

MARINE ACOUSTIC ENVIRONMENT

Study geographic boundaries: Kitimat Arm, Douglas Channel and other areas within the CCAA.

Study time boundaries: Construction, operations and decommissioning phases.

Project works and activities considered in the study*: In-water infrastructure site preparation and construction, construction support vessels, in-water infrastructure operations, moored tankers, tanker and tug traffic.

Study methods: An acoustic study with both field and modeling components was performed to measure ambient noise levels. These studies measured underwater acoustic transmission loss (the rate at which noise levels decrease with distance from a source such as a vessel), and to identify vocalizations of wildlife species present in the area. Computer models were used to predict the extent of underwater noise produced by marine vessels associated with the project.

In autumn 2005, background underwater acoustic levels were measured at four sites within the CCAA. A variety of man-made, natural and biological sounds were captured during this study. Recorded sound levels covered a broad range and spanned low to higher frequencies.

VEC	Key Issues	KIR	Baseline Results	Measurable Parameter	Potential Project Effects**	Proposed Mitigation	Residual Effects	Cumulative Effects
Marine Acoustic Environment	Vessels moving through the CCAA will generate in-air sound that could potentially disturb marine animals.	Northern resident killer whale Canadian North Pacific humpback whale Steller sea lion	Background in-air noise levels are low, as expected in the BC wilderness – dense forest acts as an effective noise absorber.	In-air sound	In-air acoustic emissions from passing vessels were modeled. The models showed that in-air sound from vessels decreased in intensity quickly. Since audible noise would be restricted to a small area around a vessel and would only last for a brief time as a vessel passes, effects on marine life are expected to be highly localized and short-term.	Currently being assessed.	Currently being assessed.	Currently being assessed.
	Marine species, particularly marine mammals, rely heavily on the use of sounds for various life functions. They use sound to communicate and coordinate hunting, navigate (using echolocation), avoid predators, and detect prey. The introduction of anthropogenic sounds (sounds from human activities) therefore has the potential to disturb or even physically harm marine animals both directly and indirectly.	Northern resident killer whale Canadian North Pacific humpback whale Steller sea lion	Background in-water noise levels were measured near the Kitimat Terminal and were determined to be low. Underwater noise from passing vessels was also captured.	Underwater sound	Underwater sound will be produced by construction activities such as dredging and pile drilling and by operational activities, such as tankers moored on standby. Vessels moving through the CCAA will also generate underwater sound that could potentially result in disturbances to marine species. Given the anticipated frequency of vessels, their noise is expected to have little effect other than temporary avoidance of the immediate vicinity of the vessel by some marine life. Long-term effects, particularly cumulative underwater noise effects such as prolonged avoidance of important foraging areas, alteration of migratory routes, or increased energetic costs, are difficult to predict and are not well understood.	Currently being assessed.	Currently being assessed.	Currently being assessed.

*Refer to Figure 3.3 in section 3, Project description, for the full list of physical works and activities. **The effects of spills and malfunctions will be included in the update for the supplemental filing.