Economic Impact of Proposed Hidden Quarry

Independent Real Estate Intelligence

August 21, 2015

Altus Group

Economic Impact of Proposed Hidden Quarry

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CURRENT CONCLUSIONS

Local Economic Impacts

- The estimated total extra expenditure occurring within the Guelph-Eramosa Township as a result of 20 years of regular operations at the proposed quarry is $11.9 million;
- The estimated total extra expenditure occurring within Wellington County as a result of 20 years of regular operations at the proposed quarry is $24.3 million; and
- The estimated total extra expenditure occurring within the Halton Region as a result of 20 years of regular operations at the proposed quarry is $2.2 million.

Effects on Local Property Values

- Review of relevant literature indicates some evidence that pits and quarries are associated with modestly lower property values, but the causality of this association may be linked to other factors such as amenities and zoning, rather than being directly related to operations;
- Analysis of local existing home transaction indicates no statistically significant price impacts, either positive or negative resulting from proximity to the subject site as the proposed uses became known; and
- As a result, there is neither conclusive evidence, nor strong reason to conclude that operation of the proposed Hidden Quarry will have a diminutive effect on local property values as the quarry goes into operation.

Net Change in Municipal Government Finances

- The annual on-going government revenues (taxes, aggregate fees) generated from the proposed hidden quarry would represent a total net change from existing revenue of more than $47,300 to the Municipality;
- The Township would be faced with around $4,120 in additional annual operating costs as a result of the quarry on an annual basis; and
- This results in an increase of more than $43,200 in annual net revenue to the Municipality.

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1 INTRODUCTION

The Township of Guelph-Eramosa retained Altus Group Economic Consulting to provide estimates of the potential economic impact of the Hidden Quarry project in the Township being proposed by James Dick Construction Limited (JDCL).

1.1 BACKGROUND

The subject site covers approximately 39.4 hectares (100 acres) on the northeast quadrant of Highway 7 and 6th Line in an area predominantly zoned for agricultural and industrial uses. A little less than 25 hectares (61.3 acres) of this would be used for extraction and the site would contain two small buildings totalling 420 sq. m. (4,520 sq. ft.)

1.2 STUDY OBJECTIVES

The purpose of this report is to provide estimates of the economic impact of the development and operation of the proposed Hidden Quarry, to provide an assessment of any property value impacts, and to estimate the net change to the local government revenue that would occur should the Quarry proceed.

1.3 REPORT OUTLINE

In addition to this introduction, this report contains seven chapters:

- Chapter 2 provides relevant background information on the subject site and the proposed Hidden Quarry;
- Chapter 3 reviews the potential economic implications from various technical reports;
- Chapter 4 introduces economic impacts models;
- Chapter 5 presents estimates of the economic impact of the initial development and on-going operations of the Hidden Quarry;
- Chapter 6 analyzes potential residential property value impacts from operations of the Hidden Quarry;
- Chapter 7 estimates the net change in local government revenue if the proposed quarry were to be approved; and
- Chapter 8 concludes.

1.4 CAVEAT

This analysis has been prepared based on the information available at the time the analysis was undertaken and the assumptions put forth in the text. However, it is not possible to fully document all factors or account for all the changes that may occur in the future. This report relies on information from a variety of secondary sources. While every effort is made to ensure the accuracy of the data, we cannot guarantee the complete accuracy of the information used in this report from these secondary sources.

This report has been prepared solely for the purposes outlined herein and is not to be relied upon or used for any other purposes or by any other party without prior written authorization of Altus Group Limited.

2 PROPOSED QUARRY

This chapter provides a description of the proposed project and the surrounding area.

2.1 SITE DESCRIPTION

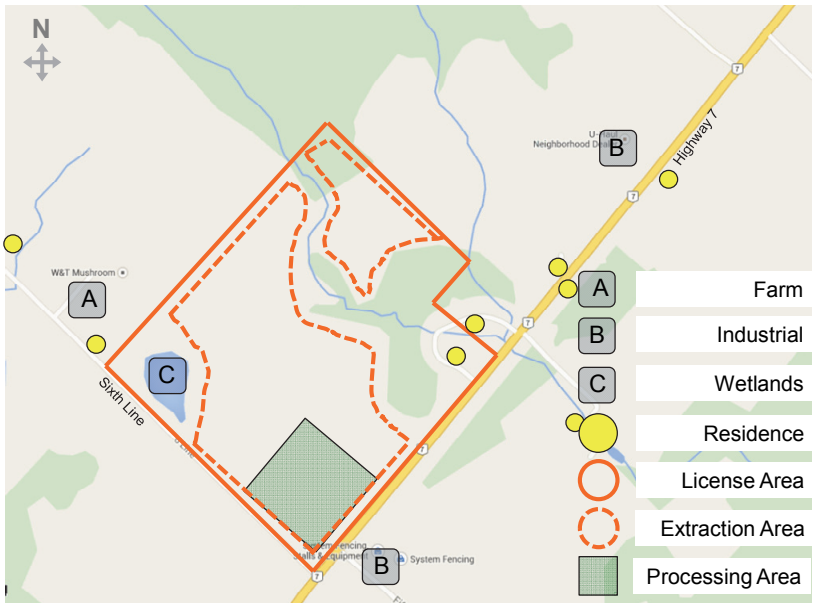
The proposed quarry is located in the northeast quadrant of Highway 7 and 6th Line in an area predominantly used for agricultural and industrial uses. In addition, there are a number of areas zoned "Hazard (h)".The following parameters and neighbouring conditions were set out in the Stovel & Associates (2012) (Figure 1):

- The subject site covers approximately 39.4 hectares (100 acres), a little less than 25 hectares (61.3 acres) of which would be used for extraction;
- The site would contain two small buildings totalling 420 sq. m. (4,520 sq. ft.) in the processing area in the south end of the site[i]; and
- Two small former pit areas are located in the north west corner and are currently mapped as wetlands.

JDCL would reconstruct 165 metres of 6th Line and improve the intersection of Highway 7 and 6th Line[ii].

Figure 1

Subject Site



Source: Altus Group Economic Consulting based on Stovel and Associates (2012) and Google Maps

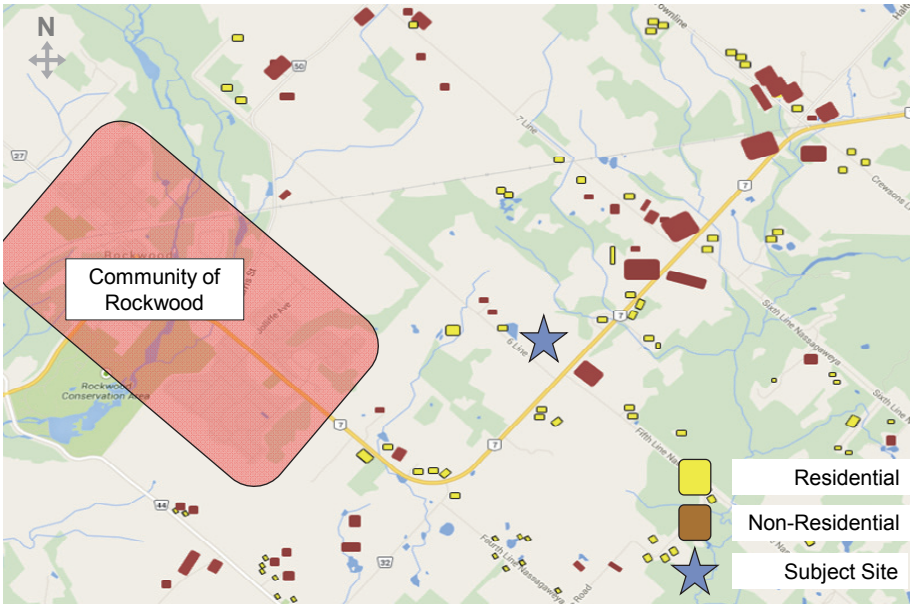
2.2 SURROUNDING AREA

The subject site is located in an area primarily used for agricultural and industrial uses within Guelph-Eramosa Township (Figure 2 and Figure 3):

- There are industrial uses to the east and the south;
- Scattered non-farm residences can be found to the north, south, and east;
- The subject site is located roughly 1.5 kilometres from the periphery of the community of Rockwood; and
- The community of Acton is approximately 5 kilometres to the east, with the city of Guelph roughly 10 kilometres to the west;
- A mushroom farm is located just north of the site along 6th Line; and
- There are industrial uses both south and east of the site that sell/rent U-Hauls and small equipment and fencing.

Figure 2

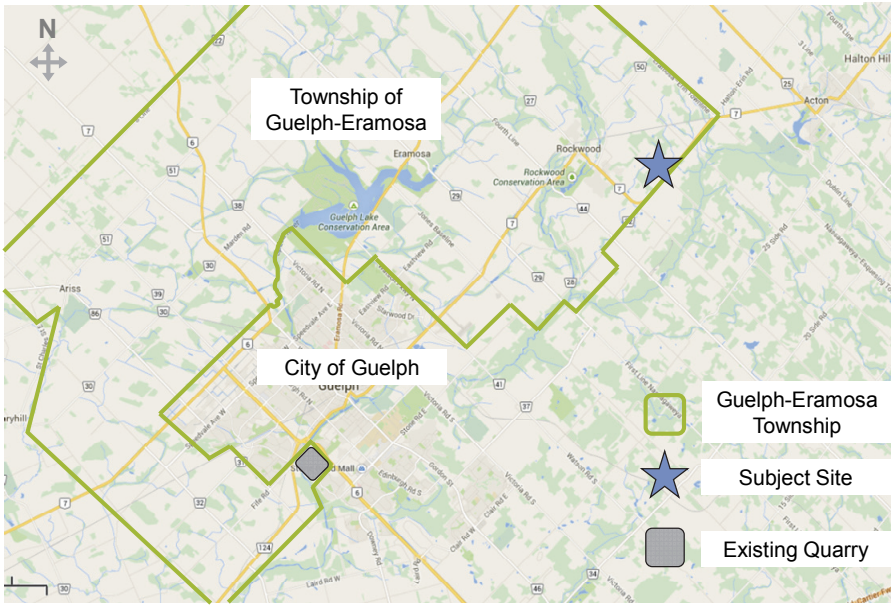
Subject Site and Environs



Source: Altus Group Economic Consulting based on Google Maps

Figure 3

Subject Site and Guelph- Eramosa Township



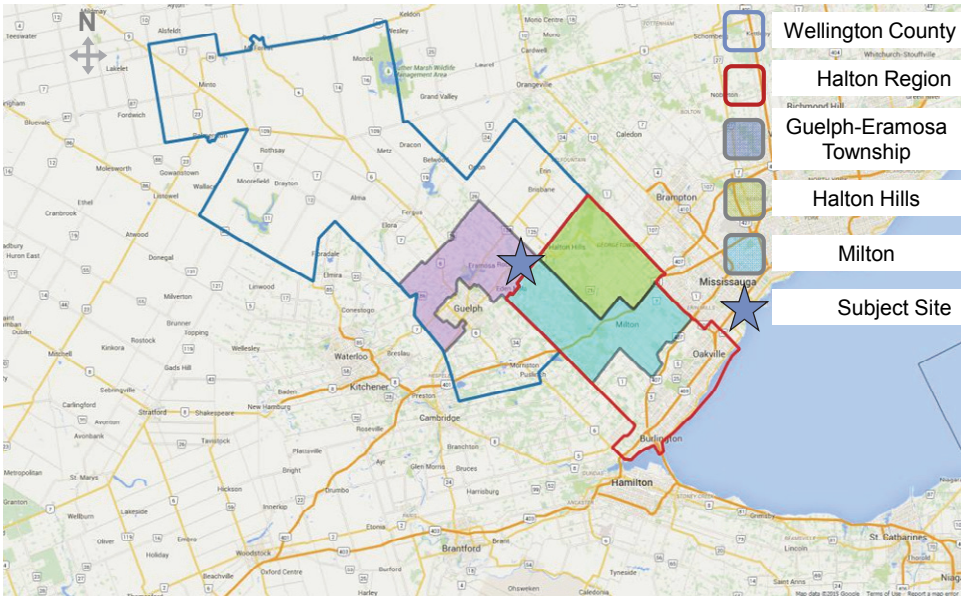
Source: Altus Group Economic Consulting based on Google Maps

Figure 4 illustrates the subject site's location relative to a larger geography:

- The proposed quarry is located on the border of Guelph-Eramosa Township and the larger Wellington County; and
- It is at the northern edge of the Town of Milton and Halton Region.

Figure 4

Subject Site, Wellington County and Halton Region



Source: Altus Group Economic Consulting based on Google Maps

2.3 OPERATIONS

According to the Stovel and Associates (2012) Planning Report:

- If the quarry is approved, up to 700,000 tonnes of aggregate material could be extracted from both above and below the established groundwater table annually, with no dewatering;
- Most of the material would be transported south on 6th Line and then is proposed to be transported east on Highway 7;
- JDCL would be required to maintain a portion of 6th Line and would not be using municipal roads, except for local deliveries[iii].

2.4 SITE HISTORY

According to the Stovel and Associates (2012), the history of the site is as follows:

- Up until 1993, the site was identified as an existing gravel pit operation in the Township of Eramosa's Official Plan;
- In 1993, when the Township updated their official plan, the site was identified as an aggregate resources area;
- The subject site was identified as a Mineral Aggregate Resource Area in the Wellington County Official Plan (1999) and no amendment was required to the Plan to permit an aggregate operation, however, a rezoning and licensing was required; and
- The subject site is currently designated on Schedule C, Mineral Aggregate Overlay, to the County Plan update to March 9, 2015 as "Sand and Gravel resources of Primary and Secondary Significance" and "Selected Bedrock Resource Areas". An amendment to the Official Plan is now required for a new aggregate operation as well as a rezoning and licensing. However, this requirement was put in place after the application by JDCL was submitted. Therefore, it is not applicable to their application.

The site has long been identified for aggregate extraction uses.

3 TECHNICAL REPORTS

This chapter outlines relevant results from the various technical reports produced by other consultants on behalf of the applicant.

Key relevant findings will refer to factors that may affect the estimated economic and fiscal impacts or be indicative of negative externalities[iv].

3.1 NOISE

Aerocoustics Engineering Limited (Aerocoustics) produced a Noise Impact Report in November 2012 to assess the noise impact of the proposed quarry on the neighbouring residences. The report was updated on May 24, 2013 in response to a peer review carried out by Novus Environmental.

3.1.1 Key Relevant Findings/Recommendations (May 2013)

- All construction equipment must meet sound emission standards set out by the Ministry of the Environment (MOE) and Guelph/Eramosa Bylaw 5001/05;
- A quiet drill (maximum sound power rating of 112dBA) should be used;
- 10m and 12m high stockpiles should be maintained around the processing plant in certain locations for each phase and stage; and
- The processing plant should be established at an elevation of 349m and a haul route trench connecting the processing plant to the Stage 1 Phase 1 extraction area should be excavated to the same 349m elevation;
- Earth beams should be constructed to specific elevations; and
- The recommended direction of extraction is identified.

With the above mentioned mitigation effects implemented, noise levels are predicted to satisfy MOE limits.

3.1.2 Peer Review(s)

Novus Environmental conducted a peer review of the above-mentioned November 2012 Noise Impact Report:

- Novus is in agreement that noise from the construction is exempt from noise guideline limits;

- There was some concern that the underlying calculations on noise impacts used receptor heights that are inconsistent with MOE guidelines and that the analysis should be updated to reflect appropriate heights; and
- An acoustic audit should be conducted during the first year of operation.

Novus reviewed the updated May 2013 report and indicated that they were satisfied that "noise levels… meet applicable guideline limits".

3.1.3 Economic Implications

3.1.3.1 Externalities

If the recommended mitigation measures are implemented, the noise emissions stemming from regular operations of the proposed quarry would be within MOE guidelines. As such, a negative externality stemming from noise nuisance is not expected.

3.1.3.2 On-Going Operations

The peer review recommends a third-party acoustic audit of the proposed quarry's operations. The GDP and employment related to the activities are incorporated in the indirect economic benefits set out later in this report. No additional economic impact is expected during regular operations of the quarry.

3.1.3.3 Initial Development

The initial study, subsequent peer review and revised study make several recommendations for noise mitigation measures. These measures include placing stockpiles and excavating the area for the main processing plant. While these measures would incur a cost, these costs are already accounted for in the current estimate of development costs.

3.2 BLASTING

Explotech released a Blast Impact Analysis (BIA) report in November 2012. The purpose was to assess vibration levels with regards to guidelines for blasting in mines and quarries set out in the Ministry of Environment Model Municipal Noise Control By-Law. A Revision was issued in October 2014

which addressed the issues identified in a 2013 peer review by Golder Associates.

3.2.1 Key Relevant Findings/Recommendations (September 2014)

- An attenuation study should be conducted by an independent blasting consultant within the first 12 months of operation;
- All blasts shall be monitored for both ground vibration and overpressure at the closest privately owned sensitive receptor adjacent to the site, or closer;
- When blasting is to take place within 400 m of an active spawning bed an additional seismograph shall be installed at the location or the closest spawning bed, or closer to the blast, to confirm compliance with the DFO guideline limit;
- Orientation of the extraction operation will be designed and maintained so direction of overpressure propagation and flyrock from the face will be away from structures as much as possible;
- Blast designs shall continually be viewed for fragmentation, ground vibration and overpressure;
- Clear crushed stone will be used for stemming;
- Primary and secondary dust collectors will be employed on the rock drills;
- An annual review of blasting procedures should be conducted; and
- Detailed blast records shall be maintained

Explotech is of the opinion that the planned aggregate extraction on the property can be carried out safely and within MOE guidelines.

3.2.2 Peer Review(s)

Novus Environmental conducted a peer review of the Blast Impact Analysis on behalf of the Township in April 2013. They concurred with the report. They further recommended that blast record information be made available to the Township for its review in the presence of any vibration complaints.

Golder Associates conducted a peer review in November 2013 on behalf of JDCL. They also reviewed the September 2014 revised report. Golder concluded that:

> […] we are conditionally in agreement with the BIA conclusion that the "blasting operations required for the James Dick Construction Ltd. Hidden Quarry site can be carried out safely and within governing guidelines set out by the Ministry of the Environment." While the empirical formulas applied are generic in nature and are to be confirmed on site through the institution of attenuation analysis and compliance monitoring programs, it is also important to apply realistic estimates so that designs, and associated costs, more closely reflect the reality to be expected. This statement should not be interpreted to mean that compliance with MOE overpressure limits would be not possible. However, compliance may require additional effort and associated additional cost. As suggest in the BIA, "the point of termination of blasting operations will be governed by the results of the on-site monitoring program and market economics."
>
> The remainder of the report's recommendations are reasonable and acceptable
>
> Additional discussion related to the points raised in this peer review may be beneficial to ensure any implications do not severely impact fiscal, operational and compliance feasibility studies prepared.

3.2.3 Economic Implications

3.2.3.1 Externalities

If the recommended mitigation measures are implemented, the blast impact stemming from regular operations of the proposed quarry would be within MOE guidelines. As such, a negative externality is not expected.

3.2.3.2 On-Going Operations

The peer review recommends third-party blast monitoring. The GDP and employment related to the activities are incorporated in the indirect economic benefits set out later in this report. No additional economic impact is expected during regular operations of the quarry.

3.2.3.3 Initial Development

No additional development costs were identified.

3.3 NATURAL HERITAGE/ENVIRONMENT

In August 2012, GWS prepared an environmental assessment of the proposed quarry to assess any danger to provincially significant wetland, woodland, or wild life (PSWs). A response was prepared to peer review comments from

Burnside in March 2013. In addition, GWS responded to comments from the Ministry of Natural Resources in May 2013. Following a site walk in June 2013 and the provision of site meeting notes which were circulated to participants, GWS responded to comments from the Grand River Conservation Authority and the County of Wellington in September 2013.

3.3.1 Key Relevant Findings/Recommendations

- There will be no direct or indirect impacts to on-site or off-site PSWs and their significant wildlife habitat functions;
- The woodlands on site have not previously been identified as significant and analysis indicates only a small portion could potentially warrant the designation while a significant area of forest will be retained and augmented by reforestation;
- There will be no effects on significant wildlife habitat; and
- Progressive site rehabilitation will, over time, increase biodiversity on the site.

No negative impacts are predicted, provided that adequate buffers are established, mitigation measures are followed (including the installation of a culvert in the intermittent stream to facilitate access to the eastern extraction area) and the existing water balance is maintained.

3.3.2 Peer Review(s)

Burnside conducted a peer review of the above study. Burnside also reviewed the various responses from JDCL as well as the information gathered during the site meeting/visit and the comments provided to various agencies (Wellington County, Grand River Conservation Authority (GRCA) and Ministry of Natural Resources (MNR)). Based on this review Burnside has indicated that JDCL has adequately addressed concerns related to the Natural Environment at the Hidden Quarry.

They further concluded that, through the application of the required mitigation and rehabilitation plans, the quarry is not likely to result in a measurable impact to the natural heritage features or functions. MNR and GRCA have also indicated that they have no further concerns with respect to the natural environment. However, these conclusions are subject to additional review if new information is provided.

3.3.3 Economic Implications

3.3.3.1 Externalities

The initial report and subsequent peer review and agency review identified no direct or indirect impacts on PSWs. No negative externalities are anticipated.

3.3.3.2 On-Going Operations

No effects on on-going operations are anticipated.

3.3.3.3 Initial Development

No additional development costs were identified that have not already been planned for by the proponent.

3.4 AIR QUALITY

RWDI AIR Inc. (RWDI) conducted an air quality assessment of the proposed quarry in September 2012.

3.4.1 Key Relevant Findings/Recommendations

RWDI believes that the predicted frequency of excursions from the dispersion modelling analysis is within acceptable levels, provided the following recommendations are implemented:

- The quarry is limited to 12 hours of operation a day;
- The maximum processing rate of 6,000 tonnes per day is not exceeded;
- Equipment specific controls are implemented;
- An Environmental Compliance Approval under Section 9 of the Environmental Protection Act is obtained;
- A Best Management Practices Plan will be developed and implemented;
- The stripping plant should be located approximately as shown; and
- Stripping of overburden should be limited to times when extraction, production and shipping activities are well below the peak rate.

3.4.2 Peer Reviews(s)

Burnside conducted a peer review of the above report. The peer review indicates that the assumptions were reasonable and represented worst case scenarios and were still within acceptable limits. Burnside saw nothing that would indicate that the site would not receive an Environmental Compliance Approval.

3.4.3 Economic Implications

3.4.3.1 Externalities

The initial report and subsequent peer review concluded that estimates of potential dispersion were within the MOE's acceptable limits. As such, no negative externalities are anticipated.

3.4.3.2 On-Going Operations

Mitigation recommendations within the report and subsequent peer review are not expected to have an effect on the economic impact of on-going operations.

3.4.3.3 Initial Development

No additional development costs were identified that have not already been planned for by the proponent and included in the initial development cost.

3.5 TRAFFIC

Cole Engineering provided a traffic impact study in December 2013. The purpose was to estimate traffic generated by the quarry, confirm the sufficiency of the sight line distances, and identify operational traffic deficiencies.

3.5.1 Key Relevant Findings/Recommendations

- The gravel pit is expected to generate 26 truck trips per hour during peak hours (13 in and 13 out);
- It is recommended that the crest be lowered on the 6th Line to improve sight lines; and
- A westbound deceleration lane should be put in place; and
- A left turn lane is warranted.

The development is expected to have no significant impact on the surrounding road network and that the recommended access location is sufficient to serve the proposed development.

3.5.2 Peer Review(s)

Burnside provided a peer review of the above report dated April 7, 2014. They concur with the recommendations of the initial report subject to specific recommendations that have to be addressed as a condition of approval. These relate to improving the road base of the 6th Line and the need for various turn lanes on Highway 7.

3.5.3 Economic Implications

3.5.3.1 Externalities

Eastbound shipments from the proposed quarry will supplant existing traffic from the Guelph quarry that are shipped to the Acton and Georgetown markets, eliminating eastbound traffic through the Community of Rockwood from the Guelph quarry. Furthermore, recommended investments in road infrastructure should compensate for increased truck traffic in the vicinity of the subject site.

Roadway upgrades and expected turn lanes will have spin-off benefits to other road users that will benefit from a safer, higher quality roadway.

3.5.3.2 On-Going Operations

The proponent has agreed to cover the costs of maintenance of a portion of the 6th Line[v]. The GDP and employment related to the activities are incorporated in the indirect economic benefits set out later in this report. No additional economic impact is expected during regular operations of the quarry.

3.5.3.3 Initial Development

Several upgrades to existing infrastructure are recommended. These include upgrading the 6th Line, installing an eastbound left turn lane and a westbound right turn lane at the intersection of Highway 7 and 6th Line, and installing a left hand turn lane at Highway 7 and 5th Line.

In a letter from Stovel & Associates to Elizabeth Howson dated November 11, 2014, the proponent agreed to upgrade and maintain a portion of the 6th Line

and improve the intersection of Highway 7 and 6th Line. As such, these costs are already accounted for in the initial development costs and do not represent additional costs.

The requirement for a turn lane at Highway 7 and 5th Line was agreed to at a later date. As such, these costs will be included in the necessary development costs detailed later in this report. An additional development cost of approximately $300,000 is needed for the turn lane at the intersection of Highway 7 and 5th based on the estimated costs of two turn lanes at the intersection of Highway 7 and 6th[vi].

3.6 HAULAGE

Cole Engineering produced a haul route study in March 2015. The purpose of the study is to assess haul routes and volumes and their subsequent impact on municipal roads from regular operations of the proposed quarry.

Burnside provided peer review comments on this study in a letter dated April 27, 2015. Further letters were submitted by JDCL on June 26, 2015 and July 23, 2015 which provided additional information related to a number of matters (e.g. JDCL's fleet of gravel trucks). JDCL submitted an email dated July 23, 2015, responding to Burnsides's April peer review comments.

3.6.1 Key Relevant Findings/Recommendations

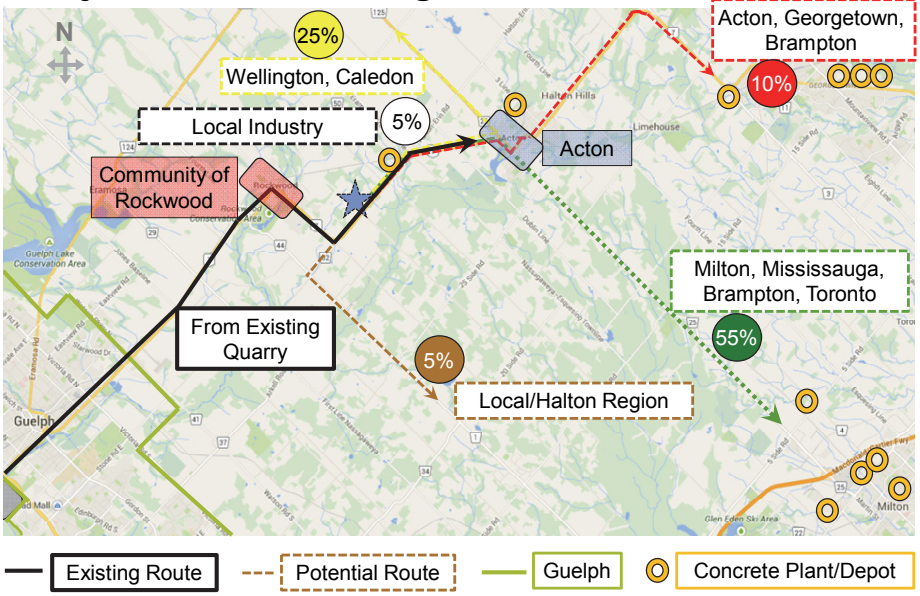
- The proposed quarry is expected to produce average peak daily traffic of 115 truckloads (230 tow-way trips) during the peak month;
- The average expected number of daily truckloads throughout the year is 69;
- The quarry will provide on-site queuing space for trucks so they do not park within municipal right of ways;
- Regional Road 25, south of Acton, would be the most significantly impacted roadway, seeing 55% of the total traffic. This would amount to an of about 1% per day that is heavy vehicles, based on the proportion of overall traffic (all types), during peak operating season (Figure 5);
- The intersection of Main Street/Mill Street (Highway 7) in Acton is recognized to be a constraint for turning movements, however, only 10% of the quarry traffic is forecast to use this route, with part of this

traffic already existing from the Quelph Quarry operation (i.e. which will be supplanted by the new quarry);

- 5% of traffic would serve the local industry in the Guelph-Eramosa Township and 5% would serve local industry in Halton Region;
- 10% would head along Highway 7 to Acton and then further east to Georgetown and Brampton.;
- 25% would go to Acton and then north towards Caledon; and
- The quarry will reduce truck traffic from the Guelph quarry to zero in the Town of Rockwood and the Town of Acton.

Figure 5

Subject Site and Haulage Routes



Source: Altus Group Economic Consulting based on Google Maps and 2015 Haul Route Study

The proposed quarry will result in an annual reduction of approximately 1.5 million kilometres of truck travel within Ontario based on the assumptions and conclusions of the haul route study.

3.6.2 Peer Review

Burnside carried out a peer review of the Haul Route Study which was completed in June 26, 2015. They identified a number of matters of concern where insufficient information is provided to support the assumptions in the report or where further review and analysis is required with respect to certain issues, including consideration of alternative haul routes. Burnside recommended that the Haul Route Study be revised and resubmitted to

address the identified issues. JDCL responded to Burnside on July 23, 2015, but a revised haul route study has not yet been submitted.

3.6.3 Economic Implications

3.6.3.1 Externalities

Truck traffic can be disruptive to "main street" style retail/commercial nodes, such as the ones found in Rockwood and Acton. This perception considers such factors as noise, diesel exhaust, safety, and unsightliness related to trucks.

The level of truck traffic through the community of Rockwood would be reduced as a result of on-going operations at the proposed quarry, although no precise information is available to say by how much. There would no longer be any through traffic from the existing Guelph quarry heading east. Local deliveries, some of which may be through the Community of Rockwood and which the report estimates would account for 5% of traffic, would still occur.

Province-wide, results indicate that truck traffic would be reduced by almost 1.5 million kilometres annually, resulting in over 2,200 tonnes of reduced greenhouse gas emissions. This represents a positive externality in the form of reduced province-wide traffic and pollution that has not been accounted for in the economic impact model.

3.6.3.2 On-Going Operations

No additional economic impact is expected during regular operations of the quarry.

3.6.3.3 Initial Development

No additional development costs were identified that have not already been planned for by the proponent and included in the initial development cost.

3.7 HYDROGEOLOGY

Harden Environmental Services Ltd. (Harden) produced a hydrogeological report in September 2012. The purpose was to evaluate the potential impacts on groundwater and surface water resources from the proposed quarry. Following the submission of this report there has been on-going review through 2013, 2014 and 2105 related to hydrogeology in response to input

from the Township consultants and various agencies. Most recently, Harden provided a letter on December 9, 2014 responding to Burnside comments of October 6, 2014. Harden also proposed well-specific contingency plans for a number of wells in the vicinity of the proposed quarry in a memorandum in January 2015. Burnside responded in two letters dated April 24, 2015. Harden responded to the April letters in a further letter of June 12, 2105. The June letter confirms the JDCL commitment to conduct all of the requested monitoring as post approval work.

3.7.1 Key Relevant Findings/Recommendations

The initial Harden report concluded:

- There will be relatively minor disturbance to the groundwater levels in the dolostone aquifer as a result of the proposed extraction;
- The maximum drawdown in the extraction areas will be limited to 2.54m below the historic water level;
- There will be a slight decline in water levels at the upgradient (north) end of the quarry upon completion and a rise in water levels at the donwgradient (south) end of the quarry;
- There will be no negative impact to off-site wetlands;
- There will be no impact to tributary B which crosses the east side of the site and flows in a southerly direction;
- There will not be any loss of water to wetlands, ponds, or streams down gradient of the site;
- Minor changes to water levels in the dolostone aquifer will not significantly affect any water well with respect to quantity or quality of water available to the residence;
- Spring discharge to the Allen and De Grandis properties will not be affected by the proposed extraction, nor will spring discharge to the Brydson Farm be negatively impacted;
- The slow extraction process and extraction phasing will allow for monitoring to detect changes in groundwater levels in the overburden and dolostone. Should unexpected water level changes arise, mitigation measures will be implemented;
- The predicted final water level in the West Quarry pond is 348.6 m AMSL and in the East Quary Pond is 348.4 m AMSL;

- That an on-going monitoring program be maintained and expanded;
- That mitigative measures described in the report be implemented; and
- That the spill action plan be implemented.

If on-site monitoring indicates an unacceptable impact may occur to a feature, one or more of the following mitigation measures could be implemented:

- Increase the length/width of the barrier;
- Decrease the rate or stop subaqueous extraction;
- Change configuration or decrease mining; or
- Alter timing of extraction to coincide with high seasonal groundwater levels.

3.7.2 Well Contingency Plans

Harden Environmental Services released a memo in January 2015 outlining more detailed contingency plans in the event that private wells are adversely affected:

- Re-setting of the well pump to a lower level;
- Drilling a new well;
- Addition of a water purification system; or
- Altering the inflow of the water to the well.

The Harden letter of June 12, 2015 confirms the JDCL commitment to conduct all of the requested monitoring as post approval work.

3.7.3 Economic Implications

3.7.3.1 Externalities

The proponent has agreed to survey local wells, actively monitor water levels, and take steps to mitigate any unforeseen issues that may arise. As such, negative externalities are not anticipated.

3.7.3.2 On-Going Operations

Monitoring costs are part of the on-going operations of the proposed quarry and would not alter the economic impact.

The proponent has agreed to take steps to mitigate any unforeseen negative effects on the water supply (Harden, June 12, 2015). Mitigation efforts could include increasing the barrier, which would increase the economic impact. However, they could also include reducing the rate of extraction, which would reduce the economic impact.

The maximum drawdown in the extraction areas will be limited to 2.54m below the historical water level. If the drawdown is exceeded, operations will cease until water levels have recovered

All-in-all, in the event of unacceptable water-related effects from regular operations at the quarry, the economic impact of on-going operations would be affected. The steps taken to mitigate the effects would determine the economic impact.

With mitigation measures and improvements planned for some local wells, there may be positive benefits to local residents that end up with better wells.

3.7.3.3 Initial Development

No additional development costs were identified that have not already been planned for by the proponent and included in the initial development cost.

3.8 ARCHAEOLOGICAL

York North Archaeological Services Inc. provided a Stage I -II archaeological assessment of the proposed quarry in August 2012. The purpose was to determine the archaeological importance, if any, of the subject site.

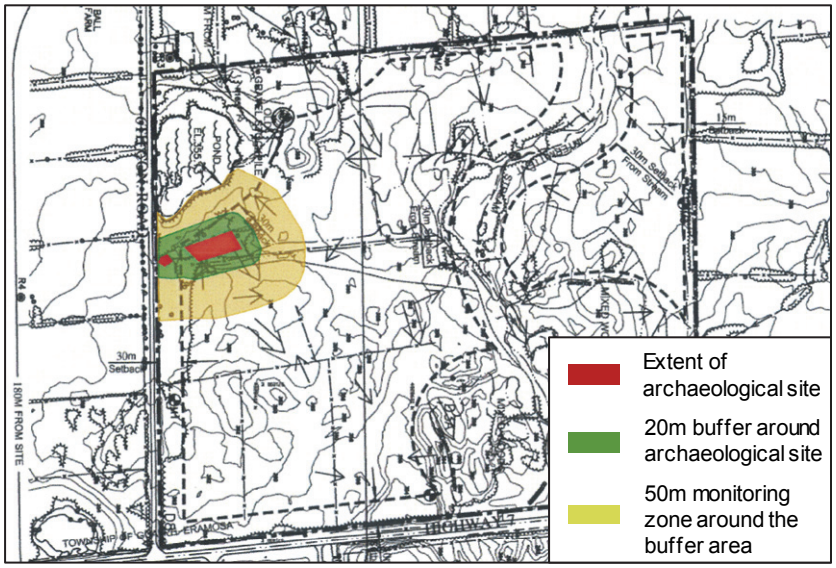
3.8.1 Key Relevant Findings/Recommendations

- The report identified a mid to late 19th century farmstead, identified as the James D. Site (Figure 6);
- The report recommends that a stage 3 assessment be undertaken to establish the historical significance and value of this site;
- Prior to completion of the stage 3 assessment, no activity is allowed within the 20 metre buffer and activity within the 50 metre buffer must be monitored by a licensed archaeologist;
- Should previously undocumented archaeological resources be discovered, they may be a new archaeological site and the proponent must cease alteration of the site immediately; and

- JDCL has agreed to this assessment.

Figure 6

The James D. Site (AjHa-50) with 20 and 50- meter setbacks



Source: Altus Group Economic Consulting based on York North Archaeological Services (2012)

3.8.2 Economic Implications

3.8.2.1 Externalities

No negative externalities are anticipated.

3.8.2.2 On-Going Operations

No effects on on-going operations are anticipated. If new archaeological discoveries are made, this would create the need for further studies and delay the timeline.

3.8.2.3 Initial Development

No additional development costs were identified that have not already been planned for by the proponent and included in the initial development cost.

3.9 AGRICULTURE

Stovel and Associates produced an Agricultural Assessment report in February 2015, which was revised on August 5, 2015.

3.9.1 Key Relevant Findings/Recommendations

- The proposed mineral aggregate operation will not result in a significant consumption of good quality agricultural land;
- The proposed mineral aggregate operation will not result in the consumption or retirement of infrastructure related to agriculture;
- The proposed mineral aggregate operation will not affect the potential future expansion opportunities or existing farm practices of adjacent agricultural operations; and
- There is not anticipated to be any potential interference with normal agricultural activities and practices.

3.9.2 Economic Implications

3.9.2.1 Externalities

No negative externalities are anticipated.

3.9.2.2 On-Going Operations

No effects on on-going operations are anticipated.

3.9.2.3 Initial Development

No additional development costs were identified that have not already been planned for by the proponent and included in the initial development cost.

3.10 CULTURAL HERITAGE

Peter Stewart from George Robb Architect provided the Cultural Heritage Impact Assessment report in June 2013. A revised September 8, 2014 study document was submitted to address peer review comments.

3.10.1 Key Relevant Findings/Recommendations

- One structure is within the boundaries of the site and five structures have been identified as being within the 120 metre off-site area. All are unremarkable and less than forty years old and are not considered to have cultural heritage value; and
- The cultural heritage landscape represented by the rural roadscape of the Sixth Line north of Highway 7 will be preserved.

3.10.2 Peer Review

Unterman McPhail Associates conducted a peer review of the above cited report. They did not identify any significant issues but they reference several "information gaps". These gaps generally refer to what the authors feel is an insufficient amount of background research on the history of the surrounding properties and their families.

3.10.3 Economic Implications

3.10.3.1Externalities

No negative externalities are anticipated.

3.10.3.2On-Going Operations

No effects on on-going operations are anticipated.

3.10.3.3Initial Development

No additional development costs were identified that have not already been planned for by the proponent and included in the initial development cost.

3.11 VISUAL

JDCL provided a report on the visual impact of the proposed quarry in 2012.

3.11.1 Key Relevant Findings/Recommendations

The proposed operation is well hidden from the surrounding area and residential properties. It is also hidden from the industrial lands to the east and to the south. There are no views into the operation from the surrounding Provincial Highway 7 or the township concession roads.

3.11.2 Peer Review(s)

Brook McIlroy conducted a peer review of the above-mentioned report in November 2014. The report concluded that the Visual Report is reasonably accurate and fairly represents the ability of the public to view the proposed operation from lands around the site.

3.11.3 Economic Implications

3.11.3.1Externalities

No negative externalities are anticipated.

3.11.3.2On-Going Operations

No effects on on-going operations are anticipated.

3.11.3.3Initial Development

No additional development costs were identified that have not already been planned for by the proponent and included in the initial development cost.

3.12 SUMMARY OF FINDINGS

Figure 7 summarizes the results of our review of relevant technical reports:

- Mitigation and monitoring measures that would be put in place are expected to keep any impacts within provincial guidelines;
- The proponent has developed contingency plans in the event that private wells are adversely affected, including the replacement of water losses to local wells should any unforeseen negative outcomes occur that affect local water levels.As such, no negative externalities are anticipated from the proposed quarry;
- A well-specific contingency plan has been developed and will be implemented in the event of water quality/quantity impacts to domestic wells;
- The maximum drawdown in the extraction areas will be limited to 2.54 m below the historic water level. If the drawdown is exceeded, operations will cease until water levels have recovered;
- This would affect the economic impact of on-going operations, but the level and directionality of effects are uncertain; and
- In the event of unacceptable negative effects to on-site wetlands, the proponent has agreed to mitigate the effects by either altering production or investing in larger barriers. This would affect the economic impact of on-going operations, but the level and directionality of effects are uncertain.

Figure 7

Effects on Economic Impact Estimates from Technical Reports*

	Externalities	On-going Operations	Initial Development
Noise	None	No Effect	None
Blasting	None	No Effect	None
Natural Heritage/ Environment	None	No Effect	None
Air Quality	None	No Effect	None
Traffic	None	No Effect	An additonal investment to upgrade the intersection of Highway 7 and 5th Line **($300,000)**
Haulage	Reduced through traffic in Rockwood and Acton	No Effect	No Effect
Hydrogeology	None	Potential for either reduced production or increased investment if mitigation is required	None
Archaeological	None	No Effect	None
Agriculture	None	No Effect	None
Cultural Heritage	None	No Effect	None
Visual	None	No Effect	None

** Assuming that all recommended mitigation measures are put in place*

Source: Altus Group Economic Consulting based on various third-party technical reports

4 ECONOMIC IMPACTS OF THE PROPOSED HIDDEN QUARRY PROJECT

This chapter presents the economic impact analysis of the proposed Hidden Quarry.

4.1 DEFINITION

Economic impact is the impact to the total economy stemming from an increase in investment activity in a given location.

In this case, the change is measured in Gross Domestic Product (GDP), wages, and employment in the broad economy stemming from economic activity generated at the proposed quarry and the investment related to the initial development.

The standard methodology, and the one used in this report, is the Input-Output (I-O) model.

4.2 INPUT-OUTPUT MODEL

The I-O model is the dominant model used to estimate economic impact.

4.2.1 Pros & Cons

This section describes the strengths and weaknesses of the Input-Output model.

4.2.1.1 Specificity and Interconnectivity

One of the main strengths of the I-O model is its specificity to industries and commodities and how they relate to one another. The I-O model takes into account:

- How different industries interact with one another – the different types of industries that a quarry might work with during its construction and operation; and
- The flow of goods and services across borders – how much of the goods and services that a quarry acquires are sourced locally (within the province) versus imported.

4.2.1.2 Acceptance and Comparability

The I-O model is the broadly accepted methodology for estimating economic impact at the provincial, national, and international level. The multipliers used in the model are derived by Statistics Canada, in accordance with accepted methodology.

4.2.1.3 Externalities

The calculation of economic impacts relies on market prices as inputs. These prices do not necessarily reflect positive or negative externalities. To compensate for this, economic impact analysis is often done in tandem with other studies, such as environmental impact.

This current study has relied heavily on technical reports in order to capture the broader array of impacts.

4.2.1.4 Broader Geography

Estimates of economic impact from the standard I-O model are limited to the provincial level. The base data in the I-O model has to be at the provincial level, to ensure an accurate accounting of the full linkages between all commodities and all sectors. However, various specifics in this case imply that the vast majority of the economic impacts would be local. Aggregate extraction involves pulling resources out of the ground, processing them on-site, and transporting them to other areas in the province. This is a local process that does not involve importing significant goods or services from afar. As such, the majority of the economic impact would be in the local area.

4.3 ECONOMIC IMPACT

The section presents the model, assumptions, and results of the broader economic impact of the proposed Hidden Quarry. Economic impacts, as estimated by the standard I-O model, are at the Provincial level. Local economic impacts are estimated in the following chapter.

4.3.1 Methodology

Economic impacts are assessed through a range of key measures, including:

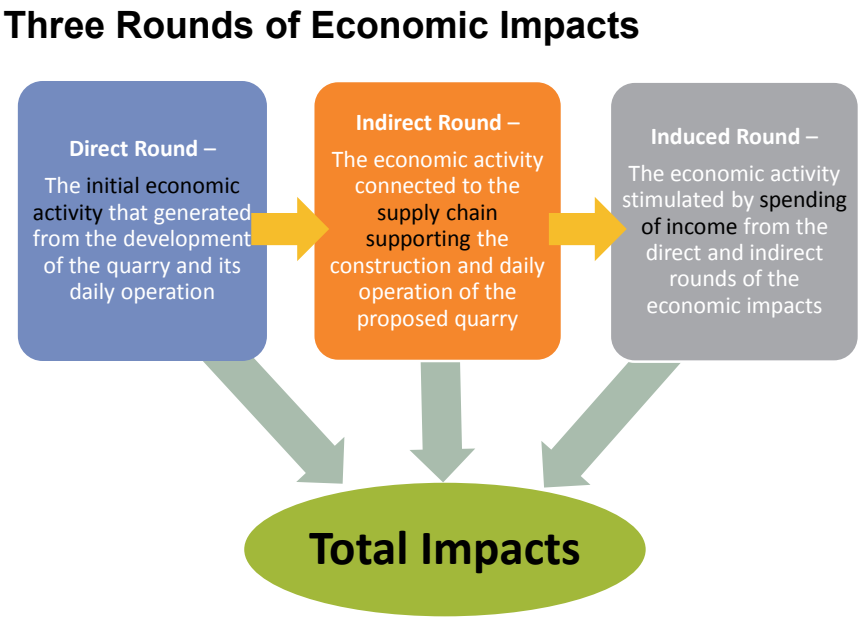
- **Economic Activity**: The volume of goods and services consumed in the economy related to the proposed development;

- **Contribution to GDP**: The value-added component of the economic activities, a measure of the contribution of the activities to Canada's Gross Domestic Product ('GDP');
- **Jobs**: The number of person years of employment directly and indirectly tied to activity at the quarry;
- **Income**: The volume of income generated through activity related to the proposed quarry; and
- **Government Tax Revenues**: Federal and Provincial tax revenues, primarily personal income taxes, and other payroll deductions

There are generally said to be three "rounds" of economic impact (Figure 8):

- **Direct Round** – jobs and economic activity directly related to the construction of the proposed quarry and its daily operation once it is complete, including construction workers, machinery operators, and administrative staff.;
- **Indirect Round** – jobs and economic activity connected to the supply chain supporting the construction and daily operation of the proposed quarry, including construction material suppliers, office supply providers; and
- **Induced Round** – jobs and economic activity stimulated by spending of income from the first two rounds.

Figure 8



Source: Altus Group Economic Consulting

This report considers potential economic impacts in two stages:

- **Initial Investment Stage**: Economic impacts from this phase are due to one-time development activity generated by the proposed quarry; and
- **On-Going Stage**: Economic impacts from this phase are generated by the on-going economic activities located within the proposed quarry after its completion.

4.3.2 Model Assumptions

For the purposes of this analysis, the following inputs were used:

- JDCL provided an estimate that total initial capital investment required in Hidden Quarry is **$7.0 million**;
- Of this, Altus Group estimates that
    - Approximately **$2.8 million** will be related to investment in engineering construction (including the reconstruction of approximately 165 metres of 6th Line and an improvement of the nearby intersections with Highway 7, and on-site engineering)[vii]; and

  - **$4.2 million** will be related to other elements of the project, including the erection of non-residential buildings, purchase and installation of equipment, and related soft costs;
- Once the quarry is in operation, it is assumed to produce the maximum allowed **700,000 tonnes** of aggregate annually for a period of 20 years;
- This aggregate would be a mix of stone products averaging an estimated **$16.75/tonne** f.o.b.[viii]; and
- Transportation costs are assumed to add an additional **33% to the underlying value** of the aggregate (i.e. transportation costs are 25% of total delivered value)[ix].

4.3.3 Economic Impact of the Initial Investment

Figure 9 lays out the estimated province-wide economic impact stemming from the initial investment:

- The initial construction, including machinery & equipment and capital improvements, would generate $7.0 million in direct economic activity;
- This would contribute a total of $7.2 million to GDP;
- An estimated 73 full-time equivalent jobs (person years of employment) would be supported, 367directly; and
- This would create $7.4 million in corporate profits and labour income and a total of $1.6 million in taxes for all levels of government.

Figure 9

Estimated Province-Wide Economic Benefits of the Proposed Development: Total Initial Construction Investment

	Direct	Indirect	Induced	Total
Economic Activity ($millions)	7.0	4.8	3.0	14.7
Gross Domestic Product ($millions)	3.0	2.4	1.7	7.2
Number of Jobs	37	21	14	73
Wages ($millions)	2.5	1.5	0.8	4.8
Business Profit ($millions)	0.8	1.0	0.8	2.6
Taxes ($millions)				
Personal				1.2
Business				0.4
Total Taxes ($millions)				**1.6**

Source: Altus Group Economic Consulting based on Statistics Canada Input-Output model and other sources

4.3.4 Economic Impact on On-Going Operations

Figure 11 lays out the estimated province-wide economic impact stemming from a single year's operations of the proposed quarry:

- The on-going operation of Hidden Quarry would generate $15.6 million in direct economic activity on an annual basis through the sale of aggregate, including transportation costs;
- This would contribute a total of $15.9 million to GDP;
- An estimated 93 full-time equivalent jobs (person years of employment) would be supported, 39 directly; and
- This would create $22.7 million in corporate profits and labour income and a total of $3.0 million in taxes for all levels of government.

Figure 10

Estimated Province-Wide Economic Benefits of the Proposed Development: On-Going Operation (Single Year)

	Direct	Indirect	Induced	Total
Economic Activity ($millions)	15.6	8.4	3.8	27.9
Gross Domestic Product ($millions)	9.5	4.2	2.2	15.9
Number of Jobs	39	34	20	93
Wages ($millions)	2.3	2.4	1.1	5.8
Business Profit ($millions)	7.0	8.8	1.1	16.9
Taxes ($millions)				
Personal				1.5
Business				1.5
Total Taxes ($millions)				**3.0**

Source: Altus Group Economic Consulting based on Statistics Canada Input-Output model and other sources.

Figure 11 lays out the estimated province-wide economic impact stemming from 20 years of on-going operations of the proposed quarry:

- The on-going operation of Hidden Quarry would generate $313 million in direct economic activity on an annual basis through the sale of aggregate, including transportation costs;
- This would contribute a total of $318 million to GDP;
- An estimated 1,860 full-time equivalent jobs (person years of employment) would be supported, 780 directly; and
- This would create $454 million in corporate profits and labour income and a total of $60 million in taxes for all levels of government.

Figure 11

Estimated Province-Wide Economic Benefits of the Proposed Development: On-Going Operation (20 Years)

	Direct	Indirect	Induced	Total
Economic Activity ($millions)	313	168	76	557
Gross Domestic Product ($millions)	189	85	44	318
Number of Jobs	780	680	400	1,860
Wages ($millions)	46	49	21	116
Business Profit ($millions)	140	176	21	338
Taxes ($millions)				
Personal				29
Business				31
Total Taxes ($millions)				**60**

Source: Altus Group Economic Consulting based on Statistics Canada Input-Output model and other sources.

4.3.5 Total Economic Impact

Figure 12 lays out the estimated province-wide economic impact stemming from the initial construction and 20 years of on-going operation of the proposed hidden quarry:

- The initial construction and on-going operation of the Hidden Quarry would generate $320 million in direct economic activity;
- This would contribute a total of $325 million to GDP;
- An estimated 1,933 full-time equivalent jobs (person years of employment) would be supported, 817 directly; and
- This would create $461 million in corporate profits and labour income and a total of $61 million in taxes for all levels of government.

Figure 12

Estimated Province-Wide Economic Benefits of the Proposed Development: Total Initial Construction and On-Going Benefits (Construction Period and 20 Years of Operation)

	Direct	Indirect	Induced	Total
Economic Activity ($millions)	320	173	79	572
Gross Domestic Product ($millions)	192	87	46	325
Number of Jobs	817	701	414	1,933
Wages ($millions)	49	50	22	121
Business Profit ($millions)	141	177	22	340
Taxes ($millions)				
Personal				30
Business				31
Total Taxes ($millions)				**61**

Source: Altus Group Economic Consulting based on Statistics Canada Input-Output model and other sources

4.4 LOCAL ECONOMIC IMPACT

Much of the economic impacts reported above would occur outside of the local market area. This section provides estimates for the extra spending supported by on-going employment at the Hidden Quarry in the Township of Guelph-Eramosa, in the larger County of Wellington, and in the neighbouring Region of Halton.

4.4.1 Critical Assumptions and Estimates

4.4.1.1 Total Employment

- Estimates from Stovel & Associates (2012) put the full-time employment from operations at the Hidden Quarry at 19 on-site and 18 transportation workers, for a total of 37 employees;
- Independently derived employment estimates generated from the I-O model put direct employment at 39 full-time equivalent jobs stemming from on-going operations;
- Consistency between estimates using the widely accepted I-O model and Stovel & Associates expert opinion gives us confidence in the number of persons directly employed; and
- Therefore, for the purposes of this model, it is assumed that 37 people will be employed by the quarry, with 19 on-site and 18 involved in transportation for a period of 20 years.

4.4.1.2 Location of Residence

Where the employees live is important when assessing their likely spending patterns:

- According to the 2006 Census of Canada, around 2,800 workers lived and worked in the Guelph-EramosaTownship (Figure 13);
- This figure includes those that have no fixed workplace address, but not those that work from home;
- The total number of transportation and warehousing workers that lived and worked in GET was 185;
- This represented 34% of the total workforce and 44% of the transportation and warehousing sector;
- Residents of Wellington County as a whole accounted for 77% of GET's workforce;

- Residents of Halton Region only accounted for 0% and 4% of GET's transportation sector and total workforce, respectively; and
- These percentages are used to allot the potential employees at the quarry to GET, Wellington County, and Halton Region.

Figure 13

Workers in GET by Place of Residence

	Transportation[1]	Total	Transportation[1]	Total
	persons		*percent*	
Wellington County				
GET[2]	105	1,245	43.8	34.0
Elsew here	80	1,575	33.3	43.0
Total[2]	**185**	**2,820**	**77.1**	**76.9**
Halton Region	-	130	-	3.5
Elsew here in Canada	55	715	22.9	19.5
Total[2]	**240**	**3,665**	**100.0**	**100.0**

[1] Includes transportation and w arehousing

[2] Includes w orkers living in GET that have no fixed w orkplace address

Source: Altus Group Economic Consulting based on data from 2006 Census

4.4.1.3 Capture Rates

Capture rates are the proportion of expenditures that occur within a defined geography. Capture rates will differ across types of expenditures (such as groceries and furniture) and by groups of individuals (such as local workers and commuters).

Altus Group has conducted a number of retail demand studies across Canada and has leveraged this experience to estimate likely capture rates. Figure 14 summarizes:

- Capture rates for local spending are generally higher for larger regions that have a greater depth and breadth of goods and services;
- For this reason, the Guelph-Eramosa Township generally has lower capture rates for locals than either Halton Region or Wellington County;
- Capture rates for non-locals in Halton Region are lower. This is because this category represents workers employed by the proposed Quarry that neither live nor work in Halton Region; and

- Data on expenditure by category from the Survey of Household Spending was used to produce weighted average capture rates which range from 5.0% for non-local spending in Halton Region to 87% for local spending in Wellington County.

Figure 14

Capture Rates by Category and Geography

	Guelp-Eramosa		Wellington County		Halton Region	
	Locals	Non-Locals	Locals	Non-Locals	Locals	Non-Locals
	percent					
Food expenditures	80	10	90	13	90	3
Shelter	100	-	100	-	100	-
Household operations	100	-	100	-	100	-
Household furnishings and equipment	60	-	75	-	75	-
Clothing and accessories	35	5	75	6	75	2
Transportation	70	20	75	20	75	20
Health care	60	-	75	-	75	-
Personal care	75	5	75	6	75	2
Recreation	50	5	75	6	75	2
Education	25	-	75	-	75	-
Reading materials	70	-	75	-	75	-
Tobacco and alcoholic	70	20	85	25	85	6
Games of chance	-	-	-	-	-	-
Miscellaneous	70	20	90	25	90	6
Weighted Average	**77**	**7**	**86**	**8**	**86**	**5**

Source: Altus Group Economic Consulting based on data from the Survey of Household Spending

4.4.2 Local Economic Impact – Township of Guelph-Eramosa

Figure 15 presents the estimate for extra spending within the Township of Guelph-Eramosa:

- Estimates from Stovel & Associates (2012) put the full-time employment from operations at the Hidden Quarry at 19 on-site and 18 transportation workers;
- After accounting for income taxes and assuming a 5% savings rate, this results in $1.56 million in annual expenditure by these employees;
- Assuming that 34% of the on-site and 44% of the off-site employees live in the local area, that would produce over $0.60 million and $0.96 million in annual expenditure by employees from the Quarry that live in and outside of the local market area, respectively;
- Applying capture rates yields $0.53 million in annual expenditure in the local market area by employees of the Quarry and an additional $64,524 in spinoff spending;
- This generates $0.6 million in annual spending in the local market area; and

- Over 20 years, employees of the Hidden Quarry are estimated to support an aggregate spending of just over $11.9 million in the local market area.

Figure 15

Estimates of Local Economic Impacts - Guelph-Eramosa Township

	On-Site	Transportation	**Total**
Full Time Employees	19	18	**37**
Average Wage	58,834	58,834	
Average Taxes Paid	14,366	14,366	
Average After-Tax Income	44,468	44,468	
Total Disposable Income	844,897	800,429	**1,645,325**
Savings Rate	5%	5%	
Total Expenditure	802,652	760,407	**1,563,059**
Residence of Employees			
Local Market Area	34%	44%	
Other	66%	56%	
Expenditure by Residence			
Local Market Area	272,661	332,678	**605,339**
Other	529,991	427,729	**957,720**
Capture Rate of Expenditure			
Local Market Area	77%	77%	
Other	7%	7%	
Total Expenditure Occuring in the Local Market Area Stemming from Direct Labour Income	245,546	284,525	**530,072**
Induced Multiplier	0.12	0.12	**0.12**
Induced Spending	29,890	34,634	**64,524**
Total Annual Spending	275,436	319,160	594,596
Total Spending Over the Quarry's Lifetime	5,508,718	6,383,196	**11,891,914**

Source: Altus Group Economic Consulting

4.4.3 Local Economic Impact – Wellington County

Figure 16 presents the estimate for extra spending within Wellington County:

- Estimates from Stovel & Associates (2012) put the full-time employment from operations at the Hidden Quarry at 19 on-site and 18 transportation workers;
- After accounting for income taxes and assuming a 5% savings rate, this results in $1.56 million in annual expenditure by these employees;

- Assuming that 77% of the on-site and off-site employees live in the local area, that would produce over $1.2 million and $0.36 million in annual expenditure by employees from the Quarry that live in and outside of the local market area, respectively;
- Applying capture rates yields $1.1 million in annual expenditure in the local market area by employees of the Quarry and an additional $0.15 million in spinoff spending;
- This generates $1.2 million in annual spending in the Wellington County; and
- Over 20 years, employees of the Hidden Quarry are estimated to support an aggregate spending of just over $24.3 million in Wellington County.

Figure 16

Estimates of Local Economic Impacts - Wellington County

	On-Site	Transportation	**Total**
Full Time Employees	19	18	**37**
Average Wage	58,834	58,834	
Average Taxes Paid	14,366	14,366	
Average After-Tax Income	44,468	44,468	
Total Disposable Income	844,897	800,429	**1,645,325**
Savings Rate	5%	5%	
Total Expenditure	802,652	760,407	**1,563,059**
Residence of Employees			
Local Market Area	77%	77%	
Other	23%	23%	
Expenditure by Residence			
Local Market Area	617,593	586,147	**1,203,740**
Other	185,059	174,260	**359,319**
Capture Rate of Expenditure			
Local Market Area	86%	86%	
Other	8%	8%	
Total Expenditure Occuring in the Local Market Area Stemming from Direct Labour Income	548,271	520,250	**1,068,521**
Induced Multiplier	0.14	0.14	**0.14**
Induced Spending	75,286	71,438	**146,724**
Total Annual Spending	623,557	591,688	1,215,245
Total Spending Over the Quarry's Lifetime	12,471,138	11,833,764	**24,304,902**

Source: Altus Group Economic Consulting

4.4.4 Local Economic Impact – Halton Region

Figure 17 presents the estimate for extra spending within Halton Region:

- Estimates from Stovel & Associates (2012) put the full-time employment from operations at the Hidden Quarry at 19 on-site and 18 transportation workers;
- After accounting for income taxes and assuming a 5% savings rate, this results in $1.56 million in annual expenditure by these employees;
- Assuming that 0% of the on-site and 4% of the off-site employees live in the local area, that would produce around $27,000 and $1.5 million in annual expenditure by employees from the Quarry that live in and outside of the local market area, respectively;
- Applying capture rates yields $0.10 million in annual expenditure in the local market area by employees of the Quarry and an additional $13,500 in spinoff spending;
- This generates $0.1million annual spending in Halton Region; and
- Over 20 years, employees of the Hidden Quarry are estimated to support an aggregate spending of just over $2.2 million in Halton Region

Figure 17

Estimates of Local Economic Impacts - Halton Region

	On-Site	Transportation	**Total**
Full Time Employees	19	18	**37**
Average Wage	58,834	58,834	
Average Taxes Paid	14,366	14,366	
Average After-Tax Income	44,468	44,468	
Total Disposable Income	844,897	800,429	**1,645,325**
Savings Rate	5%	5%	
Total Expenditure	802,652	760,407	**1,563,059**
Residence of Employees			
Local Market Area	0%	4%	
Other	100%	96%	
Expenditure by Residence			
Local Market Area	-	26,972	**26,972**
Other	802,652	733,435	**1,536,087**
Capture Rate of Expenditure			
Local Market Area	86%	86%	
Other	5%	5%	
Total Expenditure Occuring in the Local Market Area Stemming from Direct Labour Income	39,164	59,116	**98,279**
Induced Multiplier	0.14	0.14	**0.14**
Induced Spending	5,378	8,117	**13,495**
Total Annual Spending	44,541	67,233	111,774
Total Spending Over the Quarry's Lifetime	890,826	1,344,663	**2,235,488**

Source: Altus Group Economic Consulting

5 EFFECTS ON LOCAL PROPERTY VALUES

This chapter focuses on the potential property value effects of a quarry on properties in the local market area.

5.1 POSSIBLE MODELS

There are several different models commonly used to analyze effects on property values. This section describes the most prominent ones and comments on their relative strengths and weaknesses as they apply to this situation.

5.1.1 Hedonic Pricing Models

Hedonic pricing is a method often used to decompose housing prices into different components, such as the value of extra bathrooms, or a fireplace. There are potential issues with this methodology that make the use of this method less applicable to quarry operation sites.

5.1.1.1 Omitted Variables

The hedonic pricing model is sensitive to the issue of omitted variables. If an explanatory variable (such as the age of the residence) is not accounted for in the analysis, then its effect on prices will be attributed to other variables that it is correlated with. For instance, if homes near a gravel pit are, on average, older and if this has a negative effect on prices, then this negative effect will be erroneously attributed to proximity to the gravel pit.

Below are some examples of omitted variables that potentially bias the results:

- **Age of the Residence** – All else held constant, this would have a negative effect on housing prices; and
- **Proximity to Desirable Amenities** – This could include schools, grocery stores, and parks.

5.1.1.2 Endogeneity

A key issue with the use of hedonic pricing in this context is that it doesn't truly measure the effect of quarry operations on nearby housing prices. Rather, it attempts to measure the effect of distance from a given point on

which; in this case, the quarry is located. The assumption is that the gravel pit is the cause, though that may not necessarily be the case.

The key factor here is that the proposed quarry, by definition, would operate on lands that have long been identified for aggregate extraction uses and where other development potential is extremely limited by planning policies and regulations. While agricultural uses are currently permitted, the lack of development of desirable amenities would have a negative impact on prices.

Whether or not the proposed quarry is permitted, it would be located in a rural location with no amenities. It is quite possible that it is not the operation of the gravel pit that is the source of the disamenity but, rather, the lack of amenities and nearby development.

5.1.2 Difference-in-Difference

Difference-in-difference analysis is a form of time-series regression analysis that is not to be viewed as mutually exclusive to hedonic pricing. Household features and amenities are still taken into account, as in the hedonic model discussed earlier, but the dimension of time is added.

A difference-in-difference estimation essentially looks to see whether the rate of change in the dependant variable (in this case, housing prices) differs between segments of the sample (in this case, between homes near a quarry or far from a quarry). This is designed to test whether homes near a specified location see slower price growth or if homes sold after a given date (the announcement of a quarry, for example) sold for less, all else being constant.

5.1.2.1 Endogeneity

Difference-in-difference estimators suffer from the same problem than hedonic models do. Essentially, quarry operations are proposed to be located on aggregate extraction land that has been identified as such since before the time frame of the analysis, but left unzoned, unlicensed and undeveloped. This lack of amenities on or near the subject site is itself a disamenity and confounds the results of the estimation.

That being said, a difference-in-difference estimation could test whether the announcement of proposed quarry operations has an effect on local property values above and beyond the existence of the undeveloped land which has aggregate potential but which is not zoned or licensed to permit aggregate operations.

5.1.3 Case Studies

Case study analysis measures the price growth of individual homes sold within the proximity of a given site and compares the price growth to a broader market trend. The key in this analysis is that it tracks price growth for specific homes so that the characteristics of the home are not affecting the price growth.

5.1.3.1 Omitted Variable

Case study analysis does not take into account characteristics of the home. If certain characteristics were more or less desirable during a given period and if these characteristics were more common in homes either closer to or further from the subject site, this would cloud the results. As an example, if homes further from a subject site had more land and market forces were putting upward pressure on land prices during the time frame of this study, this effect would be erroneously attributed to proximity to the subject site.

5.1.3.2 Renovations & Damages

This form of analysis does not take into account any renovations undertaken within or damage occurring to the residence between sales that may have altered the value of the home.

5.2 INSIGHTS FROM THE LITERATURE

This section summarizes insights from academic literature in regards to property value impacts on a municipality from the operation of a gravel pit.

Much of the literature is based on either anecdotal or ex-ante analysis of housing price effects. This section focuses on studies that utilize quantitative methods to measure ex-post effects on housing prices:

5.2.1 Lansink[x]

Lansink (2013) used case studies of properties in the area surrounding several existing or proposed quarries in Ontario. The author compares the price growth of homes near existing or proposed quarries in Ontario to broader market trends. This is of direct relevance to the subject site.

The report found a "non-negligible decline in prices for properties near a quarry" however:

- Of the 7 quarries that were examined, the average number of transactions examined was less than three;
- It is unclear from the report how the timing of individual home sales corresponds to the beginning of operations or the announcement of the proposal of the respective quarries; and
- It is unclear whether every real estate transaction was taken into account.

5.2.2 Analysis by MPAC[xi]

The Municipal Property Assessment Corporation (MPAC) is an independent, not-for-profit corporation funded by Ontario municipalities. They value and classify properties across the province.

In response to the above-mentioned Lansink report, MPAC released its own analysis of resale price growth in proximity to quarries:

- MPAC's broad methodology was similar to that used in the Lansink report;
- Where the reports differ is the price trend that the individual sales are compared to;
- Lansink uses the overall real estate board as a comparison for price growth whereas MPAC uses a Time Adjustment Factor (TAF);
- This time adjustment factor is their standard methodology for calculating price growth within a given area; and
- This methodology takes into account the effects of a number of housing characteristics, and provides a more accurate estimation of price growth.

Using this alternate methodology, MPAC finds no loss in price in the study area.

5.2.3 Hite[xii]

In an oft-cited report, Hite estimates the effect on house prices within the vicinity of a gravel pit operation using a hedonic pricing model:

- The model centres on a gravel pit operation in Delaware County in 1998;

- The author finds a negative effect on house prices within close proximity of a gravel pit operation; however
- There are a number of potential issues with the application of this methodology to aggregate extraction that is likely influencing this result; and
- These include the potential for endogeneity and omitted variable bias as was described in section 5.1.1.

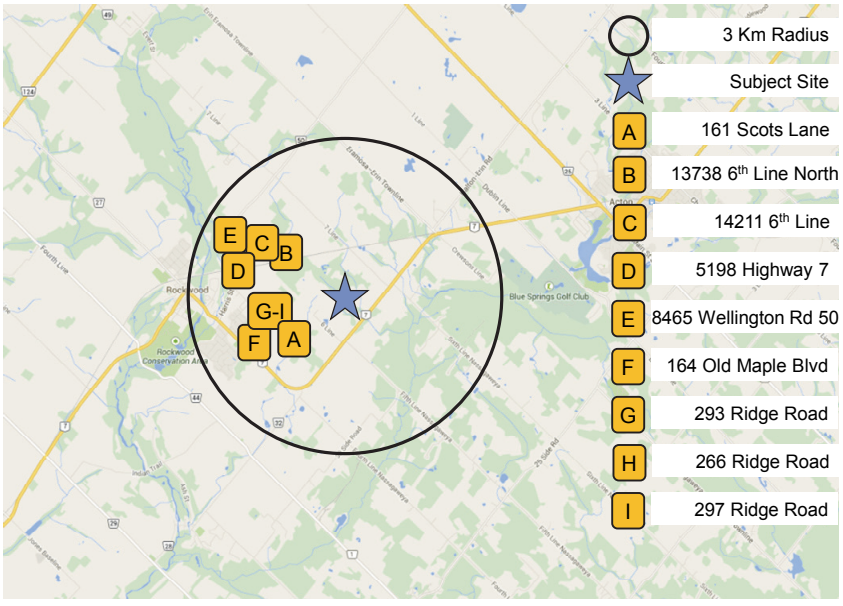
5.3 CASE STUDIES ANALYSIS OF THE LOCAL MARKET

To supplement the analysis of existing literature, Altus Group examined the sales of residential properties within the vicinity of the subject site (Figure 18).

- A radius of three kilometres was used;
- The majority of the sales occurred within the nearby community of Rockwood with most of the sales occurring less than two kilometres from the subject site; and
- All properties with at least two transactions were included in the analysis.

Figure 18

Subject Site



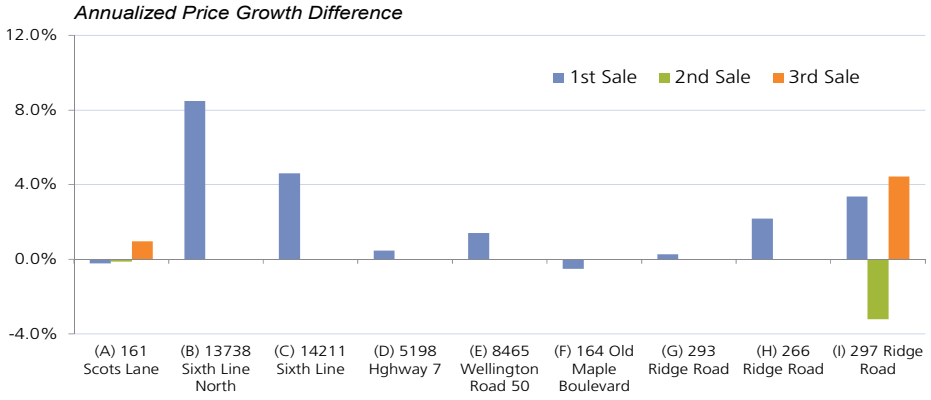
Source: Altus Group Economic Consulting based on Google Maps

Figure 19 presents the results of the analysis:

- All of the properties analyzed were in a 3 km. radius of the subject site and had multiple sales in recent years;
- Price growth between each sale was annualized and compared to price growth over that same period for all home sales covered by the Guelph Real Estate Board;
- The difference in annualized price growth between the specific property and the Board as a whole is then plotted on the vertical axis;
- As such, a positive value indicates that the specific house saw faster price growth than the overall market over a given time frame; and
- For all of the properties covered, there was only one sale where the price of the home grew at a notably slower rate than the area as a whole.

Figure 19

Paired Sales Analysis

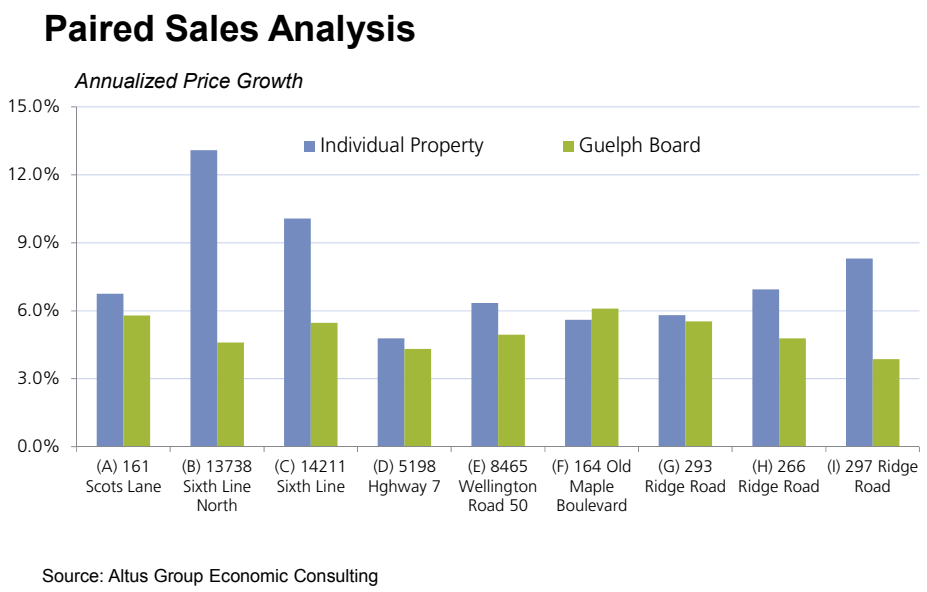


Source: Altus Group Economic Consulting

Figure 20 focuses the analyses only on paired transactions that occurred before and after the January 2012 announcement:

- In no case was the annualized price growth of an individual property negative; and
- Only in one case did the property value see slower price growth than the overall board.

Figure 20



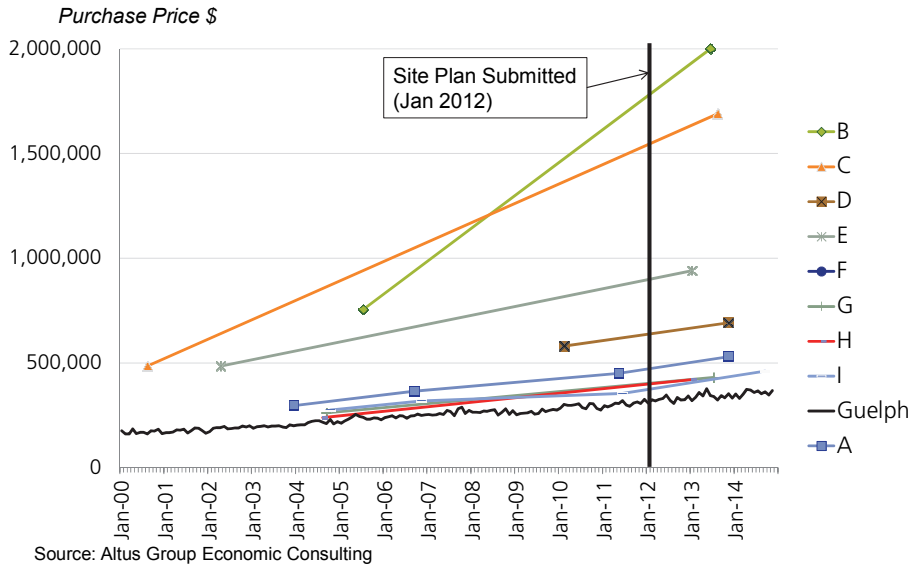
Source: Altus Group Economic Consulting

Figure 21 provides further illustration of this analysis:

- Price growth for each of the properties examined in this analysis is plotted across time;
- Price growth for the overall Guelp real estate board, the smallest geography available for this analysis, is also plotted;
- All properties examined here had a sale that occurred before and after the announcement of the proposed quarry; and
- It is clear from the analysis that the price growth among these homes was equal to or greater than that of the overall board.

Figure 21

Paired Sales in 5Km. Radius of Hidden Quarry Site



Source: Altus Group Economic Consulting

While there are a number of factors not accounted for in this analysis, we see no evidence that homes within the vicinity of the proposed Hidden Quarry have experienced downward price pressure.

5.4 CONCLUSION

It is our opinion that the operation of the proposed Hidden Quarry will not have a diminutive effect on municipal residential property values for the following reasons:

- Analysis by MPAC on property values near quarries in Ontario, as examined by the Lansink report, found no diminutive effects;
- Some quantitative analysis has been done on property value effects of gravel pits using hedonic pricing models. However, these results are inconclusive given the endogenous location of gravel pits in areas lacking other desirable amenities;
- The site has been identified as a Mineral Aggregate Area Resource under the County of Wellington Official Plan since 1999 and previously operated as a gravel pit. Diminutive effects on property values, if any, would likely already have taken place; and
- Analysis of local resale transactions found no conclusive evidence of a negative effect on property values.

6 NET CHANGE IN GOVERNMENT REVENUE

This chapter presents the methodology, assumptions, and results of our analysis of the net effect of the proposed Hidden Quarry project on the Municipality's finances.

6.1 COMMON ASSUMPTIONS AND INPUTS

- While property tax assessment data are available for the year 2014, detailed financial statements were only available for 2013 at the time of this publication. As such, all costs and revenues have been calculated based on reported costs and assessments for the year 2013;
- While documents provided by the Township refer to the subject site occupying 100 acres, property assessments indicate that the site size is 94.07 acres. This is the size used in all subsequent calculations;
- JDCL will be responsible for the maintenance of their portion of the 6th Line and the site will be "dry". As such, the subject site will not be a drain on environmental services; and
- The quarry will extract the full 700,000 tonnes of aggregate per year.

6.2 NET ADDITIONAL MUNICIPAL REVENUE

6.2.1 Existing Tax Revenues

- In 2013, the subject property was assessed at $250,000 by MPAC, which included:
  - $86,940 for residential uses; and
  - $163,560 for farm/managed forest lands.
- Based on these assessed values for current land uses, and the applicable 2013 tax rates, the landowners paid $1,425 in property taxes, $333 of which would have gone to the Township;

6.2.2 Estimated Future Tax Revenues

- JDCL proposes to use 61.3 acres for aggregate extraction, with the remaining 32.8 acres not licensed.
- The following section details how we estimated the future assessment value of the aggregate operation:

- The 61.3 acres for aggregate extraction will be worked on in three phases over the 20-year lifespan of the operation[xiii]:
  - 1st phase – 18.53 acres in the northwestern portion of the site;
  - 2nd phase – 13.59 acres in the northeastern portion of the site; and
  - 3rd phase – 29.40 acres in the southwestern portion of the site.

  Therefore, for the purposes of this analysis, we will assume that, on average, 1/3rd of the site will be actively used at any given time.

- We have based the assessed values of both the active and inactive part of the licensed lands on a cluster of quarries located in Puslinch Township, which is adjacent to the City of Guelph, similar to the subject site's location in the Township of Guelph/Eramosa.
  - There are 18 parcels in the cluster of quarries in Puslinch, comprising a total of 2,357 acres. The variety of sites in this sample allow us to show how properties with varying mixes of assessment types vary in value, so as to model how the active/inactive parts of the subject site may be assessed. These 18 parcels can be grouped into three categories based on the classification of their assessment values:
    - There are four predominantly industrial parcels (and therefore in active use), which are assessed at an average of $28,050 per acre. We will use this per acre assessment value for the 1/3rd of the subject site that will be actively used (on average) at any given time.
    - There are eight predominately residential parcels (and therefore in inactive use), which are assessed at an average of $18,480 per acre. We will use this per acre assessment value for the parts of the site that are licensed but not subject to active extraction, either because they are undisturbed or are exhausted and rehabilitated;

- There are six parcels that have a roughly 50/50 mix of industrial and residential assessment – these sites have an average assessed value of $23,480 per acre, which is generally in line with the total average of $22,670 per acre.

Figure 22 **Assessment Comparables from Cluster of Quarries in Puslinch Township**

	Assessed Value	Site Size	Assessment Value / Acre	Share of Assessment by Type: Ind.	Res.	Exempt	Comm.	Farm
Predominantly Industrial Assessment	*Dollars*	*Acres*	*$ / Acre*			*Percent*		
CON 2 FRONT PT LOT 27	1,981,000	40.03	49,487.88	90	-	-	-	-
CON 7 FRONT PT LOT 22	2,945,000	100.00	29,450.00	82	-	-	-	-
CON 2 FRONT PT LOTS 21 TO 24	6,704,000	342.30	19,585.16	86	-	-	-	-
4313 SIDEROAD 25 S	4,304,000	85.74	50,198.27	92	8	-	-	-
	15,934,000	568.07	28,049.36					
Predominantly Residential Assessment								
CON 2 REAR PT LOT 26	393,000	24.86	15,808.53	-	94	6	-	-
CON 1 REAR LOT 22	795,000	100.00	7,950.00	-	81	19	-	-
CON 1 REAR LOT 23	2,380,000	100.00	23,800.00	6	94	-	-	-
CON 5 REAR PT LOT 11	461,000	40.45	11,396.79	-	100	-	-	-
CON 5 FRONT LOT 4 PT LOT 5 PT	373,000	53.06	7,029.78	-	100	-	-	-
CON 4 PT LOTS 1 TO 3 PT RD, etc.	1,457,000	259.60	5,612.48	-	100	-	-	-
CON 5 REAR PT LOTS 7 TO 10 PT, etc.	1,269,000	131.34	9,661.95	16	84	-	-	-
CON 9 FRONT PT LOTS 22 TO 23, etc.	9,549,000	193.16	49,435.70	8	92	-	-	-
	16,677,000	902.47	18,479.28					
Mixed Industrial/Residential Assessment								
7115 CONCESSION 2	3,939,000	100.00	39,390.00	48	51	-	1	-
4350 CONCESSION 7	5,432,000	193.49	28,073.80	37	63	-	-	-
CON 7 FRONT PT LOTS 23 TO 25	4,526,000	368.80	12,272.23	59	38	3	-	-
CON 4 FRONT PT LOTS 11 & 12, etc.	2,267,000	57.10	39,702.28	40	60	-	-	-
CON 9 FRONT PT LOT 21	1,347,000	69.14	19,482.21	61	39	-	-	-
CON 7 PT REAR LOTS 23 AND 24, etc.	3,307,000	97.97	33,755.23	55	37	-	8	-
	20,818,000	886.50	23,483.36					
Grand Total	53,429,000	2,357.04	22,667.84					

Source: Altus Group Economic Consulting

- The unlicensed 32.8 acres on the subject site are assumed to have an assessment value of $1,900 per acre, which is consistent with the how these lands are currently assessed;
- In total, our model results in an estimated total assessed value for the site of approximately $1,389,400, and almost $5,630 in annual property tax revenue for the Township, using 2013 property tax rates, an increase of nearly $5,300 per year;

6.2.3 Annual Aggregate Levy Fees

- The Ontario Aggregate Resources Act and its regulation O.Reg 244/97 includes provisions requiring licensees to pay an annual fee related to the tonnage of aggregate removed during the previous year.
- The fees required by O.Reg. 244/97 is 11.5 cents per tonne, of which:

- 52.1% goes to the local municipality (Guelph/Eramosa), or 6 cents per tonne;
- 13.0% goes to upper-tier municipality (Wellington County), or 1.5 cents per tonne;
- 4.3% goes to the Aggregate Resources Trust for the purposes of rehabilitation and research, or 0.5 cents per tonne;
- 30.6% goes to the Crown, or 3.5 cents per tonne.

- Based on the estimated 700,000 tonnes of annual aggregate extraction, at 6 cents per tonne, the subject site would generate $42,000 in annual aggregate levy fees for the Township; and
- It would also generate $10,500 for the County, $3,500 per year for the Aggregate Resources Trust and $24,500 per year for the Crown.

6.2.4 Total Annual Municipal Revenue Generated

- Combined, the annual property tax revenues, and the aggregate fees generated for the Municipality amounts to approximately $47,600, an increase of more than $47,300 per year.

6.3 NET ADDITIONAL MUNICIPAL EXPENDITURES

- Altus Group obtained detailed expenditure information for the Municipality through the Township's *Financial Information Return* (FIR), as submitted to the Ministry of Municipal Affairs for fiscal year 2013;
- The data in the FIR's was used to generate costs to the Municipality per $1,000 of assessed non-residential value for individual categories of operating expenditures, such as planning, government, road costs, water, and sewer;
- Some services, such as parks, recreation programs were assumed to not be impacted by new non-residential development in the Township;
- It was also assumed that the development would have no impact on the Township's water and sewer operating costs, as the site will not require servicing;
- Costs associated with most other municipal services were allocated to the non-residential sector based on the non-residential sector's

proportionate share of assessment value in the Township (20.4%), with downward adjustments made for services where new development is not going to generate a proportionate increase in the need for services (government); and

- Setting aside costs for road maintenance and environmental services, which the proposed quarry would not incur, the estimated extra cost to the Municipality of providing services to the proposed quarry is just over $4,120 per year.

6.4 NET CHANGE TO MUNICIPAL FISCAL POSITION

Figure 23 summarizes the results of the preceding calculations:

- An estimated increase in assessed value of $1,138,900 should generate an additional $30,600 per year in property taxes, including approximately $5,300 per year for the Township;
- Aggregate extraction is estimated to generate a further $42,000 per year in municipal fees for the Township; and
- Taking into account the approximately $4,120 in annual costs to the Municipality that would result from the proposed quarry, the Municipality is estimated to see an increase of over $43,200 per year in net revenue.

Figure 23

Net Change to Township of Guelph/Eramosa Government Finances, Hidden Quarry

	Current[1]	Proposed	Difference
		Dollars	
Assessed Value	250,500	1,389,437	1,138,937
Changes to Township Revenues & Costs			
Property Taxes[1]	333	5,628	5,295
Aggregate Levy	-	42,000	42,000
Total Revenue	333	47,628	47,295
Less: Net Additional Municipal Expenditures	n.a.	4,123	4,123
Net Change to Fiscal Position			**43,172**

[1] Based on 2013 FIR and property tax rolls

Source: Altus Group Economic Consulting based on data from MPAC, Ministry of Municipal Affairs, JDCL

7 CONCLUSION

The Township of Guelph-Eramosa retained Altus Group Economic Consulting to provide estimates of the potential economic impact of the Hidden Quarry project in the Township being proposed by James Dick Construction Limited (JDCL).

7.1 BACKGROUND INFORMATION

The subject site covers approximately 39.4 hectares (100 acres) on the northeast quadrant of Highway 7 and 6th Line in an area predominantly zoned for agricultural and industrial uses. A little less than 25 hectares (61.3 acres) of this would be used for extraction and the site would contain two small buildings totalling 420 sq. m. (4,520 sq. ft.).

7.2 THIRD PARTY REPORTS AND ECONOMIC IMPLICATIONS

Various third-party technical reports were commissioned by other consultants on behalf of the applicant and were reviewed for any relevant economic implications:

- Third-party monitoring is recommended in some situations;
- Numerous mitigation measures are recommended; and
- Adverse effects are not expected if mitigation measure and monitoring are implemented.

7.3 ECONOMIC IMPACT ESTIMATES

- The initial construction and 20 years of operation of the Hidden Quarry would generate $320 million in direct economic activity;
- This would contribute a total of $325 million to GDP;
- An estimated 1,933 full-time equivalent jobs (person years of employment) would be supported, 817 directly; and
- This would create $461 million in corporate profits and labour income and a total of $61 million in taxes for all levels of government.

7.4 LOCAL ECONOMIC IMPACTS

- The estimated total extra expenditure occurring within the Guelph-Eramosa Township as a result of 20 years of regular operations at the proposed quarry is $11.9 million;

- The estimated total extra expenditure occurring within Wellington County as a result of regular operations at the proposed quarry is $24.3 million; and
- The estimated total extra expenditure occurring within the Halton Region as a result of regular operations at the proposed quarry is $2.2 million.

7.5 EFFECTS ON LOCAL PROPERTY VALUES

- Review of relevant literature indicates some evidence that gravel pits are associated with modestly lower property values, but that this association is likely the result of a lack of nearby amenities stemming from gravel pit locations and zoning, rather than operation;
- Analysis of local existing home transaction indicates no downward price pressure resulting from proximity to the subject site, despite its long-term identification as a Mineral Aggregate Resource Area; and
- As a result, we see no conclusive evidence, nor strong reason to believe, that operation of the proposed Hidden Quarry would have a diminutive effect on local property values.

7.6 NET CHANGE IN MUNICIPAL GOVERNMENT FINANCES

- The annual on-going government revenues (taxes, aggregate fees) generated from the proposed hidden quarry would represent a total net change from existing revenue of more than $47,300 to the Municipality;
- The Township would be faced with around $4,120 in additional annual operating costs as a result of the quarry on an annual basis; and
- This results in an increase of more than $43,200 in annual net revenue to the Municipality.

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[i] Zoning By-Law Amendment Application. May 2008

[ii] Stovel and Associates Inc. Letter to Elizabeth Howson. November 11, 2014.

[iii] Stovel, Robert. "Letter to Elizabeth Howson Re: Proposed Hidden Quarry". November 11, 2014

[iv] Externalities are costs or benefits borne by parties not directly involved in a transaction. A common example is the health costs from second hand smoke. The high tax rate on cigarettes is meant to account for this.

[v] Stovel, Robert. "Letter to Elizabeth Howson Re: Proposed Hidden Quarry". November 11, 2014

[vi] The estimate cost of both the right and left turn lane for the intersection of Highway 7 and 6th Line is $600,000 (Stovel and Associates letter to Elizabeth Howson, 2014). It is assumed that a single turn lane could be constructed for half the price.

[vii] Reconstruction and improvement of roadways would cost an estimated $950,000, according to Stovel and Associates. An estimated $1.5 million in site

preparation costs would also be incurred based on observed costs from comparable developments.

[viii] Current aggregate pricing was obtained from quarries operating in the broader region. Pricing for stone and concrete stone was used.

[ix] In a letter to Elizabeth Howson dated November 11, 2014, Robert Stovel states that transportation costs can account for up to 60% of the cost of delivered aggregate. This quarry's location is believed to reduce delivery distance and so a reduction in transportation costs is assumed.

[x] Lansink, Ben. "Diminution in Price (if any) to Residential Real Estate if Located in the Vicinity of an Existing or Proposed Ontario Pit or Quarry." Lansink Appraisals & Consulting. 2013

[xi] MPAC. "Re-sales Analayis – Lansink and MPAC". 2013

[xii] Hite, Diane. "Summary of Analysis: Impact of an Operational Gravel Pit on House Values Delaware County, Ohio". 2006

[xiii] Township of Guelph/Eramosa Planning Report #1, re: Zoning By-law Amendment Application (ZBA09/12), January 29, 2013