



April 8, 2013

Cuesta Planning Consultants Inc.
978 First Avenue West
Owen Sound, ON N4K 4K5

Attn: Mr. Michael Davis

**Re: Peer Review, Acoustical Study
Hidden Quarry
Novus Project No. 12-0258**

Novus Environmental was retained by Cuesta Planning Consultants Inc. on behalf of the Township of Guelph/Eramosa to conduct a peer review of the noise and vibration assessment work conducted for the proposed James Dick Construction Ltd. "Hidden Quarry", to be located in Rockwood, Ontario. This letter presents the results of our findings.

In conducting our assessment the following information have been reviewed:

- "Noise Impact Study, Project 11007, Hidden Quarry, Rockwood Ontario" prepared by Aercoustics Engineering Ltd. (AEL), dated November 19, 2012;
- "Blast Impact Analysis, James Dick Hidden Quarry", prepared by Explotech Engineering Ltd. (Explotech), dated November 19, 2012;
- Ministry of the Environment (MOE) Publication NPC-205 noise guidelines for semi-rural areas;
- MOE Publication NPC-232 noise guidelines for rural areas;
- Township of Guelph/Eramosa Noise Bylaw 5001-05;
- County of Wellington Official Plan, 1999 (Last Revision February 24, 2011);
- Correspondence with Mr. David Grant, Aercoustics Engineering Ltd.; and
- A site visit to the area of the proposed quarry.

novusenv.com

Atmospheric Sciences | Acoustics | Human Health

Novus Environmental Inc. | Research Park Centre, 150 Research Lane, Suite 105, Guelph, Ontario, Canada N1G 4T2
e-mail info@novusenv.com | tel 226.706.8080 | fax 226.706.8081

1.0 Aercoustics Noise Impact Assessment

We have reviewed the noise impact assessment prepared by AEL, and in general, are satisfied with the approaches taken. However, we do have some comments and concerns with the analysis and conclusions.

1.1 Criteria

Novus is in agreement with the criteria selected. MOE Publication NPC-205 “Class 2” and NPC-232 “Class 3” limits apply to the residences in the area, as outlined in **Table 1** of the AEL report.

Receptor-specific limits for residences along Highway 7 were developed, based on road traffic noise modelling, for receptors R2, R10, R14, and R16. While the report states on Page 4 that sample calculations are provided in Appendix C, the copy of the report provided does not include this information. AEL provided this information via email, and Novus is in agreement with the guideline limits proposed.

1.2 Receptor Height

Page 6 of the AEL report notes that a receptor height of 1.5 m was used in the assessment. This is inconsistent with both MOE NPC-205 and NPC2-232 noise guidelines.

NPC-205 defines the point of reception as “any point on the premises of a person where sound or vibration originating from other than those premises is received.” NPC-232 defines it as any “point on the premises of a person within 30 m of a dwelling or a camping area, where sound or vibration originating from other than those premises is received.”

The guidelines do not distinguish between “daytime” receptors and “night-time” receptors”. Under the definitions, points of reception include first storey windows, upper-storey bedroom windows, and ground level outdoor amenity areas within 30 m of the residence. It is important that upper storey bedroom windows be included in the analysis, as these locations receive less acoustical screening (mitigation) from berms and noise barriers, and thus can experience higher sound levels. These receptor locations are typically modelled at a 4.5 m receptor height for second-storey windows.

MOE Publication LU-131 – *Noise Criteria for Land Use Planning* is often used as a justification for using lower receptor heights. While LU-131 does identify daytime and night-time points of reception separately, it does not apply to the on-going permitting of operations at the proposed quarry, which must meet NPC-205 and NPC-232 requirements. The Ministry of the Environment has been consistently clear that “night-time” points of reception such as bedroom windows should also be investigated during daytime hours from a permitting perspective under NPC-205 and NPC-232. This was made explicit in the draft replacement NPC-300, which, while not in force, serves to illustrate the MOE’s position. In the draft guideline, which is a replacement for both LU-131 and NPC-205, no differentiation is made between daytime and night-time receptors.

This is a major issue with the AEL analysis, as receptor height plays a crucial role in the effectiveness of noise berms and barriers. However, many of the residences in the area are one storey, and therefore the conclusions of AEL analysis (that the facility will be in compliance) may be correct. This needs to be confirmed to ensure compliance with the guidelines. Based on a drive-by survey, the following receptor heights and locations should be used in the analysis:

Receptor Heights and Locations for Noise Impact Assessment

Receptor No.	Location	NPC Area Classification	No. Of Storeys	Receptor Height and Location Per NPC-205 / NPC-232
R1	Highway 7	Class 2	2	4.5 m at house; 1.5 m on property
R2	Highway 7	Class 2	1	1.5 m at house; 1.5 m on property
R3	6 th Line	Class 3	1	1.5 m at house; 1.5 m on property within 30 m of house
R4	6 th Line	Class 3	2	4.5 m at house; 1.5 m on property within 30 m of house
R5	6 th Line	Class 3	2	4.5 m at house; 1.5 m on property within 30 m of house
R6	7 th Line	Class 3	1	1.5 m at house; 1.5 m on property within 30 m of house
R7	7 th Line	Class 3	2	4.5 m at house; 1.5 m on property within 30 m of house
R8	7 th Line	Class 3	2	4.5 m at house; 1.5 m on property within 30 m of house
R9	7 th Line	Class 3	1	1.5 m at house; 1.5 m on property within 30 m of house
R10	Highway 7	Class 2	2	4.5 m at house; 1.5 m on property
R11	6 th Line	Class 3	1	1.5 m at house; 1.5 m on property within 30 m of house
R12	Highway 7	Class 2	1	1.5 m at house; 1.5 m on property
R13	Highway 7	Class 2	1	1.5 m at house; 1.5 m on property
R14	Highway 7	Class 2	1	1.5 m at house; 1.5 m on property
R15	5 th Line	Class 2	1	1.5 m at house; 1.5 m on property
R16	Highway 7	Class 2	1	1.5 m at house; 1.5 m on property
R17	5 th Line	Class 3	2	4.5 m at house; 1.5 m on property within 30 m of house
R18	5 th Line	Class 3	2	4.5 m at house; 1.5 m on property within 30 m of house
R19	6 th Line	Class 3	2	4.5 m at house; 1.5 m on property within 30 m of house

Recommendation – the AEL analysis needs to be updated to reflect the appropriate receptor heights, to ensure that the applicable Ministry of the Environment noise guideline limits are met.

1.3 Construction Activity

Novus is in agreement that noise from the “construction” aspects of the quarry operation, including stripping of overburden and rehabilitation, are exempt from NPC-205 and NPC-232 noise guideline limits.

Novus also agrees that the noise emissions from quarry equipment be restricted to meeting NPC-115 limits, as applicable. These restrictions should be listed in as part of the quarry’s operating plan.

The prohibitions of the Township of Guelph/Eramosa Noise Bylaw 5001/05 would also apply to noise emissions, and is not addressed in the AEL report. The bylaw requires that equipment be fitting with effective exhaust and/or intake muffling and be maintained in good working order.

Recommendation – an Acoustic Audit by an independent third-party contractor be conducted during the first year of operation of the quarry, to ensure that the noise emissions from facility equipment meet NPC-115 limits.

1.4 Noise Source Emission Rates

Novus has reviewed the source emission rates used in the noise modelling. The values are consistent with those typically used in these studies. It is uncertain if a tonal penalty has been applied to rock drilling noise. Noise emissions from this equipment is typically tonal in nature, and under MOE Publication NPC-104, a +5 dB tonal penalty would be applied to the assessment of impacts.

Recommendation

- ***AEL to confirm if tonal penalties should apply to rock drilling, or if a specific non-tonal drill type will be used.***
- ***Tonality should be confirmed through an Acoustic Audit***

1.5 Modelling Results

The modelling result provided in **Table 6** of the AEL report show the proposed quarry to be in compliance with the applicable guideline limits. However, these results are subject to the issues identified above (receptor height, guideline limits, tonality) and need to be updated.

The quarry will be excavated in several phases. The report does not indicate which phase was being assessed (or if the results are worst-case for all phases). The report does not indicate where source equipment is being located within the quarry for noise modelling purposes. Without this data, the accuracy of the noise modelling cannot be confirmed.

In addition, the tabular format of the data does not allow for compliance with NPC-232 to be confirmed for receptors removed from Highway 7. For these locations, the applicable limit needs to be met both at all points on the house, but also at all points at ground level within 30 m of the dwelling. This can be addressed through providing noise contours (isopleths of equal noise levels) of the noise modelling results. This can be easily accommodated using the Cadna/A noise model.

Recommendations

- *Update the results to address receptor height, guideline limits, etc., as discussed previously.*
- *Update the analysis to show impacts for various phases of the excavation. Ideally, provide the electronic Cadna/A noise model for peer review. Alternatively, provide drawings showing the location of modelled noise sources for each phase of excavation.*
- *Provide noise contours at a high of 1.5 m above grade to allow for confirmation of compliance with NPC-232.*
- *An Acoustic Audit by an independent third-party contractor be conducted during the first year of operation of the quarry, to ensure that the noise emissions from facility operations meet NPC-205 and NPC-232 limits.*

2.0 Explotech Vibration Report

Novus has reviewed the blasting vibration report produced by Explotech. We are in agreement with the guidelines used; the assessment techniques used; and with the general conclusions of the study.

We agree with the recommendations on Page 9 and Page 19 of the report, that blast monitoring should be used and that all blasts at the quarry be monitored at two locations. Novus further recommends that the blast record information be made available to the Township for its review in the presence of vibration complaints.

3.0 Conclusions

From our review, we conclude that:

- The Vibration Impact Assessment conducted by Explotech is adequate, and Novus agrees with the recommendations and conclusions. Novus further recommends that the blast record information be made available to the Township for its review in the presence of vibration complaints.
- The Noise Impact Assessment conducted by AEL has been reviewed. Novus is generally in agreement with the approach taken; however, several issues have been identified which will need to be addressed to ensure that the facility is in compliance with the applicable noise guideline limits.
- Novus recommended the following additional analysis be undertaken / additional information be provided by AEL:
 - Update the modelling to use 4.5 m receptor heights for daytime and night-time, in accordance with NPC-205 and NPC-232 requirements
 - Provide source locations used in the modelling for the extraction phases considered

- Provide noise contours at a 1.5 m and 4.5 m height for the various phases of extraction considered in the analysis, to allow for compliance with nPC-205 and NPC-232 to be confirmed.
 - Confirm if NPC-104 tonal penalties apply to the assessment of the rock drill
 - Ideally, provide the Cadna/A electronic noise modelling files for review
- Novus also recommends that a third party acoustical audit be conducted during the first year of operation. The audit would ensure that:
 - Noise emissions from the actual facility equipment meets NPC-115 requirements and are equal to or less than that used in the noise impact assessment;
 - The equipment is in good operating order, meeting the Township Noise Bylaw requirements;
 - The mitigation measures, including berms and barriers, outlined in the noise report are installed and in operation; and
 - The resulting noise impacts from facility operations are in compliance with NPC-205 and NPC-232 requirements.

Such acoustic audits are often agreed to as part of conditions of approval.

Should you have any questions or concerns, please feel free to contact us.

Sincerely,

Novus Environmental Inc.



R. L. Scott Penton, P.Eng
Principal

