

**Independent Environmental Monitoring Agency
79th Meeting of the Board of Directors
Yellowknife and Whatì, NT
September 18-20, 2012
Summary of Discussion**

Directors

Bill Ross

Tim Byers

Tony Pearse

Kim Poole

Laura Johnston

Arnold Enge

Staff

Kevin O'Reilly, Executive Director

Allison Anderson, Communications and
Environmental Specialist

Guests

Kathy Racher, Wek'èezhì Land and Water
Board (WLWB)

Ryan Fequet, WLWB

Guests (continued)

Eric Denholm, BHP Billiton Canada Inc. (BHP
Billiton)

Claudine Lee, BHP Billiton

Nicole Spencer, BHP Billiton

Nathen Richea, Aboriginal Affairs and Northern
Development Canada (AANDC)

Bruce Hanna, Department of Fisheries and Oceans
(DFO)

Tonia Robb, Rescan Environmental Services
(Rescan)

By Phone

Paul Green, AANDC

Chris Baron, DFO

Anne Wilson, Environment Canada

Peter Chapman, Golder (for BHP Billiton)

Marc Wen, Rescan (for BHP Billiton)

Patty Ewaschuk, WLWB

September 18, 2012

Meeting commenced at 9:00 a.m. in Yellowknife

MEETING ON EARLY ADOPTION OF THE NITRATE SITE-SPECIFIC WATER QUALITY OBJECTIVE

Overview and Purpose. BHP Billiton and its consultants (Rescan and Golder) met with the Agency and representatives from the WLWB, AANDC, DFO, and Environment Canada to discuss the early adoption of its proposed site-specific water quality objective (SSWQO) for nitrate. The company would like to restore the emergency storage capacity of cell D of the Long Lake Containment Facility (LLCF) as soon as possible rather than waiting until the water licence is renewed in August 2013.

History of Nitrate Guidelines. BHP Billiton provided a brief history of nitrate guidelines in Canada (see BHP Billiton presentation for details, available from the Agency). Lake trout have been identified as having the lowest endpoint of the fish species at the Ekati Mine for sensitivity to nitrate. Draft results from DFO on the acute effects of nitrate on northern species are available and a paper is forthcoming. However, DFO's acute data cannot be used as a measure of potential chronic effects. DFO said the focus of BHP Billiton's nitrate SSWQO should be on chronic toxicity and the most sensitive species.

Nitrate-Hardness Relationship. The data used by BHP Billiton in analyzing the relationship between nitrate and water hardness at Ekati were discussed. There is a relationship between hardness and toxicity, but the relationship varies according to species. BHP Billiton was requested to provide information on how the relationship between hardness and nitrate was 'normalized' based on the different relationship curves for various species. The higher the hardness of the water, the generally less toxic nitrate is to aquatic species. At Ekati, the natural hardness of water is very low, and the hardness is a

function of mine effluent. On an annual basis, however, BHP Billiton does not have much ability to control hardness levels. AANDC staff also asked questions about the suitability of using IC 25 figures over IC 10 and how this may have affected the SSWQO. Peter Chapman agreed to provide some data on this point but stated for *daphnia* there would be a 30 fold increase in the toxicity of nitrate if IC 10 is used in the analysis for fathead minnows. BHP Billiton has arranged for Tim Fletcher of the Ontario Ministry of the Environment, who helped develop the recently released Canadian Council of Ministers of the Environment (CCME) guideline for nitrate, to conduct a review of its proposed SSWQO.

Ekati SSWQO for Nitrate. The Agency asked about the effects of nitrate seen in Leslie and Moose lakes and whether *Ceriodaphnia*, the genus used in BHP Billiton's tests for nitrate, is the same genus present in waters at Ekati. *Cladocera* at Ekati are an important food source for whitefish and trout, but have declined significantly after water from the LLCF entered the receiving environment. AANDC said it is important to implement the precautionary principle for downstream effects of nitrate and that adaptive management may be appropriate. WLWB staff asked what may happen at the end of the mine life should hardness levels may drop more quickly than nitrate. Would the nitrate then become more toxic? Would the plankton communities become adapted to higher hardness and nitrate levels and how would a decline in contaminant levels affect them? DFO asked whether there were any other examples of contaminants where toxicity modifying factors are directly incorporated into regulatory limits or standards. BHP Billiton stated that the CCME guideline for copper has adopted this approach.

LLCF Water Quality. BHP Billiton began taking some adaptive management approaches in 2008, in part to control the amount of nitrate discharged from cell E. A phosphate experiment in 2009 showed a one-time only reduction in nitrate. BHP Billiton reviewed its adaptive management approach to LLCF water, including efforts to reduce nitrate levels with the addition of phosphate, diverting minewater to Beartooth Pit and using reclaim water in the processing plant. Hardness in cell D is about 200 mg/L. The company feels the SSWQO for nitrate as a receiving environment water quality objective (WQO) is protective of the environment at Ekati.

Effluent Discharge Plan to Restore LLCF Emergency Storage Capacity. The company has been losing ground with the storage capacity in cell D and intends to discharge some of this water to build up its emergency storage capacity again. There is about 8 million cubic metres of water in cell D and the company would like to cut this in half by continual discharge from cell E over about a full year. BHP Billiton would like to discharge two years of water in one year (about 8 million m³). Continuous discharge through the winter would have immediate benefit for dealing with a large freshet, should it happen, in the spring. This would restore the emergency storage capacity of the LLCF.

Feedback and Discussion. The company was asked whether it was seeking permission to discharge year round or whether it was informing parties of its decision to do so. To BHP Billiton's knowledge, there is no restriction under the water licence from doing what it proposes, and it feels this discharge is the best option for restoring the emergency capacity of cell D. The Agency asked BHP Billiton about its options for source management of nitrate. BHP Billiton staff said that there was a 2008 study done by Golder that examined explosives handling at Ekati and that it found existing procedures to be adequate.

There was some discussion as to how the SSWQO may translate into an effluent quality criterion (EQC) under the water licence. Through the renewal process, the WLWB will decide whether an EQC for nitrate is necessary in the water licence. At the moment, BHP Billiton is focusing on the LLCF and lakes and streams downstream of the LLCF rather than proposing one EQC site-wide. Environment Canada expressed concern about the risk of adopting the nitrate SSWQO in relation to increased hardness and other contaminants and what effects this may have on downstream aquatic life. BHP Billiton indicated that its water quality modeling and evaluation against benchmarks shows no significant adverse effects.

Environment Canada indicated that the SSWQO work should be confirmed against bioassays for chronic toxicity including growth inhibition or stimulus for algae. Several attendees agreed an independent peer review of BHP Billiton's studies and proposed SSWQO for nitrate would be beneficial. BHP Billiton agreed to cover any reasonable costs associated with a peer review of its nitrate SSWQO.

➤ **Follow-up Discussion**

The Agency appreciated the opportunity to meet with BHP Billiton and its consultants to discuss the nitrate issue. Although water quality monitoring downstream of the LLCF is good, the Agency feels a peer review of the nitrate study should be done. The Agency is concerned that allowing increased nitrate, based on its reduced toxicity because of higher hardness, may not be a good approach as increased water hardness (or its close correlate, total dissolved solids (TDS)) has been linked to the collapse of *Cladocera* populations downstream of the LLCF, as shown in the 2006 Aquatic Effects Monitoring Program (AEMP) review. The release of water from cells D and E would mean higher water hardness and hence higher TDS. Second, the Agency feels it would be wise for BHP Billiton to have discussions with Aboriginal Society Members about the nitrate SSWQO. Third, although water quality issues seem to be well monitored and monitoring of *Cladocera* has improved.

The Agency recommends increasing the frequency of biotic monitoring and chemistry with a focus on downstream impacts on hardness, TDS, nitrate and related variables, with particular attention on *Cladocera*. The details should be in place by next summer, as part of the Three-Year AEMP review or a special study. The Agency would also like to better understand what efforts BHP Billiton has undertaken on source reduction.

Action Item #1: Kevin to prepare a letter to BHP Billiton on the nitrate issue copied to AANDC, WLWB, DFO and Environment Canada.

AGENCY BUSINESS

Meeting re-commenced at 7:00 p.m. in Whati

➤ **Information Updates**

Bill – Attended the Panda Diversion Channel (PDC) workshop and Environmental Impact Report (EIR) technical meetings in July.

Laura – Reviewed the water licence renewal application and LLCF water quality model.

Tim – Attended the PDC workshop and EIR technical meetings in July and the Inter-Agency Coordinating Team (IACT) site visit in September.

Tony – Started to review the water licence renewal application.

Kim – Continued to work on wildlife issues, including grizzly bear monitoring and reviewing camera report.

Kevin – Reviewed the water licence renewal application. Discussed hiring a technical advisor to assist with the water licence review process with Kathy Racher (WLWB), Robert Jenkins (AANDC) and Nathen Richea (AANDC). Attended the PDC workshop and EIR technical meetings in July. Prepared correspondence regarding AANDC's inspection capacity at Ekati. Prepared correspondence regarding BHP Billiton request for a preliminary screening exemption. Met with Eric Denholm (BHP Billiton) and Nicole Spencer (BHP Billiton) regarding the site-specific water quality objective (SSWQO) for nitrate.

Prepared and submitted Agency comments on the *Wastewater and Processed Kimberlite Management Plan (WPKMP) – Version 3*. Continued work on the annual report and summary brochure. Undertook a performance evaluation of Agency staff.

Allison – Prepared a backgrounder and provided literature on the impacts of endocrine disrupting chemicals, pharmaceuticals and personal care products on fish to Agency Directors. Attended the EIR technical sessions and PDC workshop in July and meetings with BHP Billiton on nitrate in August and September. Prepared a summary of discussion for the Board meeting in June. Prepared a summary of discussion for the Environmental Agreement implementation meeting in June. Some reorganization and updating done of the website and resource library. Responded to information requests from office visitors and distributed promotional materials. Participated in a 6-month performance evaluation. (Additional tasks are outlined in the Communications Update below.)

➤ **Financial Report**

Kevin reviewed the 2011-12 Year-to-Date expenditures. The Agency has under-expended on Board meetings this year, and only two Directors visited the mine site in June. It is expected that the water licence application review process will lead to increased expenditures in the Separate Fund, as document review will continue to increase and public hearings will be held in February. The communications budget has been devoted largely to the production of the annual report and summary brochure, including the writing workshop in Penticton in May. The writing workshop for the 2012-13 annual report may be held in Creston, BC.

This year, BHP Billiton will host the annual environmental workshop so there is no need for the Agency to conduct an environmental workshop. The Agency will meet with the Aboriginal Society Members after the annual general meeting to discuss any issues of concern. The annual general meeting may be a good opportunity to discuss the water licence renewal application because interventions are due January 17. On administrative matters, staff recommended the purchase of a new teleconference phone with remote microphones, which the Directors approved.

➤ **Communications Update**

Allison – Continued to update the website, including the correspondence, presentation and meeting summary webpages, and to organize photos. Worked with translators and Outcrop to complete the Tlicho, Weledeh and Chipewyan versions of the Agency poster and pamphlet, recorded the English audio script and attempted to coordinate the Tlicho audio recording. Made arrangements for the community visit to Whati and reviewed and revised the community presentation. Work continued on the 2011-12 annual reports and summary brochure, which will be distributed to every household and business in affected communities. Updated the word list, style guide, list of acronyms, glossary of terms, mailing list and prepared a draft production schedule for next year's annual reports. The final versions of the Agency's *Annual Report 2011-12* and lessons learned were discussed.

Allison raised issues with the quality and speed of service provided by the Agency's current internet service provider. It was agreed that other options should be explored and that a switch should be made if the staff feel it is warranted.

Action Item #2: Allison to explore the difference in quality and cost of using southern printers and to proceed with the printing and distribution of the Agency posters.

Action Item #3: Allison to explore other options for internet service for the Agency office.
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FOLLOW-UP ITEMS

➤ **Endocrine Disrupting Compounds**

The Agency has thanked BHP Billiton for its response to concerns about endocrine disrupting compounds in sewage at Ekati. Agency staff provided a backgrounder on the issue to the Agency Directors.

➤ **Financial Security Review**

The Agency understands that the discussion around financial security for Ekati has been put on hold while the WLWB and AANDC clarify what is covered in the RECLAIM model as part of the Diavik financial security review.

➤ **Wildlife Camera Reports**

BHP Billiton released its wildlife camera reports at the end of August. The objectives of the cameras are not very clear. Other opportunities were available to use the wildlife cameras in such a way that would have helped BHP Billiton better design what to do during closure, but these opportunities were not taken. For example, the Agency made recommendations to BHP Billiton to set up cameras to monitor the effectiveness of inokhoks and to monitor the Misery complex during temporary closure to see how caribou were interacting with waste rock piles, ramps and so on. The Agency expects the results of the wildlife monitoring camera studies will be discussed in the next Wildlife Effects Monitoring Program report.

➤ **Wastewater and Processed Kimberlite Management Plan**

The Agency provided comments on the WPKMP – Version 3. The Agency was happy to see the LLCF water quality model. BHP Billiton is supposed to respond by September 7, at which time the WPKMP will go to the WLWB for approval.

➤ **2009-11 Air Quality Monitoring Program Report**

The Agency may want a third party to review the 2009-11 Air Quality Monitoring Program report.

➤ **AANDC Inspection Capacity**

The Agency wrote to AANDC regarding its capacity to carry out land and water inspections at Ekati, citing the inspector's increased workload and decrease in the number of inspections over the last year. A reply was received that stated that a risk management approach is used and that everything is fine. The Agency remains concerned about AANDC's inspection capacity at Ekati. To be very clear, the Agency is very pleased with the current inspector's thorough work and his communications with the Agency.

Action Item #4: Kevin to find out if the Diavik Environmental Monitoring Advisory Board, Snap Lake Environmental Monitoring Agency and WLWB have written to AANDC about inspection capacity, what responses may have been received and whether any further action may be appropriate.

➤ **Environmental Impact Report 2012 Meetings (July 10 and 11)**

The EIR 2012 is to be issued later this month. BHP Billiton does not yet have a schedule for the EIR public sessions and community site visit. Some Agency Directors should attend the sessions and site visit.

Action Item #5: Kevin to inform AANDC that a coordinated review of the EIR and Environmental Agreement and Water Licence Annual Report review is acceptable to the Agency.

➤ **Wildlife Research Permit Application**

It would be helpful to know if the caribou aerial survey program carried out this year by Diavik and BHP Billiton uses the same methodology as the previous work. The GNWT pilot study on cumulative effects on the Bathurst caribou summer-range is expected this fall.

➤ **Inter-Agency Coordinating Team Site Visit**

Lionel Marcinkoski (AANDC), Velma Sternberg (AANDC), Ryan Fequet (WLWB), Bruce Hanna (DFO), Patrick Clancy (GNWT) and Tim Byers (Agency) attended the September 17 IACT site visit, hosted by Claudine Lee, Jamie Steele, Joel Gammon and Eric Denholm for BHP Billiton. IACT toured the PDC, Pigeon Stream Diversion (PSD), Beartooth Pit, LLCF and incinerator.

The entire length of the PSD is almost complete, and the connection with the existing stream will be made next year. Nothing has changed on the PDC widening since the Agency's last site visit. BHP Billiton has taken water samples from the bottom of Beartooth Pit. The west side of cells A and B of the LLCF have a shallower profile, and extra-fine processed kimberlite is being deposited on the beaches. Crested wheatgrass, a non-native species, was evident in the re-vegetated east track of the Fay Bay spill site. The Agency noted some problems with waste separation during the tour of the incinerator. Some recyclable items were seen going into the incinerator. Also, AANDC personnel told an Agency director during the IACT tour in June that rock at the Misery camp and haul roads appears to contain pegmatite, a possible source of molybdenum.

The IACT visitors were told that Elders and other members of the Yellowknives Dene First Nation were also touring Ekati and Diavik and receiving training in wildlife and water quality monitoring (e.g., moving hair-snagging posts and collecting hair samples). Currently, 111 bear snagging posts are placed within the study grid.

➤ **Diavik Site Visit**

The Agency's Executive Director toured the Diavik mine site with Environmental Monitoring Advisory Board staff in August. (For details, see the Agency staff report available from our office.)

➤ **Water Licence Renewal Application and Schedule**

The Agency will provide the WLWB with the Agency's preliminary thoughts on the water licence renewal application by September 24. There are two main areas of concern for the Agency. First, BHP Billiton proposed changes to specific wording in the water licence. Second, the process used and the results of BHP Billiton's identification of contaminants of concern, in particular how contaminants of concern will be addressed (through limits set in the licence or through adaptive management plans), may present some concerns. However, BHP Billiton has certainly done a good job preparing the application and has provided much better information than for the Sable, Pigeon and Beartooth water licence renewal. The water quality modeling is particularly helpful and appears to be well done.

The Agency wishes to reserve judgement on the nitrate issue pending a peer review. The Agency may encourage more EQCs than what BHP Billiton proposes. The Agency is concerned about the number of Surveillance Network Program (SNP) stations BHP Billiton proposes to eliminate. The Agency does not take issue with BHP Billiton removing SNP sites if the stations overlap with AEMP stations. A conformity

table for SNP and AEMP sites would be useful, so a proper comparison can be made of what variables are sampled and how often, to ensure key information is not lost. There is also concern over the SNP sites BHP Billiton wants to relocate. The Agency will suggest that, for those SNP stations to be relocated, there should be a reasonable overlap period to ensure data comparability.

The Agency feels BHP Billiton's "Response Framework" (adaptive management plan framework) should be improved. If BHP Billiton's approach is accepted, few variables will have EQCs. There should be more lead time and specific ideas for actions around specific contaminants.

The Agency agrees with much of BHP Billiton's approach except on the eight elements of concern. The Agency disagrees with BHP Billiton reducing the number of EQCs and the consideration of variables of concern as candidates for EQCs. The Agency believes all eight contaminants of concern should likely have EQCs under the water licence. Specifically, the Agency wants EQCs for nitrate and molybdenum. BHP Billiton wants EQCs for four (e.g., pH and Total Suspended Solids) and proposes to drop others (e.g., copper, arsenic and ammonia). The values for the various EQCs will become clearer through the WLWB review and technical workshops.

The Agency discussed the BHP Billiton proposals to change the wording in the water licence. Many of the proposed changes are helpful in improving consistency and interpretation but some are more problematic. It is essential to have WLWB approval of any changes to the ICRP. BHP Billiton would like to differentiate its interpretation of data collected from SNP stations and data collected from points of compliance.

The Agency is also concerned about the AEMP versus SNP reporting (i.e., how data are reported and whether the Agency will have access to the data reported monthly in the SNP or only annually in the Annual Report). The Agency would like a more fulsome AEMP-SNP comparison and to receive SNP data in a more user-friendly manner.

The Agency reviewed the proposed protection measurements for the aquatic receiving environment. The Agency is not comfortable with biological testing under the AEMP being made less prescriptive, such as BHP Billiton's proposal to end an explicit requirement for monitoring of changes in plankton communities. The Agency will flag in its comments that BHP Billiton's wording could use clarification.

Action Item #6: Kevin to prepare a draft covering letter and comment table containing the Agency's initial comments on the BHP Billiton water licence renewal application. Interested Directors will review the draft and changes will be made to ensure it is submitted before the September 24, 2012 deadline.
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AGENCY SPONSORED OPEN HOUSE AT WHATÌ CULTURAL CENTER

The Agency hosted an Open House for the community in the Whatì Cultural Centre the evening of September 19. Approximately 20 people were in attendance for a general presentation by the Agency on our mandate and activities. An additional 20 - 30 people attended the Open House at other points in the evening.

A resident asked whether the Agency works with elders and deals with Diavik. The Agency responded by saying that we invite our Society Members, including the Tlicho Government, to our annual general meetings and workshops and that elders are often there providing very helpful insights. The Agency does not deal with Diavik, but we have a sister organization that does and we cooperate with them whenever we can.

Concerns were expressed regarding how caribou may move through the Ekati Mine site. The Agency discussed some of the preventative measures taken by BHP Billiton, including the recent replacement of the airport fence.

One resident raised concerns about the effects of mine dust on workers' health and safety. The Agency indicated that it has heard concerns around the environmental effects of dust, but worker safety is an area outside our mandate. The Agency offered to pass the concern on to GNWT.

The former Chief thanked the Agency for visiting the community and providing information about Ekati and our work. Another community resident also thanked the Agency for coming to Whatì and suggested that more Dene people need to be involved in careers in the environmental field. The Agency said that it would visit the school in Whatì the next day to explain our mandate and encourage students to pursue their educations to get good and interesting jobs.

PRESENTATION BY AGENCY DIRECTORS AT MEZI COMMUNITY SCHOOL

Agency Directors made a presentation on environmental monitoring and the Ekati Mine to approximately 35 students in the Grades 10-12 classes at Mezi Community School. The Directors and staff encouraged the students to complete their education and emphasized opportunities to work in the environmental field. The students demonstrated an impressive level of interest and knowledge in environmental issues relating to the mine.

OTHER BUSINESS

➤ Future Board Meetings

The date of future Agency Board meetings and other activities were agreed upon as follows:

- October 23-25, 2012 – Water Licence Technical Sessions (Laura, Tim and Agency staff to attend)
- December 5-6, 2012 – Agency Board Meeting and AGM
- December 6, 2012 – Christmas Open House with Environmental Monitoring Advisory Board and Snap Lake Environmental Monitoring Agency

Meeting adjourned at 1 p.m. on September 20, 2012.



**Summary of Discussion Approved by
Jaida Ohokannoak, Secretary Treasurer.**