

Response to Comments on March 2006 Report, Acoustic Assessment, North Bala Small Hydro Project

Classification of the Community - We agree that the site can be treated as a Class 3 location with the following noise level criteria:

Time of Day	One Hour L_{eq} (dBA)
0700 - 1900	45 dBA
1900 - 2300	40 dBA
2300 – 0700	40 dBA

Noise Sources, Frequency Spectrum and Manufacturers' Data - The powerhouse contains noise sources such as the fan that forces air through the generator, noise from the turbine draft tube and in this case we plan to locate the transformer in the powerhouse. There will be no significant noise from the power electronic equipment in the powerhouse. While the equipment has not been procured at this time, we expect the powerhouse interior noise will be below 90 dBA. We make this estimate based on three similar powerhouses that we built recently. It is our intention that the powerhouse will be a windowless poured concrete “box” constructed with thick reinforced concrete walls. The Sound Transmission Class (STC) of an 8 inch thick dense concrete wall is 51 dB. This will bring the noise immediately outside the wall to something less than the ambient. The more significant noise source outside the powerhouse is the ventilation openings that we will be putting in the walls or the roof. We will estimate the sound power level of noise escaping through the openings. Where we anticipate a noise problem, we will orient the ventilation openings to avoid the sensitive receptors. If this is not possible, then we will use an acoustically treated ventilation hood at the openings. We will predict the noise outside the powerhouse using octave band data that we obtained from measurements inside one of the recently completed powerhouses mentioned above.

Ideally, noise predictions should usually be done using octave band data. This data will not be available from suppliers before the equipment has been procured, and even then it may not be available. For this reason, we are committing to a conservative style of powerhouse enclosure as described above. We are also required to take noise data after the plant has been completed, and we will be required to take additional noise control measures in the event that the predicted noise levels are not being obtained. Retrofit modification options would be an additional acoustic hood inside the powerhouse, or a duct silencer inside the powerhouse.

The report as written is a preliminary submission to the Ministry of the Environment and a more detailed submission will be prepared later as a part of the approvals process.

Air Leaving the Powerhouse - The air leaving the powerhouse will be warmer than the ambient air because it is transporting the small amount of generator losses as heat. The exhausted air will be from the powerhouse working space, and it will be no “hotter” than the air on the generator floor. The leaving air velocity will be modest and the term “blast” is alarmist and not appropriate.

Points of Reception - We have followed Ministry of the Environment guidelines regarding the identification of “Points of Reception” (POR). We note that an overlook and proposed stair access way are now being identified. While these are not PORs as defined by the Ministry (there will be no sleeping considerations, for instance), we will estimate the sound levels at the “Park” locations when the final submission to the Ministry is made. We will take suitable remedial measures if the daytime criteria levels are predicted to be exceeded. We will also re-visit the Stone Church and Purk’s Place issues and ensure that they are suitably protected from any noise that might otherwise escape from the powerhouse ventilation openings.

Vibration – There are normally no out of balance or impact forces originating from a hydroelectric plant. The Ministry does not ask for any ground vibration analysis. We do not believe there will be any ground vibrations at the property limits that could be detected by a human observer.