



## **HIGHLIGHTS – ROCKFORT QUARRY PEER REVIEWS**

January 2009

### **Issue:**

The contentious Rockfort Quarry proposal and its amendments have generated four different sets of expert peer reviews over eleven years. Serious concerns still remain outstanding, particularly around the issues of water resources, mitigation, Adaptive Management and potential adverse effects.

It is important to review the findings of these experts to have a fundamental understanding of the proposal. Here is a selection of report highlights that continue to raise concerns over this proposal. An appendix of the various experts is found on the last page.

### **Excerpts from the Peer Review Reports:**

#### **WATER**

“Our current position with respect to the technical documentation submitted by the applicant is that there is insufficient information presented on which we conclude, definitively, that the engineering mitigation measures, as proposed, will function as intended, such that the off-site fishery habitat, wetland features and residential water wells will be protected.” *Jagger Hims, Page 2.*

“Since the groundwater flow in the bedrock actually occurs along interconnected fracture planes and bedding planes that may result in a layered and/or erratic and unpredictable flow pattern at the site scale, the simplified approach that has been adopted may not be sufficient to provide the necessary design parameters for the mitigation system, on which approval of the quarry is to be based.” *Jagger Hims, Page 3.*

“The quantity of good quality hydro geological data collected matters very little if this information is not translated into a sound conceptual understanding of the aquifer system. This understanding is called a “conceptual model” and is the foundation of reliable predictive analysis. The proponent’s conceptual model for the study area aquifer is fundamentally flawed. It assumes that preferential flow via fractures, a well established hydro geological attribute of carbonate systems, can be conveniently ignored, and that the aquifer can be adequately represented by an “equivalent porous medium.” *Howard, Page 1.*

“The models are unreliable and simply incapable of providing direction on aquifer management for the type of project proposed. Based on the quality of the dataset and the types of model developed, I fail to understand how anyone can even hope to predict how the aquifer (grossly modified by the injection of grout) will respond to the complex water management schemes proposed. CRA claim that adoption of an Adaptive Management Plan is the ideal way to proceed. I would argue that this approach is only suitable when the aquifer is well understood and the existing management plan is well supported scientifically.” *Howard, Page 19.*

“Suffice it to say, that the penultimate paragraph of our 2001 report (Ref.2) still remains applicable today, 7 years later...viz...”Despite considerable extra information supplied by the Proponent’s consultant in the latest submitted reports, it is concluded that insufficient quantitative assessment has been made of structural geological and packer test hydro geological data to allow adequate and appropriate replication of field conditions in the hydro geological model used as the basis for all of the mitigation designs. This is a serious deficiency of the submittals because, without credible model replication of actual conditions, it is impractical to assess the technical viability of the proposed mitigating measures, irrespective of whether or not the Proponent has realistically considered the practicalities and expense of installing the proposed measures.” *Golder, Page 10.*

### **Grout Curtain**

All the research presented by the applicant refers to grouting under static conditions. In their operational plans, contrary to what is outlined in the AMP, they propose to install the grout curtain under flow conditions—a complete contradiction. In fact, their own test results show the grout curtain would fail to achieve the desired results under static conditions but to attempt to execute it under flow conditions is considerably more challenging and could cost hundreds of millions of dollars.

“In order for a technically viable mitigation measure to be considered a credible solution, it has to be also economically feasible. I have come to the conclusion that no economically viable barrier technologies exist to protect the water resources in the area adjacent to the proposed quarry. JDCL stands to lose in excess of \$150 million if he is serious about protecting the water resources while mining the Rockfort quarry.” *Naudts, Page 3.*

“Our concerns relating to adherence to the long-term monitoring requirements and to the possible high costs associated with the complex nature of the mitigation measures also still remain, mainly from the context that these would not normally be a part of a typical quarry operation.” *Golder, Page 7.*

### **Adaptive Management**

“The Adaptive Management Plan, which forms the cornerstone of the monitoring/mitigation plans for the site, is essentially a “try it and see” approach that is to be relied upon to protect the natural environment. Since the computer modeling does not incorporate any assessment of the fracture-flow nature of ground water movement in the layered bedrock aquifer, it is unable to predict specific impacts at specific locations, and the specific level of mitigation that will be required to manage those impacts in an appropriate manner. This is considered a significant weakness in the technical assessment, particularly since the nature of the ground water/surface water interaction and fishery habitat (that is, the vertical hydraulic gradient conditions) at the water courses adjacent to the site are not documented in any detailed manner.” *Jagger Hims, Page 3.*

“In cases involving major development projects which can have adverse environmental effects it is the second of these criteria, reversibility of effect (our underline) that is most critical. In the case of the Rockfort Quarry application, the key consideration in determining whether AM is an appropriate approach rests on whether a failure in the mitigation strategy could be reversed, or if detected early whether the effect could be limited to a level that would be acceptable. Since the AMP states that:

*“The potential changes in groundwater levels around the quarry that could arise from dewatering activities during the active quarrying stages, and the creation of lakes under rehabilitation conditions dictate the need for groundwater mitigation measures to prevent potential unacceptable effects to water resources in the vicinity of the Site.”*

we conclude that the consequences of mitigation failure, unless such effects could be reversed, would also be unacceptable.” *Greig, Pg. 6-7.*

“When implemented correctly, this type of approach [the basic philosophy of AMP] is reasonable and supportable. If, however, this approach is done incorrectly, then unacceptable change can occur and remain un-noticed to the point where permanent and significant (unacceptable) impact may occur.” *Jagger Hims, Pg. 7.*

“Since the impacts of large-scale dewatering can’t be predicted with a reasonable degree of scientific certainty prior to the project, the AMP is destined to fail.” *Howard, Page 19.*

### **Social Impact**

“The Town of Caledon’s policies in OPA 161 are approved. While OPA 161 does not require a stand-alone report, the deliberate assessment of social impacts is required. The assessment needs to be scientifically sound, complete and comprehensive. Social impact assessments have been completed in support of previous aggregate applications in Caledon so as to meet the requirement of OPA 161. I conclude that a specific social impact assessment has not been and should be, completed for the Rockfort Quarry application.” *Hardy, Page 4.*

“Taking into account the cumulative effect of all of the impacts, it is evident that this quarry development as proposed will significantly alter the environmental and social components that residents value. The many qualities of the area that have attracted residents and visitors alike – and that have promoted the area as a unique or special place – will be diminished or lost.” *DPRA, Page 87.*

### **Environmental Impact Assessment:**

“Although the mitigation plan seems to be feasible in theory, there are some critical and detailed timing issues that are relevant to maintaining natural heritage features that are not addressed in the EIA. There is a high degree of risk associated with moving forward with only a general level of understanding of how mitigation may work with respect to ecological impacts. Although the proposal indicates that understanding will be improved through monitoring once excavation is underway, this may result in impacts that cannot be mitigated.” *North-South Environmental Inc., Page 9.*

### **Conclusion:**

Expert peer reviewers over eleven years continue to have serious concerns about the proposed project. Since everything hinges on whether or not the proponent’s theory of mitigation will work, and uncertainties still remain, there are consistent warnings that irreversible adverse impacts could occur.

# A P P E N D I X

## **Peer Reviewers**

Following is a list of consultants and peer reviews quoted and referred to in this document.

### Region of Peel and the Town of Caledon Peer Reviewers

- 1) *Jagger Hims Limited* – environmental consulting engineers reviewed water related resource aspects.
- 2) *Golder Associates (T.G. Carter, PLS, P. Eng)* – reviewed the grout curtain and proposed mitigation system.
- 3) *David R. Hardy (B.A. Hons., M.E.S., M.C.I.P., R.P.P.)* – reviewed social impacts.
- 4) *North-South Environmental Inc. (Mirek Sharp, Principal)* – prepared the “Preliminary Peer Review Comments on the Environmental Impact Assessment and Addendum, Proposed Rockfort Quarry-Draft”. January 2009

### Coalition of Concerned Citizens Peer Reviewers

- 5) *Mr. Ken W. F. Howard--hydrogeologist (PLD, PHG. PGEO, CGsol, FGS; University Professor and Ground Water Consultant)* – reviewed hydrogeology aspects.
- 6) *Eco Grouting Specialists Ltd. (Alex Naudts MA. Sc., P. Eng.* – reviewed the grout curtain plans.
- 7) *ESSA Technologies Ltd. (Lorne Greig, Senior Systems Ecologist)* – reviewed the Adaptive Management Plan.
- 8) *DPRA (Dr. Peter Homenuck, PH.D, RPP)* – prepared a Social Impact Analysis of the Proposed Rockfort Quarry.

Complete copies of the Peer Review reports are available at: [www.coalitioncaledon.com](http://www.coalitioncaledon.com)