

From: Katherine Hess

Sent: October 9, 2012 2:19 PM

To: Myles,Debra [CEAA]; kelly.mcgee**Cc:** DGR Review / Examen DFGP [CEAA]; kiza.francisGregory Kaminski; Kitty Ma

Subject: Fw: DGR: HC comment on proponent's reponse to noise IR (EIS-03-97)

Dear Debra and Kelly,

Health Canada was asked by CNSC to assess the sufficiency of the proponent's response to EIS-03-97 (Document # 608) for the Deep Geologic Repository project (CEAR #17520). Please find Health Canada's comment on this response in the table attached below.

Should you have any questions, please do not hesitate to contact Katherine Hess at
Thank you.

Katherine Hess

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IR#	Information Request	OPG Response	Health Canada Sufficiency Assessment of Response
EIS-03-97	<ul style="list-style-type: none"> • Provide an analysis of the quantitative uncertainties associated with the CadnaA Noise Model used to evaluate changes in noise levels. • Demonstrate how parametric changes (conservative assumptions) adequately address uncertainties. <p>Context: In Table 7.4.1-5, the anticipated changes in the noise levels at ecological receptor sites are evaluated using the CadnaA Noise Model. Uncertainties are addressed in Table 8.1.1-2 (Atmospheric Environment TSD) by stating, "Uncertainty associated with emissions is managed by making conservative assumptions".</p>	<p><i>The CadnaA Noise Model implemented the ISO 9613 prediction algorithms for outdoor propagation of sound. The prediction accuracy for the model is ±3 dB for distances up to 1,000 m. For distances greater than 1,000 m, the accuracy has not been established, but it is expected that the predicted levels will be higher than what will be experienced at the receptor locations.</i></p> <p><i>In predicting noise levels associated with the construction and operations of the DGR Project several assumptions were made that would result in conservative results. Specifically, the following assumptions would result in higher noise level predictions relative to what would be expected:</i></p> <ul style="list-style-type: none"> • <i>During the construction phases of the Project, all noise sources were assumed to operate simultaneously for a full hour, every hour. Equipment duty cycle was not considered in the analysis.</i> • <i>Construction noise sources were located in areas that would result in higher predicted noise levels at receptor locations.</i> • <i>During the operations phase of the Project, directivity effects were not included for most stack type sources.</i> • <i>Paved areas were considered to be perfectly reflective.</i> • <i>Any shielding provided by the significant amount of treed areas on-site was not taken into consideration when predicting noise levels at off-site points of reception.</i> 	<p>The response is acceptable. ISO 9613 is probably the most widely accepted propagation method in current use.</p> <p>A comment on perceptibility: Clause 7.8.2.3 in the March 2011 OPG's Deep Geologic Repository for L&ILW Environmental Impact Statement makes the following statement: "For the noise levels VEC, adverse effects were considered to be likely if the predicted noise levels resulted in a change from existing conditions that would be perceptible to humans [412]. An adverse effect was considered to be likely if the predicted noise levels exceed the quietest existing hourly noise levels by more than 3 dB."</p> <p>In a quiet environment, the 3 dB criterion may be acceptable. However, for most projects perceptibility of noise is expected and for this reason perceptibility is not normally used as a criterion in environmental assessments. Contrary to the statement in Clause 7.8.2.3, when the project noise exceeds the quietest existing hourly noise levels by 3 dB the project noise could actually be 23 dB or more above the threshold for perceptibility . At large distances, project noise can be masked by other noises, so that the project noise may effectively be not perceptible. ANSI S12.9 Part 4 clause A.1.3 (1) indicates that the degree of masking is difficult to determine unless the masking noise exceeds the project noise by at least 20 dB. This effect was observed recently in a paper by Pedersen, who found that the presence of road traffic sound did not decrease annoyance with wind turbine noise, except when A-weighted levels of road traffic sound exceeded the A-weighted level of wind turbine sound by at least 20 dB.</p> <p>References:</p> <p>ANSI 12.9 -2005/Part 4 Quantities and Procedures for Description and Measurement of Environmental Sound – Part 4: Noise Assessment and Prediction of Long-term Community Response.</p> <p>Eja Pedersen, E., van den Berg, F., Bakker, R., Can road traffic mask sound from wind turbines? Response to wind turbine sound at different levels of road traffic sound, .Energy Policy (2010), doi:10.1016/j.enpol.2010.01.001</p>