



**INDEPENDENT  
ENVIRONMENTAL  
MONITORING AGENCY**

A PUBLIC WATCHDOG FOR  
ENVIRONMENTAL MANAGEMENT  
AT EKATI DIAMOND MINE

**PLAIN LANGUAGE ANNUAL REPORT**

**2011-12**



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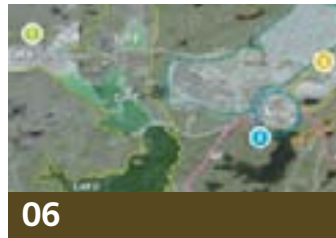
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# Message from the Chair

It is my pleasure to provide this report in the fifteenth year of the Independent Environmental Monitoring Agency (the Agency). BHP Billiton Canada Inc. (BHPB) has continued to do a good job of environmental protection at the EKATI™ Diamond Mine (Ekati). Major events of the last year include the approval of the *Interim Closure and Reclamation Plan*, the start on calculating the financial security needed to close the mine, and the approval to deposit *tailings* into Beartooth Pit. The Agency believes these are positive developments, and we have worked with BHPB and others to make them happen.

We are making every effort to be part of the work on financial security as required by the *Environmental Agreement*. If this work goes well, we can assure our Society Members that there will be enough money set aside by BHPB to ensure the environment and human health are protected when the mine is closed. The

security can be returned to BHPB when the work is done.

Last year, we expressed concern about how BHPB's Environmental Impact Report was being handled. Since then, several meetings have taken place about the report. We believe the next version in 2012 will be much improved.

Last December, we held a workshop on Traditional Knowledge (TK). All of our Society Members took part, and we are pleased with the results. The Agency's recommendation about community consultation and *closure* in this annual report is based, in part, on the results and recommendations from our TK workshop.

With respect to wildlife monitoring at Ekati, we have seen both good and bad developments. The regional grizzly bear monitoring program appears ready to begin. Caribou monitoring, on the other hand, seems quite uncertain.

For the last few years, the Agency has been told it needs a good Communications Plan. We are pleased to report major progress on this task. Early this year, we hired Allison Anderson as our Communications and Environmental Specialist. She has been working hard on several communications tasks described in this report. We welcome Allison, and we welcome the return of Sheryl Grieve to the Agency as a director. We also wish to thank Audrey Enge and Monica Krieger, who left the Agency last year, for their contributions.

In the coming year, we will work hard to ensure that the water licence renewal process results in a good water licence that protects the environment.

The Agency welcomes your input and suggestions. We will make our best efforts to address any questions or concerns you may have. ■



William A. Ross, Chairperson  
March 31, 2012





# 01 How We Do Our Work

## HIGHLIGHTS

- > **Held four board meetings, an annual general meeting and an open house in Yellowknife.**
- > **Completed an Agency Communications Plan. Improved our communications and website.**
- > **Hosted a workshop on Traditional Knowledge.**
- > **Made presentations to Łutsel K'e Dene First Nation and North Slave Métis Alliance.**
- > **Took part in the review of monitoring programs, closure and reclamation guidelines, and BHPB's annual environmental report.**
- > **Toured the Ekati Mine.**

## ACTIVITIES 2011-12

The Agency held four board meetings in Yellowknife this year. We had our annual general meeting and open house in Yellowknife in December. We visited the mine site twice. Agency staff saw the widening of the Panda Diversion Channel in April 2011, and Agency directors and staff toured the site and met with BHP Billiton (BHPB) staff in June 2011.

The Agency repeated its request for BHPB and the Government of the Northwest Territories (GNWT) to begin a regional grizzly bear monitoring program in 2012. We were happy BHPB showed leadership by proposing a joint monitoring program with other diamond mines in the region.

In May 2011, we commented on the new *Wildlife Act* proposed by the GNWT. We expressed our support for a better framework for wildlife monitoring and management.

In July 2011, we were part of a technical meeting about the filling of the Long Lake Containment Facility, a lake used as the *tailings* pond for Ekati. The aim is to keep *tailings* out of the lower part of the lake (cell D) to ensure cleaner

water is released from cell E into Leslie Lake (see maps on page 6 and on the inside back cover).

In September 2011, we sent comments to Aboriginal Affairs and Northern Development Canada (AANDC) on BHPB's 2010 environmental annual report for the Ekati Mine. We found the report to be mostly satisfactory, but we made suggestions to improve public reporting and environmental management at the mine.

In October 2011, we commented on draft guidelines for the *closure and reclamation* of advanced mineral exploration and mine sites. We support this joint work of AANDC and the Mackenzie Valley Land and Water Board.

In February 2012, we also made several comments and recommendations on BHPB's proposed fish sampling program, part of the company's 2012 Aquatic Effects Monitoring Program.

## Agency Communications and Collaboration

In December 2011, with BHPB's help, we held a workshop in Yellowknife on community-based

Traditional Knowledge (TK) projects. We urged BHPB to better report on its use of TK at Ekati and to involve TK holders in *closure* planning.

In February 2012, we were invited to Łutsel K'e to talk about environmental issues at Ekati. We had very good discussions about caribou, air quality, inspections and *closure* planning. We heard concerns about what would happen to the *Environmental Agreement* if the mine were sold. We also visited the local high school to talk about possible careers and the effects of diamond mines on the environment.

In March 2012, the Agency and BHPB were invited to a North Slave Métis Alliance meeting to make a presentation and answer questions. People told us they want BHPB to improve its communications with communities.

In May and December 2011, we gave an update on our activities to the environmental monitoring agency for the Snap Lake Mine. In March 2012, staff from the environmental monitoring agencies for Snap Lake and the Diavik Mine updated us on their activities.



Agency presentations in Łutsel K'e, February 2012.

The Agency and the parties that signed the *Environmental Agreement* (BHPB, GNWT and Government of Canada) met together twice this year. These meetings improve coordination among the parties and the Agency. Each group has a chance to give an update on its activities and to respond to recommendations made in the Agency's last annual

report. The Agency also reports on our expenses and future plans.

In June 2011, the Inter-Agency Coordinating Team (IACT) met. IACT consists of the Agency and a group of government agencies—GNWT, AANDC, Fisheries and Oceans Canada (DFO) and Environment Canada. Its members work together to share

information on environmental issues at Ekati and usually visit the site together every year.

In June 2011, we met with BHPB consultants doing a Human Rights Impact Assessment of BHPB's operations in Canada, including Ekati.

In July 2011, we met with BHPB and DFO staff to discuss work to

## AGENCY COMMUNICATIONS PLAN

In an effort to improve our communications with Aboriginal peoples and the general public, the Agency completed a Communications Plan in October 2011. Some of the plan's details are listed here.

### 1. Our Key Messages

The top things the Agency wants people to know are:

- > We are a public watchdog for environmental management at Ekati.
- > We are independent of BHPB, governments and regulators.
- > We make recommendations to BHPB, governments and regulators to best protect the environment at Ekati.
- > We are an important source of information on environmental issues at Ekati.
- > We try to have a helpful relationship with BHPB, governments and regulators and to work together to protect the environment at Ekati.
- > We encourage input from Aboriginal peoples and the general public on environmental management at Ekati. We pass on these concerns to BHPB, governments and regulators.



### 2. Our Target Audiences

The main groups we need and want to communicate with are:

- > Agency Society Members (i.e., Tłı̨chǫ Government, Akaitcho Treaty 8 First Nations (Lutsel K'e Dene First Nation and Yellowknives Dene First Nation), Kitikmeot Inuit Association, North Slave Métis Alliance, Government of Canada, GNWT and BHPB);
- > Aboriginal organizations;
- > Regulatory authorities and policy makers;
- > Our directors and staff;
- > Other diamond mine environmental monitoring groups; and
- > The general public.

### 3. Influences On Our Communications

Some of the things that affect how we communicate include:

- > We have a limited budget and staff.
- > Community and Aboriginal groups have many priorities and a big workload.
- > Many regulatory and other processes have short deadlines for comments.
- > Our target audiences have different levels of technical knowledge, English-language skills and computer skills.
- > Technology changes constantly.

## 4. Our Goals

Our communication goals are:

- > Active and empowered Agency directors and staff;
- > Informed Aboriginal communities and organizations;
- > Informed BHPB, regulators and government agencies; and
- > Informed public.

## 5. Ways We Communicate

Some of the ways we communicate include:

- > Public registry and resource library in our office;
- > Technical reports and reviews;
- > Publications (e.g., *The Ekati Monitor* newsletter, technical and plain language versions and a summary brochure of our annual report);
- > Electronic communications (e.g., website, Ekati Timeline, e-mail correspondence);
- > Meetings (e.g., annual general meeting, Board meeting in a community once a year);
- > Community visits;
- > Workshops and conferences; and
- > Internal communications between directors and staff.

Each year, we will review the success of our communications. We will also consider new communications methods.

➤ For more details on our Communications Plan, please go to our website at [www.monitoringagency.net](http://www.monitoringagency.net).

prevent a pond from becoming a sediment source above the Panda Diversion Channel.

In September 2011, we attended an international mine closure conference, where we learned more about restoring pit lakes, cover design and water management.

### HOW ARE WE DOING?

We have made great progress on our Communications Plan (the sidebar has a summary). Our TK workshop in December was well received and resulted in important advice. We could not have a

Board meeting in a community this year, but we plan to hold one in a community in 2012-13.

We have promoted a regional approach to grizzly bear monitoring with some success. We will continue to offer advice to BHPB to help improve its wildlife monitoring.

We are proud of our input on BHPB's fish sampling program. BHPB included all but two of our suggestions.

Lastly, we have urged the groups responsible for setting the financial security for Ekati to work together and share information. ■

Agency site visit, June 2011.



## 02

## Mining at Ekati

**BHP Billiton (BHPB) is mining diamonds using large open pits and underground tunnels to remove the kimberlite rock that contains the diamonds.**



1

### Long Lake Containment Facility

The Long Lake Containment Facility (*tailings pond*) holds the crushed wet *kimberlite* that remains after diamonds are removed. It is a lake divided into five sections (cells A to E) by dykes (rock walls) so the *processed kimberlite* can settle. Water is eventually released into lakes downstream when it is clean and pollutants are below the amounts set in the water licence.



2

### Main Camp

This area includes an accommodation building for hundreds of workers, a power plant, a truck shop and a processing plant where the diamonds are removed from the *kimberlite*.

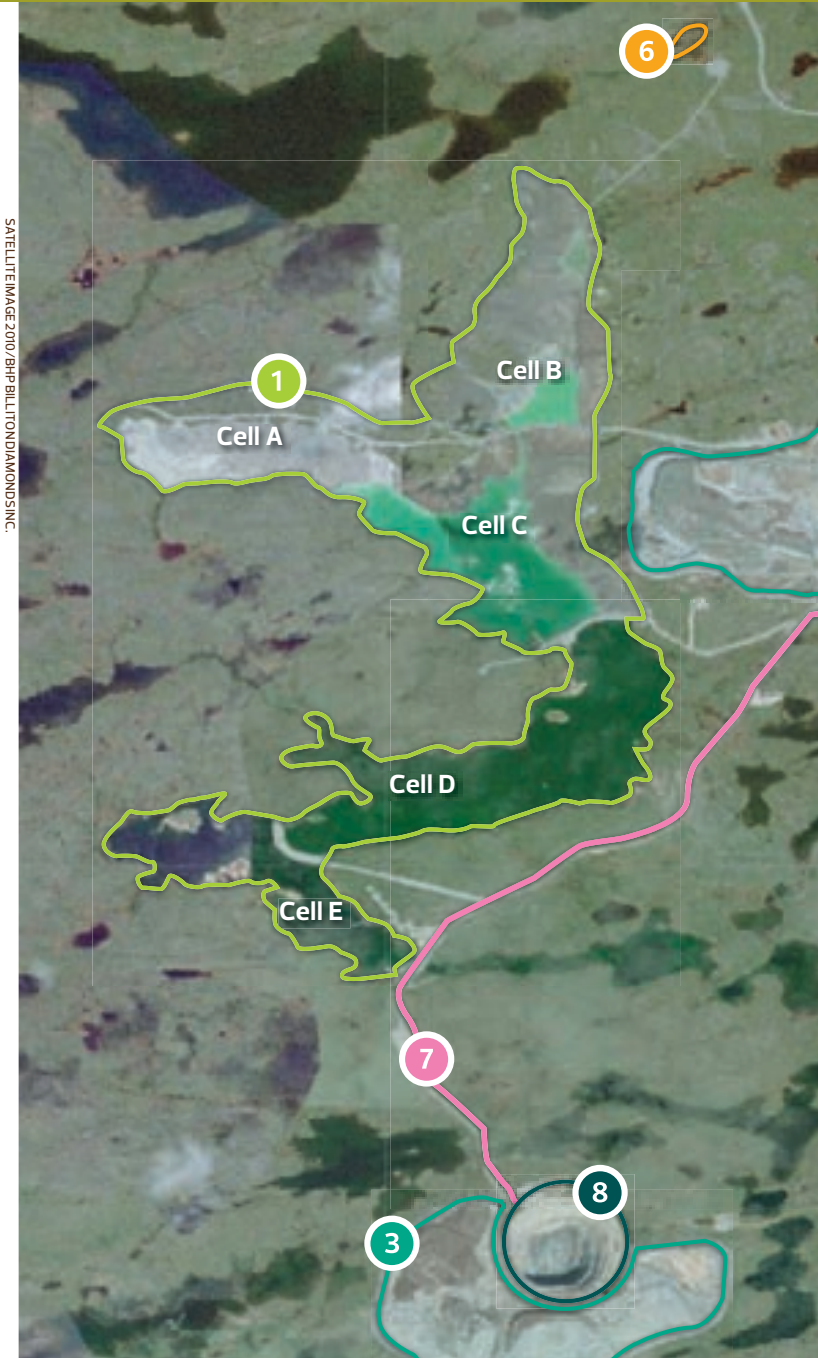


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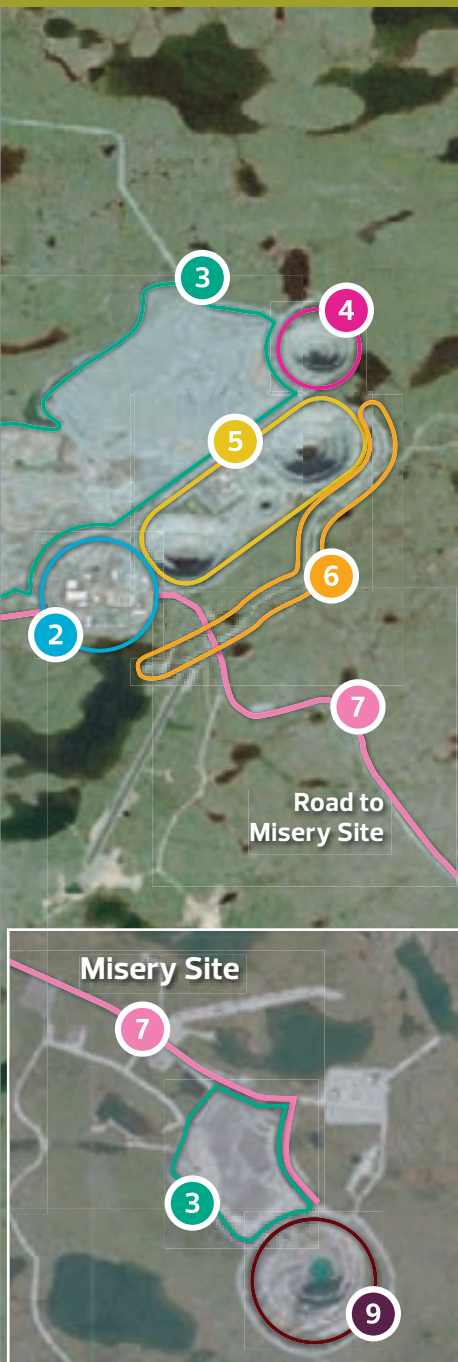
### Waste Rock Piles

Rock that does not contain diamonds is piled in layers up to 50 metres high.

SATELLITE IMAGE 2010 / BHP BILLITON DIAMONDS INC.







4

### Beartooth Pit

BHPB has finished mining Beartooth Pit. The company currently stores water from underground mining in the pit. In late 2012, BHPB will start to store *processed kimberlite* in the pit.



5

### Panda and Koala Pits

Open pit mining has finished here. Underground mining is finished at Panda, but is still happening at Koala. BHPB has built an underground tunnel (located between Panda and Koala pits) to provide access to the bottoms of the pits. A conveyor belt system takes the *kimberlite* rock to the processing plant.



6

### Panda Diversion Channel and Pigeon Stream Diversion

The Panda Diversion Channel and Pigeon Stream Diversion (proposed) are man-made streams diverting water that would otherwise flow into the pits. Fish, mostly grayling, use the new channels for travel and spawning. The Pigeon Stream Diversion will be opened in 2013.



7

### Haul Roads

BHPB has built all-weather roads to connect the pits to the main camp. BHPB carefully applies chemicals to reduce dust on the roads to try to make sure that chemicals do not seep into the lakes and streams near the roads.

8



### Fox Pit

This is the biggest pit at Ekati and most diamonds are found in here.

9



### Misery Pit

BHPB stopped mining at Misery Pit in 2005. The company has begun work to push back the walls and mine deeper in the pit.



## 03 Wastewater and Waste Rock

### HIGHLIGHTS

- > **Beartooth Pit was approved for use as storage for processed kimberlite.**
- > **Large parts of the Fox waste rock pile are not freezing.**
- > **AANDC inspector directed BHPB to do daily inspections of the Long Lake Containment Facility.**

### ACTIVITIES 2011-12

Mining in 2011-12 focused on three *kimberlite* pipes—at Fox Pit and two underground operations (Koala and Koala North). BHPB

plans to mine at Misery Pit in 2012. It has started with a push-back of the walls of the pit. *Processed kimberlite* (PK), also known as *tailings*, was still

deposited in cells A and B of the Long Lake Containment Facility (LLCF). This operation is a challenge for BHPB. Extra-fine PK is not packing down on the pond bottom, so the cells of the LLCF cannot store as much.

BHPB decided it was time to study new ways for storing *tailings*. A number of options were looked at, including using Beartooth Pit to store PK. In July 2011, BHPB held a workshop for the Agency and regulators to review the results of the study and proposed changes to the operation of the LLCF.

The study found storage could be increased greatly by raising and building dykes. This means BHPB may not need to deposit PK into cell D. Cell D could be kept as a water management pond, which would be a good thing.

These options were listed in a new *Wastewater and Processed Kimberlite Management Plan* (WPKMP). The new WPKMP was sent to the Wek'èezhìi Land and Water Board (WLWB) in October 2011. The Agency reviewed this plan and gave comments to the WLWB. We said the plan is a good way to operate the LLCF to *closure*.

In December 2011, the WLWB approved the new WPKMP. BHPB will have to submit an updated WPKMP and water quality prediction model for the LLCF. We have encouraged the development of a water quality model for the last few years.

At this time, *tailings* continue to be deposited in cells A and B of the LLCF. Regular deposit of *tailings* directly into cell C is scheduled for 2013. *Reclamation* of cell B is planned to start in 2013.

Minewater going into Beartooth Pit.



## Nitrate in the Long Lake Containment Facility

Over the past few years, *nitrate* levels in cell E of the LLCF have increased. Cell E is the place from which water is released into Leslie Lake. BHPB conducted experiments to reduce *nitrate* levels, but had some success in the first season only. These studies continue. BHPB also is developing a Water Quality Objective for *nitrate*.

## Waste Rock Management

The WLWB asked BHPB for an updated *Waste Rock and Ore Storage Management Plan* (WROMP) when it announced in 2010 that it would resume mining at Misery Pit. The revised WROMP was due in May 2011. BHPB submitted it in November 2011. The Agency reviewed the plan and gave our comments to the WLWB. It still awaits WLWB approval.

Seepage from the *waste rock* piles is monitored twice a year. This is required by BHPB's water licence. The results of each survey are reported to the WLWB. No long-term problems have been found so far.

## AGENCY COMMENTS

### Long Lake Containment Facility

We support the new plan for *tailings* storage. It has the added security of avoiding the use of cell D.

We also support the idea of using available storage space in Beartooth Pit (along with good water quality monitoring). We have encouraged BHPB to consider this for the past few years. Having as much PK stored as possible in a secure place with a large water cover at *closure* is an important

precaution to take to avoid depositing *tailings* into cell D.

Overall, operations at the LLCF are carried out well. The facility seems to be operated according to BHPB's approved plans.

We note there was a minor lapse in monitoring the LLCF during the winter of 2011-12. In response to a 2008 warning letter from the AANDC inspector after a *tailings* spill, BHPB said it would inspect the entire facility every shift. This would ensure that possible problems were spotted earlier. However, in March 2012,

the AANDC inspector noticed there were no signs of regular inspection. He directed BHPB to carry out the inspections every day, keep a log book for review, and put no more *tailings* into cell B until summer. BHPB has agreed.

### Waste Rock Seepage Survey

As in former years, we found no issues with the company's twice yearly surveys of *waste rock seepage*. The two surveys of waste rock pile seepage conducted each year are complete and show generally that water

Fay Bay spill site, June 2011.



Beartooth Pit.



quality criteria for mine rock drainage are being met. In a few cases, there are temporary small problems due to leaking of *contaminants* from *waste rock* or blasting residues. These generally stabilize or get smaller over time.

### Waste Rock Management

In our view, the management of *waste rock* at Ekati still sets a good standard. Also, the revised WROMP we recently reviewed was well done.

We have a nagging concern, however, about the continuing failure of some *waste rock* piles to freeze inside. BHPB's strategy for preventing bad reactions inside the rock piles depends on the freezing of the rainwater and snowmelt that fill the empty spaces during summer. This freezing would create *permafrost* in the rock pile. The inside of the main Panda-Koala pile has mostly stayed frozen, but there is a general warming trend at the base of the pile.

Large parts of the Fox pile remain unfrozen. In fact, the pile seems to be heating up. There are at least a few places where internal pile temperatures are above freezing,

ranging up to 10.5° C in the core of the pile and up to 2.7° C at the base.

We are not convinced by BHPB's explanation that this is likely a function of placing warm *waste rock* on the piles or placing *waste rock* in above-freezing temperatures. After all, these same conditions apply to all pile operations at Ekati. In our view, this is a serious situation, and more effort is required to find the cause of this effect.

BHPB also states that freezing of the Fox *waste rock* pile is expected, but the time required for this is not known.

The Misery *waste rock* pile has a thick zone that does not freeze year round, up to 14 m in some cases. Parts of some rock layers 10 m below the surface of the Misery pile also do not freeze.

Given the delay in the freezing of the Fox and Misery piles, permanently frozen interiors might not develop. In that case, thinking about how to deal with seepage from unfrozen piles at *closure* would be important. This is especially true for Misery, where higher amounts of metals in run-off may be expected. ■



## 04 Traditional Knowledge

### HIGHLIGHTS

- > Agency hosted a Traditional Knowledge workshop.
- > BHPB is implementing a Traditional Knowledge strategy for Ekati.
- > BHPB should make better use of Traditional Knowledge in *closure* planning.

### ACTIVITIES 2011-12 BHPB's Traditional Knowledge Strategy

The Agency is aware of BHP Billiton's (BHPB) recent Traditional Knowledge (TK) strategy for Ekati. We commend

BHPB for beginning to build stronger ties with communities. Its new TK specialist is working with our Aboriginal Society Members to help communities develop and implement their own TK projects. BHPB also proposes to set up a TK advisory group to help plan *closure*.

## Community Engagement Tours

BHPB held a number of community engagement tours to show Elders and youth how its environment staff do their work. During the tours, BHPB collected ideas and listened to concerns from participants. BHPB has summarized these in reports.

BHPB hosted an Air Quality Monitoring Program tour in May 2011 with people from the Tłı̄chǫ, Kitikmeot Inuit Association (KIA), North Slave Métis Alliance (NSMA) and Yellowknives Dene First Nation (YKDFN). The company also held week-long Wildlife Effects Monitoring Program tours. Community members from the KIA, YKDFN, NSMA and Łutsel K'e Dene First Nation (LKDFN) participated.

## Agency TK Workshop

In December 2011, the Agency hosted a TK workshop in Yellowknife. The purpose of our workshop was to review BHPB's use of TK at the Ekati Mine and to give community members a chance to talk about TK projects in their communities:

- > In Łutsel K'e, a Geographic Information System (GIS) is used to store information on hunting, fishing, trapping, place names, burials and industrial uses of LKDFN lands.
- > NSMA Community Heritage Project aims to help define the North Slave Métis community and to collect information on their land use.
- > Yellowknives Dene are computerizing recordings of interviews with Elders from as far back as the 1960s. This work could help create a library and research centre for the YKDFN.
- > KIA is studying the effects of development on caribou. This work uses both Inuit Traditional Knowledge (Inuit Qaujimagatuqangit) and western science.

BHPB's TK specialist talked about its TK strategy and the projects the company is supporting. A staff member from Aboriginal Affairs and Northern Development Canada (AANDC) talked about how industry can better work with Aboriginal communities and the benefits. The Agency gave an overview of BHPB's use of TK

to date and talked about our role in helping with TK use at Ekati.

Participants in the TK workshop made several recommendations to BHPB:

- > Give significant wildlife incident reports directly to communities and other interested groups.
- > Do better reporting on the use of TK at Ekati in improving environmental management.
- > Bring together people working on TK documentation projects to share information and methods.
- > Use TK in *closure* planning. A TK advisory committee is a good starting point.

- > Spend more time with the communities explaining what is in the *Interim Closure and Reclamation Plan* (ICRP), including how the pits will be reclaimed and managed.

## AGENCY COMMENTS

There is still confusion in the communities about what is in the ICRP. During our community visits, we found that even people who were part of BHPB's meetings on the ICRP are unclear about *closure*. What are the *closure* options, goals, and ways of measuring success for each part of the mine? This suggests a

Elders at Agency TK workshop, December 2011.



weakness in BHPB's consultation process. TK use in *reclamation* planning is an important part of the overall ICRP research plans. The company should do its best to use TK in *closure* planning.

We recommend that BHPB review its work with communities. It should get the most it can out of using TK in *closure* and *reclamation* planning. The company's TK specialist should be an asset in achieving this.

We have suggested to BHPB before that it should:

- > Spend more time in communities. (Take full advantage of TK holders' availability and

eagerness to offer advice. Include overnight stays when accommodations are available.)

- > Send discussion papers to communities before planned meetings. (Let people have time to think about the information. Give translators more time to work with the ideas so they can translate better.)

We believe more participation by communities in *closure* planning is well worth the company's time and effort. A TK advisory panel is a good idea. We urge BHPB to move forward on this quickly and to involve all Aboriginal Society Members. ■

Elders in Lutsel K'e, February 2012.



## 05 Wildlife

### HIGHLIGHTS

- > **A joint diamond mine regional grizzly bear monitoring program appears likely for 2012.**
- > **Limited monitoring of caribou is being done.**

### ACTIVITIES 2011-12

How does the mine affect wildlife? BHP Billiton's (BHPB) Wildlife Effects Monitoring Program (WEMP) reports on Ekati's impacts on wildlife. It also measures if protective actions are working. The 2011 WEMP focused on caribou, grizzly bear, wolverine, wolf, fox, falcons and wildlife

habitat. Monitoring included:

- > Reports of animal deaths and injuries;
- > How often wildlife was seen;
- > Surveys on the ground;
- > How wildlife behaved; and
- > Testing of new ways to monitor wildlife.

## Ekati Mine Area

The area covered by the mine increased by only 4 hectares during 2011. The total area of the mine site is now 3,002 hectares (about the size of Yellowknife).

## Wildlife Incidents

BHPB continues to try to improve waste management and to reduce items in landfills that attract wildlife. It tries to reduce wildlife accidents and keep animals away from danger.

BHPB reported there were:

- > Eight vehicle-related animal deaths (three ptarmigan, two Arctic hare, one fox, one ground squirrel and one raven);
- > Seven non-vehicle wildlife deaths (five caribou and two muskrats);
- > Deterrents needed to move five grizzly bears and two wolves; and
- > Two moose seen on remote cameras.

Plastic fencing replaced electrified wires around Ekati's airstrip in 2010. However, drifting snow is still a problem. Snowdrifts allowed a cow caribou to cross over and get inside the airstrip fence. She

was feeding next to the airstrip and could not be moved. She was shot with the approval of the Government of the Northwest Territories' (GNWT) Department of Environment and Natural Resources (ENR). The other four caribou died of natural causes.

## Caribou Monitoring

BHPB used to report on the number of caribou and their location and behaviour while on the mine site. The company also used to do ground and air surveys. No air surveys have been done since 2009. In 2010-11, observers estimated there were 14,766 caribou in the Ekati study area. Groups of over 3,000 and 5,000 animals passed through the mine site. Roads were closed during these migrations. However, in the fall of 2011, caribou numbers were lower. Only 628 caribou were seen passing near the mine.

Caribou are of great concern for northerners. The major decline in Bathurst herd numbers should concern BHPB, as low numbers can affect a caribou population's ability to adapt to change. This means that development may increase the

risk to caribou numbers. Although mines probably did not cause the decline, people have said that the diamond mines impact caribou location and cause injuries as a result of road crossings. We need to find out why caribou are avoiding the area around mine sites.

During 2011, the behaviour of 27 individual caribou was documented near Ekati. However, the sample size was too small. The 2011 WEMP report also says that 50 remote cameras were placed within the property in 2011. However, no results are given in the report.

## Wolf and Fox Monitoring

To study Ekati's impact on wolves, surveys of den sites are done each year. In 2011, 19 historic and 3 new wolf dens were found. In June, 4 dens were occupied, but no pups were observed in August. Only 1 wolf den has been successful since 2007. This may be caused by lower caribou numbers.

In 2010-11, 66 foxes were seen. All of them were red foxes except one (an Arctic fox). During the mid-1990s, Arctic foxes were more commonly reported than red foxes. Why do red foxes now outnumber

Caribou .



BHPB/DAVE BROSHIA PHOTOGRAPHY

Arctic foxes at Ekati? Red foxes are perhaps stronger. Climate change may also be a factor.

### Wolverine Monitoring

DNA sampling of wolverine hair was done in 2005 and 2006. As a follow-up, studies were done at the Ekati and Diavik mines and Daring Lake in April 2010 and 2011. Over four years, 63 wolverines (35 males, 28 females) were identified in the Ekati study area. We are waiting for the final results for all four years.

### Bird Monitoring

Bird monitoring is no longer done at Ekati other than counting breeding birds as part of a larger survey. As recommended at workshops in 2010, regional raptor surveys were not done. However, BHPB found that rough-legged hawks, peregrine falcons and ravens nested successfully in pits during 2011.

### Grizzly Bear Monitoring

There are few grizzly bears in the Barrenlands, but they are important. Pilot studies of grizzly bears were done in 2010

and 2011. BHPB tested hair snagging and lures. Of the 15 grizzly bears identified, 9 were male and 6 were female.

In November 2011, ENR hosted a workshop on ways to monitor grizzly bears. During the workshop, all mines agreed to the following recommendation: Determine if mine-related activities influence the relative abundance and distribution of grizzly bears in the study area over time.

The three diamond mining companies (BHPB, Diavik and De Beers) agreed to work together on a large-scale, long-term grizzly bear DNA program. The study is expected to start in June 2012.

## AGENCY COMMENTS

### Review of the 2011 WEMP Report

The WEMP report talks about existing programs at the Ekati Mine. Most results are well presented, but limited information is given on the grizzly bear pilot studies and the recent wolverine DNA surveys. BHPB has removed raw data from the report. However, we would like to see more data, such as weather information

and the dates of partial and complete snowmelt. In addition, a summary of the timing of caribou sightings would be useful.

We would like future WEMP reports to present more details about the big picture. We suggest each section discuss long-term trends and the importance of results rather than simply repeating results. What is happening to wildlife at Ekati? Are the mitigation methods working? We also suggest that the report include changes to future monitoring programs.

In March 2011, BHPB proposed a number of changes to the WEMP. Major programs have been dropped and the focus has changed. Progress has been made on a regional grizzly bear

DNA program. We commend BHPB for this leadership.

Hauling from Misery Pit in 2012 will significantly increase vehicle traffic and possible impacts on caribou. However, progress has been slow on finding good ways to monitor caribou. Air surveys have been proven to provide clear information, but BHPB has not done one since 2009. In 2011, 50 remote cameras were placed on the mine property, but study details and results have not been provided. Why are there no studies to find out what influences the movements of caribou and why caribou avoid mine sites? We strongly believe that BHPB must restart its air surveys or find another way to monitor caribou. ■

Red fox.



Wolf.



PHOTOS: BHP BILLITON CANADA INC.





BHPBILLITON/CANADA INC.

# Water and Fish

06

## HIGHLIGHTS

- > **BHPB continues to find ways to reduce *nitrate* levels in water flowing from the Long Lake Containment Facility, but more work is needed.**
- > **Comparing methods for sampling lake mud was helpful. Future reporting should include results from both methods.**
- > **Lessons learned from monitoring fish use of the Panda Diversion Channel will be applied to the Pigeon Stream Diversion.**
- > **Work to widen parts of the Panda Diversion Channel may require more monitoring.**
- > **Fish sampling program will be improved to consider effects from *hydrocarbon* exposure.**

## ACTIVITIES 2011-12

Each year, BHP Billiton (BHPB) checks to see if there are changes in the water downstream of the mine. The Aquatic Effects Monitoring Program (AEMP) collects information on any changes in water, small plants, insects and fish. Two special studies are also carried out.

*Tailings*, treated sewage and minewater were pumped into the Long Lake Containment Facility (LLCF). The solids settle and the *wastewater* is filtered through

dams. Once the water reaches the last cell of the LLCF, it is ready to be pumped into lakes downstream. In 2011, water was released from the LLCF from July to November. It becomes diluted as it flows from lake to lake and into Lac de Gras (see Figure 1 on page 16).

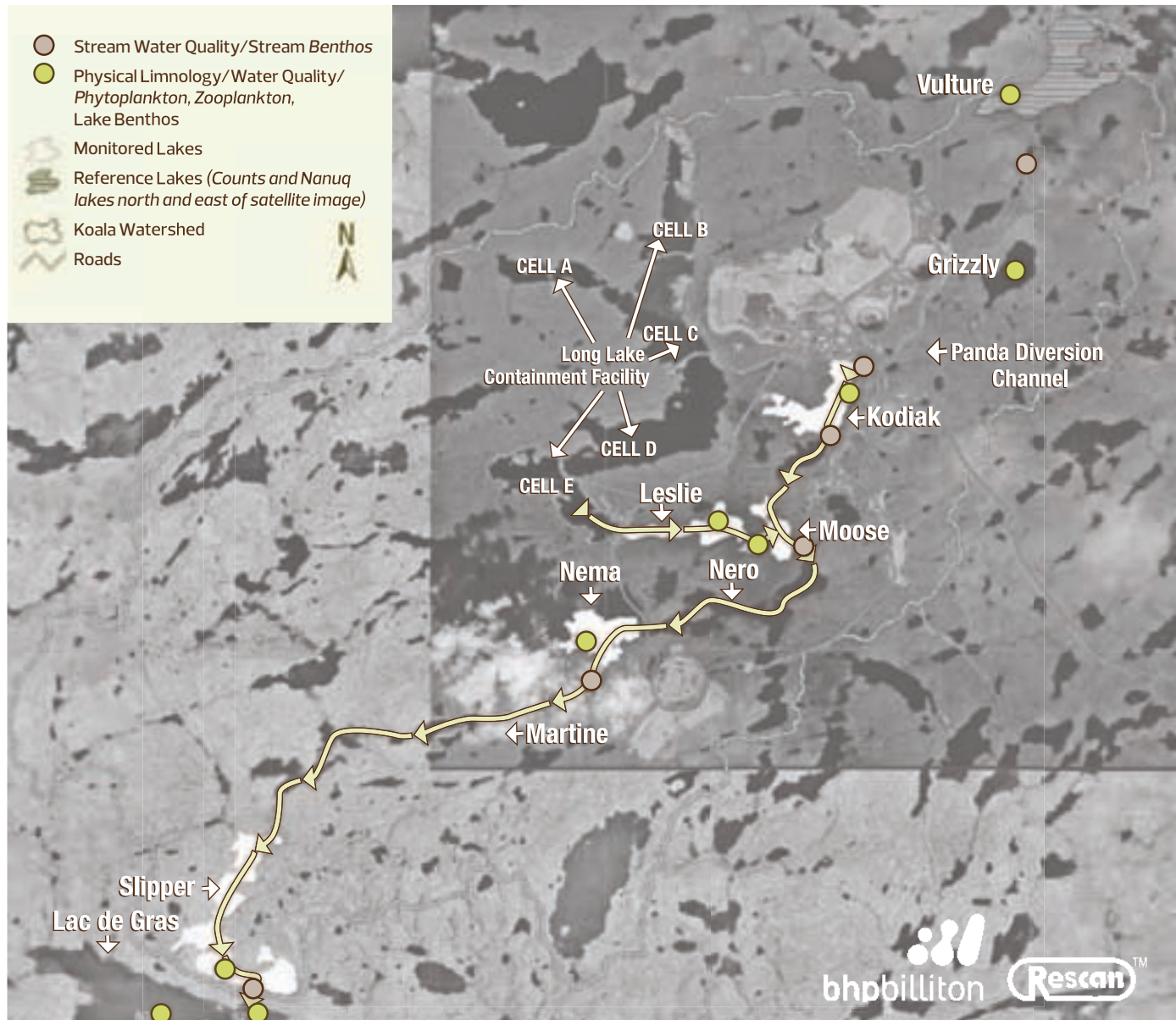
Minewater from the Misery site was pumped into King Pond from July to September. BHPB also pumped minewater into Beartooth Pit because it has finished mining there.

Pigeon Stream.



BHPB/DAVE BROSHIA/PHOTOGRAPHY

**FIGURE 1: AEMP REFERENCE LAKES AND OUTFLOW STREAMS**



**Changes to the 2011 AEMP**

The Wek'èezhii Land and Water Board (WLWB) directed BHPB to make several changes to the AEMP. In the 2011 AEMP report, tables and graphs were added to show whether a *contaminant* is increasing or decreasing compared to previous years.

**AEMP Monitoring Results**

**Water Quality Sampling**

Figure 1 shows some lakes and streams monitored under the AEMP.

In 2010–11, *nitrate* amounts in LLCF water rose. *Nitrate* provides nutrition to plants, but *nitrate* levels that are too high can cause too much algae to grow in the water and baby fish to have growth problems. In 2007, high *nitrate* levels were found in Leslie and Moose lakes. To fix this problem, starting in 2009 water in the LLCF was not pumped out until later in the summer, and phosphate was added to the LLCF to encourage plant plankton to use up more *nitrate*. This helped lower the amount of *nitrate* released in the first summer, but had little affect in later years (e.g., 2011).

We are concerned about *molybdenum* at Ekati. It is a metal that can affect trout just after they hatch. *Molybdenum* stayed the same or declined in lake water downstream of the LLCF. However, it is still higher than the guidelines set for protecting fish. It is also found in bottom mud in all small lakes downstream of the LLCF. Rocks from Misery Pit seem to be where the *molybdenum* is coming from, so the levels could get higher as Misery mining restarts.

Arsenic, copper, chromium, iron and salts are also rising downstream of the mine. We will continue to watch

them to make sure they do not reach levels that will cause harm to fish and other water creatures.

All of these *contaminants* will have to be discussed during the upcoming water licence renewal for the mine.

### Sediment Sampling

In 2011, sediments (bottom mud in lakes and streams) were collected using two different tools (a corer and a dredge). The corer and dredge gave different results. Samples from the dredge were used to determine changes from

previous years because BHPB has always used the dredge. However, the corer proved to be better at showing the true chemical composition of the topmost layer. The results show the metals antimony, *molybdenum* and strontium have increased in lake mud downstream of the LLCF.

### Plant and Animal Sampling

When plankton (tiny water plants and insects) change, fish can be affected. Plankton seem to be changing in Leslie and Moose lakes to less nutritious

and less edible species, which in time could affect fish.

### AEMP Fish Sampling

Starting in 2012, trout will be sampled for *contaminants* in a way that will not kill them. The health of a new fish species (slimy sculpin) will be monitored. Sculpin live on the bottom of lakes and do not travel far, so they will be an early warning of fish health problems. Sculpin have larger populations than trout and whitefish. Sculpin therefore will be sampled every three years, but trout and whitefish will be sampled every six years (in the past, they were sampled every five).

Fish samples will be studied to determine the source of *hydrocarbons* found in some fish in the past.

Fish health monitoring will involve Aboriginal peoples.

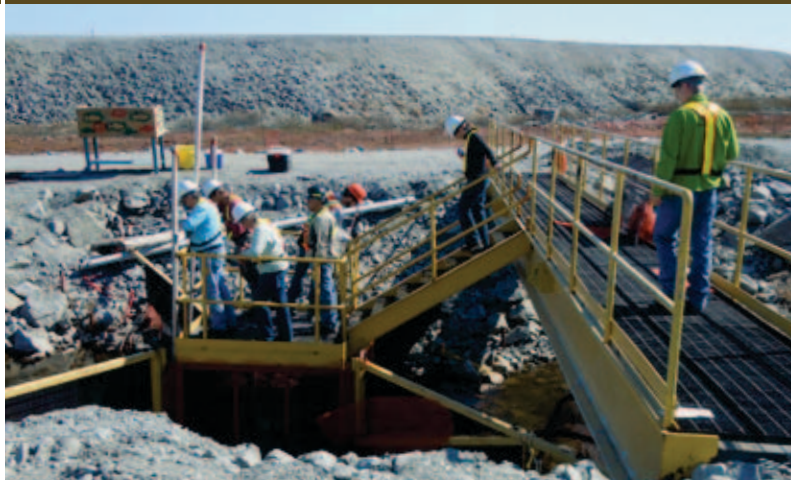
### AGENCY COMMENTS

Our review of BHPB's 2011 reports shows it is doing a good job of protecting the water and fish at Ekati. The AEMP can find small changes in the samples that can alert managers to problems.

Sediment capture on widened part of Panda Diversion Channel.



Fish collection box, June 2011.



However, the Agency is concerned about pollutants downstream from the mine that are close to or above the guidelines for protecting fish. We are worried that lake trout downstream from the LLCF may be exposed to too much *nitrate*. We think the standard chosen by BHPB for *nitrate* is not appropriate. We look forward to seeing this resolved during the upcoming water license renewal.

BHPB's comparison of the corer and dredge results for lake mud was very useful. Having historical data favours the use of the dredge for samples, but the corer gives more accurate numbers. We recommend that both sample methods be used and their results reported on in the future.

We are happy to see the company putting more emphasis on looking at changes in the plankton community, as it may affect fish at the upper end of the food chain.

The WLWB has said that the *Water and Effluent Quality Management Policy* will be used during the water licence renewal. We recommend that the guidance documents for this policy be finished quickly. ■

## Panda Diversion Channel Monitoring Program

### 2011 Monitoring Results

The Panda Diversion Channel (PDC) was built in 1997. BHPB has monitored the PDC for 13 years. In 2011, six types of fish were using the PDC. Longnose suckers were found in the past but not in 2011. Arctic grayling captures totaled 171. Of those, 44% were spawners. This is the highest number since 2007 and 2008.

In 2003, the fins of some young fish were clipped as a mark to see if grayling return to the PDC. In 2011, for the second straight year, the proportion of fin-clipped to total grayling was the same as the year young fish were clipped. The results indicate grayling return to the PDC. Also, it was found that baby grayling in the PDC have about the same amount of body fat as those in a stream untouched by the mine. This is encouraging for the long-term survival of baby grayling into adulthood.

### Evaluation of PDC Monitoring

The Agency hired an expert for a review of 10 years of PDC monitoring results. This work

turned into a study by university researchers and BHPB's consultants of whether the PDC is providing good fish habitat.

The study found that over time stream conditions for fish and fish food insects are becoming similar to those in untouched streams in the area. However, the growth rate of young grayling in the PDC is much lower than those in regular streams. The study says the cause may be that fish in the PDC have fewer insects to eat.

BHPB's final monitoring report, on

the other hand, says their smaller size is due to colder temperatures in the PDC caused partly by shade and ice buildup. These problems likely will be solved by more planting on the stream banks and widening a steep canyon along the upstream end of the PDC to help melt snow pack there. BHPB believes this work will mean no more monitoring is needed.

The good news is that lessons learned from the PDC are being used in developing fish habitat in the Pigeon Stream Diversion.

Widened part of Panda Diversion Channel, June 2011.



# Air Quality

07

## HIGHLIGHTS

- > **Incinerator is operating, but the Waste Management Plan needs updating.**
- > **Agency has not received the 2011 Air Quality Monitoring Program report.**

## ACTIVITIES 2011-12

Air quality monitoring is required under the *Environmental Agreement*. BHPB's Air Quality Monitoring Program (AQMP) was started in 1998. It is reported on every three years. We have not received the 2011 AQMP report,

so we cannot give a full review of the results in this year's annual report. However, BHPB gave a summary of the results in its 2011 environmental annual report, which we briefly report on below.

The AQMP consists of:

- > Weather monitoring (daily);

- > Air emissions and greenhouse gas reporting (monthly and yearly);
- > Air quality monitoring:
  - High-volume sampling (every six days); and
  - Continuous monitoring (all the time);
- > Dustfall monitoring (during the summer);
- > Snow core monitoring (every three years);
- > Lichen sampling (every three years); and
- > CALPUFF modeling (looks at air movements to compare impact predictions and operational changes).

### Air Emissions

From 2009 to 2011, greenhouse gas emissions have gone down by 21% over the last three-year period (2006 to 2008).

### High-Volume Air Sampling

During the 2009 to 2011 monitoring period, two measurements were above the 24-hour national air pollution objective. BHPB suspects this was caused by measurement error. All other values were

generally well below the standard. BHPB reported that extreme winter conditions frequently caused the equipment to fail.

### Continuous Air Monitoring

Results from 2009 to 2011 show a slight decreasing trend for two gases. A third gas (sulphur dioxide) and *total suspended particulates* (dust) have increased slightly. However, over 75% of BHPB's data for measuring the smallest dust particles was not usable, possibly due to human or equipment errors. Northwest Territories standards

Dustfall samplers.



for total suspended particulates were exceeded a total of five times.

### Dustfall Sampling

Sampling shows that there was much more dust close to haul roads. One kilometer away from the road, dust was at normal levels. BHPB also calculated acid deposits, and these samples were below national standards. Metals in the dust were also sampled, but all values were low.

### Snow Chemistry Sampling

BHPB reports that snow samples in 2011 showed *contaminant* levels were lower than those in 2005 and 2008. Chemicals did not appear to change with distance from mining activity.

### Lichen Tissue Sampling

Lichen samples showed results similar to those of snow and dust samples. BHPB found that the amounts of pollutants in lichen (except nickel and copper) were lower in 2011 compared to 2005 and 2008. Sulphur and nitrogen had a wider distribution, but have increased in some places. This might be due to gas emissions rather than dust.

### CALPUFF Air Dispersion Model

BHPB compared the 2006 CALPUFF air dispersion model results with field numbers. The modeled deposits from Ekati, Misery operations, and the Diavik Mine are about the same as background levels beyond three to five kilometers from the mines.

### Incinerator

BHPB restarted work on its new incinerator in September 2011. The Agency is happy to report the incinerator began burning waste consistently in January 2012. A stack test is to be conducted in 2012 to ensure proper operations.

### Community Involvement

In May 2011, BHPB hosted a community engagement tour with Elders and youth from the Kitikmeot Inuit Association, North Slave Métis Alliance, Tłı̨chǫ Government and Yellowknives Dene First Nation. The tour showed participants how BHPB monitors air quality. During the tour, BHPB received recommendations from the groups.

### AGENCY COMMENTS

Only a summary of the 2011 AQMP report was available for our review. We believe the summary does not support BHPB's conclusions that the program is

good at measuring the effects of the mine on air quality.

There still seem to be big problems in collecting data. There is a problem when 75% of the data is not valid due to equipment and human errors. BHPB has monitored air quality since 1998. Problems should have been found and fixed by now.

Operating procedures have not been written for the incinerator. The Waste Management Plan should be updated to include the incinerator and Environment Canada's guidelines on how to properly burn garbage to prevent pollution. ■

Dust from trucking.



# Closure Planning

08

## HIGHLIGHTS

- > **Interim Closure and Reclamation Plan received final approval in November 2011.**
- > **Limited progressive reclamation and little reclamation research was carried out in the last year.**
- > **Next step for closure planning is a review of the financial security needed to ensure the mine is closed properly.**

## ACTIVITIES 2011-12

The most important *closure* event for Ekati this year was final approval of the *Interim Closure and Reclamation Plan* (ICRP) in

November 2011. The highlights are:

- > BHP Billiton (BHPB) must join the pit lakes to the natural water system when the water becomes safe;

- > BHPB must create shallow areas to help fish live in the pit lakes;
- > The *tailings* pond must be covered with a combination of *waste rock* and plants; and
- > BHPB must leave the ground clean enough that plants can grow and be eaten safely by people and wildlife.

The next steps for implementing the ICRP are very important. *Reclamation* research continues. This helps ensure information is ready to properly close the mine and develop the next *closure* plan. *Reclamation* research includes setting goals for *closure* and finding ways to measure success. BHPB will report progress on this research in December 2012. We look forward to seeing and discussing the progress report.

We were asked by BHPB in March 2011 to discuss how the Agency and BHPB could work together to ensure successful completion of *reclamation* research plans. In September, we asked BHPB how best to proceed with this project. BHPB told us that such action without other interested groups would not be appropriate. We are not sure

why the company changed its mind. We will still help with the research plans where we can.

Beyond research, the next step is to make sure there is enough money set aside to carry out the *closure* plan. How much money should be held by the government to enable safe *closure* of the mine if something were to happen to the company? (More details on financial security can be found on page 22.)

In 2011-12, BHPB continued to monitor earlier *reclamation* work at Fred's Channel, the Airstrip *Esker*, South Camp and the Fay Bay spill.

We took steps this year to pursue an interest of ours. How can we ensure replanting at Ekati will succeed? To answer this, we hired a revegetation specialist to do a study. The report, entitled *Towards Revegetation Sustainability Criteria for Northern Mine Closure*, was received in March 2012. It is available on our website. From this study, we wanted to know the early signs of successful revegetation. Can these signs be used to measure successful revegetation as the mine is closed?

Research was done on the trial *waste rock* pads this year. Tundra

## Financial Security Review

With the final approval of the ICRP, it is time to review the financial security for the Ekati Mine. Financial security is held by the Government of Canada to make sure that the mine is closed and reclaimed as agreed. For Ekati, the financial security is primarily in the form of irrevocable letters of credit from banks. These letters can be cashed in at any time by the Government of Canada if it needs the funds to close the mine according to the ICRP.

Financial security for the Ekati Mine is held under:

- > Water Licence (for matters that relate to water and deposits of waste into water);
- > *Environmental Agreement* (for matters including the use of land held under surface leases); and
- > Land Use Permits (for land use at places outside of surface leases).

The total financial security currently held is about \$125 million.

The WLWB has said that it will set the total financial security required based on the approved ICRP. It also will consider how the financial security should be divided up.

BHPB, with the Agency, WLWB and federal government (AANDC), developed a timeline to review the financial security for Ekati:

- > July 2012 – BHPB to deliver proposed costs for various types of work and cost estimates to AANDC and the Agency;
- > August 2012 – Site visit and meeting to discuss BHPB cost estimate;
- > September 2012 – AANDC to deliver a cost estimate to BHPB and the Agency;
- > October 2012 – Meeting to discuss AANDC cost estimate; BHPB may update its cost estimate; and
- > November 2012 – Progress report from all the parties to WLWB.

plants and soil were transplanted to help plants grow. Plantings were watched carefully. Results suggest revegetation on the rock piles may be difficult. Seedlings did not survive well. Fireweed and dwarf birch at the rock pad study sites were eaten by Arctic hare. In other places where food for hares grows, seedling survival was better.

Good use of Traditional Knowledge in *closure* planning is also part of the approved ICRP. For this to work, it is important that communities understand the ICRP. There are many signs that the plan

is not understood yet. BHPB has met with communities, but we often hear questions and concerns from community members about the ICRP. Our Society Members want to know more about the plans for closing the different parts of the mine (e.g., the pits) and want to be part of the planning.

Another urgent step is to figure out the financial security deposit needed to close Ekati. This is money that will be set aside and held by the government. The amount must be large enough that the public will not have to pay

Revegetation plot, September 2010.





Bench on newly-widened PDC to capture sediments, June 2011.



for proper closing if the company cannot meet its obligations at the end of the mine's life. Finding the right amount of financial security is complicated. We may have to look for outside expert advice to help us in these discussions. It is our view that we

should be more involved rather than less. That way, we can assure our Society Members that the security held by the government is adequate. Meetings regarding the security have been good so far, but the process has just begun. We will report on the process again next year. ■



BHP BILLITON CANADA INC.

## Regional Monitoring and Cumulative Effects

09

### HIGHLIGHTS

- > **Government of the Northwest Territories has yet to complete the Bathurst caribou herd summer-range pilot project.**
- > **Federal government accepted some recommendations from the WRRB for helping caribou, but no deadlines were specified.**
- > **Caribou, fish and water will be the focus of cumulative impact monitoring over the next three to five years.**

### ACTIVITIES 2011-12

The Government of the Northwest Territories' (GNWT) Department of Environment and Natural

Resources (ENR) committed to a project in the Bathurst caribou range in 2008. This work has not been completed. It should

be finished and made available.

In October 2010, the Wek'èezhìi Renewable Resources Board (WRRB) made a decision on caribou management. The WRRB made recommendations to ENR, Aboriginal Affairs and Northern Development Canada (AANDC) and the Tłı̨chǫ Government. Here is an update.

An implementation plan was developed and approved. The WRRB said that AANDC and ENR should work together to find ways to lessen impacts on caribou during and after calving. These would include limits on land use activities near the caribou. It could also include reporting on landscape changes. For example,

Roads at Ekati.



how do fires and mine exploration change caribou habitat?

In August 2011, the Minister for AANDC responded to the WRRB's October 2010 recommendations. The Minister accepted the recommendations in part, but gave no timeline for carrying out the plan.

The Cumulative Impact Monitoring Program (CIMP) collects and analyzes environment information for the Mackenzie Valley. It also reviews the success of resource management. So far, CIMP has stressed the need for work with communities, coordination and environment data important to northerners. In 2011, 43 projects in the Northwest Territories received

CIMP-funding, for a total of more than \$1.5 million. CIMP hosted a workshop in the fall of 2011 to exchange results and ideas. A priority-setting workshop selected fish, caribou and water for the focus of the program. ■



## 10 How are the Government Regulators Doing?

### HIGHLIGHTS

- > **Federal government does effective inspections, but more resources are needed for this work and the water licence renewal.**
- > **Federal agencies have been helpful in understanding the aquatic environment.**
- > **Government of the Northwest Territories should strengthen its technical input into decision-making about Ekati.**
- > **Wek'èezhìi Land and Water Board should provide clearer direction on content and detail for management plans. It should complete guidelines for Adaptive Management Plans and supporting documents for the Water and Effluent Quality Management Policy.**

## THE REGULATORS AND OUR MANDATE

The Agency is the public watchdog for the environment at the Ekati Mine. We monitor BHP Billiton (BHPB) as well as government agencies and other regulators regulating the mine.

The regulators are doing a good job of ensuring BHPB operates an environmentally sound mine. During 2011-12, we feel there were times when their work was good and times it could have been better. We were pleased to see that everyone was willing to work together. For example, the Government of the Northwest Territories (GNWT) coordinated discussions on regional grizzly bear monitoring. Fisheries and Oceans Canada (DFO) and Environment Canada have been helpful in giving us a better understanding of regulations protecting water and fish.

### Aboriginal Affairs and Northern Development Canada

We are pleased with the inspections carried out over the last year by the inspector for

Aboriginal Affairs and Northern Development Canada (AANDC). However, the number of inspections was reduced to six this year from nine the previous year. We hope that AANDC soon finds the resources to ensure timely and complete inspections of Ekati.

AANDC continued to provide sound technical advice on water issues. It is important that AANDC continues to hire independent technical experts, especially as we get ready for the water licence renewal in 2012.

### Fisheries and Oceans Canada

DFO staff have been helpful to the Agency and others. For example, when a site tour was planned to see the widening of the Panda Diversion Channel, DFO asked if the Agency could send a representative. DFO also provided leadership and funding in a final, joint evaluation study of stream habitat in the Panda Diversion Channel. DFO conducted *toxicity* testing on northern fish species, and we look forward to the results. This information will help in setting water quality goals and *contaminant* limits at the mine.

### Environment Canada

Environment Canada continues to provide sound advice to BHPB and the Agency on air quality monitoring. The department also has helped us better understand the policy and practice for protection of water ecosystems.

### Government of the Northwest Territories

The Department of Environment and Natural Resources (ENR) has given helpful advice on air quality monitoring.

We were pleased with ENR's hosting of a grizzly bear monitoring workshop, where BHPB proposed a joint approach to monitoring with other diamond mines. We are hoping ENR will promote the same idea for better caribou monitoring.

We believe ENR should do more technical reviews of BHPB's water licence submissions. It also should provide more review, input and advice on wildlife monitoring at Ekati.

We hear that a new *Wildlife Act* is a priority for the GNWT. We look forward to the improved regulation of wildlife monitoring and management plans in the territory.

### Wek'èezhii Land and Water Board

We have a good working relationship with Wek'èezhii Land and Water Board (WLWB) staff. We were generally pleased with the WLWB's direction on BHPB management plans submitted last year. However, clear guidelines are needed. What does the WLWB expect in the content and detail of management plans?

We are pleased that the new *Water and Effluent Quality Management Policy* will be used for the Ekati water licence renewal. This means the pollution limits in the licence will be reviewed. However, we urge that supporting guidance documents be developed for the policy.

We are also growing anxious to see completed guidelines for *Adaptive Management Plans*. This is important work to make sure that there are proper plans in place if new *contaminants* begin to be detected or reach certain limits. We urge that this work be finished in the next six to twelve months. ■



# 11 How is BHP Billiton Doing?

## HIGHLIGHTS

- **BHPB continues to run the Ekati Mine in an environmentally sound way.**
- **New *Interim Closure and Reclamation Plan* was approved and sets a high standard.**
- **Improvements to caribou monitoring and community consultation are needed.**
- **Aquatic effects monitoring and reporting were improved.**

In our view, BHP Billiton (BHPB) runs Ekati in an environmentally sound way, as it has for many years. There were no major

problems last year. However, there is always room to improve.

While we sometimes disagree with BHPB, we still have a good working

relationship with the company's environment staff. In 2011-12, BHPB had helpful meetings on the water licence renewal and the 2012 Environmental Impact Report. These will be major issues next year.

An important event in 2011-12 was final approval of the *Interim Closure and Reclamation Plan* (ICRP). We believe this plan is a good one. It sets a high standard for *closure* planning. However, communities still need to understand the plans to reclaim and close the mine so that they can provide their input well before *reclamation* begins. We look forward to the first progress report on *closure* planning. It is due in December 2012, and we will review it carefully.

The new incinerator began to operate in early 2012. We look forward to standard operating procedures for it. We also would like to see an updated Waste Management Plan that includes how the company will operate the incinerator and keep records on it.

We commend BHPB for its leadership in working with other diamond mines on a regional program for grizzly bear DNA

analysis. There appears to be good progress on moving this forward in the summer of 2012. Caribou monitoring, on the other hand, needs to be improved as soon as possible.

We were pleased to be part of a BHPB meeting to review the management of the Long Lake Containment Facility. A teleconference afterward with BHPB's consultant was also very helpful. We support BHPB's efforts to keep *processed kimberlite* out of cell D, the area that helps make the water cleaner. We look forward to more information on water quality models and monitoring of *processed kimberlite* in Beartooth Pit.

The company has improved its presentation of data in the Aquatic Effects Monitoring Program. Plankton analysis and reporting also has been improved. Starting in 2012, sampling will include a small bottom feeding fish that will provide early warning signs of fish health problems. This all makes for a better program.

Lastly, we were happy to see better reports of community visits, which we have recommended in the past. ■

# Agency Recommendations for 2011-12

## RECOMMENDATION 1

The Agency recommends that BHPB implement in 2013 a monitoring program with the objective to determine the influence of mine-related activities on the relative abundance and distribution of caribou.

**BHPB Response:** BHP Billiton monitors for mine-related effects on caribou in several ways. Behavioural scans were augmented in 2011 by remote cameras and enhanced field procedures, which will continue through 2012. Also, an aerial survey is planned for 2012. The specific programs for caribou monitoring in 2013 will consider the information gathered in 2012.

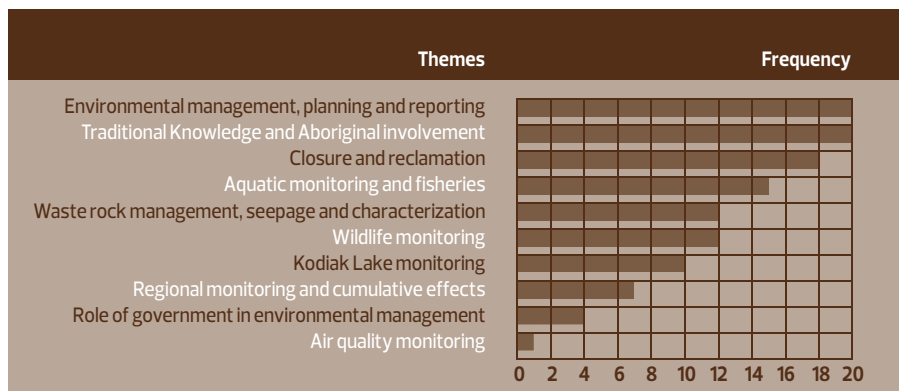
## RECOMMENDATION 2

BHPB should undertake more effective community consultation regarding closure in order to:

- > Achieve better community understanding of the closure plan;
- > Gain a better understanding of the views of communities regarding closure; and
- > Facilitate the incorporation of Traditional Knowledge into closure planning.

**BHPB Response:** It is important to BHP Billiton that Aboriginal communities participate in planning for closure and reclamation of the EKATI Diamond Mine. The *Interim Closure and Reclamation Plan* approved by the Wek'èezhii Land and Water Board includes programs that will build on established relationships to further enhance community participation. BHP Billiton will seek to work directly with Aboriginal communities through 2012 and beyond to implement these programs.

### AGENCY RECOMMENDATION THEMES 1997-2012



Recommendation Recipient	Frequency of Recommendations
BHPB	88
Government (GNWT, Government of Nunavut, Government of Canada)	14
Water Boards (NWT Water Board, MVLWB, WLWB)	8
Environmental Agreement signatories	3
Aboriginal Society Members and BHPB	3
Aboriginal Society Members	1
All Agency Society Members	1
<b>Total</b>	<b>118</b>

# Glossary

## **Adaptive Management** –

Learning from environmental monitoring results and using the results to change and improve operations and monitoring.

## **Closure** –

Act of ceasing mining, processing and other production activities (final closure of the mining operation).

## **Contaminant** –

A substance not naturally present in the environment or present in amounts that can negatively affect the environment.

## **Cumulative Effects** –

Environmental changes or impacts from past, present and future human land use activities (e.g., exploration and mining) combined with natural factors (e.g., fires, climate change).

## **Effluent** –

Wastewater that flows into a receiving body of water.

## **Environmental Agreement** –

Signed by BHPB and the federal and territorial governments in 1997 to provide environmental monitoring for the Ekati Mine not covered by other licenses and permits. The Tłı̨chǫ Government, Akaitcho Treaty 8 First Nations (LKDFN and YKDFN), KIA and NSMA were involved in the negotiations.

## **Esker** –

Long, low, narrow mound of sand and gravel left behind by a stream in a glacier.

**Hydrocarbons** – Elements made of only hydrogen and carbon. Hydrocarbons are found in oil products.

**Kimberlite** – A rare type of rock rich in iron and magnesium that sometimes contains diamonds. Created deep below the earth's surface, kimberlites are usually found in long pipe-shaped forms.

**Molybdenum** – A metal that can affect trout just after they hatch.

**Nitrate** – A nutrient formed from nitrogen. Nitrate can affect the growth of baby fish.

**Permafrost** – A permanently frozen layer below the earth's surface found in cold locations (e.g., the Barrenlands).

**Phytoplankton** – Tiny plants that live in the water. They are an important food source for zooplankton.

**Processed Kimberlite** – The crushed rock and water mixture that is left over after kimberlite ore has been processed by the mill to collect diamonds. Also called "tailings".

## **Progressive Reclamation** –

Reclamation that can be carried out during the construction and operation phases of a mine prior to final closure (e.g., rock waste dumps). See also "Reclamation".

**Reclamation** – The process of returning areas of land and water to healthy ecosystems after being disturbed by mining or other human activities.

**Tailings** – See "Processed Kimberlite".

## **Total Suspended Particulates** –

Portion of dust released into the air that remains in the air.

**Toxicity** – The ability of a material to cause harmful effects in a living creature.

**Waste Rock** – Rock that must be removed to access kimberlite pipes, or rock that contains

diamonds but that is not worth mining or processing.

**Waste Rock Seepage** – Water that drains over waste rock piles. This water may pick up chemicals when it touches the waste rock and may enter into rivers, lakes and streams.

**Wastewater** – Water that contains wastes from the mining process (e.g., sewage and chemicals from explosives).

**Zooplankton** – Tiny insects that live in water and are an important food source for small fish. Zooplankton eat phytoplankton.

Agency directors and staff.



# Acronyms

**AANDC** – Aboriginal Affairs and Northern Development Canada, previously known as “Department of Indian Affairs and Northern Development (DIAND)” and “Indian and Northern Affairs Canada (INAC)”

**AEMP** – Aquatic Effects Monitoring Program

**AQMP** – Air Quality Monitoring Program

**BHPB** – BHP Billiton Canada Inc. (“the company”)

**CIMP** – Cumulative Impact Monitoring Program

**DFO** – Fisheries and Oceans Canada (also known as “Department of Fisheries and Oceans”)

**DIAND** – See AANDC

**DNA** – deoxyribonucleic acid

**ENR** – Department of Environment and Natural Resources (NWT), previously known as “Department of Resources, Wildlife and Economic Development (RWED)”

**GIS** – Geographic Information System

**GNWT** – Government of the Northwest Territories

**IACT** – Inter-Agency Coordinating Team

**ICRP** – Interim Closure and Reclamation Plan

**IEMA** – Independent Environmental Monitoring Agency (“the Agency”)

**INAC** – See DIAND

**KIA** – Kitikmeot Inuit Association

**LKDFN** – Łutsel K’e Dene First Nation

**LLCF** – Long Lake Containment Facility

**MVLWB** – Mackenzie Valley Land and Water Board

**NSMA** – North Slave Métis Alliance

**NWT** – Northwest Territories

**PDC** – Panda Diversion Channel

**PK** – processed kimberlite

**TK** – Traditional Knowledge

**WEMP** – Wildlife Effects Monitoring Program

**WLWB** – Wek’èezhii Land and Water Board

**WPKMP** – Wastewater and Processed Kimberlite Management Plan

**WROMP** – Waste Rock and Ore Storage Management Plan

**WRRB** – Wek’èezhii Renewable Resources Board

**YKDFN** – Yellowknives Dene First Nation



## PLAIN LANGUAGE ANNUAL REPORT

2011-12

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*All photos by the Agency unless  
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