



Director Bill Ross learning about the wildlife cameras

HIGHLIGHTS

- 306 caribou observed – the lowest ever recorded.
- Enhanced waste management used to reduce attractants at landfills and reduce wildlife incidents.
- 62 infrared motion sensor cameras deployed with emphasis on Misery and (proposed) Sable roads; results to be published in an Addendum to the 2015 WEMP in June 2016.

ACTIVITIES 2015-16

Dominion Diamond Ekati Corporation's (DDEC) Wildlife Effects Monitoring Program (WEMP) documents wildlife effects resulting from mining activities, and assesses the effectiveness of wildlife mitigation and management efforts at Ekati Diamond Mine. The 2015 WEMP is the 18th annual report, and focuses on wildlife habitat and species of greatest interest including caribou, grizzly bear, wolves, wolverine, foxes, raptors and breeding birds. Monitoring techniques included compilation of incident reports and visual observations, ground based and aerial surveys, behaviour surveys, and photographic monitoring. Power line surveys were undertaken along the Misery Road power line.

Ekati Mine Footprint

During the 2015 reporting period, 106 ha of additional surface area of habitat were disturbed at Ekati due to mine development and operations, including the expansion of Pigeon Pit, development to support Lynx Pit, and a new laydown area near Misery Pit. The total amount of direct habitat loss caused by the project footprint since 1997 is now 3,400 ha (34 km²), including 87 km of road.

Waste management

DDEC continues its efforts to improve waste management practices and reduce attractants at landfills, to reduce wildlife incidents, and to deter wildlife from areas of danger (e.g., airstrip, high traffic areas). Adherence by employees to effective waste management disposal practices at the mine site remains a challenge. In addition to continued emphasis on employee education and awareness, in 2015 DDEC also hired two full-time waste management Team Leaders and a full-time waste management consultant focused solely on managing and reducing waste.

Overall occurrence of wildlife attractants or misdirected wastes was relatively high and

similar to 2014. DDEC attributes the general increase in the amount of misdirected wastes and attractants at the Ekati landfill in 2012–2015 to an increase in the number of contractors and new employees with the commissioning of Misery Camp, activities at Misery, Lynx and Pigeon pits, increased survey intensity, more focus on identifying and removing waste, and a broadening of what is considered an attractant. In response to this increase in misdirected waste, the Environment Department increased the frequency of surveys to track this issue, focused more on identifying and removing attractants, and launched a series of waste management presentations targeting problem areas. Wildlife sightings at the landfill, generally correlated with the amount of misdirected wastes and attractants, increased over 2014.

Wildlife Incidents and mortalities

Wildlife incidents involved direct interaction between wildlife and humans or infrastructure. There were 13 wildlife incidents with humans or mine infrastructure reported at Ekati, including grizzly bear (4), wolf (4), fox (1), wolverine (3), and a bird (Tundra swan). The number of incidents in 2015 is similar to numbers reported from 2011 to 2014 (6-15 annually). The bear incidents involved deterrence with a helicopter and bear bangers, and the wolf incidents involved the same individual within the Main Camp that ultimately died from probable canine distemper.

Nine vehicle-related wildlife mortalities were reported during the 2015 reporting period, none of which involved Valued Ecosystem Components (VEC) species. There were three non-vehicle related wildlife mortalities reported including one mortality among VEC species (one wolf), and two among non-VEC species (common raven and an unknown waterfowl species). No caribou mortalities as a result of mine activities have occurred in recent years (Figure 2).

WASTE MANAGEMENT

The Agency is encouraged that DDEC continues to make waste management a priority. The commissioning of the new in-vessel Brome composter and establishment of three new positions in waste management during 2015 reflect this priority. Other notable milestones include:

- 406 tonnes of hazardous waste, electronics, and recyclables was shipped off site;
- 23 tonnes of wet and dry biodegradable waste was composted rather than being incinerated;
- Incinerator operation was reduced to one unit each day for approximately 12 hours, saving an estimated 30,000 liters of diesel fuel; and
- Approval of DDEC's Waste Management Plan Version 2.0 by the WLWB. As a result of these efforts, the Agency provided a letter in support of DDEC's submission for the Towards Sustainable Mining Environment Excellence Awards for its work on the Waste Management Program.

Misery Power Line Interactions Monitoring

In 2015 power line surveys were conducted 291 times over 138 separate days. VEC species accounted for 37% of observations, with caribou observed on 11 occasions, grizzly bears on 12, wolves on 27, and birds on 53 occasions. There were no incidents of caribou or other wildlife exhibiting negative wildlife-power line interactions due to construction operations, and no modifications of local road and construction activities, or temporary suspensions of local road access were warranted. The WEMP did not record whether caribou successfully crossed under the power line. Deterrents were used on two occasions when foxes approached personnel. Monitoring will continue during the remaining construction (spring 2016) and all operation phases of the power line.

Caribou Monitoring

Caribou monitoring activities for 2015 included a simple analysis of abundance and distribution (from satellite collared cows collected by ENR), incidental caribou observations, behaviour surveys, Long Lake Containment Facility (LLCF) monitoring and wildlife camera monitoring. Sample sizes for most monitoring were low. This was in large part due to low numbers of Bathurst caribou and their tendency in recent years to spend summer and fall further north of the mine site.

Incidental observations of caribou have generally declined since 2009. In 2015, ground based incidental observations recorded 306 caribou, by far the lowest recorded since incidental observations began in 2006. Nearly one-third of observations occurred during late winter, half were observed during mid to late May during spring migration, and about 17% were observed

during post-calving and summer. Fewer caribou have been recorded during post-calving and summer in recent years, with 2015 being the lowest year on record with no groups greater than 2 individuals observed.

Eight focal behavioural surveys were conducted in 2015 between early August and early September on seven bull and one juvenile caribou close to infrastructure. Although sample size was small, caribou spent about 80% of their time either feeding, bedded, walking or standing, similar to compiled results of focal surveys conducted in 2010-2013 at Ekati. Caribou in 2015 responded to 28 potential stressor events at distances up to 500 m, and showed no or minor overt responses.

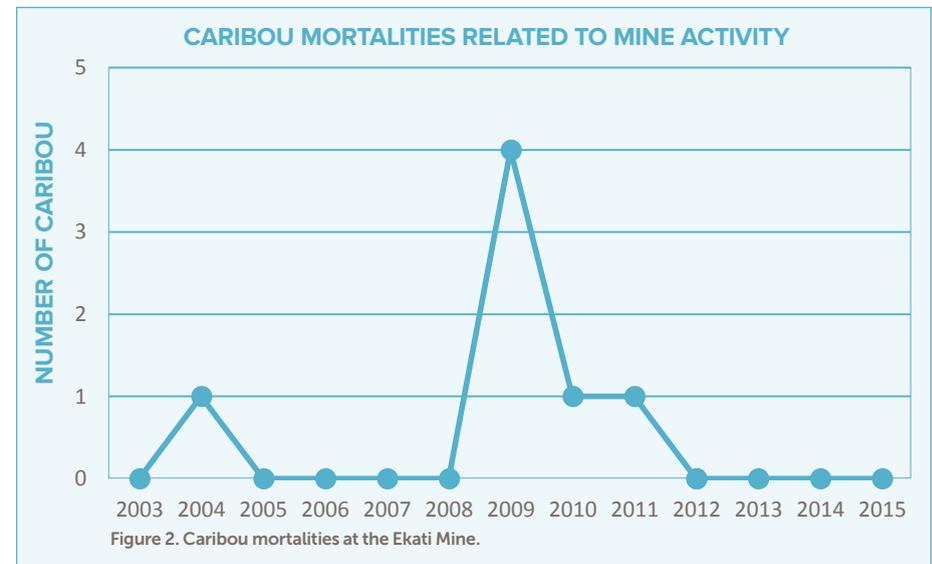
The LLCF wildlife monitoring program documents wildlife activity in the LLCF to address concerns related to potential injury and ingestion of processed kimberlite. There were no caribou observed in the vicinity of the LLCF in

2015. A total of 674 caribou have been observed within the LLCF area between 1999 and 2015. To date, no caribou injuries or deaths have been directly attributed to the LLCF.

The Wildlife Camera Monitoring Study initiated by DDEC in 2011 uses motion-triggered cameras to monitor caribou activity along Misery Road and Sable, Pigeon, and nearby access roads. Sixty-two infrared motion-triggered cameras were deployed in 2015 around Ekati Mine in a continuing effort to better understand how caribou respond to mine infrastructure and in particular to roads. DDEC was unable to conclude processing and analysis in time for the 2015 WEMP, but has committed to an Addendum Report no later than June 2016 which will summarize 2014 and 2015 results.

Grizzly Bear Monitoring

For 2015 grizzly bears were monitored at Ekati through incidental observations and remote wildlife cameras. The DNA mark-recapture study





Geese in the Long Lake Containment Facility

undertaken jointly by DDEC and Diavik Diamond Mine concluded in 2013 and the results were published in 2014. DDEC held discussions with ENR regarding a plan to repeat the grizzly bear DNA mark-recapture study in 2017.

In 2015 there were 60 grizzly bear sightings of 75 individuals, the highest since 2005. In four instances the use of a helicopter and/or deterrents was required. Fifty-one management activities resulted in site wide notifications in response to grizzly bear observations and temporary work stoppages or relocating crews from the area to allow grizzly bears to forage or move through an area undisturbed.

Other Wildlife

There was no monitoring of known wolf denning activity in the Ekati study area in 2015, although an active wolf den site near Misery Road km 20 was assumed to be productive. In 2015, 69 incidental observations of 95 wolves were

recorded. The number of incidental sightings of wolves has been higher since 2012 compared with 2001 to 2011.

DNA-based wolverine population assessment was conducted in 2005 and 2006 at Ekati Mine, concurrent with studies at Daring Lake, Diavik Diamond Mine, and Kennady Lake. These studies were repeated in 2010–2011 and in 2014–2015. The Ekati study area was surveyed in April 2015, with 180 lure stations deployed and nearly 500 hair samples collected and submitted for DNA analysis. The results were not available for inclusion in the 2015 WEMP. The number of incidental sightings of wolverines in 2015 (26) is within the range of observation since 2006, which, coupled with the hair collections, suggest continued high wolverine activity in the region.

While Arctic fox and red fox were not identified as VECs during the Environmental Assessment Review Process, fox occurrence at Ekati Mine

is an ongoing concern because of potential attraction to human activity and the risk of transmission of rabies. Monitoring of foxes has been undertaken since 2007. In 2015 there were 182 incidental sightings of 194 individual foxes, on the high side of sighting numbers since 2007. There was one unconfirmed case of rabies in 2015.

There were 11 incidental sightings of 23 moose individuals in 2015, following the trend of increasing observations of moose in recent years.

Raptor nesting activity occurred in several of the pits in 2015. Nesting was actively and successfully deterred from the Misery and Pigeon pits to minimize conflict with mining activities. Regional falcon surveys were conducted during 2015 in conjunction with ENR and Diavik Diamond Mine, the first since 2010, with nest sites surveyed in mid-June (occupancy) and late July (productivity). Occupancy of nest sites by falcons (35%) was the lowest recorded since 1995. Only two of 10 occupied sites produced chicks; there was no discussion of the cause of this poor nesting success. No gyrfalcon nesting attempts were recorded, the continuation of a decline since 1995.

The North American Breeding Bird Survey was conducted for the 13th year with number of species observed (35) and the number of individual birds recorded (505) in 2015 within the range observed in previous years.

AGENCY ASSESSMENT

Results of the 2015 WEMP programs undertaken were generally well presented, and it was encouraging to see that DDEC has made waste management a priority.

The fact that caribou observed incidentally on site was the lowest recorded since 2006 underscores concerns with the decline of the Bathurst caribou herd, which has dropped to record low numbers with no indication of a herd recovery. The very

low numbers adversely affect monitoring efforts and reduce the amount of and confidence in the data from which to assess mitigation efforts.

The Agency has been concerned about the degree to which roadways and other infrastructure may be acting as barriers to wildlife movement. The 2015 Wildlife Camera Monitoring Program used 62 infrared motion-triggered cameras most of which were set up along Misery Road and the proposed access road to Sable Lake. Remaining cameras were deployed along the Lynx access road and proposed access road for the Jay Project. Unfortunately, the processing and analysis of photos taken was not concluded in time for inclusion in the 2015 WEMP. DDEC has committed to produce an addendum by June 2016. While the Agency acknowledges that the Jay Project review process took much effort in 2015, it is nonetheless unfortunate that the results of this important monitoring program could not be included in the 2015 WEMP. We remain optimistic that many of the initiatives developed during the Jay Project environmental assessment will be integrated into the WEMP. ■



The Narrows between Lac du Sauvage and Lac de Gras

HIGHLIGHTS

- The Review Board determined that significant adverse impacts from the Jay Project are likely and set out 22 measures to mitigate the impacts.
- Many of the recommendations made by the Agency were incorporated into the Review Board's Report of Environmental Assessment. These are summarized in Table 3.
- If approved, the Jay Project will extend the life of Ekati Mine by more than ten years.
- Potential effects on caribou and water quality were top concerns of communities.
- Additional workshops involving caribou and roads, and offset mitigation were conducted.

The Jay Project consists of mining and processing diamonds from the Jay Pipe, 30 km southeast of the existing Ekati processing facilities. The Jay Pipe will be accessed by constructing a horseshoe-shaped dike in Lac du Sauvage. DDEC proposes to drain the water in the diked area to expose the kimberlite and build a series of roads from the pit to the existing Misery site 7 km to the southwest. Trucks will transport ore along these roads and then along the Misery haul road to Ekati's main site for processing.

With the exception of the series of new roads to access the pit, diversion channels to manage surface water and the horseshoe-shaped dike, most of the needed milling and power infrastructure already exists at the Ekati main site and Misery location. A new waste rock storage pile will be constructed on the shore of Lac du Sauvage for rock and overburden excavated from the pit during construction and operation. Open-pit minewater, which is expected to be the largest source of water, and surface runoff water will be pumped to

the Misery Pit for storage and management at mine closure.

If approved, the Jay Project will extend the life of Ekati Mine by more than ten years.

DDEC submitted the Jay Project Developer's Assessment Report (DAR) in October 2014. The Mackenzie Valley Environmental Impact Review Board (Review Board) initiated an adequacy review and requested additional information from DDEC. The adequacy review was a new step in the environmental assessment (EA) that examined not just the presence or absence of information, but the quality of that information in relation to the EA's Terms of Reference.

DDEC held very useful information sessions on the DAR in December 2014, including community and technical meetings. After the sessions, more than 500 requests for information (of which 52 were from the Agency) were assessed by the Review Board and submitted to DDEC, government and others.

In April, the Agency participated in Technical Sessions to discuss DDEC's responses to the requests for information and assist in narrowing down the issues to be addressed in the remaining parts of the environmental assessment. The sessions focussed on wildlife and caribou, surface and groundwater, fish and fish habitat, air quality, and socio-economic issues.

Following the Technical Sessions, a second round of information requests was carried out by the Review Board where another 78 requests were submitted, including six submitted by the Agency.

The Review Board conducted a Public Hearing on the Jay Project in September, 2015. A hearing is held at the end of an EA to tie together and focus all the information

JAY EXPANSION PROJECT

gathered through the process. The hearing also enabled DDEC and others to present their conclusions and final arguments to the Review Board. Twelve formal intervenors, including the Agency, participated during the hearing in Yellowknife, and the community sessions in Behchokò, Lutsel K'e and Kugluktuk.

Based on the provided information, the Review Board concluded that the Jay Project is likely to have significant adverse impacts on the environment, and that there is significant public concern related to these impacts. The Review Board also concluded that the impacts can be mitigated through the commitments and measures identified through the environmental assessment.

The Agency focused on four major areas of concern during the EA process:

- Caribou;
- Water quality and aquatic life;
- Air quality; and
- Waste rock.

Effects on Caribou

Caribou are an essential part of Aboriginal peoples' culture, language, and way of life. DDEC argued that, while there will be a small and largely unmeasurable effect from the Jay Project on the Bathurst caribou herd, there will not be a significant adverse impact to caribou as a result of their proposed mitigation measures. DDEC stated that given caribou-friendly road construction, additional traffic management and lower traffic thresholds to trigger enhanced mitigation, and continuing development of better dust management, potential impacts to caribou would be reduced.

The Agency argued that, given the precarious state and continuing decline of the Bathurst caribou, any additional impact would be significant. The Agency suggested that the

TABLE 5: IEMA COMMENT OR MEASURE	REVIEW BOARD RESPONSE
CARIBOU	
There would be a significant adverse cumulative impact of the Jay Project on the Bathurst caribou herd.	The Review Board concluded that the Jay Project is likely to cause significant adverse project-specific and cumulative impacts to the Bathurst caribou herd.
The Jay haul road route design should minimize disturbance to high quality caribou habitat.	Measure 6-1: The Caribou Road Mitigation Plan (CRMP) will detail means to avoid and minimize habitat disturbance and include a response framework that links monitoring results to changes in mitigation.
Additional mitigation is required to reduce the effect of haul truck and other traffic on caribou.	Measure 6-1: DDEC will define specific thresholds that trigger road management responses and describe specific monitoring and mitigation for caribou impacts related to the road.
Dust management best practices with adaptive management triggers for additional dust suppression are required.	Various measures: DDEC will prepare a dust management best practices document, conduct an enhanced dust mitigation study and implement the Air Quality Emissions Monitoring and Management Plan prior to construction. The GNWT will develop an interim dustfall objective.
Precautionary traffic management is required to reduce sensory disturbance.	Measure 6-1: DDEC will use convoys or other methods to manage traffic on haul roads to maximize time intervals between disturbances from vehicles.
Concerned with the ability to detect caribou at intermediate distances.	Measure 6-1: DDEC will describe methods for monitoring approaching caribou at intermediate distances beyond line of sight from the roads, including at night and in poor visibility.
Traditional Knowledge should be used in mitigation and monitoring.	Measures 6-1 and 6-5: DDEC will use Traditional Knowledge when designing CRMP and monitoring caribou responses.
Jay esker crossing design should involve selection of less critical habitat, one-way traffic, buried power lines, remote sensory devices, and other innovative approaches.	Measure 6-1: DDEC will investigate and implement innovative actions to mitigate impacts to caribou from barriers to movement at the esker.
A collaborative research program to identify the causes of the Zone of Influence (ZOI) for caribou avoidance should be implemented.	Measures 6-2 (a) and 6-5: DDEC will support ZOI research, including a collaborative research program incorporating Traditional Knowledge designed to identify the causes of the ZOI for caribou avoidance
Aerial surveys to monitor relative caribou distribution and abundance and measure the effectiveness of mitigation measures for caribou currently in use for Ekati and proposed for the Jay Project should be undertaken.	Nothing specified
An Offset Mitigation Plan for caribou, which will be reported annually, should be prepared.	Measure 6-2 (a): DDEC will provide details on offsets in a Caribou Offset and Mitigation Plan, which will be reported annually and updated every three years. The GNWT will measure, evaluate and enforce the effectiveness of Dominion's offsets that result from the approved Plan.

IEMA COMMENT OR MEASURE	REVIEW BOARD RESPONSE
WATER QUALITY AND AQUATIC LIFE	
Quality of wastewater discharged to Lac du Sauvage at the end of mine life should not be acutely toxic to the aquatic environment.	Even if the water is not toxic, any elevated levels of TDS after closure that would result in perceived poor water quality would likely adversely affect traditional use.
Surface and mine water management contingencies are needed in the event a stable meromixis condition fails to establish in the Misery Pit.	Measure 4-2a: The Water Management Plan is to include an evaluation of contingencies to manage water during operation of the Jay pit; conditions under which each will be implemented; Dominion’s preferred contingency; and how water would be monitored to evaluate the performance of the chosen contingency.
Fish will require access to Lac de Gras if spawning habitat in Lac du Sauvage is impacted. A prolonged disruption of fish movement between the two lakes would result in a significant impact to fish.	Measure 5-1: DDEC will maintain water levels at the Narrows so that fish passage is not affected. Prior to construction, the company will revise the Aquatic Effects Monitoring program (AEMP) to describe how it will monitor the Narrows before and during closure and manage activities in Lac du Sauvage during closure.
Non-lethal testing of large-bodied fish within Lac du Sauvage should be used in aquatic effects monitoring.	Further engagement is required through the water licensing regulatory phase to finalize the Jay Project AEMP.
A model of depth of wave turbulence in Lac du Sauvage in areas likely to be affected by dust deposition should be developed.	The Review Board is satisfied that dust deposition concerns will be adequately addressed during the water licensing regulatory phase and supports Dominion’s further engagement with parties on the development of the Fish Offsetting Plan.
The impacts on Counts Lake as an AEMP reference lake should be evaluated and where necessary, alternative lakes should be identified as reference lakes.	Revisions to the Jay Project AEMP will be reviewed through the established Wek’èezhì Land and Water Board approval process.
The possible acute toxicity to zooplankton occurring in the Lac du Sauvage mixing zone should be evaluated using natural conditions in the receiving environment.	Revisions to the Jay Project AEMP will be reviewed through the established Wek’èezhì Land and Water Board approval process.
Possible shifts in plankton community structure should be annually assessed to determine how changes could impact fish of Lac du Sauvage.	Revisions to the Jay Project AEMP will be reviewed through the established Wek’èezhì Land and Water Board approval process.
AIR QUALITY	
The Air Quality and Emission Monitoring and Management Plan (AQEMMP) should be revised to contain timeframes for developing triggers and response actions for monitoring and mitigating air pollutants, road dust, snow and lichen.	DDEC’s AQEMMP already describes air quality monitoring and contains triggering criteria. Any necessary revisions for the Jay Project could be addressed through the existing AQEMMP review process.
A plan to manage road dust caused by vehicle traffic should be developed as dust will be a significant deterrent for caribou to pass through and forage in the area of the Jay Project.	Measure 6-1: The Caribou Road Mitigation Plan is to include dust management best practices measures with adaptive management triggers for additional dust suppression and should link to the AQEMMP.

measures proposed by DDEC did not go far enough to adequately eliminate sensory disturbance and reduce deflection of caribou away from the site. A dust management best practices document is still lacking, as is an explicit commitment to reducing road, Long Lake Containment Facility (LLCF), and other fugitive dust deposition at Ekati. Sensory disturbance from truck traffic could be further reduced by more protective traffic management.

In addition to the environmental assessment, DDEC held two workshops in 2015 to revise the site-wide Conceptual Wildlife Effects Monitoring Plan and Caribou Road Mitigation Plan, and one workshop and one teleconference to refine the Caribou Compensatory Mitigation Plan. DDEC committed during the meetings to complete a Caribou Road Mitigation Plan within one year of acceptance of the Review Board’s Report of Environmental Assessment, stating that this plan will contain additional mitigation measures, details on financial support for caribou research and offsetting, enhanced dust suppression, and accelerated progressive reclamation. DDEC committed to apply these enhanced measures to the Jay Project and existing Ekati Mine operations, which are expected to provide an additional degree of offset to existing and future impacts on the Bathurst caribou herd.

Water Quality and Aquatic Life

Like caribou, the waters and aquatic life of Lac du Sauvage and particularly the “Narrows”, a shallow channel connecting Lac du Sauvage and Lac de Gras, are culturally important to Aboriginal peoples and are ecologically significant. During the public hearing, DDEC described how it would manage surface and minewater with high total dissolved solids (TDS) concentrations during the life of the Jay Project

by storing it in the Misery Pit. DDEC argued that by establishing a state of meromixis, or the permanent stratification of water in the Misery Pit, water that is high in TDS would remain in the bottom of the pit lake and never rise to surface to be discharged to Lac du Sauvage.

The Agency and other parties argued that the preservation of the waters of Lac du Sauvage and Lac de Gras is critical if the waters are to remain suitable for traditional use upon final closure of the mine. The Agency expressed concern over relying solely on the establishment of meromixis to ensure high quality of water in the Misery Pit upon it being discharged. The Agency suggested that water management contingencies are needed in the event a stable meromictic condition fails to become established. The Review Board agreed and directed DDEC to investigate alternative water management contingencies.

In addition, DDEC committed to maintain Lac de Sauvage as an oligotrophic lake (low organic content and algae growth, and high dissolved oxygen).

The Agency also argued that high concentrations of naturally occurring metals and major ions, which are found in local deep groundwater, could be chronically or acutely toxic to zooplankton, phytoplankton and benthic organisms in Lac du Sauvage if discharged. For several years the Agency has been tracking shifts in phytoplankton communities downstream of the Long Lake Containment Facility (LLCF). In part due to these observations, the Agency recommended that possible shifts in plankton community structure downstream of the Misery Pit be assessed annually to determine if, and how, similar shifts are occurring and how fish populations in Lac du Sauvage could be impacted.

IEMA COMMENT OR MEASURE	REVIEW BOARD RESPONSE
Air quality monitoring should be expanded to sample dustfall, snow and lichen on the Jay esker system and the northern and eastern shores of Lac du Sauvage.	Nothing specified.
Additional incinerator in-line continuous emissions monitoring (CEM) should be undertaken to detect the possible formation of dioxins and furans.	Measure 9-1: DDEC is to, in consultation with the GNWT and Environment Canada, assess the feasibility and need for additional in-line CEM for assessing incinerator performance. DDEC is also to develop an adaptive management response plan for the possible release of dioxins and furans from the incinerator and include a consideration of in-line continuous emissions monitoring.
An enforceable territorial regulatory air quality framework should be developed as soon as possible.	The GNWT committed to phasing in enforceable air regulations, starting in 2017 with incineration regulations.
DDEC, in collaboration with GNWT, other interested parties and Diavik should develop a regional approach to air quality monitoring, management and mitigation.	Nothing specified.
WASTE ROCK	
Thermal and hydrologic monitoring of the Jay waste rock pile should take place and an adaptive management approach adopted with triggers and action levels for acid rock drainage.	DDEC committed to monitor the Jay waste rock pile as part of the Waste Rock and Ore Storage Management Plan and install thermistors to monitor ground temperature.
GENERAL	
DDEC and other parties should report annually on the measures, suggestions and commitments recorded in the Report of Environmental Assessment.	Measures 13-1, 13-3 and 13-4: Monitoring and annual reporting by DDEC and regulatory agencies is necessary to evaluate the effectiveness of adaptive management and mitigation actions and to report on the implementation of measures.
A permanent participant funding program for environmental assessments held under the <i>Mackenzie Valley Resource Management Act</i> should be established by Canada and the GNWT.	Nothing specified.



Director Bill Ross, Executive Director Kevin O'Reilly, Director Tim Byers, Emery Paquin at the Jay Project public hearing.

Air Quality

The Jay Project will be a significant new source of road dust. The Agency argued that dust from all sources, but particularly road dust, may be a major deterrent to caribou using the area and may impact fish habitat in Lac du Sauvage. To mitigate the effects of fugitive dust, the Agency argued that specific response strategies are required when short-term episodic exceedances of numeric standards occur because of road traffic.

The Agency also suggested that a regional approach to air quality monitoring and management be developed and that the GNWT develop an enforceable regulatory framework as soon as possible.

Non-hazardous combustible waste generated through the Jay Project will be managed using Ekati's existing incinerators. Evidence suggests that incinerators at the Ekati Mine have not always been operated properly and have been the source of dioxin and furan releases into the environment. While DDEC has committed to stack testing the incinerators every three years and responding adaptively to any failure, the Agency argued that inline

continuous emissions monitoring (CEM) is required to assess incinerator performance on a real-time basis. Although the installation of CEM is not a specific recommendation of the Review Board, the Agency notes the Review Board recommended that, following any failed stack test, the company develop an adaptive management response which may include inline incinerator CEM for flow of flu gas, oxygen and carbon monoxide.

Waste Rock

Meta-sediment and overburden material collected during dike construction and waste rock from the Jay Pit will be stored immediately adjacent to the shores of Lac du Sauvage. In the DAR, DDEC confirmed that approximately 34% of the meta-sediment and overburden is potentially acid-generating. Because of the location and composition of the waste rock pile, the Agency sought assurances that DDEC would be able to adequately detect any seeps from the pile and manage them effectively. DDEC committed to monitor the Jay waste rock pile as part of its Waste Rock and Ore Management Plan and install ground temperature cables to monitor pile

temperatures. Given these commitments, the Review Board concluded seepage from the pile is not likely to significantly affect water quality in Lac du Sauvage.

AGENCY ASSESSMENT

Throughout the EA and in its closing submissions, the Agency provided suggestions to the Review Board to increase or enhance caribou mitigation and offsetting to reduce project-specific and cumulative impacts of the Jay Project on the Bathurst caribou. We are pleased to note that almost all the Agency's proposed suggestions were included in the Review Board's Report of Environmental Assessment.

The Review Board agreed with the Agency's conclusion that the Jay Project is likely to cause significant adverse project-specific and cumulative impacts to the Bathurst caribou herd. The measures identified by the Review Board ensure that a comprehensive and innovative combination of monitoring and mitigation measures will be developed and implemented to reduce the risks of serious harm to the Bathurst caribou herd and the environment.

The Review Board was particularly critical of the GNWT for lack of progress on a Bathurst Caribou Management Plan, lack of dustfall objectives for caribou habitat and delays in developing a comprehensive air quality regulatory framework.

While the Agency is pleased that the Review Board agreed that DDEC should investigate site water management contingencies beyond meromixis, we note that our recommendations as they pertain to impacts on zooplankton, phytoplankton, benthic organisms and fish have been deferred to the Wek'ëezhì Land and Water Board (WLWB) regulatory process.

The Agency remains concerned over DDEC's ability to monitor and manage the thermal and hydrological processes of the Jay waste rock pile. Experience has shown that metal leaching is occurring in other seepage at neutral or near-neutral pH as a result of weathering of both granite and waste kimberlite material. We look forward to working with the WLWB to ensure the Waste Rock and Ore Storage Management Plan incorporates a robust monitoring system and an adaptive management approach with clear triggers and action levels that lead to actions to prevent potential acid rock drainage from entering Lac du Sauvage.

The Agency is pleased with DDEC's commitment to hold further discussions on the Air Quality and Emissions Monitoring and Management Plan prior to start of construction of the Jay Project. We would anticipate that, in addition to examining dustfall response triggers and strategies, DDEC would consider the need for additional dustfall, snow and lichen monitoring sites on the northern and eastern shores of Lac du Sauvage and along the Jay esker system.

The Review Board recognized the value of inline CEM as a tool to monitor incinerator performance. In its report, it suggested that DDEC, in consultation with the GNWT and Environment Canada, assess the feasibility and utility of CEM and provide a report of the findings. The Agency is pleased with this suggestion and looks forward to the results of the study.

The reporting of results is needed to evaluate the effectiveness of adaptive management actions and mitigation measures. The Agency is pleased that measures have been put forward by the Review Board which require DDEC and regulatory agencies to report annually on actions being taken to implement the measures put forward in its final report. ■

LYNX AND SABLE EXPANSION PROJECTS

HIGHLIGHTS

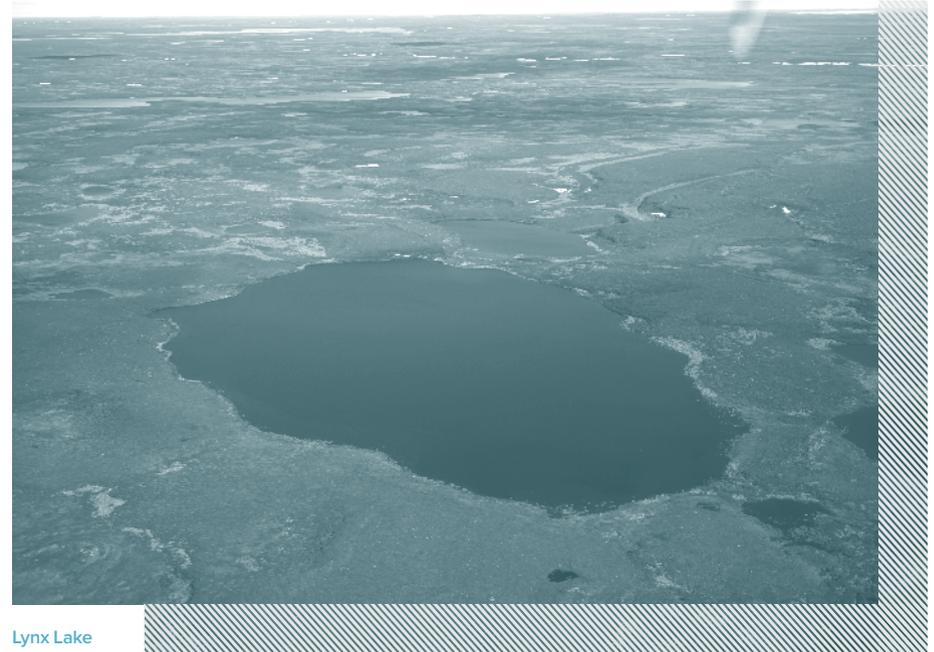
- Communities participated in Ceremony of Respect to initiate fish-out of Lynx Lake.
- Commencement of Sable Project announced.

LYNX PROJECT

The Lynx Pipe is a small deposit located 5 km southwest of the Misery Camp. It is located under Lynx Lake and will provide approximately 4-5 months of ore to the Ekati processing plant.

The fish-out of Lynx Lake was initiated in June 2015 following a Ceremony of Respect to honour the land, water and culture. It was led by representatives of the Yellowknives Dene First Nation and was attended by community Elders. Following completion of the fish-out, the harvestable fish were distributed to the Impact Benefit Agreement communities. Clean water was then pumped from Lynx Lake to Lac de Gras and the silted lower-depth water pumped to the King Pond Settlement Facility. Pre-stripping operations later began to expose the underlying kimberlite in preparation for mining activities.

Under their land use permit (LUP), Dominion Diamond Ekati Corporation (DDEC) was required to submit caribou road crossing designs to the Wek'èezhì Land and Water Board (WLWB) for the Lynx access road. The Caribou Crossing Plan was approved by the WLWB provided that DDEC use finer crush to cap the crossings or demonstrate how using the proposed 6 inch minus granite crush addresses the concerns of Aboriginal organizations expressed during the Caribou Crossings Workshops.



Lynx Lake

SABLE PROJECT

Commencement of the Sable Project, originally approved in 2003 after an environmental assessment, was announced by DDEC in September. The kimberlite pipe is located beneath Sable Lake located 27 km north of the Ekati Main Camp. The project will require construction of a new access road, onsite camp and fuel storage facilities, and a sedimentation pond allowing Sable Lake to be dewatered ahead of the pre-stripping operations. Sable is currently fully permitted under an existing land use permit (LUP), water licence and a Fisheries Act authorization, and is expected to supply ore to the processing plant for approximately 8 years.

DDEC submitted a proposed Aquatic Effects Monitoring Program (AEMP) plan in December 2015. Under the plan, DDEC

will monitor and report on any effects to the aquatic environment near the Sable Pit and downstream of the Two Rock Sedimentation Pond. The WLWB rejected the proposed plan and directed DDEC to submit a revised Sable AEMP as a section within the upcoming 2016-18 site-wide AEMP Design Plan.

A proposed design of the Sable Road was also submitted, the construction of which is permitted under the existing LUP. Although the planned routing has not changed significantly from the preliminary design first submitted in 2001, minor changes were proposed to reduce dangers associated with sharp curves and elevation above adjacent tundra, and to optimize the material needed for construction. An Elders group has been formed to assist in refining road design using Traditional Knowledge, including the location of caribou crossings once the road is in place. ■

REGIONAL MONITORING & CUMULATIVE EFFECTS



Caribou

HIGHLIGHTS

- CIMP led study on the cumulative effects of the Ekati Mine and Diavik Diamond Mine on Lac de Gras.

ACTIVITIES 2015-16

In this section, we review progress on regional monitoring and cumulative effects. Regional monitoring can be a useful tool for cumulative effects monitoring and management.

The Government of the Northwest Territories (GNWT), Department of Environment and Natural Resources (ENR) hosted a Slave Geological Province Regional Wildlife Monitoring Workshop in March 2015. The Agency participated as did representatives of all the diamond mines including DDEC.

Wildlife

GNWT has made some progress on regional monitoring and cumulative effects assessment. A task group established to study and develop guidance on Zone of Influence monitoring of caribou avoidance around diamond mines released a draft background document in March 2015. This work provides useful

data for cumulative effects assessment and management and was supported through the participation of Agency Director Kim Poole. Unfortunately, little additional progress on this initiative was achieved in 2015-16, largely due to efforts directed at the Jay Project environmental assessment. We hope that work on this important topic will continue in 2016-17.

In February 2016, ENR initiated a meeting among diamond mining companies, the Agency, and caribou experts to standardize behavioural monitoring at the mines to feed into regional monitoring. Discussions focussed on clarifying objectives and summarizing methods and protocols currently in use. Reports, field protocols, and data from existing programs are being collated and an initial review of data is planned for 2016-17.

The Bathurst Caribou Range Plan project led by ENR continued during 2015-16. The working group's mandate is to develop recommendations to manage cumulative disturbance of Bathurst caribou habitat at the range and population scale. Management objectives and issues, evaluation criteria and potential management strategies have been developed with Traditional Knowledge (TK), primarily caribou migration trails and harvesting areas being incorporated into the process. Three years of funding was secured from Polar Knowledge Canada to support this work.

Water Quality and Aquatic Effects

The GNWT Cumulative Impact Monitoring Program (CIMP) completed an initial study on the ability of the existing Aquatic Effects Monitoring Plans (AEMP) at the Ekati Mine and Diavik Diamond Mine to detect cumulative impacts at the outlet of Lac de Gras. The study report is expected to be submitted in advance of the AEMP re-evaluations for the Ekati Mine and Diavik

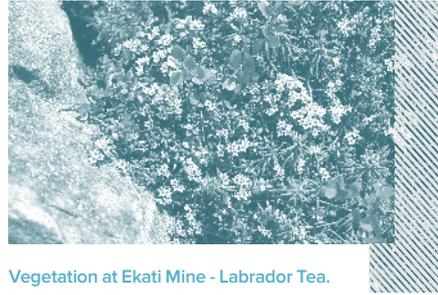
Diamond Mine, both of which are due to the Wek'èezhì Land and Water Board (WLWB) by June 30, 2016. The Agency looks forward to this collaborative initiative, as it should allow for the design of a more effective AEMP at both mines.

The GNWT released their 'Status and Trends of Water Chemistry and Flow in the Coppermine and Lockhart River Basins' final report in March, 2015. The study analysed water quality and quantity data collected by both GNWT and Environment and Climate Change Canada between 2000 and 2015 to evaluate trends in water quality and flow. It was also used to help identify gaps in monitoring such as number of sampling locations and frequency of sampling. In general, the data showed some parameters had statistically significant changes. However, the magnitude of these changes was not included in the report.

Coppermine Watershed Results

Significant increasing temporal trends in pH, conductivity, total hardness, dissolved calcium, dissolved magnesium, chloride, and total molybdenum and strontium were identified at the Lac de Gras outlet, as well as downstream Desteffany Lake, and to a lesser extent Point Lake. No highly or moderately significant increasing temporal trends were identified at Daring Lake or Rocknest Lake. The present trend results for pH, conductivity, total hardness, chloride, and total strontium at the Lac de Gras outlet correspond with the significant increasing trends identified throughout Lac de Gras.

Another noteworthy finding, the southern half of Coppemine River is eutrophic while the northern half starting at Rocknest is mesotrophic. This is likely due to different geology. ■



Vegetation at Ekati Mine - Labrador Tea.

HIGHLIGHTS

- DDEC engaged community members and Elders on a variety of subjects including fish salvage, caribou, roads, waste rock piles and reclamation.
- The AEMP is deficient in use of Traditional Knowledge.

ACTIVITIES 2015-16

DDEC has sponsored Traditional Knowledge (TK) projects that are based in the communities and at Ekati Mine.

Community Based Traditional Knowledge Projects

Lutsel K'e Dene First Nations (LKDFN) Traditional Knowledge and Livelihoods Program. There are two components to this program:

TK Digital Archives: The Agency is happy to learn that Lutsel K'e has obtained funding from DDEC to continue their work to document and record TK. This included collecting, digitizing, cataloguing and sharing knowledge, including traditional place names, hunting and trapping trails, and many of the stories passed down by

2 RECOMMENDATION

The Agency recommends that DDEC increase the use of Traditional Knowledge into aquatic monitoring and report on its usage in these activities.

Elders pertaining to the use of the land and traditional practices on it. The funding enabled LKDFN to hire two community members to perform this work.

Caribou Monitoring – Traditional Livelihoods Project: The Bathurst Caribou Herd hunting ban means that Aboriginal groups that normally hunted the herd must now travel farther to hunt other herds, such as the Beverly herd. Because LKDFN hunts primarily the Beverly herd, DDEC, in partnership with the GNWT's Environment and Natural Resources (ENR) department, is funding the LKDFN to monitor the health of the caribou and ensure that hunters are acting responsibly when out on the land, and are not wasting meat by taking only the most desirable parts of the caribou.

Lands That Are Wide and Open, Yellowknives Dene First Nation (YKDFN) Traditional Knowledge Report. This report focused on the proposed Jay Project. The YKDFN undertook a review of the 1997 'A Traditional Knowledge Study of Ekati' report recommendations to determine if they are still valid, if the YKDFN beliefs and attitudes are still reflected, if past baseline studies for Ekati Mine are valid for the Jay Project, and if there are gaps in the data that can be addressed by further analysis.

Web-Based Atlas for the Naonaiyaotit Traditional Knowledge Project (NTKP).

This project involved the creation of a user-friendly, web-based, interactive atlas of Inuit land use and TK for the Kitikmeot region. The atlas will use information from the NTKP. This outreach tool is expected to be used as an educational tool for school in the Kitikmeot region of Nunavut and in cultural programs.

Inconnu Recovery Program. This fish study program provided the opportunity for YKDFN members to assist with a fish assessment in the Yellowknife River Inconnu Recovery Program.

Ekati-Based Community Engagement Programs

Site Visits: This past year the YKDFN chiefs were invited to an update on the Jay Project as well as site tours of the Misery operations and the 2015 Lac du Sauvage Winter Drilling Program. The YKDFN Lands and Environment Committee, Deninu Kue First Nation, Fort Resolution Métis Council and the Lutsel K'e Dene First Nation were also invited for a site tour of the Jay Project.

Monitoring Programs and Studies: Over the past several years, DDEC has provided opportunities for Aboriginal community members to become familiar with the Ekati Diamond Mine Environmental Monitoring Programs and studies and provide any TK they may have.

The Misery Pit Raptor Surveillance Team undertook surveillance of raptors attempting

to establish nests close to the Misery Pit expansion project. The Misery Road powerline wildlife monitors monitored the installation of the powerline poles along the length of the Misery Road. Community Wildlife Assistants were hired from Kugluktuk and the Tłı̄chǫ to assist with the Ekati Diamond Mine Caribou Track Survey. An Archaeological Assistant from the YKDFN assisted with the Jay Project Archaeological Field Surveys. Members of the YKDFN also assisted with a fish shoal survey for the Jay Project in Lac du Sauvage.

For one week in August, five youth from each of the Aboriginal communities participated in reclamation projects where they collected goose grass seeds at the Long Lake Containment Facility (LLCF), removed invasive weeds from around the Ekati main camp, and removed debris from the Old Camp Reclamation Project. The students also assisted the environment program with their on-site wildlife monitoring and water sampling programs. This visit provided the opportunity for young community members to gain first-hand experience working safely at the mine, while actively participating in mine reclamation.

Community Caribou Engagement Program:

In August 2015, DDEC held its annual Community Caribou Engagement Program with 22 Aboriginal community members (youth and Elders) from the KIA and Hamlet of Kugluktuk, LKDFN, NSMA, Tłı̄chǫ Government, and the YKDFN. This year, the focus of the program was on how caribou interact with roads at the mine site, how successful existing mitigation methods have been, and how new mitigation methods are being incorporated to reduce the risk to caribou and other wildlife from traffic on the Misery, Sable and Lynx roads and the proposed Jay Project road. The community

participants had the opportunity to view first-hand the new Ekati Caribou Roads Mitigation Plan, the established and future caribou crossing locations, and the proposed Jay Project esker road crossing. The participants were also flown by helicopter along the Sable Road route.

Use of TK in Operations:

Tłı̄chǫ What'aa Eskers TK Project: Tłı̄chǫ Elders were brought to Ekati Mine to observe the landscape and properties of natural eskers around the existing mine site and the proposed Jay Project and provide advice on designing and building waste rock piles to make them as caribou-friendly as possible. The What'aa Eskers project involved taking Elders and other community members to study a historic, culturally-significant esker. The Elders studied its design, structure, rock placement, and topography to determine the key characteristics of the esker in the landscape and transfer these principles to the Jay waste rock pile. The Elders explained that caribou are attracted to eskers due to their high elevation over the surrounding tundra.

Lynx Lake Ceremony of Respect and Fish Out:

Upon request from YKDFN, DDEC hosted a Ceremony of Respect to honor the land and water at Ekati. The ceremony took place on the shores of Lynx Lake before the fish-out and involved Elders and community members from the YKDFN and several YKDFN members that work at Ekati Mine.

DDEC worked with the Department of Fisheries and Oceans and Aboriginal community members from Gamètì, Kugluktuk, Łutsel K'e, Dettah, and Yellowknife to determine the best way to collect the fish in Lynx Lake. The species, weight, length, and age of the fish were recorded. Fifty pounds of fish from Lynx Lake were flash-frozen and sent to communities.

3 RECOMMENDATION

The Agency recommends DDEC document the implementation, successes, and lessons learned from Traditional Knowledge studies and how it is incorporated into environmental management at Ekati Mine.

AGENCY ASSESSMENT

The Agency is pleased that the Report of Environmental Assessment for the Jay Project included a number of measures designed to address the inclusion of TK to inform decision-making at the Jay Project and Ekati Mine.

Reclamation Research Plan RP 7.1 was designed to investigate how to incorporate TK into closure and reclamation planning activities. The Agency is pleased that the DDEC engaged with Elders on designing and building of the Jay and Sable waste rock piles through the Tłı̄chǫ What'aa Eskers TK Project and with youth on the reclamation research seed collection program. While this work is encouraging, DDEC needs to document the implementation, successes, and lessons learned from TK programs and workshops and how TK is incorporated into environmental management at Ekati Mine. The Agency encourages DDEC to go further in obtaining TK input into reclamation research programs for closure.

The Agency believes there needs to be more TK used in the Aquatic Effects Monitoring Program (AEMP). It appears that the only TK that is used occurs every 5 or 6 years during assessments of physical health of large-bodied fish (the DELT – deformities, erosion (on fins), lesions and tumours – program). There is more

TK available that could be utilized in aquatics monitoring. The Developer's Assessment Report (DAR) for the Jay Project, for example, states:

YKDFN Elders have observed a lowering of the water levels in the Ekati Mine area and have demonstrated how this changes the location of the campsites in relation to the existing shorelines. It is possible, too, that the lowering water levels have also affected the direction of surface water flow from the area.

The DAR also describes how water quality is assessed using health of shoreline vegetation. The Agency believes that TK has a role to play in not only fish health monitoring, but hydrological and water quality monitoring as well and encourages its use. ■