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City of Brampton
2 Wellington Street W.
Brampton, ON L6Y 4R2

**Re: Proposed Norval Quarry
Peer Review of Air Quality Assessment
RWDI Reference Number: 1011996**

RWDI AIR Inc. (RWDI) was retained by the City of Brampton to conduct a peer review of the Air Quality Assessment Report prepared by Jacques Whitford in support of a quarry zoning application by Brampton Brick for the proposed Norval Quarry. This letter summarizes the results of the review of the technical report. The review was based on the Peer Review Matrix Guideline provided by the City of Brampton. The completed matrix is included as Appendix A to this letter.

The opinions expressed in this peer review (including appendices) may be supplemented, reconsidered or otherwise revised by the author(s) due to new or previously unknown information.

SUMMARY

In general, the technical report is very clear. The methodology followed in the assessment is technically sound and it exceeds the requirements of Ontario Regulation 419/05 and the associated guidelines. RWDI does have some concerns about the adequacy of the proposed mitigation measures and their subsequent implementation to ensure that off-site dust impacts are reduced to acceptable levels. The deficiencies noted in the assessment include:

- The water requirements for dust control have not been included in the water balance.
- The screening out of meteorological anomalies was not conducted properly. Therefore, the maximum predicted concentrations could be under-estimated.
- The emission sources were aggregated into a large area source. This could result in higher predicted levels of dilution. The active face and internal haul routes should have been modelled explicitly.
- There is no reference to a Best Management Practices Plan (BMPP) for fugitive dust. This is essential to ensure that proposed mitigation measures are implemented, and that the effectiveness of these measures can be monitored.

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- Onsite dust deposition was not assessed. Although this is not required under the applicable regulations and guidelines for air quality, this information is useful for the natural environment assessment.

REGULATORY REVIEW

As part of RWDI's review of the Air Quality Assessment Report prepared by Jacques Whitford, the following regulations, guidelines and policies were considered:

- City of Brampton Official Plan Section 4.5.15.2.2 (Air Quality & Energy)
- Environmental Protection Act, R.S.O 1990 (last amendment: 2007);
- Ontario Regulation 419/05: Local Air Quality (last amendment: O. Reg. 507/09);
- Ministry of the Environment Guideline A10: Procedure for Preparing an Emission Summary and Dispersion Modelling Report, Version 3.0, March 2009;
- Ministry of the Environment Guideline A11: Air Dispersion Modelling Guideline for Ontario, Version 2.0, March 2009; and,
- Ontario's Ambient Air Quality Criteria, February 2008.

DETAILED FINDINGS

The silt and moisture content of the road surfaces and the shale being handled are reasonable based on published values in the literature. These values should be confirmed based on site-specific measurements once normal operations are established, to ensure that they are representative of actual site conditions.

With respect to the paved shipping haul route, the combination of daily road flushings/watering and weekly vacuuming of the paved access roads is sound, and the estimated control efficiency of 85% should be achievable. RWDI would tend to assume a lower control efficiency, but the dust emission rates presented are over-estimated. The U.S. EPA has released updated emission factors for dust from paved roads (January 2011), which results in a significant reduction in emission factors for heavy duty vehicles travelling on paved roads.

With respect to the movement of the scraper on the unpaved roads, the assessment considers a control efficiency of 75% due to watering of the haul routes. As the specific level of watering has not been provided, it is difficult to determine if the 75% is suitable, but is in line with the normal range of assumptions for regular watering of haul routes of this nature. The maximum hourly watering rate is required to assess that the desired level of control can be achieved. It is our understanding that this requirement for water has not been included in the water balance for the site.

There are minor concerns with the dispersion modeling assessment that cause an underestimate of the predicted impacts. The first concern is the screening out of meteorological anomalies. Our opinion is that some of the meteorological conditions that have been screened out as anomalous should not have been screened out. The screening approach used was not consistent with MOE Guideline A11.

The second concern is regarding the use of an area source for emissions in the quarry. The use of an area source spreads the emissions over a larger area, creating initial dilution of the emissions when, on any given day, the emissions would be more localized, occurring at a specific active face area and along a specific internal haul route within the extraction area itself. These concerns may result in an increase in predicted impacts.

There is no reference to a Best Management Practices Plan (BMPP) for fugitive dust. The BMPP will help to ensure that the proposed mitigation measures are implemented, and that the effectiveness of these measures can be monitored. A BMPP will provide a clear and enforceable process for ensuring mitigation measures are implemented, reviewed, and improved upon as required, through a formal process of monitoring, record-keeping and complaint resolution. Although a BMPP is not required by the regulations, it would provide a clear indication of all dust control measures at the proposed quarry.

Onsite impacts such as dust deposition, were not included in the assessment. If this information is required for technical studies in other fields, including natural environment, these impacts can be predicted by the models used in this assessment.

CONCLUSION

Although issues have been identified, based on RWDI's review of the Air Quality Assessment Report prepared by Jacques Whitford, this report does warrant approval under the applicable legislation and guidelines.

CLOSING

We trust that this information will be helpful in your review of the application. Should you have any questions or concerns, please do not hesitate to contact us.

Yours very truly,

RWDI AIR Inc.



Brian Sulley, B.A.Sc, P.Eng.
Senior Engineer



Sharon Schajnoha, P.Eng.
Senior Project Manager/Associate

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APPENDIX A

Norval Quarry Rezoning Application (Brampton Brick)

February 17, 2011

Preliminary Review Table – AIR QUALITY

This table is to provide a summary of the peer review work and must be submitted with the draft peer review report. It is not meant to be fully comprehensive, but to provide a starting point to organize thoughts and lead to final conclusions on the peer review assignment.

Guideline Question	Findings regarding the Brampton Brick Report	Implications if this concern/issue is not addressed in the technical report
Purpose		
Is the purpose of the work clearly and understandably stated in the applicant's report?	The report is clear in purpose. The study consists of an air quality assessment conducted in accordance with Ontario Regulation 419/05, MOE Guideline A10 MOE Guideline A11, and considers the Schedule 3 standards under the Regulation, as well as Ontario's Ambient Air Quality Criteria.	No concerns, this is the appropriate study for this application.
Does the purpose set out the proper direction to undertake the study?	Yes, the purpose sets out the proper direction.	No concerns.
Methodology		
Is the methodological approach technically sound? Is the review of issues, data, facts, objective and appropriate?	<p>The assessment generally goes beyond the requirements of Ontario Regulation 419/05 and the associated guidelines, in that it includes an assessment of tailpipe emissions from motor vehicles. It also considers emissions of PM2.5, which is not required, but is an accepted practice that RWDI agrees with.</p> <p>There are minor concerns with the dispersion modeling assessment that may increase the predicted impacts but further assessment is required to determine the exact level of increase. Specifically, these concerns include the screening out of meteorological anomalies when emissions are not continuous over the entire year, and the use of an area source used for emissions in the quarry, as opposed to specific line and volume sources. This spreads the emissions over a larger area.</p>	The concerns with the dispersion modeling may result in an increase in predicted impacts. Without re-running the model to confirm, it is difficult to assess whether these impacts will exceed the ambient air quality criteria, but it is not expected to be the case.

<p>Does the peer review identify any technical concerns stemming from the methodology (and assumptions made to inform the methodology) that may compromise the analysis and/or conclusions of the report?</p>	<p>Overall the methodology is appropriate, with the exceptions noted above.</p>	<p>As noted above, the concerns with the dispersion modeling may result in an increase in predicted impacts. Without re-running the model to confirm, it is difficult to assess whether these impacts will exceed the ambient air quality criteria, but it is not expected to be the case.</p>
<p>Information</p>		
<p>Are relevant data and facts clearly and consistently presented in the technical report?</p>	<p>Data and facts are clearly presented. The report was easy to follow, and the information supplied was sufficient for my review.</p>	<p>No implications.</p>
<p>Is information gathered from appropriate sources? Is the information useful? Accurate? Are there concerns regarding their quality or validity?</p>	<p>All information presented in the report was referenced, and is appropriate to the study type. The silt and moisture content of the road surfaces and the shale being handled are consistent with appropriate literature values.</p>	<p>On-site silt and moisture values may alter the results of the assessment. Additional mitigation may be required.</p>
<p>Is the data used critical to the conclusions?</p>	<p>The silt and moisture content of the road surfaces and the shale being handled are critical to the emission estimates.</p>	<p>On-site silt and moisture values may alter the results of the assessment. Additional mitigation may be required.</p>
<p>Is the Brampton Brick report thorough/comprehensive/complete? To respond to this question, peer reviewers must consider accuracy, appropriateness and timing/seasonality of the data collection (if applicable).</p> <p>Where specific technical report warrants, there may be a need to consider broader connections (i.e.: water inter-relationships). Please indicate if you feel this is lacking in the Brampton Brick report and what broader connections should be considered.</p>	<p>Overall the report is sufficient to allow a complete review of air quality issues.</p>	<p>No implications.</p>
<p>How comprehensive and complete are the recommended mitigation and monitoring measures proposed by Brampton Brick? This includes assessing direct and indirect impacts; short and long term aspects.</p>	<p>Controls on the paved haul routes may be overstated. More recent published emission factors suggest that this is acceptable however, as the net emissions will tend to be slightly lower than those shown.</p>	<p>The level of watering to achieve the level of dust control quoted should be specified. The ability to supply this water must be included in the water balance for the site.</p>

	There are minor concerns with the dispersion modeling assessment that may increase the predicted impacts. The first concern regards the screening out of meteorological anomalies when emissions are not continuous over the entire year.	
The gap analysis will assess the relative importance of the data gaps and limitations to the project and identify potential options for addressing them. As such, a recommendation from a peer reviewer could be that additional survey and baseline monitoring must be undertaken as the project proceeds, provided the necessary frameworks are in place to direct this data collection and any changes that are triggered.	On-site silt and moisture data should be collected as soon as operations commence. This will ensure that the conclusions of the assessment remain valid. The modelling should also be updated to reflect the issues noted above. Despite the issues noted, the assessment is considered to be acceptable.	Should the project proceed, monitoring of silt and moisture should be conducted upon commencement of operations.
Certainty		
Are certainties and uncertainties of the proposal's success openly and objectively stated in the applicant's report/study?	The certainties and uncertainties are clearly defined, and are also well-understood in the context of assessments of this type.	No implications.
Are all assumptions clearly stated? Are the assumptions reasonable? Analysis of assumptions and parameters.	The assumptions are clearly stated, and are supported by the literature, except where noted above.	No implication.
Are the standards or thresholds commonly accepted in this type of technical area identified and appropriately utilized? (i.e.: transportation, soils, natural environment? Etc...)	The appropriate standards and guidelines have been used in the assessment. These include the standards in O. Reg. 419/05, MOE Guideline A10 and A11, and Ontario's Ambient Air Quality Criteria.	No implication.
Issue Gaps		
Are there issue gaps arising from the review?	Watering requirements for dust control not determined. On-site dust deposition not addressed.	This has implications on the water balance. Although not required for the air quality assessment, may have implications on impacts on the natural environment.
Were the identified issues addressed in the technical report?	No	Not addressed in hydro geology or natural environment assessments.
Are there key issues, related to the specific technical report, that have not been considered?	No, not other than those stated above.	No implication.

Mitigation/Monitoring		
Are realistic mitigation measures/ rehabilitation plans proposed in the applicant's report? Is there sufficient detail?	Controls on the paved haul routes may be overstated. More recent published emission factors suggest that this is acceptable however, as the net emissions will tend to be slightly lower than those shown.	Despite the issues noted, the assessment is considered to be acceptable
Do the proposed measures mitigate the impacts? Is the end result desirable from a technical point of view?	Yes.	No impact.
Will the proposed measures be adequate to address outstanding concerns?	Yes.	Despite the issues noted, the assessment is considered to be acceptable.
Conclusion		
Do the conclusions satisfy the applicable policies of the relevant policy documents that need to be consulted as per the specific discipline (i.e.: Official Plan, Provincial legislation, standards and guidelines, etc...). This should be informed by the policy matrix. Have implications relating to required jurisdiction and agency approvals including environmental assessments been identified?	<p>The conclusions show compliance with all applicable regulations and guidelines noted previously. The inclusion of tailpipe emissions from vehicles and the addition of background concentrations actually go beyond the minimum requirements set out in the applicable regulations and guidelines.</p> <p>In addition, the report satisfies the requirement under Section 4.5.15.2.2 (Air Quality & Energy) of Brampton's Official Plan, specifically that "Development applications which have the potential to generate dust, odour and other emissions to air must be evaluated in accordance with the Ministry of Environment's Provincial guidelines and approval requirements."</p>	No implication.
Are the conclusions relevant to the purpose/objectives and supported by the work undertaken by the report authors?	Yes.	No implication.
Based on the peer review, would the same conclusions be determined?	Although there are differences in the methodology, RWDI would generally reach the same conclusion. RWDI does suggest that a Best Management Practices Plan be implemented, and the requirement for a Best Management Practices Plan should be included as a condition on the Site Plan prepared under the Aggregate Resources Act. This would demonstrate the applications commitment to controlling all on-site sources of dust.	It is not expected that the differences in the methodology will have a significant implication to the assessment itself. The requirement for a Best Management Practices Plan does have an implication for the Site Plan prepared under the ARA, should the proposal proceed.

Adequacy		
Does the applicant's report/study adequately address the stated purpose?	Yes.	No implication.
Is there anything that should, in your opinion, have been done differently?	Aside from the differences in the methodology noted above, the assessment was done correctly.	No implication.

Conclusions Summary (indicates in point form what overall conclusions are made on the technical report and identify issues to focus on). Please complete a gap analysis and a policy matrix table (compliance with relevant legislation/policy - referencing policies relevant to the technical review). The matrix table should identify if the relevant policy is addressed completely or in part, or not addressed. In this way, gaps or where policy information is lacking will be identified.

Policies Reviewed	<p>As part of RWDI's review of the Air Quality Assessment Report prepared by Jacques Whitford, the following regulations, guidelines and policies were considered:</p> <ul style="list-style-type: none"> • City of Brampton Official Plan Section 4.5.15.2.2 (Air Quality & Energy) • Environmental Protection Act, R.S.O 1990 (last amendment: 2007); • Ontario Regulation 419/05: Local Air Quality (last amendment: O. Reg. 507/09); Ministry of the Environment Guideline A10: Procedure for Preparing an Emission Summary and Dispersion Modelling Report, Version 3.0, March 2009; • Ministry of the Environment Guideline A11: Air Dispersion Modelling Guideline for Ontario, Version 2.0, March 2009; and, • Ontario's Ambient Air Quality Criteria, February 2008.
Conclusion Summary	<p>Although issues have been identified, based on RWDI's review of the Air Quality Assessment Report prepared by Jacques Whitford, this report does warrant approval under the applicable legislation and guidelines.</p>