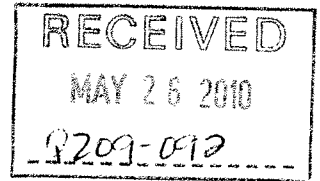


24 May 2010

Yvonne Bessette  
 Box 2 Site 1  
 Keno, Yukon  
 Y0B 1M0  
 Phone: 995-3151  
 Email: [Yvonne@northwestel.net](mailto:Yvonne@northwestel.net)



Yukon Water Board  
 #106 – 419 Range Road  
 Whitehorse, Yukon  
 Y1A 3V1

Attention: Ms. Carola Scheu

RE: Intervention to Type A Water License Application QZ09-092  
 Alexco Keno Hill

Dear Ms. Scheu,

The water license application before the YWB for Alexco requests a ten year Type A Water License. The proposed time frame for milling the ore at the Bellekeno Mine is five years. What will happen after five years? Why aren't the cumulative effects of the mill located 900 meters from Keno City considered? Alexco and YTG have made it clear to us that we do not matter. There is no mitigation to having the DSTF leak into McLeod Creek, flowing into Christal Lake, then into Christal Creek, then into the South McQuesten River for all eternity. There will be no liner under the tailings, although the Mayo YESSA Board assessed the DSTF as having a liner beneath them.

The mill could in all likelihood be used 7 days per week for a long time. Alexco has been busy drilling for more ore all around the area. Has the area around the mill been assessed as having the potential for many many years of Dry Stacked Tailings piled all around the area for all eternity?

Our quality of life will be ruined. Having an industrial facility on our doorstep is not a prospect we relish. In Alexco's application, Volume I, Section 1.3 Type A Water License Application report, page 5-11, Table 5-4 VC Spatial and Temporal Boundaries:

- Community quality of life (Keno City)
- Spatial boundaries: regional context
- Rationale: current quality of life standard is very important to local residents
- Temporal Boundaries: Flame & Moth mill development and operations – 5 years
- Rationale: Potential for diminishing quality of life in Keno City during mill operations at historic Flame & Moth pit area

There is no mitigation to a “diminishing quality of life in Keno City”. I participated in the YESSA review for the Bellekeno Mine and the mill. None of my questions were answered, just one of my concerns was acknowledged, ie. the possible presence of toxaphene in Christal Lake. The assessor recommended testing for toxaphene in Christal Lake. This was varied by YTG, to exclude testing for toxaphene.

No water sampling results of the creeks and South McQuesten River were provided during the YESSA review. The water samples that were presented were in “spread sheet” format and couldn’t be read. I tried to print one sample, Christal Creek at Silver Trail Highway, an established sampling site. I got 52 pages of gibberish. I phoned the assessor in Mayo the day before the deadline for comments, to ask the zinc readings of Christal Lake and Christal Creek. :

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In 1993 the Galkeno 900 plug construction was begun, because Environment Canada had warned UKHM that the Galkeno 900 mine was putting zinc into Christal Lake. First the miners had to blast the ice out of the adit. It was frozen solid, with a very small pond of water in front of the adit. The adit was built into the side of the hill at the foot of Galena Hill. The Federal Govt. had UKHM remove the side of the hill with an excavator, blast the ice out of the adit and rehabilitate the adit back 1200 feet. There a cement plug was installed. They treated any water with lime. The plug was completed in November 1994.

In 1994 and 1995 extensive water sampling of the creeks and South McQuesten River were done by Laberge Environmental Services (LES) for the new owner of UKHM, Stephen Powell who had bought the mine from Bharti Laamanen in March 1994. Powell was having studies done to support his application for a Type A Water License. LES did sampling in the vicinity of Christal Lake, below the Galkeno 900 mine.

Water treatment at Galkeno 900 had commenced in 1993 with the construction of the installation of the cement plug. They did sampling in the vicinity of Christal Lake:

- LES 31-B (11 July 1995) Galkeno 900 decant from pond #2 – Zinc 0.032
- LES 31F (11 July 1995) seep near swamp effluent - Zinc 7.66 ppm
- LES 31G (11 July 1995) flow along old path, 5m upstream Christal Lake - Zinc 4.89 ppm
- LES 31H (11 July 1995) seep below wetland access road - Zinc 10.1
- LES 53 (11 July 1995) Old Galkeno freshwater pumphouse water – Zinc 0.038
- LES 55 (12 July 1995) Inflow to south end of Christal Lake – Zinc 0.339
- LES 56 (11 July 1995) Christal Lake – Zinc 0.339
- LES 66 (12 July 1995) Spring along Duncan Creek Road – Zinc 0.112

These results showed the water from the Galkeno 900 adit was not putting zinc into the lake. A wetland expert could have examined the water sampling results and the actual site to determine that the Galkeno 900 adit was not putting zinc into Christal Lake. Appendix II of Access Consultants 1996 Site Characterization Report is “Design of A Passive System for Treatment of Discharges from the Galkeno 900 Adit at UKHM”. This person

seems not to have looked at the water sampling results from LES. He states on page 38 of his report:

“The information presented above provides the basis for designing a wetland treatment system. While the field work focused on (and assumed the need for) treatment of the discharge from the Galkeno 900 adit, it is clear that such a design could be applied to other discharges on the property, should there be need for treatment.”

A wetland expert would have carefully studied the need for treatment, would have carefully studied the water sampling LES did in 1994 and 1995, and would not assume the need for treatment. The water sampling LES did in 1995 clearly showed the zinc was not coming from the Galkeno 900 adit, as it was being treated.

Now the plug is a disaster. The plug is melting all the ice in the mountain and the water now gushes out of the Galkeno 300 adit. I'm sure the mountain will slip down into Christal Lake, killing all in its path. It is from Galkeno 900 that Alexco will pipe water for the mill.

Is water treatment necessary at any of the sites now being treated? Access Consultants do not seem confident that it is. From Volume I, Section 1.3 Main Application Report, 5.4.1.4 (page 5-18) Christal Creek Site Specific Water Quality Objectives:

“Many water quality parameters and locations within the Christal Creek drainage do not consistently achieve Canadian Water Quality Guidelines. This is acknowledged to be a result of historical mining related activities and impacts within the drainage area, and possibly due to naturally high concentrations of metals in this metal rich district.”

Which will it be? Are the mines putting zinc into the creeks and South McQuesten River, or is it due to naturally high concentrations of metals in this metal rich district?

I would like to see professional independent environmental scientists, wetland experts and professional water samplers examine this area. For the purposes of this application, it is a very small area to study – McLeod Creek, Hinton Creek which flows into McLeod Creek, which flow into Christal Lake from the south end, then Christal Creek that flows out of Christal Lake to the north to the South McQuesten River. Examine the area from Duncan Creek Road to Christal Lake, it is a short distance. And the mill has already been built between these two points. Examine Galena Hill and the plug.

In Volume I, Section 1.3 Main Application Report, 5.4.1.5 Projected Mass Loading (page 5-23)

“The organic nature of many of the soils and the extensive presence of saturated organic rich bog soils also indicates the potential for zinc sulfide formation in the soils along the flow path between the storage facility and the groundwater/surface waters. Listing multiple mechanisms is not just a ‘throw up everything at the wall and see what sticks’ approach. Rather, the redundancy associated with multiple mechanisms that individually can cause greater than 90% reduction in zinc concentrations shows the overall robustness of the attenuation mechanisms at Keno.”

In Volume I, Section 1.3 Main Application Report, Table 5-7 Mill Site Groundwater Program Elements:

“Element: Christal Creek

Location: 400 m west of mill site

Rationale: potential groundwater connection with aquifer beneath mill site

The desktop study on the groundwater can not examine this important issue. This issue cannot be studied on a computer, it needs to be examined by an independent professional hydrogeologist. It should have been studied before the mill was built. Is the mill right on top of this aquifer?

Page 5-34: “Based on potential effects and mitigation measures listed above, an assessment of the residual environmental effects, significance assessment and determination of the likelihood of the effect was completed. Potential adverse effects to groundwater resources are considered to be minimal as the duration is moderate (5-10 years), geographic extent is moderate and magnitude is low.”

I totally disagree that the effects will be minimal. The duration is not 5-10 years. The duration is for all eternity, as the DSTF leaches into the groundwater below them.

A mitigation is not: 6.3.2.1.1 (page 6-70)

“Dry stack tailings placement procedure: The organic soils will be left in place beneath the DSTF to provide some insulation and slow the rate of permafrost thaw.”

What are the long term effects of the “permafrost thaw”. What magnitude will there be in 50 or 100 or 1000 years?

Although we are a direct stakeholder, we are ignored. No assistance was given to us during the YESSA review on this project, no assistance was given us in preparing for the Water Board hearings on this project. Alexco is paying a stakeholder in Mayo to participate in a meaningful way, giving them a technical advisor to guide them through these important processes.

We asked YTG to give us an advisor. We were refused. The way YESSA is set up does not give us any assistance in important projects like the one now being considered by the Water Board. Even though our town is located just 900 meters from an industrial complex, we are given no independent experts to study the situation and inform us of possible issues of concern, such as ground water contamination from the DSTF to McLeod Creek. A desktop study by SRK Consultants done for Alexco gives me no confidence that the ground and surface water has been studied. You cannot examine such an important issue on a computer.

And what about noise? It was the assessor of YESSAB in Mayo who did a desk top study on the noise.

She was never here studying noise.

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Many submissions were made to the YESSA Board in Mayo concerning this project. We had one meeting with the YESSA assessor. Told her we totally support mining but do not support the location of the mill. In her report she stated YESSA is not a "blog", and if important questions are to be asked of the proponent, she will ask them. I kept asking her for water sampling results in a readable version. The results were presented in Alexco's YESSA application in "spread-sheet" format. You cannot read them on an ordinary computer. I phoned her the day before the deadline for submission of comments and asked her to at least tell me the zinc levels of Christal Lake and Christal Creek.

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Alexco originally proposed building the mill at Christal Lake. We were opposed to the location as it is too close to town. Four days before the end of comments and submissions, Alexco changed the location of the mill to the Flame & Moth pit. How can changing the location to the Flame & Moth pit help anything. It is even CLOSER than Christal Lake. How can the location be changed four days before the end of seeking comments?

I am very disappointed with the Environmental Assessment process we have ended up with, in YESSA. The process is totally leaned toward the proponent, the public does not have the technical expertise to examine the projects, and do not have the funds to hire experts. How can Alexco make funding available to a stakeholder in Mayo. What about the people who are living in the middle of their project. Are we not stakeholders?

Keno City sits in the middle of Alexco's project. We are so close that one resident commented that he could hear the music in a truck at the mill site. We have had concerns with this project since its inception because of Alexco's choice to locate the mill 900 meters from our town. Alexco has been in this area since 2005. In the five years they have been here we never had a problem, until they chose to locate the mill so near our town. I have serious concerns about the location of the mill because so little is known about the surface water or ground water in the area between Duncan Creek Road and Christal Lake, where the mill has now been built.

My biggest concern is what the location of the mill will do to McLeod Creek. Alexco does not even mention McLeod Creek in their water license application. I have sent the Yukon Water Board a copy of a map which shows the location of McLeod Creek, which is west of the mill, and Hinton Creek, which flows into McLeod Creek, which flows into Christal Lake at the south end, then Christal Creek that flows out of Christal Lake at the north end of the lake, which flows into the South McQuesten River. Access Consulting states Mackeno Creek flows into Christal Lake. This would be a new creek that nobody has ever heard of. Where exactly is that creek?

Christal Lake also receives Lightning Creek water. This is only mentioned in their application in Volume IV, section 1.5, Applicant's Response to Review for Adequacy and Supplemental Information, in a "Revised Figure 3-4: Christal Creek Mass Loading Node Inputs and Metal Concentration Schematic.

This schematic shows, entering from the south “KV 37 water enters Christal Creek Watershed (zinc 0.114 mg/L).

KV 37 is Lightning Creek. This is the only place I can see it mentioned that Lightning Creek water ends up in Christal Lake. And what about another site on this schematic, entering near the bottom of the flow chart, from the east, “Natural Spring on Duncan Creek Road (zinc 5.00 mg/L zinc)”. This is alarming. What is this water?

Access Consultants refer to the Lightning Creek water entering Christal Lake in their 1996 Site Characterization Report, but I don’t see any mention of it in this application, except for the fact that they reference their Site Characterization Report of 1996. From page 3-21:

“3.2.3 Physiography and Surficial Geology: The area has been profoundly influenced by the latest glaciation but shows more subtle evidence of an earlier event as well. The lower slopes of Galena Hill show clear evidence of ice marginal deposits such as kame terraces related to the glacial lobes occupying the major valley. Ice moved south down the McQuesten Valley and a lobe extending up Christal Creek to a terminus near Keno City. This lobe diverted Lightning Creek into Duncan Creek from its original course into Christal Creek...The retreat of the Cordilleran ice sheet has had a major impact on the south McQuesten valley. Till blankets much of the valley and glacio-fluvial deposits are widespread.”

I have a report by Dr. H.S. Bostock of the Geological Survey of Canada, Memoir 284, which states on page 134:

“In pre-glacial times Lightning Creek evidently discharged into the McQuesten River by way of Christal Creek. The gravels on the right limit of the creek above the canyon occupy the old channel and contain very little clay. Some of the Lightning Creek water still finds its way through them, and, rising to the surface near Christal Lake, flows down Christal Creek.”

The mill has been built either on top of or beside this water. Where is the mill in relation to this water? What ever leaches out of the DSTF will contaminate this water, as well as the water of McLeod Creek, Christal Lake, Christal Creek and South McQuesten River, as well as surface water.

In the schematic, Volume IV, Section 1.5, revised figure 3-4, the schematic shows Onek water entering Christal Lake (zinc 61.10 mg/L). This is impossible. The Onek mine has very little water and is a vast distance away. The Onek Mine was developed 1950-1952, then shut down before it went into production because the silver values proved to be too low, 10 oz. silver/ton.

From Access Consultants 1996 Site Characterization Report:

“Dye studies by Environment Protection Enns (personal communication 1996) show that Onek surface water flows to Christal Lake via the spring north of the old Mackeno Mill site”.

I asked \_\_\_\_\_ of Environment Canada to repeat the test, as I did not believe this. He refused to repeat the test. This is the one and only time that a claim was made that a dye test was used to test anything in the area. I also asked him to test the Galkeno 900 water with dye. He refused.

In Section 1.3 of the Main Application Report, following page 1-6 is the YESSA decision document table of conformance:

“#81: From borehole drilling throughout the various sites surrounding the Keno City region, evidence of permafrost was generally not encountered”.

This is not true. There is definitely permafrost in the area. When the Galkeno 900 adit was dug out of the side of Galena Hill in 1957, the miner's encountered 10 to 15 feet of glacial boulder clay and 50 feet of solid ice.

The 1996 Site Characterization Report quotes R.W. Boyle of the Geological Survey of Canada, page 3-23:

“The lower slopes of Keno Hill and Sourdough Hill were severely glaciated during Pleistocene time by ice-sheets that spread from the east over the entire area. Glacial till, gravel and other debris lie in a series of benches on the slopes of the hills and floor the valleys. The deposits are generally five to twenty feet thick, but in some areas as on the southern slope of Keno Hill facing Lightning Creek and north of Christal Lake, they are thirty to fifty feet thick or more.”

“The Keno Hill-Galena Hill area is in the region of permanently frozen ground... The permafrost is irregularly distributed and its occurrence is dependent upon the elevation, hillside exposure, depth of overburden, amount of vegetative cover and presence of flowing underground and surface water. At high elevations and on slopes with a northern exposure it is generally present. Thus, on Keno Hill, the mine workings on the top of the hill and on the northern slope encountered permafrost some four hundred feet below the surface. On the northern slopes of Sourdough Hill and Galena Hill, a similar situation prevails and frost and ice lenses have been encountered at depths of two hundred fifty feet or more in the mine workings.”

The Bellekeno Mine is located in Sourdough Hill. The Galkeno Mine is located in Galena Hill. The mill has been built at the foot of Galena Hill.

I have a report by The Geological Survey of Canada's K.C. McTaggart who wrote about the glaciation in the area in his report “The Geology of Keno and Galena Hills, Yukon Territory” 1960, Bulletin 58, page 3:

“There is some evidence of two episodes of glaciation in the area, an early one in which Galena Hill and much of Keno Hill were covered, and a later one in which only the lower flanks of the hills were buried. Evidence of the earlier period is rather scanty. Erratic blocks of quartzite and boulders of gabbro and diorite are scattered across the top of Galena and Sourdough Hills and erratics are found almost to the top of Keno Hill. Glacial grooves and striations were not found and probably have been destroyed by intense frost action.

It might be considered that the younger glaciation is simply a continuation of the older. Topographic evidence of the earlier episode, however, is obscure, whereas below the level of the highest kame terrace that marks the minimum upper limit of the later glaciation, rounded and scored outcrops, drumlins, kame terrace and outwash features are in many places perfectly preserved. This contrast suggests a long interval between the two glacial episodes during which the earlier glacial features were largely destroyed.

The most striking evidence of the more recent glaciation is a succession of kame terraces which are easily visible along the Christal Creek Valley between Keno and Galena Hills and also on parts of Keno Hill and on the flanks of Davidson Mountains to the north.

...As the ice level dropped, the margins of the glacier contracted, and its snout, extending at first far down McQuesten Valley, retreated northeastward. The lobe that extended south up Christal Creek Valley similarly thinned and retreated northward, and the glacial stream that flowed between its edge and Galena Hill and down Duncan Creek Valley occupied successively lower and lower positions (marked by terraces) on the side-hill.

At last, when an outlet to the northwest was opened around the base of Galena Hill, the upper part of this southward-flowing stream started to flow north to the McQuesten, capturing the temporary ice-margin stream on the north side of Christal Creek Valley, and forming the present Christal Creek.

Somewhat similarly, Flat Creek probably follows the final course of the ice-margin stream that deposited successively lower terraces along the northwest slope of Galena Hill as the level of the confining glacier fell.”

Alexco references Dr. Aaro Aho's book "Hills of Silver". Of the Galkeno 900 adit Dr. Aho writes:

“The real future of the mine appeared to be at depth, so a 5000-foot long lower level adit was started near the mill to tap the vein 750 feet below the main adit at Galkeno 300; a two-compartment vertical service shaft was being planned to meet the adit and work was being done on the upper levels.

The collar of the adit at the Galkeno 900 adit went through ten to fifteen feet of glacial boulder clay, then over fifty feet of solid ice, a preserved remnant of the valley glacier of 10,000 years ago.”

The DSTF is being placed directly on the ground with no liner. What will happen to water that will seep from the piles. What will happen to the permafrost beneath the piles. How long will it take to melt the permafrost. How much will the DSTF sink into the ground over the years? The ground and surface water around the mill will be contaminated, McLeod Creek to the west of the mill will receive the seepage, which will then continue its way north into Christal Lake, then into Christal Creek to the South McQuesten River.

In 1993 Environment Canada had warned UKHM that the zinc from Galkeno 900 adit was going into Christal Lake. UKHM started work on the adit, digging into the side of the hill at the foot of Galena hill, where the adit was, then blasting out the ice as the

portal was frozen solid, then rehabilitating the adit 1200 feet, there installing a cement plug.

They were still working on the Galkeno 900 adit when the water sampling was done by Laberge Environmental Services. The results proved the zinc didn't come from the mine. The plug has been a disaster, as the ice in Galena Hill is melting and is now gushing out above the Galkeno 900 adit, at Galkeno 300 adit. Eventually, the entire side of the mountain will slump down into Christal Lake. Who will take responsibility for this?

There was only a small intermittent amount of water coming out of the Galkeno 300 mine until 2001, after INAC seized the mine. What has happened to dramatically increase the flow needs to be studied by independent professionals. Alexco plans to use the treated Galkeno 900 water in their mill. What about historic liabilities. Will Alexco start paying for the Galkeno 900 water treatment?

When Falconbridge owned UKHM (1960 to 9 January 1989) they did no water treatment except at the tailings ponds. They treated the tailings with lime at the mill and piped the water to the tailings pond in the valley, which also had two polishing ponds. There was no treatment after Falconbridge suddenly shut down the mine 9 January 1989. When the final decant at the ponds was sampled by Laberge Environmental Services in July 1994 the zinc level was 0.012 part per million zinc.

Falconbridge's Type A Water License expired in July 1990, the same month they sold UKHM to a junior mining company, Bharti Laamanen Ltd. They also handed off their closure report that called for \$450,000 for closing down the mine. Bharti applied for and was given a one year extension. In July 1991 Bharti's water license expired. They were not required to extend or renew it. They did not have to treat the tailings ponds or anything else.

Stephen Powell bought UKHM from Bharti in March 1994. He applied for a Type B Water License to drill the Silver King and Bellekeno Mines. While he was in the process, he was told he would also have to apply for a Type A Water License, due to the amount of water in the dams. And INAC decided Falconbridge's Closure Report, which takes one afternoon to read, that INAC had been studying since July 1990, was inadequate. And Powell would have to prepare a new Closure Report, as a condition of his Type A License.

He hired Access Consultants to oversee the gathering of data for a district wide environmental study and to write reports. They contracted White Mountain Environmental Services to do the fish and fish habitat study, Laberge Environmental Services (LES) to do water sampling and benthic studies, etc. LES got 162 samples in 1994 and 1995. These results are important, because Galkeno 900 was already being treated, Silver King and Bellekeno Mines started being treated in December 1994 to accommodate the drilling. The results, which are contained in Appendix VII of Access Consultants 1996 Site Characterization Report, show the water from the mines did not go to a creek or river.

In spite of the excellent results in July 1994 at the tailings ponds, INAC ordered water treatment commenced there in spring 1995. They ordered stop gates put on the dams and the freshet be held back. Falconbridge designed the ponds to be free flowing. Powell hired Bruce Geotechnical Consultants in 1996 to study the dams and write a report. Access Consultants had told them that the entire freshet at the dams would be held back for five years while they built a wetland.

As part of Powell's Type A Water License Application, he hired Bruce Geotechnical Consultants Inc. (BGC) to examine the tailings dams. This was Exhibit 1.6 of Powell's Application (license number QZ96-001) "Conceptual Design Report, Tailings Disposal Study for UKHM". The report was written by BGC's Iain Bruce, P. Eng, Senior Consultant 2 October 1996.

Bruce Geotechnical Consultants state in their report on pages 28 and 29:

"It is our understanding that the entire freshet is to be contained behind Dam No. 3. Our concern with this closure scenario is that containment of water behind Dam no. 3, while possibly mitigating metal levels in the short term, will require ongoing maintenance, and, in our opinion, will result in a relatively high potential for a dam breach at a future date. It may be more practical to accept short periods of non-compliance during freshet, if downstream impacts are minimal. Therefore Dams No. 2 and 3 could be eliminated and the system become passive with little or no ongoing maintenance required."

Downstream impacts would be minimal, as the dams are located in a natural wetland and do not decant near a creek.

This report was written 14 years ago, and the water at the dams is still held back each spring during freshet. Who will be responsible if the dam fails, the taxpayers? Falconbridge designed and built the dams to be free flowing. They did not hold the water back. Bruce Geotechnical Consultants state in their report that if the water is harmless it should be allowed to flow during freshet.

And the water is harmless, in spite of the claims made in the Fish and Fish Habitat Report, Appendix V of the 1996 Site Characterization Report and in the 1996 Site Characterization Report itself. They state on page 8-29 of the Site Characterization Report:

"There were reported fish kills in this drainage as a result of tailings loss. The tailings are now impounded behind engineered structures and their performance regularly monitored".

And from the Fish and Fish Habitat Report in Appendix V of the 1996 Site Characterization Report, page 2:

"Concerns with mine effluent in the Elsa-Keno Hill area effecting fish date back to 1961 when UKHM's tailings pond at the head of Flat Creek washed out during spring freshet. The ensuing contaminated slug of water entered the South McQuesten River via

Flat Creek and caused a large die-off of resident fish species – Dept. of Fisheries & Oceans, Unpublished Correspondence 1961-1964”.

UKHM never caused the death of any fish, let alone a large die-off of resident fish species. The Fish & Fish Habitat Report, Appendix V of the 1996 Site Characterization Report was written by

told me White Mountain Environmental Services did the actual fish and fish habitat study and that wrote the report which constitutes Appendix V. He told me past experience working for Dept. of Fisheries, then Environment Canada and then INAC enabled him to write the report. wrote the UKHM 1996 reports – Site Characterization, Closure, etc.

The quote on page 2 “Concerns with mine effluent...” is a quote by This statement is not contained in the “Unpublished Correspondence 1961-1964”. I requested these reports (DFO sent 46 pages), they do not have this quote, they do not say that UKHM caused the die-off of a resident fish species.

UKHM did not have a tailings dam until 1965. UKHM’s tailings pond is not at the head of Flat Creek. Flat Creek originates many miles away on top of Galena Hill, then flows well west of the dams. says in the Fish Report that Flat Creek had been broken into five reaches, that four of them were studied. The origin of the creek on Galena Hill, to a point at Silver Trail Highway, west of the ponds, was never studied. Flat Creek is so named because it is 5 km of wetland extending from that point at the Silver Trail Highway.

The tailings pond and two polishing ponds do not decant into Flat Creek. They decant into a huge wetland that is well east of Flat Creek. On page 13 of the Fish Report, “Attempts by the Calumet Fishing Society (defunct) were made to establish populations of rainbow trout in the Elsa area during the early 1960s, these attempts met with little to no success. The introduction was aimed at providing recreational opportunities for what was a large community of mine workers and their families (Walker et al 1973). Christal and Hanson Lakes (near the head waters of the South McQuesten River) were the lakes chosen for stocking.

The only record of the stocking program comes from Dept. of Fisheries & Oceans stream files. A review of correspondence from the late 1950s to the early 1960s shows that stocking of Christal Lake with rainbow trout eggs was as follows:

- 35,000 eggs 1 June 1961
- 13,000 eggs 15 June 1961
- 13,000 eggs 7 July 1961

Hanson Lakes, the second choice for stocking, were treated with ‘poison’ as it was determined to be ‘absolutely necessary’ that the two major species inhabiting the lake, northern pike and lake whitefish, be eradicated if rainbow trout were to be established.

Lower Hanson Lakes were determined to be more suitable for the introduction of rainbow trout, however, both lakes were poisoned with toxaphene at a concentration of

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0.006 ppm in July 1963. Rotenone was used to poison the outlet and two inlet streams prior to introducing rainbow trout...

The most lasting result of the attempts to establish rainbow trout in Hanson Lakes was the extirpation of the rare species of whitefish known as the Squanga Whitefish, a sub-species of the Lake Whitefish that did reside in five water bodies within the Yukon Territory, including Hanson Lakes. The Hanson Lakes population was extirpated during the poisoning of the lake prior to the rainbow trout introductions (Bodaly et al, 1987). The remaining four populations have been assigned 'rare' status by international convention."

The outlet stream at Hanson Lake flows into the South McQuesten River. It was not the non-existent Calumet Fishing Society that poisoned Hanson Lake with toxaphene, it was Dept. of Fisheries. Why would [redacted], who had worked for Dept. of Fisheries, put incorrect information in the critical Fish & Fish Habitat Report, Technical Appendix V of the Site Characterization Report. He quotes the Walker et al report as the source of information. I have a letter from then Dept. of Fisheries [redacted] who also quotes the Walker et al report. [redacted] states it was Yukon Fisheries who poisoned Hanson Lake with toxaphene. Footnote at bottom of his letter:

"Walker CE, Bryan JE, Brown RF, Report on Rainbow Trout Planting and Lake Survey Program in Yukon Territories 1956-1971. Environment Canada, Fisheries and Marine Services, Northern Operations Branch, Pacific Region, 1973)."

Dept. of Fisheries in Whitehorse also admitted to using toxaphene in Hanson Lake. From Yukon News 18 March 1992:

"There is only one documented case of the use of toxaphene use in the Yukon. The Dept. of Fisheries & Oceans used it in Hanson Lake, just north of Keno City. It was used to kill off whitefish and pike so the lake could be stocked with rainbow trout for sportsmen. The plan failed, however, and later it was found that toxaphene actually prevented the restocking of treated lakes. 'We have very good information about how it was used, how much was used and when it was used' said [redacted] of the federal Dept. of Fisheries. It was decided it was not necessary to test this lake at this time since it is not being fished, he added. 'It's hoped that an archival search will uncover more information about when and where toxaphene was used in the territory', he said."

[redacted] of the federal Dept. of Fisheries, stationed in Whitehorse, took part in environmental reviews, which included the Fish and Fish Habitat Report from Technical Appendix V of the 1996 Site Characterization Report. He did nothing to set the record straight. I have brought the matter up in two previous YESSAB reviews. In the last YESSAB review on Alexco's current proposal, I brought this information forward and requested that Christal Lake be tested for toxaphene.

What did happen in 1961 when, [redacted] states in the Fish & Fish Habitat Report, the tailings dam in Elsa failed and killed a resident fish species? What did happen is that Christal Lake was planted with rainbow trout eggs by Dept. of Fisheries. Did they poison Christal Lake in 1961 then Hanson Lake in 1963? On 21 April 2009 I made a submission to YESSAB for Alexco's project. I expressed my concern that Christal Lake had been

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poisoned with toxaphene. In their recommendations, YESSAB advised testing Christal Lake for toxaphene.

From Section 9.2 of the Registry, page 14 of 18:

“Government of Yukon varies the following: #14: Conduct water quality monitoring including dissolved oxygen and temperature profiles and toxaphene, sampled at spring overturn, mid-summer and fall.

Justification: Toxaphene is not contemplated for this project, and the Minister of Fisheries & Oceans Canada has stated that his department did not place toxaphene in Christal Creek. This toxic product is outside of the scope of the project.

Replaced with: #14: Conduct water quality monitoring, including dissolved oxygen and temperature profiles, sampled at spring overturn, mid-summer and fall.

YTG states DFO assured him they did not put toxaphene in Christal Creek. It was Christal Lake that the YESSA assessor stated in her recommendations should be tested for toxaphene. It was Christal Lake I was concerned had been poisoned. Not Christal Creek.

I do not interpret “no historical evidence” as being proof. From then Fisheries Minister R. Thibault’s letter 2 August 2002:

“Fisheries and Oceans Canada (DFO) has no historical evidence to suggest that Christal Lake was ever treated with toxaphene.”

This does not assure me that Christal Lake was not poisoned. If there is toxaphene in the sediment, Access Consultants will dig it up as they clean the “tailings” around Christal Lake. “Tailings” that I suspect are just glacial till, as the lake is surrounded by and on top of glacial till. What will happen if there is toxaphene in the sediments. It is a persistent organic pollutant. Will it be re-released into the water, the air, will it be put through the mill with the “tailings”?

Is the water at the mines so contaminated that non-treatment would make the creeks and South McQuesten River a possible health hazard? From the Yukon News 29 January 2001:

“Contaminants will continue to flow. Contaminated water from UKHM will continue to flow into surrounding creeks, at least for a few more days. Federal agents took over the property on 19 January when Northern Affairs learned the water had not been treated at the site since January 9.

Now Ottawa must repair damaged equipment before water treatment can resume at the mine. Parts of the system need to be replaced, said \_\_\_\_\_, Regional Manager of Water Resources for Northern Affairs. Paddles to mix the lime slurry have completely corroded away, he added.

The zinc contaminated water currently being discharged poses a significant danger to the environment and could also pose serious health risks, said \_\_\_\_\_. The levels of zinc in the water are significantly above the water license limit, he said. But until legal samples are returned from the lab, the precise limit is unknown, he said...”

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This article is dated 29 January 2001. INAC is waiting for "legal samples" to be returned. They refuse to release the results, which should have been mandatory as INAC seized the mine, not on 10 January when lime treatment ceased because no insurance on lime and water trucks as INAC had been told of in December 2009, but they seized it on 19 January 2001, the day creditor protection expired.

There was no equipment to fix, paddles weren't even used. There was lime, five faithful employees who had worked through all periods of non treatment of the mines, there was a lime truck and a water truck. The only thing needed was insurance on the lime and water truck. INAC could have stepped in 10 January, gotten insurance, and had no interruption of treatment.

INAC did not seize the mine sooner because they had no legal right to do so. They were aware the water treatment wasn't necessary. I asked \_\_\_\_\_ why INAC had seized the mine when they were aware the water treatment wasn't necessary.

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On 30 January 2001 INAC ordered lime treatment recommenced. They did not get samples (and then only six) until 2 February. When I asked \_\_\_\_\_ lime treatment had been recommenced before the creeks and South McQuesten River were sampled, he told me INAC did not want the sampling done without lime treatment.

I asked for the water sampling results that were done between 10 and 29 January. INAC and Access Consultants claim there are none. I'm sure there are. The only results they gave me were from the 2 February 2001 sampling. The mine sites were not yet in compliance, Bellekeno lime treatment was not recommenced until the end of February: The total zinc in the samples taken were:

UK 2 South McQuesten River at pumphouse 0.0308 mg/L  
 UK 3 South McQuesten River 350 m downstream of Flat Creek 0.0340 mg/L  
 UK 5 South McQuesten River immediately upstream of Flat Creek 0.0314 mg/L  
 UK 7 Christal Creek at Hanson Lake Road crossing 0.0742 mg/L  
 UK 9 Flat Creek 200 m upstream from the South McQuesten River 0.0407 mg/L  
 UK 12 Lightning Creek at Keno City Road crossing 0.0145 mg/L

There were only three periods of time that there was non-treatment of the water from December 1994 to 10 January 2001:

18 December 1998 to 27 January 1999  
 8 January to 20 March 2000  
 9 January to 29 January 2001

The first time there was non treatment 18 December 1998 to 27 January 1999 I was told by INAC that they had sampled the creeks and South McQuesten River and that there was no environmental benefit to treating the water, because it did not go to a creek or river. An INAC employee visited the mine 13 January 1999.

The second time there was non treatment 8 January to 20 March 2000, two INAC employees, their truck, trailer with two skidoos, were in the area on 22 February. I asked them to sample the creeks and South McQuesten River. They refused and said they would only sample sites accessible by road. Christal Creek beside the Silver Trail Highway is an established sampling site. A hole was chopped in the ice by UKHM and kept open. They didn't get a sample. The only sample they got was from the Silver King Mine, sent to Vancouver for a 96 hour fish toxicity test. There was 100% survival.

The third time there was non treatment was 9 January to 29 January 2001. I was assured by Access Consultants that INAC had to sample the water during non treatment because they had seized the mine 19 January and had to sample the creeks and South McQuesten River for an "afterburn" which would show how polluted they were. Then INAC denied they'd sampled the creeks and river. An INAC employee was at the mine on 18 and 19 January. He must have done some sampling, but INAC refuses to release the results.

I think these results should be brought forward during this application for a Type A Water license by Alexco.

If the water treatment is so vital, why was there treatment only at the Galkeno 900 Adit when Hatch Assoc. & Rescan Environmental Services visited the area 2 June 2003 for YTG. A potential buyer had walked away in spring 2003, never having paid the \$250,000 for Powell's Type A water license. YTG took over care and maintenance of the site. A Receiver was not appointed until April 2004. Powell's water license was set to expire 31 December 2003.

On page 19 of Hatch's report:

"8.8 Water Treatment Plants: Lime treatment has been used to remove heavy metals from mine water at four sites over the last ten years: Silver King, Bellekeno, the Elsa tailings impoundment and Galkeno 900. At present time, only Galkeno 900 has a continually active water treatment facility."

UKHM's water license was still current, effective until 31 December 2003. Did YTG apply for an amendment to the license to stop treating the water at Silver King Mine, Bellekeno Mine and the Elsa tailings ponds?

Is mining responsible for contaminating the creeks and river, or is it natural? From Volume I, Section 1.3 Type A Water License Application Report, page 5-18:

"5.4.1.4 Christal Creek site specific water quality objectives: Many water quality parameters and locations within the Christal Creek drainage do not consistently achieve Canadian Water Quality Guidelines. This is acknowledged to be a result of historical

Mining related activities and impacts within the drainage area, and possibly due to naturally high concentrations of metals in this metal rich district.”

*Sydney Bessette*