July 31, 2008

Bruce Howarth
McNab/Braeside Community Township
2508 Russett Dr., RR2
Arnprior, Ontario
K7S 3G8

Re: Proposed Miller Quarry Expansion
Peer Review of Environmental Noise and Air Quality Studies
RWDI Project W08-5275A

RWDI AIR Inc. (RWDI) was retained by County of McNab Braeside to conduct a peer review of Noise and Air Quality assessments conducted for the proposed Braeside Quarry Expansion. This letter presents the results of our findings.

We have conducted a review of the following documentation:


Initial comments are provided in this letter, but further details of both the acoustics study and air quality studies are required to complete a properly thorough peer review. In summary, there was insufficient information provided to RWDI to assess whether the air quality assessment demonstrates compliance with Air Quality Regulations and Guidelines. To complete the review of the air quality assessment, RWDI would require further details of the emissions estimates and dispersion modeling and specifics of the dust control measures, such as would be provided in an Emission Summary and Dispersion Modelling Report and a detailed Dust Management Plan submitted with a C of A application.

The Air Quality report provides a summary of the air quality assessment conducted for the site. It includes the following information:

- Summary of Legal Requirements
- Summary of Air Emissions sources
- Description of Dispersion Modelling
- Emission Summary Table, as required for a Certificate of Approval application
- A summary of the Emission Rate Calculation Assumptions’ and
- A Dust Management Plan Summary
For a proper peer review, we would need to review supporting details of the modelling such as would be included in an ESDM report submitted to the MOE.

This review provides comments, considerations and, where applicable, recommendations for the air quality assessment report. It is organized following the same section structure as is found in the CTI report.

1.1 Legal Requirements

CTI’s description of Regulation 419, the EBR, Guideline D-6 and the MOE’s definition of an “Adverse Effect” is adequate.

1.2 Sources of Air Emissions

CTI’s summary of the sources of Air Emissions appears to address all potential sources of air emissions based on the summary of operations provided. However, RWDI would require more detail on the emissions used in the modelling before being able to properly complete the peer review. In particular, the following information would be required:

- A source summary table showing
  - the calculated emission rate for pollutant from each source
  - The physical parameters associated with each source (i.e. location, dimensions, exhaust temperature, etc.)
  - The total site-wide emissions for each pollutant.
- Sample output files for Regulation 346 and AERMOD dispersion modelling runs.
- Sample emission calculation sheets demonstrating the application of assumptions and emission factors to develop the modelled emission rates.

1.3 Air Dispersion Modelling

RWDI would require a copy of the Regulation 346 model output files in order to properly review its acceptability. Note that if the Regulation 346 model is setup up in a similar format to the AERMOD model (i.e. one virtual source for all sources), the MOE may request that the sources may be articulated into more specific locations.

The AERMOD model considered the following parameters:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>RWDI Opinion</th>
</tr>
</thead>
<tbody>
<tr>
<td>MOE – supplied terrain data</td>
<td>Acceptable</td>
</tr>
<tr>
<td>Emission source parameters:</td>
<td></td>
</tr>
<tr>
<td>• 550 m x 550 m x 10 m pit</td>
<td></td>
</tr>
<tr>
<td>• Single emission point centred within source at a 4-metre depth</td>
<td>This appears to be a very coarse estimation of the emission sources. It also may result in AERMOD under-predicting concentrations, since most of the sources are expected to be at or near the active face. For example, the most southerly residence is approximately 350</td>
</tr>
<tr>
<td>Parameter</td>
<td>RWDI Opinion</td>
</tr>
<tr>
<td>--------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>metres from the Asphalt Plant Processing area but more than 750 metres</td>
<td>It is recommended modelled sources be located as realistically as possible to</td>
</tr>
<tr>
<td>from the centre of the pit expansion. <em>(See Figure 1).</em></td>
<td>the worst-case planned locations.</td>
</tr>
<tr>
<td>• Paved roads modelled as 5 straight-line segments following expected</td>
<td>Adequate based on information provided.</td>
</tr>
<tr>
<td>routes</td>
<td></td>
</tr>
<tr>
<td>• Unpaved road as straight-line segments, following the edge of the</td>
<td>Adequate based on information provided.</td>
</tr>
<tr>
<td>quarry face and into the quarry.</td>
<td></td>
</tr>
<tr>
<td>• Land-use classification: FOREST</td>
<td>Adequate given surrounding land use</td>
</tr>
<tr>
<td>• Met Data: 5 – year met data from Environment Canada</td>
<td>Acceptable, although we believe the source of the data is actually prepared</td>
</tr>
<tr>
<td>• Concentrations compared against December 2005 Standards and Texas /</td>
<td>by the “Ontario MOE Environmental Monitoring and Reporting Branch” – CTI to</td>
</tr>
<tr>
<td>Michigan Limits</td>
<td>confirm.</td>
</tr>
</tbody>
</table>
1.4 Interpretation of Air Dispersion Modelling Results

Since the publication of the Air Quality report, new standards have been released from the Ministry of the Environment regarding the acceptable concentrations of pollutants. As a result, RWDI recommends a new Table 1 with the following edits:

<table>
<thead>
<tr>
<th>Contaminant</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-pentene</td>
<td>½-hour MOE Jurisdictional Screening Limit = 108 µg/m³</td>
</tr>
<tr>
<td>2-methyl-1-pentene</td>
<td>½-hour MOE Jurisdictional Screening Limit = 318 µg/m³</td>
</tr>
<tr>
<td>n-butane</td>
<td>½-hour MOE Jurisdictional Screening Limit = 22,800 µg/m³</td>
</tr>
<tr>
<td>Carbon dioxide</td>
<td>½-hour MOE Jurisdictional Screening Limit = 63,00 µg/m³, Maximum % = POI Limit = 33%, based on new limit</td>
</tr>
<tr>
<td>Ethylene</td>
<td>AAQC = 40 µg/m³, Maximum % = POI Limit = 11%, based on new limit</td>
</tr>
</tbody>
</table>

The new standards do not appear to affect the overall outcome of the air quality assessment.
1.4.1 Section 5.3.2 – AERMOD Model

This sub-section cannot be supported without more detail. In particular, we would require a review of the AERMOD output file to confirm that the modelling that was actually performed accurately reflects the assumptions that are outlined in the report.

Also, it is not clear from the report whether meteorological anomalies were removed from the model, as is recommended in the Ministry of the Environment’s “Air Dispersion Modelling Guideline for Ontario”: (Section 3.7).

1.5 Conclusions

Provided that the modelling has been done correctly, the conclusions of the air quality assessment appear to be appropriate. RWDI recommends one point of clarification on the interpretation of the regulations and guidelines governing the assessment of air quality impacts:

We understand that two models were run for TSP:

- All stationary sources that require approval under Regulation 419 (i.e. HMA and RMC plant operations) using the MOE’s Regulation 346 model; and
- All stationary and fugitive emissions (HMA, RMC, blasting, roadway dust, wind erosion) using AERMOD.

What is inferred but not directly stated in the CTI report is that the AERMOD modelling is intended to evaluate the potential for an adverse effect to be reported at nearby residences. The AERMOD modelling that was conducted for the facility indicates that exceedences of AAQC’s could occur at the property line.

However, we expect that the AERMOD modelling that was conducted was not intended to be included in the application. Rather, it is presented for illustration purposes in the interest of due diligence. In this regard, the AERMOD modelling results demonstrate an important fact: that the measures listed in the BMP are necessary to ensure that the facility expansion does not cause an adverse effect on the environment.

However, we do note that if the facility was modelled following an approach that was more representative of a worst-case scenario, it may be shown that MOE Limits may in fact be exceeded without more aggressive control measures.

1.6 Additional comments on Appendices

1.6.1 Appendix A – Emission Rate Calculation Assumptions

- A.2.5 RMC Truck Loading:
  * No documentation (photos) available to determine the applicability of 50% control assumption for the fabric sock used in the drop zone between the weigh hopper and the truck.

- A.4.1.1 Paved Road Dust:
  * The 80% reduction factor associated with use of water or other dust suppression is a reasonable estimate for unpaved roads, but high for the paved sections based on our past experience. Supporting details regarding quantities water/dust suppressant, frequency of application and the approach to control dust on both paved and unpaved routes are needed to justify this assumption.
Also, the 2005 documentation from the Michigan DEQ should be provided for review.

* The silt loading value for (8.8 g/m²) paved roads used by the hot mix asphalt trucks is very low compared to what is recommended in AP42 Chapter 13.2.1 (76-193 g/m²). CTI refers to professional judgement for the lower value. However, more documentation (e.g., site-specific road surface sampling or at least samples from other similar sites) is desired to support this judgement.

- A.4.1.2 Unpaved Roads:
  * The average vehicle weight of 15 tons seems low, considering that many highway aggregate haul trucks have a payload in excess of 30 tonnes, and rock trucks that haul from the face to the plant are likely to have an even larger payload. This requires some commentary from the quarry operators.

### 1.6.2 Appendix B – Dust Management Plan Summary

There is insufficient information in this summary to determine if the Dust Management Plan will be sufficient prevent an adverse effect. The MOE typically requires a more detailed Dust Management Plan that demonstrates that the facility’s mitigation measures will be adequate for the size of the facility.

Some of the questions that should be answered by the Dust Management Plan are the following:

1. What is the capacity of the watering system to be used in controlling dust on 300 m of unpaved road and 700 m of paved road? Will it be sufficient?
2. Since all operations appear to be at least 300 metres away from sensitive receptors, does this mean that dust-suppressing devices will not be used on site? This may not be appropriate, since the modelling assumed that dust suppression was in place.
3. What are the deciding factors for watering?
4. What are the minimum property line setbacks for operations around stockpiles (loading of trucks) and at the plant (truck unloading, crushing/screening/transfers/stockpiling) and any other operations that may be moveable in the life of the operations?
5. What is the capacity of the watering system to be used in controlling dust from the 450 tonnes/hour crushing plant? Will it be sufficient?
6. What speed limit will be set to minimize paved/unpaved road emissions?
7. What is the implementation schedule and Dust Management Plan?
8. What monitoring program is planned for the site, if any?
9. Is there a complaint-response procedure?

### 2 ACOUSTIC REPORT

Below is a summary of the current findings for the Acoustic Assessment completed by Hugh Williamson and dated November 15, 2007.

Below is a list of our findings based on the information provided to date:

- Source sound power levels (PWL) seem reasonable and within range of observed PWLs by RWDI for Quarries, Asphalt Plants, Ready-Mix Concrete Plants, washing and screening plants.
The list of sources is consistent with equipment observed to be significant at Quarries, Asphalt Plants, Ready-Mix Concrete Plants observed by RWDI personnel.

Assigning of tonal penalties seems appropriate

Use of overall sound levels (vs. spectral data) and 500 Hz calculation parameters are acceptable, per ISO 9613-2, but may be under-predicting noise impacts for sources with more significant low frequency noise (e.g. vehicles, asphalt plant, etc.).

Receptor selection seems appropriate

However, to ensure a thorough review of the report, RWDI requests that a number of assumptions be clarified and documented. The following is a list of clarifications required to complete the assessment:

Source locations of portable equipment (e.g. Crushing Plant, Rock Drill, On-site truck movements, etc...) are not clear in FigureA1.3. Based on information provided in the Appendix 2, source locations were determined to be worst-case locations for each receptor, and not a worst-case location for each phase. **We request confirmation of this assumption.**

Overall facility noise impacts seem excessively conservative. Based on a review of the results, worst-case impacts are combined for each receptor. However, phases that do not overlap have noise impacts included. For example, “Table A2.8 Combined Noise Sources, All Operations Simultaneous – Worst Case” R1 impacts indicate a worst-case Crushing impact of 42.1 dBA, which is consistent with Phase 1B of the expansion. The noise impact of 42.4 dBA for the Rock Drilling is included from Phase 2A, 3A, 4A and 5A, which are unlikely to coincide with Phase 1B of the expansion. **Please confirm that a worst-case source impact has been applied independent of phase overlaps.**

A discussion of blasting should be included to justify its exclusion from the acoustic assessment.

Clarification is required regarding the base elevation for the Asphalt Plant. Detailed noise modelling in Appendix 2 indicates a ground elevation of 140 m. However, Figure A1.3 indicates a ground elevation of 125 m.

A discussion of working face noise should be included to justify exclusion of rock truck and loader noise when in close proximity to receptors.

Justification should be provided for the exclusion of on-site haul route noise (e.g. from working face to crusher, product sales, asphalt product, cement product, etc.) for areas in the perimeter of the quarry (i.e. near residences).

On-site truck traffic appears to be modelled as a single point source, and assumed to represent truck traffic in the general area of the operating equipment. This is a reasonable assumption. However, if other on-site haul route noise is considered significant (e.g. from working face to crusher, product sales, asphalt product, cement product, etc.), the haul routes should be modelled as line sources to accurately represent any significant on-site haul route impacts.

The assumption of 12.5% and 25% of “time for truck movement” seems reasonable, but should have a justification for these assumptions (i.e. Number of trucks/hour, etc...)

Clarification is required for the inclusion of the Night-Time Loading Noise indicated in Section 3 – Noise Source Summary. The detailed noise calculations in Appendix 2 currently do not indicate any analysis of loader noise (61.5 dBA at 90 m) independent of other operations (e.g. Crushing Plant, Asphalt Plant, etc.). It is not clear where the loader noise is included in the night...
operation noise impacts shown in Tables A2.12 and A2.13. A description on the inclusion of loaders for the night operation calculations is required.

- It is not clear the reasoning for excluding Detailed Sound Level Predictions for Crushing Operations for Phase 1A of the expansion. Justification for this assumption should be provided.

- The Lift B (125 m floor elevation) detailed sound level calculations show shorter separation distances to the receptor than the equivalent calculation for Lift A (133 m floor elevation) for the Rock Drill. Please clarify this modelling assumption (currently, the noise modelling implies that the source locations for the higher floor elevations (Lift A) are further from receptors than the lower floor elevations (Lift B)).

- In the copy of the report received, tables show unmitigated noise impacts, potential compliance issues, and mitigated and unmitigated sound level predictions. A summary table showing the combined impacts of all mitigated sources in comparison to the guideline limits is required. A numerical justification of compliance should be shown.

3 CONCLUSION

In this correspondence, RWDI has requested clarification and supplemental information to ensure that a thorough review is conducted prior to recommending to the Township that the acoustic and air quality analyses are adequate. We are available to update our review following the receipt of the additional information requested.

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.

Colin Welburn
Project Manager Specialist

Marcus Li
Senior Technical Coordinator