copy via Email to: sholiday@hamilton.ca

Enclosure