

Ajax Mine Application for Environmental Assessment Certificate/
Environmental Impact Statement

**Working Group Comments from
Interior Health – Health Protection**

This document contains a compilation of review comments from Interior Health – Health Protection on KGHM Ajax Mining Inc.'s (Proponent's) Application for an Environmental Assessment Certificate / Environmental Impact Statement. These comments are the "round one" Working Group comments from Interior Health.

For the purposes of documenting comments, EAO requires that the Proponent compile all written comments from Working Group members in a comment tracking table. The Proponent must provide responses to the Working Group submissions, in a table format or memo format as necessary. EAO reviews Working Group submissions to ensure that key issues in the environmental assessment are understood and addressed.

EAO's direction to the Proponent regarding Working Group comments is posted at http://a100.gov.bc.ca/appsdata/epic/html/deploy/epic_project_doc_list_362_r_com.html



Interior Health
Every person matters

March 3, 2016

Memo ID: 03/03_IHHP_Ajax45DayReview

Ms. Tracy James
Project Assessment Manager
BC Environmental Assessment Office
2nd Floor, 836 Yates Street
PO Box, 4926 Str. Prov. Govt.
Victoria, BC V8W 9V1

Dear Ms. James:

RE: Ajax Application, 45-Day Review Comments

This letter is provided as summary of our review to date of the KGHM AJAX Project proposal. It is intended to complement our specific comments submitted on the EAO Working Group Tracking Table referencing this Memo, ID: 03/03_IHHP_Ajax45DayReview.

The Interior Health's Infrastructure Program participates in and supports Environmental Assessment processes with local governments, industry and partner agencies to promote safe industry practice. We focus on the application of better management practices to promote healthy community environments. This work supports the BC Public Health Plan by improving stewardship of water, land and air through partnership. It also supports quality, evidence-based administration of the *Public Health Act* and *Drinking Water Protection Act* to prevent associated health hazards during subsequent project construction, operation, and decommissioning phases.

In consideration of the application submitted for review, we have the following comments and concerns:

1. The Application and Assumptions Within

The application, some 18,000 pages with multiple appendices, is highly technical and model-dependent with interconnected assumptions. These assumptions in some cases are reflections of goals and targets, rather than what can be referenced as accomplished in similar operations across the world. It must be understood that it is not within the role of Interior Health to contribute in design and drafting of an application of this nature. Furthermore, we can't be expected to identify all the missing technical elements, or present each and every question, or an answer to such, that may come forward. We expect full disclosure from the Proponent, and advocate for principles of better practice for a sustainable environment with a high regard for public health.

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2. Air Quality and Country Foods

The principle pathway of concern for public health exposures to hazardous substances for this project appears to be from potential airborne dust and particulate matter (PM). Every airshed has a capacity. Any increase in PM_{2.5} is known to negatively impact health, especially for those who are more vulnerable. The generation of some additional PM_{2.5} is unavoidable. Not so well understood is the projected performance at the site, as predictions are highly influenced by the assumed emission factors. Working group expertise indicates serious concerns around the performance expectations related to dust and PM retention at the site. The 0.1 factor presented in the application suggests that 90% of all emissions will be absorbed at the operation site; this is seen as extremely optimistic and a performance level not likely to be attained.

The proponent is unable to supply an example of a mine functioning to this level, and is non-committal on the specific operational procedure involved to achieve such. This is highly relevant, as air emission calculations and modelling are directly related to inhalation and country foods exposure predictions. Furthermore, due to the changes in factors such as humidity, precipitation, and wind direction/speed, the weight and intensity of particulate matter emissions are not equally distributed throughout the year, resulting in spikes of significant particulate matter emissions at times that might exceed 24-hour human exposure limits and potentially trigger air quality advisories.

Accepting the 0.1 factor of the application essentially demands that the proponent adhere to the 0.1 factor and the premise of an Adaptive Management Plan, this being that mitigation efforts be implemented if conditions are not met.

In case a decision is made by the Ministry of Environment to issue a certificate, it is our expectation that a proactive, rather than reactive, approach be built into the project. Interior Health promotes adherence to the Canadian Council of the Ministers of the Environment (CCME) Guidance of Continuous Improvement and Keeping-Clean-Areas-Clean through mitigation, in combination with opportunities to offset emissions through reduction of other sources in the airshed.

In the above regard, in addition to outlining the projected performance, it would be prudent for the proponent to define and commit to functions of offset. Specifically, a commitment by the proponent to implement factors of offset (e.g. through the Community Investment Program) for a performance outcome would respect the sensitivity of existing assumptions and uncertainties.

3. Environmental Monitoring and Proactive Adaptive Management

This proposal includes critical assumptions about potential air, water and land impacts. These assumptions should be supported by a specific plan for monitoring to confirm these assumptions, and to assess performance. Any monitoring regime should thoroughly cover all components of exposure: air, water, soil, country foods, and noise and vibration; it should also be flexible to focus on any aspects of deviation.

A public communication and information-sharing component is critical, and should involve a specific strategy for how monitoring results will be evaluated and communicated, and how any identified concerns will be addressed. The proposal should clearly articulate how the proponent will measure, and be accountable to those measures, to ensure early detection

and timely response to protect public health from direct (e.g. inhalation of particulate matter) or indirect (e.g. deposition and resultant exposure/uptake) exposures.

4. Emergency Response Planning and Preparation

Any mining activity poses some level of risk to public health from unforeseen failures in infrastructure or operation. These risks can be mitigated through deviation and emergency response planning. The proposal does not provide specific information on how emergency response plans for the site will integrate with community emergency response systems to ensure public health is protected. A project of this scale, in such proximity to an urban centre, should have explicit and detailed plans for how emergency response will ensure public health is protected in the unlikely event of a significant design or operational failure.

Summary

Issues of community safety and potential socio-economic impacts of the proposed project are outside the scope of our review. Interior Health acknowledges and supports the direct involvement of the local governments and communities in this review process. For example, it is our expectation that proper transportation safety infrastructure be planned for and put in place to prevent transport-related injuries. This aligns with the proponent's commitment to a Community Investment Program.

Interior Health looks to local communities, including the Secwepemc Nation and the City of Kamloops, as leaders in gauging the benefits of industrial proposals for their community members. Without clearly understanding the potential environmental health risks (including those discussed above) our local communities will not be able to fully consider the net benefits of this project.

Consistent with our program goals and Interior Health's commitment to healthy communities, any approval of this proposal should be subject to support from the affected stakeholder populations.

If you have any questions, please do not hesitate to contact me.

Sincerely,



Greg Baytalan
Specialist Environmental Health Officer

Att: Working Group Tracking Table

Environmental Assessment for the proposed Ajax Mine Project

WORKING GROUP ISSUES TRACKING TABLE

*Please refer to "Instructions" tab for directions

For Working Group Use						
ID #	Comment Date (i.e., 5-Feb-16)	Commenter Name/ Agency (i.e., John Smith, MEM)	Section of EA (i.e., 6.1.2)	Subject (i.e., Surface Water Quality)	Category of EA Comment	Comment (include Memo ID as applicable)
		Christina Yamada, IHA	2, 3	Environment, Health, Project Planning	Comment	Strongly recommend following Recommendations 1-4 of the Independent Expert Engineering Investigation and Review Panel - Report on Mount Polley Tailings Storage Facility Breach and clearly stating this. While it is apparent that Recommendation 1 has been followed, the rest is not as clear. These recommendations are industry better practice.
		Christina Yamada, IHA	17.12	Environment, Health, Project Planning	Comment	The description of the Adaptive Management Plan does not reflect the criticality of predictions regarding environmental effects and mitigation measures. The complexity of the project and receiving environments means the proponent must recognize uncertainties in the assessment and mitigation effects and develop a comprehensive Adaptive Management Plan.
		Christina Yamada, IHA	17.12	Environment, Health, Project Planning		The absence of a follow up programme for air quality does not reflect the need to verify the environmental assessment predictions for air quality are accurate, address air quality issues of public concern, verify effectiveness of mitigation measures or acknowledge the nature of the project. Please address is an follow-up programme for air quality.
		Christina Yamada, IHA	17.12	Environment, Health, Project Planning		Proponent has not identified EA predictions to test or any adaptive management options within the follow up programmes. Please revise.
		Christina Yamada, IHA	Table 17.6-7	Environment, Health		The interaction on Human Health VC from potential dam breach scenarios (Case #1 and Case #5) has been evaluated at "tertiary/minor interaction between failure mode and VC". This seems remarkable given Norwest Corporation identified the potential for loss of life for mine personnel working downstream of the embankments. Please revise the interaction on Human Health VC.
		Christina Yamada, IHA	11.16.3.2	Environment, Health		Proponent does not specifically describe how emergency response plans for the site will integrate with community emergency responses systems to ensure public health is protected in the unlikely event a significant failure occurs. It is our opinion this lack of specificity is inappropriate for a project of this scale, especially given the proximity to an urban center like Kamloops.
		Christina Yamada, IHA	10.2-13	Health, Domestic Water Quality		The proponent states "the magnitude of dustfall would also be too low to influence the water quality of a major river such as the Thompson River". Quantify the amount of dustfall and provide supporting data.

		Christina Yamada, IHA	10.2-13	Health, Domestic Water Quality		The assertion "treatment of the raw water from both water treatment facilities would remove suspended solids and further reduce the potential for Project-related metal-bearing dust to alter the quality of the Kamloops municipal water supply" needs supporting data.
		Christina Yamada, IHA	Appendix 10.4.A Section 3.3.2.4	Health		It is our expectation that when prioritizing water quality guidelines for screening the first priority is to use a combination of BC Water Quality Guidelines and Health Canada Guidelines for Canadian Drinking Water Quality. Where these two guidelines differ, the more conservative value should be used.
		Christina Yamada, IHA	Appendix 10.4.A Section 3.3.2.4	Health		When identifying which guidelines the COPC exceeded, please be specific. "exceeded the guideline for protection of drinking water" is not specific.
		Christina Yamada, IHA	10.2.4.1, Domestic Water Used for Human Drinking Water	Health, Human Health		Give consideration to the upcoming development of a health-based guideline for manganese in drinking water due to neurological development impacts. For more information refer to Health Canada's webpage for Water Quality - Current Consultations.
		Christina Yamada, IHA	10.4.2.3, Baseline Data - Domestic Water Quality	Health, Human Health		The proponent has eliminated the "occasional consumption of surface water during traditional or recreational activities" from the assessment. This is only acceptable if the proponent ensures there is no material change in the surface water quality (i.e., lake, river and creek).
		Christina Yamada, IHA	10.4.4.2, Effects on Human Health	Health, Human Health		(follow-up from previous comment) Unless the proponent demonstrates that there is no material change in the surface water quality (i.e., Jacko Lake), Recreational Receptors should also be evaluated for "occasional consumption of surface water during traditional or recreational activities".
		Christina Yamada, IHA	10.4.4.2, Effects on Human Health	Health, Human Health		The receptors do not include a mine worker who also lives in the area. While a worker's health and safety is typically covered by other legislation, a worker that lives in the area may be at higher risk of exposure to contaminants from the site and should be discussed in the assessment.
		Christina Yamada, IHA	10.4.4.2, Human Health Risks via Ingestion of Water	Health, Human Health		The proponent states "Water quality from the municipal distribution systems is not expected to be affected by the Project". This needs to be supported by data.
	1-Mar-16	Greg Baytalan, IHA	10.1.2.1 & 10.4.3.1	Air Quality	Clarification Required	Paragraph 5 of 10.1.2.1 describes the dominant winds as from North-Westerly in summer, and South, South-Easterly in winter, whereas paragraph 3 in 10.4.3.1 indicates a South-West prevailing wind in the summer. This should be clarified rather than having to search for this in later appendices or another report.
	2-Mar-16	Greg Baytalan, IHA	Section 4.4.3 Appendix 10.1-A	Air Quality	Clarification Required	The abbreviation SOC is not defined, and doesn't appear in the abbreviations definition section.
	2-Mar-16	Greg Baytalan, IHA	10.1.1.2	Air Quality	Clarification Required	Indicates that Ozone and Secondary PM2.5 will not be modelled, yet page 72 of Appendix 10.1-A describes that Ozone is consistently the greatest contributor to the AQHI, and page 74, that Ozone and NO2 dominate the AQHI in Kamloops.

	2-Mar-16	Greg Baytalan, IHA	Section 2.1, Appendix B, Appendix of Appendix 10.1-A	Water Quality and HHERA	Clarification Required	Water emissions to atmosphere limited to evaporation from storage facilities and wetted surfaces, example TSF and road surfaces. In that water will be recycled at the site, including introducing sewage wastewater into the recycle stream, what provisions will ensure adequate water quality for spraying in regard to the potential for airborne contaminants such as Legionella (primarily a worker issue, although there's report of person-to-person spread), and possible surface carry-over from vehicles to the wider environment?
	2-Mar-16	Greg Baytalan, IHA		Water Quality	Clarification Required	In relation to Category 1 and 2 Parameters (predicted to exceed BC aquatic, wildlife or livestock Guidelines), is there any parameters (Category 1, 2 or other) whereby the human Drinking Water Guideline or sensitivity is of lower value (less concentration) than that of aquatic, wildlife or livestock?
	2-Mar-16	Greg Baytalan, IHA		Water Quality	Clarification Required	Has the potential of Nitrate introduction into the environment from blasting residue been considered?
	2-Mar-16	Greg Baytalan, IHA		Air Quality	Clarification Required	The TSF is indicated to be 140 Ha; how much of this area will be submerged in water, and for the portion of the TSF not submerged, how much of the surface is expected to be dry, and is the 40% moisture area that is drying out considered wet, when in reality the top few cm may be very dry? As the goal is to get the tailings to ultimately dry out (seep to catchment and evaporate), will water be applied to the dry surface to keep dust down when perhaps the tailings slightly below the surface is near 40% moisture?
	3-Mar-16	Greg Baytalan, IHA		Air Quality & Noise & Vib.	Clarification Required	The closest facility (east mine rock storage) is approximately 1.4 km from Knutsford and 1.7 km from the neighbourhood in Aberdeen; is there any other mines known to be operating (or operated in the past) within such proximity to residential areas?
	3-Mar-16	Greg Baytalan, IHA		General	Provincial EA Information Requirement	In regard to haulage to the Port of Vancouver, has the Ministry of Highways, or GVRD had opportunity to comment?
	3-Mar-16	Greg Baytalan, IHA		General	Provincial EA Information Requirement	In regard to securing right-of-way for power lines, concern could occur from residents about the route and powerline infrastructure (tower size and power), and if large and in near proximity of people (residents, existing industry), such concerns should be taken into account long prior to securing right-of-way.
	3-Mar-16	Greg Baytalan, IHA		Permitting	Permitting Information Requirement	The Proponent should contact the local Environmental Health Officer regarding any applicable food service permitting under the Food Premises Regulation, and water supply system permitting under the Drinking Water Protection Regulation, including the approval of plans prior to facility construction. As per the Sewerage System Regulation, domestic style (toilets, showers, etc.) sewerage systems of a flow less than 22,700 litres per day require filing to the Health Authority; larger flow systems are to be vetted through the MOE process.
	3-Mar-16	Greg Baytalan, IHA	6.5.1, page 65	Air Quality	Clarification Required	In that the downtown Federal Building Air Station measured the 2014 annual average PM 2.5 at 9.1 µg/m³, how is it that the predicted annual average PM2.5 is indicated as 6.4 µg/m³. In that the variation is indicated to be +14%, are improvements intended to better localized downtown air quality?
	3-Mar-16	Greg Baytalan, IHA	6.5.5, page 71	Noise	Clarification Required	The updated Feb. 2016 meeting information on noise and vibration was far more explanatory than the information transferred in July 2015. However, the concluding sentence in this Noise and Vibration section indicates there to be no cumulative vibration effect. Why has noise been left out of this statement?

	3-Mar-16	Greg Baytalan, IHA	6.5.7, page 74	General	Comment	Mitigation is indicated to successfully alleviate traffic. In that 4 intersections were assessed, and that the Community Investment Program includes the ability for community improvements including road signage, the strategy for such mitigation should be geographically flexible and receptive to the potential impact area (well beyond that of the 4 intersections assessed).
	3-Mar-16	Greg Baytalan, IHA	4.4.2 of 10.4-A	HHERA	Clarification Required	Clarify what is meant by the last sentence ending at the top of page 4.81. Specifically, by only reporting the Future Case Lifetime Cancer Risks (not considering background), to thereby represent the increase in potential cancer risk due to the project only, has the combined background and Future (Project) Case, the actual exposure been left out of calculation/evaluation?
	3-Mar-16	Greg Baytalan, IHA		HHERA	Clarification Required	In relation to the different receptors (residential, Aboriginal, farmer/rancher, recreational), the mention of the rancher anticipated to eat 5 times more beef and consume surface or groundwater, and the 5 hrs/24 hrs recreational; can this be put into context with the farmer/rancher spending far more time than 5 hrs/24 hrs in the area, and the present closer-to-home diet (people, including city folks purchasing food produced closer-to-home).
	3-Mar-16	Greg Baytalan, IHA	Executive Summary	HHERA	Clarification Required	Recreational Receptor exposed to air, PM10 CR above 1 (1.4), for 1 day. To what certainty will this not to happen in other areas, and for possibly more than 1 day?
	3-Mar-16	Greg Baytalan, IHA	Executive Summary	HHERA	Provincial EA Information Requirement	Include exposure calculations based upon emission capture performance less than the 0.1 factor (10% release), example 20%, 30%, or greater release to the environment. A comparison table would be valuable.
	3-Mar-16	Greg Baytalan, IHA	Executive Summary	HHERA	Clarification Required	It is described that there's a 0.1% (Sahali), and 4.6% (downtown) increase in PM2.5 from the Baseline Case to the Future Case, yet elsewhere is indicated that the Project boundary and upper Aberdeen is to experience more impact than downtown from the Project (Application repeatedly concludes no impact from the Project downtown)? Does this not conclude that although described as not substantial, the air quality in downtown Kamloops is impacted, and in this example, more than upper Aberdeen?
	3-Mar-16	Greg Baytalan, IHA	Executive Summary	HHERA	Clarification Required	A CR >1 is indicated to reflect a >1:100,000 lifetime cancer risk for the farmer/rancher re arsenic in drinking water for the Project-Alone Case, yet the Application indicates predicted concentrations in water are below the Guidelines, and the predicted increase is negligible. Elaborate, and compare to projected farmer/rancher full daily intake of arsenic from all sources, Application Baseline and Project Case, ingestion, inhalation, including if the 0.1 factor is out.
	3-Mar-16	Greg Baytalan, IHA		HHERA, Country Foods	Provincial EA Information Requirement	Justify country food surrogates (example twigs or bark for berries), and establish representative sampling (foods and soil) and methodology (example moss bags) to adequately monitor and report. Initiating a baseline will enable trend analysis (stable, upward, downward).
	3-Mar-16	Greg Baytalan, IHA	Sec. 4.4.1 of 10.4-A	HHERA	Clarification Required	This section and as per unresolved discussion at the Feb. meeting, requires further clarity, as to Hazard Quotient (HQ) comparisons, benchmark applied, overall ingestion vs. individual ingestion, potential Project-related exposure compared to all-source exposure, etc.

	3-Mar-16	Greg Baytalan, IHA	Sec. 4.4.2 of 10.4-A	HHERA	Clarification Required	Some agencies use 1:100,000 others 1:1,000,000 acceptable cancer risk and the risk between these levels is considered indistinguishable from background. In that the population of Kamloops and immediate area is approximately 100,000, elaborate on what this may mean to the public. Perhaps an easy to read table according to differing site emission factor scenarios, and real-life comparisons would assist the public to put this in broader context.
	3-Mar-16	Greg Baytalan, IHA	Sec. 4.4.3.2 of 10.4-A	HHERA	Clarification Required	In that short-term recreational exposure to the inhalation of metals is not considered chronic and CR's were not established, what is the potential for airborne exposure in the recreational area to reach levels equivalent to where a worker would require Personal Protective Equipment (PPE), example for a 5 hour shift?
	3-Mar-16	Greg Baytalan, IHA	Sec. 4.4.3.5 of 10.4-A	HHERA	Clarification Required	Further explain the rationale why the Res. 2 well, although containing Arsenic < than the Res. 4 well background level, is not considered of concern for elevated Arsenic from the Project, when the Peterson Creek aquifer is at a lower elevation than the Project?
	3-Mar-16	Greg Baytalan, IHA	10.1.6.2	Air Quality	Clarification Required	The Project's proportion of the total effect on air quality is said to actually decrease relative to existing air quality (decrease in association with sporadic events, such as wildfires). Additional future industry will render a further relative decrease. It is difficult to see 25 years plus into the future, and some calculations, perhaps in Table form relating to airshed capacity (how much more industry can the Kamloops airshed handle) would be helpful.
	3-Mar-16	Greg Baytalan, IHA		TSF	Clarification Required	It has been explained that modelling an entire TSF collapse wasn't credible, as engineers couldn't figure out how 12 m water against a wall of this nature could breach to a Mount Polley scenario. Elaborate on this aspect in relation to the TSF banks of a 10 to 130 m height.
	3-Mar-16	Greg Baytalan, IHA		Pit	Clarification Required	With 520 m to the bottom of the Pit, and percolation and modelling done to 200 m, this leaves 320 m untested. Has this 320 m been explored, and if so what are the characteristics, and what is the potential for something unusual to be found, such as a vein of crystalline silica, or asbestos?
	3-Mar-16	Greg Baytalan, IHA		Pit	Clarification Required	During the Feb. 2016 meeting a question was asked about hydraulic pressure in the Pit due to the massive volume and depth of water within, the concern being possible seepage through fractures. It was explained that the Pit will be the path of least resistance, and no water will exit the Pit (other than evaporation), water will only flow into the Pit. Elaborate further on this; what will be the operating depth, associated pressures, and the capacity of the Pit wall structure (and the mountain) to hold back seepage, and support the load?
	3-Mar-16	Greg Baytalan, IHA		Application and Review Task	Comment	I highly suspect answers to many questions are within the Application somewhere, but the volume renders finding such a major chore. In respect of the dialogue leading to VC conclusions as being no appreciable impact from the Project, it would be helpful to have a Table outlining the items within the Application that point to a degree of negative impact, even though the final conclusion is no appreciable negative impact. This would greatly assist with the review task.

	3-Mar-16	Greg Baytalan, IHA		Review Process	Comment	Different approaches to review have been described and Working Group members have expressed concerns about the massive workload reviewing a project of this nature. As a "reviewer", if feedback is desired, I'd be happy to lend input; please contact me.)
	3-Mar-16	Greg Baytalan, IHA		Memo		See March 3, 2016 Memo, ID: 03/03_IHHP_Ajax45DayReview