



**BC Centre for Disease Control**  
An agency of the Provincial Health Services Authority

25 May 2012

Dear Peter,

Thank you for sharing the reports regarding the Ajax Mine Project:

1. Detailed Noise Modelling Plan
2. Detailed Dispersion Modelling Plan

We have reviewed these documents briefly in the short turnaround time and present our initial comments here. A thorough review of these documents should involve experts in the environmental impact assessment and human health risk assessment of noise and air pollution.

The approach taken in these reports includes standard environmental impact assessment (EIA) methodology. There are a number of considerations that could be addressed to more thoroughly assess the potential impacts to air and noise and their effects on human health. There is no methodology in these plans for human health risk assessment. It is not clear from these reports whether this is meant to feed into a human health risk assessment. Our comments pertain to the assessment of both environmental impacts and human health impacts. We have limited our mention of health impacts to those directly relating to environmental impacts noise and air pollution, however, comprehensive health impact assessment should include other determinants of health that may be affected by the project. For example, industrial projects in other communities have been demonstrated to have a broad range of health-related effects such as increases in communicable diseases, substance abuse-related affects and social disruption.

Overall, in both plans the following should be considered:

- Include all sites: mine site, tailings storage facility, waste rock facilities in assessments of environmental impacts.
- Consider all phases of the project: construction, operation, decommissioning, and potential technological failures and natural disasters. These reports focus on construction and operations phases only.
- Include transportation effects in the local area (noise and air pollution) and those associated with transporting ore to distant sites (e.g. Port of Vancouver).



- Clearly state the inputs, outputs, methods and assumptions for all models. Limitations of interpretation should be transparent and where uncertainty exists, sensitivity analyses should be conducted.
- Outline potential mitigation measures and monitoring strategies for assessment of noise and air pollution during all phases of the project. For example, under worst case scenario air pollution episodes, would the mining operations be reduced to improve air quality? Given the proximity to a large population, it is reasonable to expect best available pollution control technologies across the multiple sources of noise and air emissions.
- Model human health effects during the EIA.
- Focus the predictions on parameters which are associated with health effects. Ensure that the impacts on a range of appropriate environmental parameters are predicted (i.e. those for which predictive models for health effects exist such as PM<sub>2.5</sub> for air) and that the population exposed includes both sensitive receptors and the general population. In these reports the exposure assessments do not include the entire range of environmental impacts that can be used to assess health outcomes and exposures are predicted for sensitive receptors but not the general population.
- Consider overlapping, additive and/or synergistic health effects of multiple environmental impacts on health (e.g. cardiovascular effects of air pollution and noise combined).
- Consider the baseline health status of the population which directly affects how the population will respond to environmental impacts.
- In addition to prediction of impacts on the community as it currently exist, predict health impacts under realistic future scenarios accounting for changes in community characteristics, geographic distribution of residential areas and changes to the built environment. This would include cumulative environmental effects associated with other activities in the area (e.g. increased pollutants in the air shed from increased personal, business and industrial traffic), changes in exposure scenarios (e.g. with community growth adjacent to the site) and changes in population susceptibility (e.g. with changing population dynamics). These plans account for changes in the mine activity over time, but not for changes in these other factors.
- Assess effects on workers and non-workers. It is not clear whether this is the purview of EIA, but should certainly be considered for a project of this nature.
- Estimate effects on population health mediated through noise and air pollutant effects on wildlife and country foods should be estimated.

In addition, the following comments are specific for each report.

In the report: Detailed Noise Modelling Plan the following should be taken into consideration:

All possible noise sources from the mine should be inventoried at all sites and phases of the project including all sites and transportation between sites and to Vancouver.

Baseline noise assessment should be based on multiple measures within a statistically robust sampling frame. This should include measures of noise at multiple sites during test blasts at the site. The highest noise periods should be predicted based on models over the entire period and grounded in empiric evidence from other similar sites.

Consider modeling under various operation and mitigation scenarios as well as worst case scenario.

Methodology for estimates of “% highly annoyed” is not stated.

Adequate literature review of health risks of noise exposure should be included in assessment.

Reference to municipal noise by-laws

Discussion of the rationale for health protection basis of guideline levels used, and where the guidelines are not health protective, then more stringent levels that are health protective should be used.

In the report Detailed Dispersion Modelling Plan the following should be considered:

Include emissions along transportation corridors, including transport of ore along major roads.

Chemical composition of the ore should be fully disclosed based on previous mining at this site and ore and multiple similar sites around the world. Chemists and geologists should be consulted to estimate the products of chemical reactions involved in mining operations and their associated air emissions.

Adequate evidence review of health impacts of air emissions should be conducted.

Model inputs should include baseline air monitoring adjacent to the site.

A thorough monitoring plan should be presented including monitoring pollutant hot spots in addition to the modelling at receptor sites.

This is a brief overview given an initial look at these documents. We advise more detailed review using the experts in air and noise impacts of large industrial projects.

Sincerely,



Catherine Elliott MD MHSc CCFP FRCPC(c)

Physician Epidemiologist

Environmental Health Services

National Collaborating Centre for Environmental Health