

KGHM

INTERNATIONAL

A J A X P R O J E C T



Community Information Sessions

TRU Grand Hall • Sept. 9 to 12, 2013



Thank you. We're listening.

KGHM International wants to thank all who came to our recent Community Information Sessions at TRU's Grand Hall. The events, which took place over four days, were held to give you the chance to learn more about important environmental studies related to the proposed Ajax Mine, from the experts who are doing the research.

The many questions through the sessions show your interest and we hope the experts were able to help you better understand the long and involved environmental assessment process.

For those who missed the sessions, this booklet provides a complete summary of all the presentations, as well as the questions posed to our experts by those in the audience. Powerpoint slides used by the consultants have been posted on our website at www.ajaxmine.ca as well as videos of the presentations, which were filmed during the first session.

If you have outstanding questions about the studies being done as part of the Ajax Project's environmental assessment, email us at info@ajaxmine.ca, call us at 250-374-5446, or drop by our office at 330 Seymour St.

We look forward to hearing from you.

Sincerely,

A handwritten signature in black ink, appearing to read 'Yves Lacasse', written over a white background.

Yves Lacasse
External Affairs Manager



Blasting, Ground Vibration and Airblast

By FRANK CHIAPPETTA, BSc., MSc.
BLASTING ANALYSIS INTERNATIONAL

A house is the single largest investment most people make. Homes are people's castles, their safe havens, and blasting regulations today show respect for residences to unprecedented degree.

The USBM (United States Bureau of Mines) conducted extensive testing more than 30 years ago to analyze the effects of blasting on residential structures. That test continues to be the best study done. The results continue to influence blasting regulations, requirements and guidelines around

the world.

There are two kinds of energy produced by blasting – ground vibration and airblast. Both have potential to cause damage to structures.

Standards developed by the USBM study indicate drywall, which is the weakest structural component in any home, won't suffer damage from blasting unless ground vibration exceeds 20 mm/s. As long as the maximum vibration amplitude from a blast, measured next to the structure, remains below that limit, no damage is possible.

Airblast will begin to break single-pane glass windows when overpressure levels reach 150 dBL. The USBM guidelines stipulate blasting levels

NEXT PAGE

must not exceed 133dB for airblasts and must stay below 20 mm/s for ground vibration.

Airblasts can never produce a sonic boom, which is a special kind of sound pressure wave caused by the passage of an object through air at speeds greater than the speed of sound. Sonic booms can cause damage to buildings and seriously aggravate people.

The design of blasts today makes it possible to conduct blasting safely as little as 100 metres from houses, highways and sensitive natural environments.

In a blasting scenario, experts drill a series of side-by-side holes which are partially filled with explosives. In open-pit mines, the holes are typically 15 to 17 metres deep. The top four to six metres of the hole is plugged with inert material (stemming) to contain the blast. The series of holes are triggered one at a time in extremely quick succession, achieving the fragmentation of the rock required for mining purposes while minimizing blast impacts.

In Kamloops, it is likely the blasts from the Ajax operations will produce one mm/s of ground vibration in Aberdeen, which is two kilometres away. At 1,300 metres from the pit – the planned extent of residential development to the city’s south – the ground vibration will measure two mm/s, which is 10 times less than the threshold for damage to drywall. Airblasts will not exceed 120 dBL at Aberdeen and will not be noticed by more than 95 per cent of the local population.

A line of seismographs from the pit to Aberdeen will continually monitor ground vibration and overpressure, recording not only blasting vibration from mine activity but also vibration produced by natural seismic and weather activity.

Open-pit blasting at the proposed Ajax site poses little technical challenge because of the significant “buffer” distance between the pit and the closest homes.

Audience Q&A

Q: In Aberdeen, there are issues with ground water and soil stability. What effect will blasting at the Ajax Mine have on the stability of areas that are already prone to problems?

A: When it comes to blasting, at two kilometres from the proposed pit, Aberdeen is in the “far field.” It takes ground vibration levels of 50 mm/s to 250 mm/s to affect ground stability, even when the soil conditions are marginal. The predicted ground vibration from mine blasting at Aberdeen will be one to two mm/s. Other naturally occurring seismic events will have far more impact on ground stability than mine blasting. This kind of blasting does not present any kind of technical challenge.

Q: What happens when we have repeated blasting, let’s say every day for more than 20 years? Will there be cumulative effects from blasting that could damage people’s homes?

A: Studies have shown that as long as blasting is done at safe levels, the cumulative effects of blasting on structures is practically non-existent. At the levels predicted from the Ajax Mine, it would take 600 to 800 years of blasting to cause fatigue damage in drywall in a home.

Q: If the risk is so low, would you recommend that Ajax does not need insurance to protect against blasting damage?

A: It is always prudent to have insurance.

Q: What about the effects of blasting on fish at Jacko Lake?

A: I worked for seven years (1995 – 2002) as the principal blasting consultant on the widening of the Panama Canal, where we often blasted right at the water’s edge. We were closely watched by environmental agencies. We saw no dead fish nor effects on fish. Fish would return after the blasting.

NEXT PAGE

Q: A local engineering consultant's report (Golder and Associates) predicted significant effects from blasting on Kamloops residents and their homes, at distances more than 10 kilometres from the mine. Will Ajax conduct a full-scale test blast so residents can gauge what blasts will feel like?

A: *The Golder report was very misleading and technically incorrect. Mine blasting can never cause "sonic booms," which require an object to pass through air faster than the speed of sound. Supersonic jets or high-velocity rifle bullets are examples. The sound wave from blasting travels at the speed of sound, which is 331 metres/second. There will be no damage to Kamloops homes from airblast. As for test blasts, new mines always start with small blasts and work up to larger production blasts over time, always monitoring to see the effects. In my 40 years of experience, no mine ever tests with a full-scale production blast. You always start small and work up incrementally, to ensure compliance with United States Bureau of Mines (USBM) standards.*

Q: A report from Orica about a test blast conducted by Abacus uses a questionable model to extrapolate predictions about overpressure levels in Kamloops. Do you support the model used by Orica in analyzing the test blast?

A: *Overall the report is good but I did have questions about the model used to make predictions, and I disagree with that part of the Orica report.*

Q: What about the effect on ground stability close to the mine, especially in areas that will support the waste rock dumps? Could blasting cause geotechnical issues there?

A: *Studies will consider the geotechnical stability all around the mine. To affect the ground stability would require vibration from 50 to 250 mm/s.*

Q: What about the effects of blasting on the Kinder Morgan pipeline, which runs very close to Jacko Lake and the proposed pit?

A: *From Dan Ferriter, KGHMI's VP HSEC: We are in discussions with Kinder Morgan to move the pipeline.*

Q: What about dust from the blasting?

A: *The design of the holes will minimize dust. The top portion of the hole is filled with inert material – "stemming" that contains the effect of the explosive forces to the intended substrate.*

Q: What about storage of the explosives. How will that be done safely?

A: *Regulations govern all aspects of explosive storage, including how much explosive can be kept on hand and how far it must be stored from mine operations, people and buildings.*

Q: How do USBM standards compare to European standards?

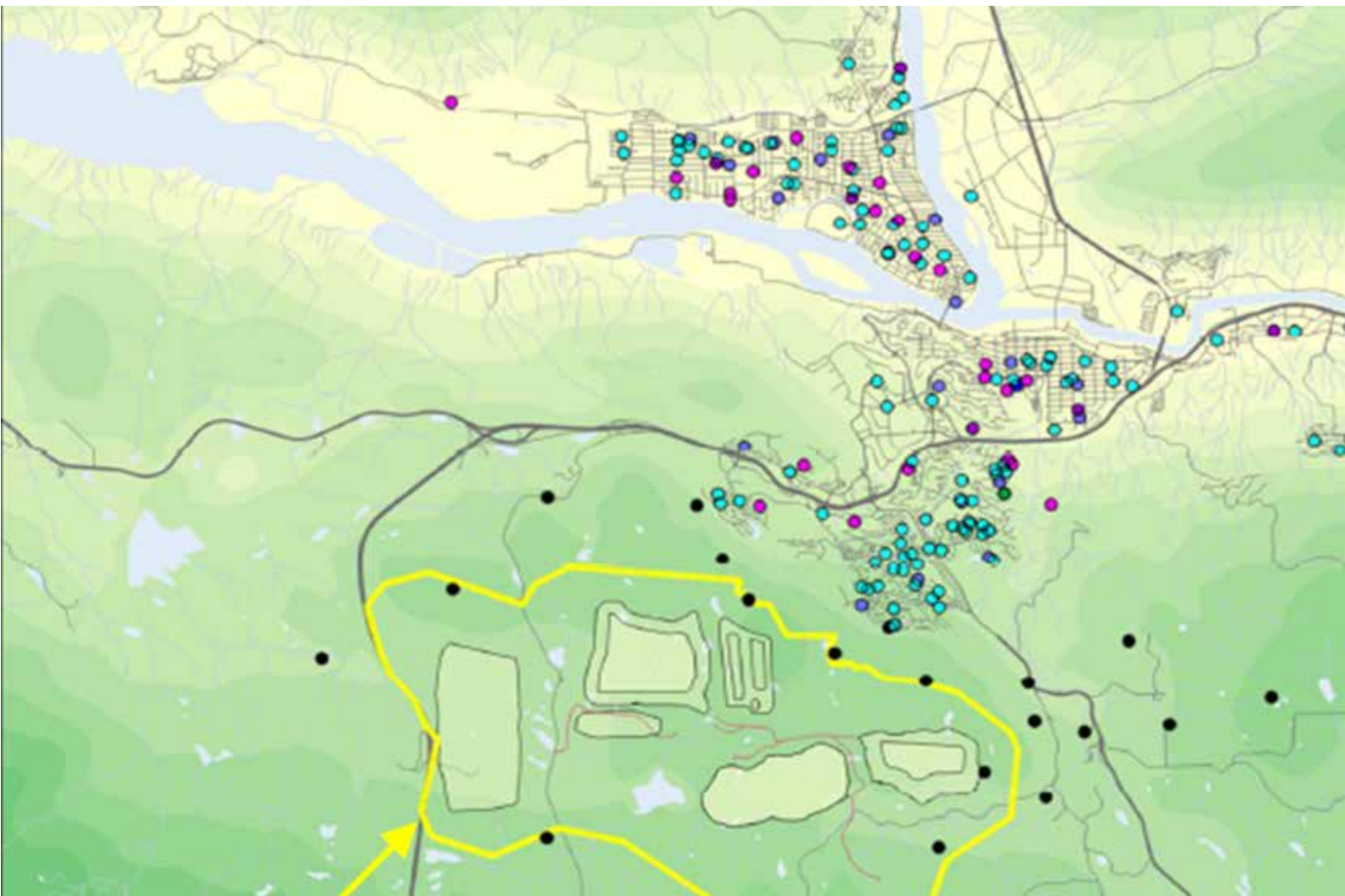
A: *Many of the international standards – in England, India, Germany, and countries in South America – are derived from USBM standards, which are considered to be the most comprehensive in the world.*

Q: What will be the size of the blasts?

A: *Operational plans have not yet been decided, but likely about 50 metres by 50 metres.*

Q: What kind of delay will be used when firing the holes?

A: *Likely between eight and 65 milliseconds between each hole. Each hole acts as a single "shot" and will not have cumulative effects.*



Noise and Vibration Modelling

By JONATHAN CHUI, STANTEC

Noise and vibration, both which arise from mining operations, will form key aspects of studies underway as part of the environmental assessment process. Both are equally important, and have the potential to affect City of Kamloops residents in nearby neighbourhoods, as well as the ecology (birds and animals) around the site of the proposed Ajax mine.

Three periods will be examined in the study, which represent potential “worst-case scenarios” for the creation of noise and vibration – construction phase, in Year One when the mine is being

built and in Year 14, the peak of production. All possible sources of noise and vibration, including traffic, mill operations and blasting, will be considered and included as part of the evaluation models.

Many “noise receptors” have been identified and will be used in the studies. The receptors are located around the mine and within city limits, including in the closest neighbourhoods to the proposed mine site.

Computer models – a standard way of studying these issues – will simulate the kinds and levels of noise and vibration likely to emanate from potential sources at the proposed mine site. The

NEXT PAGE

model is based on international standard in noise propagation prediction – ISO 9613.

Blasting will be a key focus of the studies. USBM and Ontario’s guidelines for air and ground vibration limits will be used as B.C. does not have its own guidelines. Two aspects of blasting vibration will be considered – ground movement and vibration caused by airblasts, or overpressure.

Air blast results in air pressure waves that can be physically felt, and in extreme cases can cause structural damage. The Ontario guidelines specify 120 dBL as the maximum allowable overblast pressure and 10 mm/s as the maximum for ground movement.

Both limits are well below levels that cause structural damage to buildings, or discomfort in humans. In fact, much of the air overpressure produced by blasting occurs at very low frequencies (below 20 hertz), which is out the audible range of most receptors.

Computer models have long been used to predict how noise propagates through air across distances. The models are tested against real data to ensure they accurately assess the intended effects.

Once the models are developed, values for noise and vibration for each of the receptors will be established. If the results indicate that estimated noise and vibration levels at a given reception point exceed limits, then mitigations can be suggested. Noise sources can be put into buildings, for example, moved further away or barriers can be installed. If required, a noise management will be implemented.

Audience Q&A

Q: How will the noise from the Ajax Mine operations compare to other kinds of noise in Kamloops, including trains, commercial truck brakes, airplanes and other sources?

A: *It depends on where you are in relation to*

the noise source. Ambient noise levels vary according to location, weather and time of day. Close to a railway, ambient noise levels could be about 60 to 70 dBA. (B.C. noise guidelines require industrial operations to maintain noise levels between 40 and 60 dBA depending on the time of day, population density and proximity to heavily travelled road or railway.)

Q: In Kamloops, it’s common to have “drainage” winds (that pull sound from one area to another). What affect will wind have on sound levels (from the mine)?

A: *The regulatory standards are set to minimize community annoyance from noise. We will consider weather effects when we model for noise.*

Q: At a layperson’s level, if you are sleeping in Aberdeen, will your sleep be disturbed by the noise from mine operations?

A: *People’s perceptions of noise and what disturbs them are extremely variable. Some people sleep through everything while others wake at the slightest disturbance. It’s hard to predict such things without knowing the full range of ambient sound sources and the particular sensitivities of individuals. However, the noise limit set in the BC OGC Noise Guideline is designed to minimize community annoyance.*

Q: You talk about mitigation – what is it and how do you do that?

A: *If the model indicates particular noise levels are too high, it’s possible to redesign aspects of the operation to reduce the noise levels. A building can be oriented in a different direction or moved further away. Engineered noise barrier or natural barrier (berms) can also be used to mitigate noise.*

Q: What about the effects of mine noise, especially blasting, on wildlife?

NEXT PAGE

A: There are specific studies being done as part of the environmental assessment that will examine the impact on wildlife.

Q: What about strong wind? Won't that carry the mine's noise even farther?

A: The assessment will consider downwind condition from the mine site. In the case of a very strong wind, the wind noise will increase the ambient noise level and potentially mask the mine noise.

Q: What about sound and vibration levels close to the mine and the pit? Will they be safe

for animals and people?

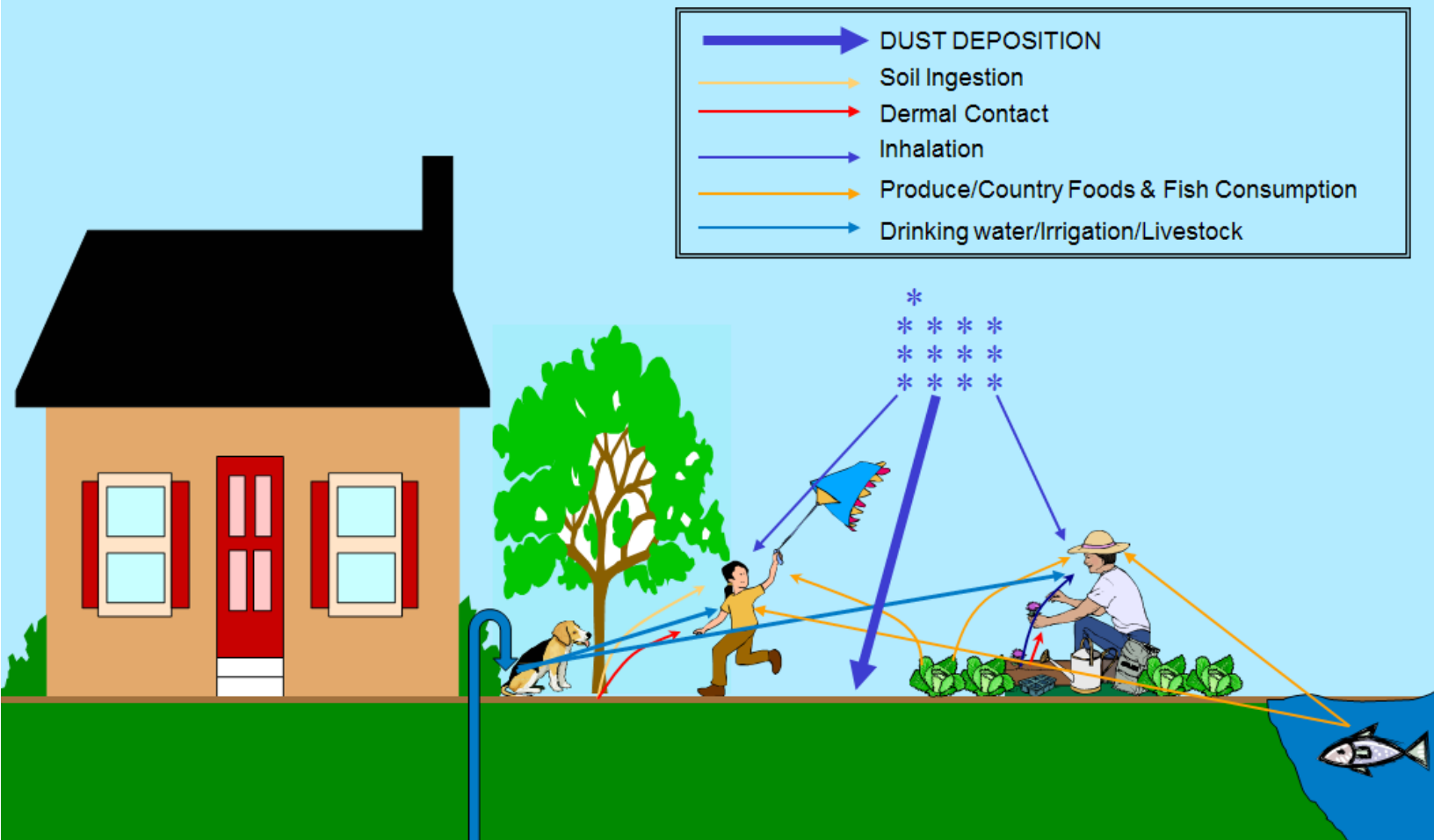
A: The mine will create appropriate safety blasting zones which will be cleared of people before a blast is done.

Q: When it comes to blasting, what about in the rest of Kamloops past Aberdeen? Will we hear it?

A: The "sound" will likely be below the audible range of human hearing in the more distant parts of Kamloops. People may perceive or sense the blast, but they will not necessarily hear it.



Sample Conceptual Site Model- Human Health



Human Health, Ecological Risk Assessment

By BRYAN LEECE, PHD
STANTEC

The purpose of the HHERA is to determine if the proposed Ajax Mine presents risks to human and/or ecological health, and if so, how big are the risks. The answers to those questions will inform regulators and the proponent about necessary steps needed to mitigate the risks.

The study criteria and processes are governed by federal and provincial guidelines and follow strict procedures outlined by international standards. The underlying models were developed by the U.S. Environmental Protection Agency.

The HHERA is a comprehensive look at potential sources of pollutants or toxins and the pathways by which they might enter the food chain or affect human and/or ecological health. Many HHERAs have been done in Canada or are underway, including the assessment of five coal mining projects and four copper-gold projects in B.C. and a mine in Nunavut.

The first step involves the complex task of “problem formulation,” or deciding what needs to be studied. Part of that task requires assessing the toxicological components that need to be examined, as well as the means by which people might come into contact with substances.

NEXT PAGE

This study will focus on five key “exposure pathways” – inhalation, soil contact, drinking water, produce consumption and country food consumption (including consumption of wild birds, fish, game, vegetation and traditional medicines).

The study will consider different receptor groups; people expected to have different levels of exposure. The groups are: City residents, First Nations, residents outside of Kamloops, and ranchers. Each of the receptor groups will be further subdivided into age ranges, with special consideration given to sensitive subgroups such as pregnant women or the elderly.

The study will first look at two time periods for direct exposures (soil contact, drinking water, backyard garden produce and country foods) – baseline conditions prior to the mine and modelled conditions once the mine ceases operation. Post-closure represents the worst-case scenario for this study, as the effects of exposure to substances on human health are typically cumulative.

If the modelling indicates post-closure levels are OK, there is no need to consider other stages of mine operations. If post-closure levels signify an issue, then the study will look at different phases of mine operation. Inhalation pathways, however, will consider all the operational phases.

When interpreting results, researchers will look for changes between baseline levels and levels in various phases of mine operation. Are changes in levels large or small? When weighing the potential impacts to human health, it is not exposure to substances that is significant but the size of the incremental changes from baseline conditions, and whether exposure exceeds Health Canada’s allowable limits.

Audience Q&A

Q: Canada’s standards for health assessments are different than elsewhere. Many places such as European countries have more comprehensive

processes. Should we not be doing a broader, more comprehensive Health Impact Assessment?

A: *The HHERA is just one component of the overall package of studies. Components such as the socioeconomic effects of the proposed mine are being considered by other studies. The overall assessment might not be called a Health Impact Assessment, but all the same work is being done.*

Q: Have mines ever been shut down if they are found to exceed estimates? Who will do the long-term monitoring?

A: *I’m not sure.*

Q: Why are uranium, chromium and manganese not on the list of substances to be studied?

A: *The list of substances to be studied is not yet complete. The regulator – not KGHMI – has final say over what must be studied. Criteria will be based on the likelihood the substance in question exists at the site in higher concentrations than what can be expected to be found in base levels in the earth’s crust. There is no flexibility – the regulators will decide what is to be studied or not.*

Q: I’m concerned about the release of lead from the mine, the proximity of the mine to schools and the effect of lead on children. Should we not measure lead levels in children now with blood tests and compare them later?

A: *Blood tests are usually only done in places where lead levels in soil are known to be elevated usually as a result of some industrial activity. The study will account for Health Canada’s allowable exposure limits for lead.*

Q: We heard recently from a physician from Salt Lake City who said even trace amounts of some elements escaping from open-pit mines cause serious health effects. Many Kamloops doctors are also adamantly opposed to open-pit

NEXT PAGE

operations close to Kamloops. Whom do we trust – doctors or scientists?

A: Salt Lake City is a much different community. There is a smelter and refinery there as well as an open-pit mine. Comparisons between the two centres are extremely difficult to make. Without seeing the Salt Lake City doctor's data, it's not possible to comment on his opinions.

Q: Is there a correlation between increases in exposure levels as a result of proximity to mines and increased rates of asthma or other diseases? It's hard to find figures on such things.

A: With regards to cancer rates, there is very good geographically based data, but it is often not possible

to tie those rates to specific substances. The government considers exposure to known carcinogens in any amount to be a health risk. Exposure levels to other substances that do not cause cancer, that are occurring below Health Canada's limits, are not considered a health risk.

Q: What about the links being continually established between exposure to PM 2.5 and mortality rates? The knowledge of such links is growing. What happens if the mine is approved and safe exposure levels later change? Will the mine be made to comply with standards if they change?

A: Regulators will decide what the applicable standards are.





Surface, Groundwater Quality & Quantity

By **HAMISH WEATHERLY** and
TREVOR CROZIER, BGC CONSULTING

Surface streams, lakes, groundwater sources and aquifers will be studied based on environmental assessment guidelines and regulations at both federal and provincial levels.

In particular, the studies will examine the Peterson Creek and Cherry Creek watersheds, as well as key aquifers in the area. Peterson Creek flows through the proposed mine site and eventually to the South Thompson River through Kamloops. Alkali Creek flows to Cherry Creek and then to Kamloops Lake.

The first part of the study involves measuring “baseline” conditions – the hydrologic conditions in place before mine development takes place. Of interest is the seasonal and annual variation in climate (e.g. precipitation, temperature, evaporation), stream flows and water quality. Groundwater baseline conditions will be established in similar fashion. It is important to establish baseline conditions throughout the project area, not only in the vicinity of the proposed mine.

The process of establishing baseline conditions is underway. The process will lead to an understanding of month-to-month and year-to-year variations in water quantity and quality in the

NEXT PAGE

study area.

Once baseline conditions are established, three models will be created: a “water balance model” that provides predictions of surface stream flows, a groundwater model that provides predictions of groundwater levels and flow directions and a water quality model that provides predictions of potential changes in water quality.

The three models will be calibrated to baseline conditions and will then be used to evaluate the potential changes in water quantity and quality from the proposed mine operations. Changes to both water quantity and quality can be predicted by the models both in the vicinity of the mine footprint and at various downstream locations. If the models suggest undesirable results from proposed mine activity, mitigation efforts can be developed and entered into the models, generating new results.

The models for both surface water and groundwater will consider existing users, including agricultural and industrial users. It will also consider those who depend on ground or surface water for domestic purposes, such as the City of Kamloops.

The results from the water studies will also help inform other studies, including the Human Health and Ecological Risk Assessment (HHERA), another of the key studies being performed as part of the environmental assessment.

Audience Q&A

Q: There are many underground streams in the area. How will you model and gather baseline information on underground stream levels?

A: We look at registered wells in the area (to assess ground water levels) and we will also consider the geology mapping and aquifer mapping available for the area. There will also be a groundwater monitoring well network established in the project area.

Q: There are known ground water issues in Aberdeen. The City has done many studies to assess the geotechnical issues in the Aberdeen area. Will you use the City of Kamloops’ information and data, and its models?

A: Yes. The assessment will consider all available data. The scope of the assessment will examine changes in water flow and pressure in ground water in the Aberdeen area. The results will be available to the City of Kamloops for review with its engineers.

Q: Computer models are only as good as the inputs and outputs. In mountainous areas, about 20 per cent of water input comes from fog. If you remove the trees, grass and shrubs from 40 km², you are removing a water input. That needs to be considered by your model.

A: Any open-pit mine has localized impact on water inputs, which will be accounted for in the models. Vegetation removal will be localized and not occur over an area of 40 km².

Q: What will KGHM do to insure no heavy metals enter Peterson Creek or the area’s aquifers?

A: Monitoring requirements for mining operations are typically imposed during the permitting stage of project review. Government agencies are tasked with ensuring compliance with monitoring requirements.

Q: Will there be a considerable volume of water taken from Kamloops Lake? We already have water temperature issues in the river. Reducing the volume, what will be the impact?

A: The water required for mine operation amounts to less than 0.5 per cent of the flow through Kamloops Lake during the winter low flow period.

Q: Are you modelling for how long it will take

NEXT PAGE

all that water to re-enter the soil? Will that affect ground water and soil stability?

A: The change in groundwater levels as a result of the project, including as a result of changes to the rate of infiltration of water to soils, will be considered as part of the water quantity and quality modeling for the EA. Geotechnical engineers would be provided with predicted changes in groundwater levels as a result of the project and would consider these changes in the context of soil and soil stability.

Q: What chemicals — especially from waste rock — will be picked up by rainfall and runoff and transferred to surface and ground water?

A: Runoff and infiltration from waste rock will be studied. Typically, if such runoff is predicted to be of unacceptable quality, then mitigation will be included in the project to collect it. Typical mitigation strategies include intercepting runoff using

collection ponds or monitoring groundwater quality and intercepting seepage-affected groundwater using interceptor wells.

Q: Is there a possibility that mine operations could improve the problematic groundwater conditions in Aberdeen?

A: Yes that is possibility.

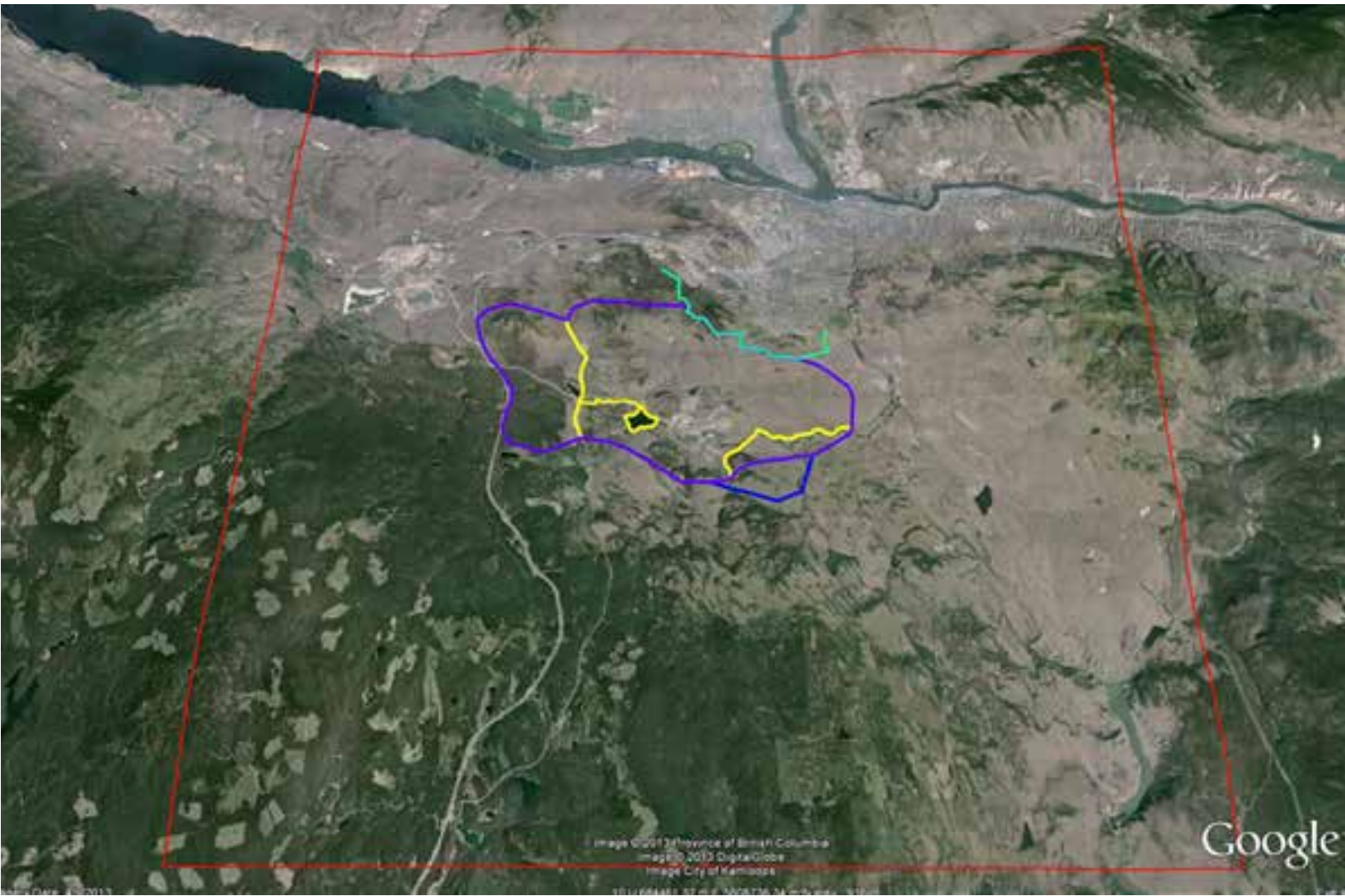
Q: Are you that confident that your modelling will work, especially over a 23-year period?

A: There is uncertainty in every study. The key is to recognize areas with high uncertainty. If there is high uncertainty, than you build in greater levels of safety in the design in those areas.

Q: Can you monitor real-time water data or are all your data based on historical records?

A: Data loggers have been installed in several locations to gather real-time data for this study.





Atmospheric Dispersion Modelling

By DAVID RANDALL, AIR SCIENCES INC.

This study will examine all of the potential effects on air quality posed by proposed mine operations, including dustfall and emissions. B.C.'s Ministry of Environment (MOE) has approved the plan of study.

As with other studies, federal and provincial guidelines mandate how research needs to be done. The final report, when finished, will include all of the technical data produced by the study, as well as all the information used to support the conclusions, including maps, climate models and climatic norms. The CALPUFF modeling system

is the ministry-approved refined core model that will be used for this study. There are two important modules in the CALPUFF modeling system – CALMET model, which predicts how air moves through an area and CALPUFF, which simulates how emissions disperse into the environment.

A 625-km² area encompassing most of the City of Kamloops will be studied. More than 190 “special receptors” have been identified for the study, including Royal Inland Hospital, 27 nearby residences, 21 elementary schools, six secondary schools, 110 daycare facilities and 23 retirement homes. Representative background concentrations (including natural background and concentrations

NEXT PAGE

due to emissions from other existing sources of emissions) and modelled pollutant concentrations will be generated for each of the receptors.

Three years of regional meteorological data from CALMET has been provided by the B.C. MOE as representative data for the study region. One of these years (2003) will be used in the modeling analysis. In this instance, the CALMET data files was generated using meteorological data sets from four near the study region, representative upper air data, and computer-generated estimates of detailed wind fields. CALPUFF will use the meteorological data and inputs of anticipated emissions of particulate matter (dust) and other substances of interest caused by proposed mine operations. Sources of emissions that will be examined include:

- Diesel exhaust from haul trucks and heavy equipment
- Dust from haul roads caused by traffic
- Dust from other sources, including conveyance and transfer points, pit operations and tailing storage facilities and waste rock management facilities.

The goal of the study is to capture the representative worst-case scenarios for air quality as a result of the proposed Ajax Mine. The primary construction year and maximum production year during operations will be the key years studied.

A key component of the study will be to examine dispersion of the very fine particles that bear potential to affect people's breathing (PM 2.5). Metal levels in dustfall will also be modelled. All aspects of the study will be subject to rigorous quality assurance/quality control procedures and independent peer review. Reporting will include digital files of the model inputs and outputs in an effort to allow for transparency of the dispersion modeling process and repeatability of producing the modeling results.

In addition, the report will include a discussion of the uncertainty of the modeling results due to the uncertainty in the model inputs and

the precision of model. Results from the analysis will be used to support decisions pertaining to levels of air pollution control at the project, permitting of the project, the assessment of risk in the Human Health and Ecological Risk Assessment, and other areas of interest.

Audience Q&A

Q: Kamloops is a unique place, with its own specific topography, air quality and climate. Will existing conditions be properly established?

A: Inputs to the computer models will consider Kamloops' unique features, including weather inversions and prevailing winds. In addition, background concentrations that are representative of the Kamloops area will be used to account for existing levels of air pollution (including natural background and air quality concentrations due to other existing sources).

Q: Has all the weather data (for the assessment) come from one location? The Kamloops Airport is often the source of weather information in Kamloops, but conditions there are different than other places, especially the city's higher elevation neighbourhoods.

A: The weather data come from numerous datasets provided by the government. The data used are not collected from a single weather station. There are data from four ground stations at different locations and elevations, as well as high-atmospheric data.

Q: Will the most recent version of CALPUFF, the dispersion modelling software, be used for this study? We've heard an older version will be used.

A: Regulatory standards require these kinds of assessments to use the most appropriate and recent version of the CALPUFF software. The B.C. MOE will approve the version of the model to be used. Older versions will not be used. CALPUFF has

NEXT PAGE

gone through many revisions since it was created, with each version addressing known “bugs,” adding new features, and/or providing improvements to its accuracy and predictive abilities.

Q: Are you using high-atmospheric measurements from Kelowna as the data for this study? Would that limit the accuracy of Kamloops’ modelling?

A: Upper air data from the Kelowna area were approved by B.C. MOE as one of the many sources of data used to prepare the CALMET meteorological data files. There are relatively few sources of upper-air weather data and it is common for upper air data from areas outside of the study region to be used in modeling analyses. Because of the nature of high-atmospheric weather, data from regional stations work well in these kinds of assessments.

Q: Isn’t the grid being used to model topographic effects on weather too large?

A: The study grid (identified in the Powerpoint) captures well the region’s unique and diverse topography. CALPUFF is a three-dimensional model that accounts for variations in elevation and terrain.

Q: When you use computer modelling, you must be aware of the calculated uncertainty. Will you guarantee that all results come with specific uncertainties calculated for each input value?

A: The sheer number of inputs being used would make such individual calculations daunting. But the final study will include a discussion of the uncertainty of the modeling results due to uncertainties in model inputs and the precision of the model.

The reporting of the uncertainty of the modeling results can be considered by regulatory agencies as they use modeling results to support their decisions.

Q: If pollution levels are exceeded, what will you do? Your (computer) results won’t be realistic, you can’t help it.

A: If applicable ambient air quality objectives (AAQO) levels are exceeded due to emissions from the project, mitigation efforts will be identified and implemented. Exceptional events (e.g., fires or regional dust storms), upset conditions at the project, or non-compliance with regulatory standards will be reported and operations adjusted as appropriate. The mine will be required to address and fix issues as expeditiously as possible.

Q: I understand that 2003 – one of the worst years for local air quality because of the bad wildfires in the region – is one of the years being used as a baseline for this study. How is that possible?

A: The regional meteorological data from CALMET for 2003 has been selected for this study. Background concentrations (that would include air quality impacts due to wildfire activity) are derived from many years of ambient air quality data that have been collected in the area.

Q: Will the effects of climate change be modeled?

A: No. Historical meteorological data (2003) and two emission scenarios for the project (construction and maximum year of operation) will be modeled.



Open Questions from the Audience

Q: Will a new Application for Information Requirements (AIR) be filed now that the mine has indicated it might change its plans?

A: *It's not yet known if a new AIR will be required.*

Q: When the original public comment period was happening, someone asked if KGHM has plans for a smelter? And some of the land at the Ajax site is already zoned for a smelter. Can we get a promise that Ajax will never ever build a smelter?

A: *From Dan Ferriter, KGHMI's VP HSEC: The process we are in is an environmental assessment for a proposed 23-year copper-gold mine with no smelter. KGHM has no plans for a smelter. Nor are we considering joint ventures with other companies for a smelter. We have no plans for a smelter.*

Q: What about down the road?

A: *We can't speculate about what might or might not happen decades from now. We have no plans for a smelter.*

Q: How about using data from similar mines in similar topographies in other parts of the world in these studies?

A: *We can't use data from other parts of the world. That information is not applicable here. Weather is extremely variable from place to place. It's not feasible to examine data from other places and extrapolate results here.*

Q: When will the study results start to be made available?

A: *Results of all the studies will be made public when KGHMI files its application for an environmental permit, which is expected in early 2015.*

Q: Will KGHM fund an independent and

complete hydrogeological study of the Thompson River upstream and downstream of the drinking water intake?

A: *BGC Consulting, an independent engineering firm, has been contracted to study surface and ground water studies in the area and model the effects of proposed mine operations. The results will form part of the company's application for an environmental permit.*

Q: Is KGHM willing and to accept the risk of geological catastrophic failure of the walls of the valley?

A: *Geotechnical studies are underway as part of the environmental assessment. KGHM is not willing to accept catastrophic failure of the walls of the valley.*

Q: Are the various regulation and thresholds for various parameters the same for all industries as they are for this proposal?

A: *Yes. Thresholds or allowable daily intakes apply to all industries across Canada. In provinces that have their own daily intakes (like Ontario), these provincial thresholds apply to all industries. Regulations differ between provinces but within a province the same regulations apply equally to all industries.*

Q: I am concerned that there may not be enough attention paid to conditions after mine operations (the pit, the waste rock piles and the tailings facilities). I am concerned about acids produced by weathering and oxidation of residual sulfides and other minerals. This might have long-term effects on groundwater.

A: *Work is underway to evaluate the potential long term quality of runoff and infiltration from pit walls, waste rock and tailings. This work includes studies to consider the potential for acid rock generation and metal leaching (ARD/ML) into closure and post-closure phases of the project.*