

Red Dog Mine Draft Risk Assessment Meeting with Kivalina Residents April 20, 2005 (1:55 p.m. to about 3:50 p.m.)

Questions and comments raised by attending residents of Kivalina on April 20, 2005 held at the Kivalina school gym regarding a summary of the upcoming presentation on the findings of the risk assessment of the fugitive dust issue from the port to the mine by Scott Shock.

28 adult residents attended. Some of the residents present were: Richard Sage (Vice Mayor), Austin Swan, Lucy Adams, Alice Adams, Myra Henry, Lulu Swan, Nelda Swan, Colleen Swan, Enoch Adams, Jr. and Dolly Foster.

Teck Cominco representative: Jim Kulas

Exponent presenter: Shock Shock

DEC attendees: Rich Sundet and Lindsay Smith

Kulas gave a brief overview of the risk assessment process and Shock later gave a slide presentation of the findings of the risk assessment.

Comment - When you performed the risk assessment, did you use the same assumptions regarding the types of subsistence foods used by residents for the various metals?

Response – Shock - We used information obtained from Kivalina and Noatak on the types of food used. We also used information from other studies on intake and toxicity.

Comment - You did not use some foods such as the bearded seal and shrimp in the risk assessment.

Response – Shock - We know that you eat a lot of seafood. We looked at metal concentrations in the sediment and water. Risk assessment involves two main parts. The first part is to look at concentrations in soil, water, and sediment samples and compare them with protective criteria established by the government. This is how we identify which chemicals to evaluate further in the rest of the risk assessment. In the marine environment, the concentrations of metals were low and were decreasing steadily over time and there is a significant decrease in concentrations as you move away from the shiploader. The concentrations were all below the protective screening criteria, so there were no chemicals identified for the marine environment, and no further analysis needed to be done at this time.

Comment - I saw on the videotape of the dust from the barges going into the ocean water.

Response - Shock - I will talk about the marine environment soon.

Comment - When was the sediment sampled.

Response - Shock- I will talk about that now.

Comment - Did you compare the 2004 data to the earlier sampled sediment data?

Response - Shock- Yes (Shock then further described those sampling concentrations). We also collected the sediment samples from the surface because that is where the organisms live such as crabs.

Comment - In the years past before the ship improvements, did the metals sink or what happened to the metals that went into the ocean?

Response – Shock - It is a dynamic environment along the ocean. So through wind, waves, and ocean currents, the metals dissipate and concentrations diminish farther away from the port.

Comment - How long does it take for the metals to sink and how far can the metals migrate?

Response – Shock - We don't know how long it takes for the metals to sink, but the metals dissipate by wind, waves, and ocean currents. [**Additional Note:** Concentrations in sediment decrease with distance away from the shiploader, and are mostly near background levels at the edge of the sampling grid at the port.]

Comment - Does anything happen to the animals in the ocean prior to the metals dispersing in the water or sediment? For example, is the water cloudy?

Response – Kulas - The videotape indicated that some metal was floating near the shiploader on a very windy day. We know the metals do settle and in the early days the levels of metals in the sediment were higher. We never saw cloudy water though. (Kulas then explained the improvements to the offloading system to the barges).

Comment - Has there been a decision to expand the port?

Response – Kulas - There has been no decision. Before the decision is made, Kivalina should be consulted. The U.S. Army Corps of Engineers (COE) and the State are evaluating the port expansion possibility. An environmental impact statement (EIS) is expected to be done this year and needs public input. However, they have not yet solicited for comments. The Northwest Borough and NANA, and Arctic Slope Regional Corp. is in favor of port expansion provided the studies don't show a problem.

Comment - I understand that the benefits provided would be to Red Dog Mine.

Response- Kulas - Yes. However, we would not build it only for ourselves because we have found it too costly, but other entities such as the city of Noatak and NANA Corp. want the port expansion.

Comment - The reason why I asked how deep the sediment samples at the port were collected at is if the port is expanded, will that be an issue.

Response – Shock - The EIS would address this and I believe that the COE collected samples at different depths in the sediment, but the COE has not yet released that information.

Comment - Will the risk assessment report help the port expansion?

Response - Kulas - If anything, this study would hurt the port expansion because the past release of metals is an impact that will have to be addressed.

Comment - Several individuals commented that it seems like Kivalina is the village that has the most potential to feel a negative effect from mining activities, but that they are

not seeing any benefits to compensate for the risks. [**Additional Response:** Teck Cominco provides employment opportunities to residents of Kivalina, the operation focuses its monitoring on the activities that are most likely to affect that village (air and water monitoring has shown no effect), and oversight of the operation is provided by the Red Dog Subsistence Committee. Half of this eight-member independent committee are residents of Kivalina].

Comment - Why are there no fish noted in the lagoon slide of the presentation?

Response – Shock - The lagoons by the port freeze solid. However, we seined and netted the two lagoons there anyway but found no fish. We focus on the lagoons by the port facilities to be most conservative, because we know the metals concentrations are higher there and decrease with distance. We did not evaluate the lagoons by Kivalina because they are farther away and no elevated metals were anticipated there. (Shock then explained toxicity tests done to organisms collected from the lagoons).

Comment - Did you do the same bug studies by the mine such as by the port and at the Wulik River?

Response – Shock - We did bug studies near the port, road, and near the mine boundary.

Response -Kulas- We did not sample the Wulik River for the risk assessment though we do under a separate program which is the water discharge program.

Comment - Kivalina has the water rights to every stream that goes to the Kivalina river or to the Wulik River.

Comment - Did the findings from the ponds depend upon the time of season?

Response - Shock- Yes, some of these ponds dry up seasonally. Based on sediment metals concentrations, we found that at the ponds by the port that there is a possibility that effects could occur, but we did not actually see any visible effects from the metals.

Comment – Are you still collecting dust in the winter season?

Response - Kulas- We monitor all year round using mechanical samplers (i.e., tapered element oscillating microbalance or TEOM samplers which are continuous data recorders to measure particulate matter) and stationary jars (dust fall jars).

Comment - Are you seeing any improvements in those dust jars that you have installed?

Response - Yes. [**Additional Comment** - Our dust fall jar results have shown a steady decline in dust levels over the last three years.]

Comment - Are the plants dying by the road?

Response - Shock- No, but we have seen some changes in the types of plants present near the road as compared with further away from the road. However, we can't determine whether the impacts are because of the metals or because of the physical dust or a combination of the two that are impacting the plants near the road edge. [**Additional Note:** The changes observed in the plant community are similar to changes that have been seen near other gravel roads in Alaska. Although we were not able to determine whether metals were causing any changes on their own, it could be a combination of effects from metals and physical road dust.]

Comment - If there is an impact to the voles by the road wouldn't there be an impact to shrimp in the ocean?

Response – Shock - No. The metals accumulate in the tundra where the vole lives, while the metals disperse in the water where a shrimp lives, so concentrations are much lower in the water. [**Additional Note:** Marine water concentrations were below standards that are protective of animals that live in the water.]

Comment - If there is an impact to the small mammals, would there be one as well to humans?

Response – Shock - No because there is a greater exposure of the animals near the road to metals.. [**Additional Note:** There are two main reasons why the risk assessment results for humans may differ than those for animals. The first has to do with the differences in the ways and amount that people and animals are exposed to metals in the environment. For example, a small animal like a vole or a shrew has a very small area in which they live. Therefore, they could potentially live their entire life in a small area right next to the road that has higher metals concentrations in the soil. People spend their time over a much bigger area and so their exposure to soil would be to soil metals concentrations averaged over a large area, including areas with much lower concentrations. Also, most animals have much more intense and constant contact with soil than humans. The second reason has to do with differences in sensitivity to the effects of metals and how we do risk assessment. Risk assessment is always done by evaluating the most sensitive effect for every chemical of potential concern. If the risk assessment is done in a way that it is protective of effects that occur at the lowest exposure levels, then it is also protective of effects that occur only at higher exposure levels. For example, for lead the effects associated with the lowest exposure levels are subtle nervous systems changes in children related to learning and behavior that are only detectable when you look at large populations, rather than individual children. Therefore, a risk assessment that is protective of those effects would also be protective of effects that only occur at higher exposure levels, such as reproductive effects. For voles and shrews, however, effects on reproduction might affect the ability of those animals to maintain their population. That is why we evaluate growth and reproduction for those animals, rather than effects on learning and behavior.]

Comment - Did you study the marrow from animals?

Response - Shock- Yes, but indirectly because we analyzed the whole small animal in a laboratory (bones and all). We then use the information obtained from the small animal as food for larger animals.

Comment - What about sampling of caribou?

Response - Shock- We sampled them differently than small mammals, so we looked at muscle tissue and different organs where those metals could accumulate (liver and kidney).

Comment - Did you sample the marrow?

Response – Shock - Do you eat marrow?

Audience - Yes.

*Shock - Maybe then we should sample the marrow next time caribou are collected.

Comment - Did you use your own caribou data?

Response – Shock - We used data collected in 2002 from a sampling program that Fish and Game helped coordinate. With the assistance of villager hunters, 10 caribou were shot, 4 near the mine and 6 near the road toward the port.

Shock and Sundet then discussed the public comment period noting that DEC is seeking comments during this 45 day public notice. Sundet requested that the audience contact him via mail or email by sending any written comments that the audience may have. Sundet informed the audience that forms to complete and send to him were on the nearby table.

Comment - I understand that you no longer wash trucks.

Response - Kulas - There has been a safety issue with washing trucks in the winter so our focus is to keep them clean. So modifications have been made at the port and mine during unloading and loading, respectively. We have made those modifications at the port. We will continue to wash at the mine in the summer until we correct the problem such as we have done at the port.

Comment - Have you ever monitored when you off load the barges to the ships?

Response – Kulas - The State will be looking into that issue and I believe that the COE has done some sampling in this area which is about three (3) miles off shore.

Response – Shock - Recently, Foss Marine made improvements such as to the snorkel system for the barges by making the snorkels longer which reduces the fugitive dust.

Comment - Who is liable for any spill?

Response - Kulas - Teck Cominco is ultimately responsible, but we have contracts with Foss and Lyndon/NANA that they are responsible to cleanup their spills.

Comment - How far offshore are the ships?

Response - Kulas- Around three (3) miles because the water is too shallow at less than that distance. One ship that I know of can move a bit closer. [**Additional Response** – all ships stay beyond the three mile limit due to regulatory restrictions]

Comment - What do bearded seals eat?

Response - Shock- Shrimp and crab.

Comment – If the dust can be causing an adverse effect on voles and shrews, can't it also be causing effects on shrimp and other things in water?

Response - Shock-No, not likely. We compared marine sediment and water concentrations with criteria protective of marine animals. Because the concentrations were very low, below these criteria, no effects are expected for marine animals, and so no further analysis was done on marine animals.

Comment - If reproduction of some animals may be affected, why wouldn't it cause the same effect in people?

Response – Shock - People are not exposed as much as a vole or shrew that lives right next to the road. (**Additional Note:** See the lengthy additional note above in response to a similar question).

Comment - Did you look for shrimp and crab by the port?

Response – Shock - Because the metal concentrations in the sediment and water were below the screening levels, we did not sample for those species.

Comment - Shouldn't the risk assessment address that?

***Response** – Kulas - That is an issue that the State needs to look at.

-Shock then explained the screening process and why they did not sample for animals in the marine environment. [**Additional Note:** The screening process is part of the risk assessment. So the risk assessment does address effects on shrimp, crab, and the marine environment as a whole. The screening process uses assumptions that are even more conservative than the health protective assumptions used in the risk assessment. So when a metal or an environment is screened out in the screening process, we can feel very confident that there is no risk to human and ecological health.]

Comment - Which way does the ocean current flow?

Response - Shock- Government studies have shown that the ocean current direction is seasonal.

Response - Kulas- There is a ton of information on this issue.

Comment - You should take separate samples on each of the organism's parts such as the liver.

Response – Shock - Depending whether the animal is food for other animals, or food for people, we analyze it whole, as another animal would eat it, or we analyze the organs, if it is a subsistence food item.

The risk assessment portion of the meeting ended about at 3:30 p.m. but some questions continued to about 3:50 p.m.