

INDEPENDENT ENVIRONMENTAL MONITORING AGENCY



A public watchdog for environmental management at EKATI DIAMOND MINE

ANNUAL REPORT

2019-2020



PLAIN LANGUAGE

MINING AT EKATI

Dominion Diamond Mines ULC is mining diamonds using large open pits and underground tunnels to remove the kimberlite rock that contains the diamonds.



Long Lake Containment Facility

The Long Lake Containment Facility is a tailings pond, and is the final destination for the crushed, wet kimberlite that remains after the diamonds are removed. The LLCF was once a lake that is now 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.



3 Waste Rock Piles

Rock that does not contain diamonds is piled in layers totaling 50 to 70 metres high.



4 Waste Management Facility

The building where recycling, composting, and burning of waste happens. This waste facility deals with regular or domestic waste from offices, buildings and the cafeteria at the mine site.



6 Fox Pit

This is the biggest pit at Ekati. Fox pit began development in 2001. Mining of the pit was finished in early 2015.

7 Lynx Pit

The Lynx Project officially started development in 2013. The pit has been actively mined since 2015 and the water licence it is approved under expires in 2021.

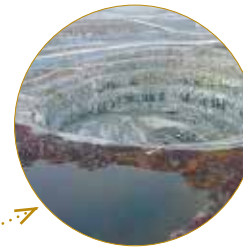
5 Pigeon Pit

Pigeon pit is a relatively small pit which began development in 2013. It is currently being actively mined and is expected to be active until 2022.



8 Sable Pit

Development on the Sable Project began in 2017. Active mining is ongoing and is expected to continue until 2023.



9 Beartooth Pit

Started in 2004, Dominion finished mining Beartooth pit in 2009. The Beartooth pit started being used for storing processed kimberlite in 2012.



10 Panda and Koala Pits

Starting with Panda in 1997, open pit mining of these two sites has finished. Underground mining started in Panda in 2003, and finished in 2011. Underground mining started in 2004 at Koala, and continued until 2019. Processed kimberlite has been deposited into Panda and Koala Pits beginning in 2019.



11 Panda Diversion Channel and Pigeon Stream Diversion

The Panda Diversion Channel and Pigeon Stream Diversion are man-made streams diverting water around pits that would otherwise flow into the pits. Fish, mostly grayling, use the new channels for travel and spawning. The Pigeon Stream Diversion was completed in 2014, and the Panda Diversion Channel was completed in 1998.



12 Haul Roads

Dominion has built all-weather roads to connect the pits to Main Camp. Dominion carefully applies chemical dust suppressants or water to reduce dust on the roads. Currently there are 141 km of road at the Ekati mine site.

14 Jay Project

In the spring of 2018 Dominion decided that work planned for the Jay Project would be put on hold for a year to complete an optimization study. If the Jay Project proceeds, it is expected to extend the life of the Ekati mine from 2024 to 2034.

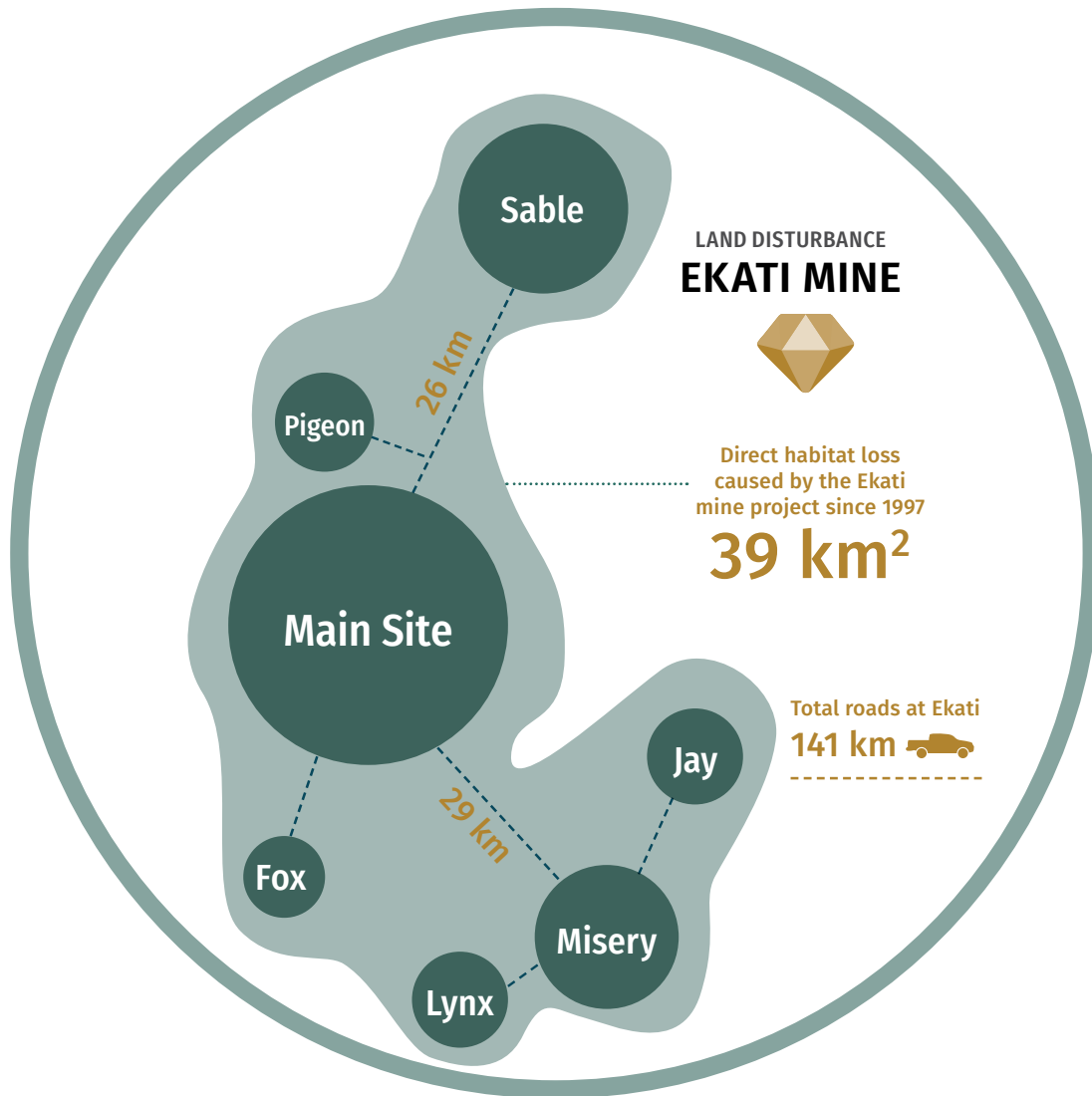


13 Misery Pit

Mining stopped the Misery pit in 2005. In 2019, work began on developing underground mining at the pit. The underground portion is expected to be finished in 2023.



LAND DISTURBANCE AND ROAD LENGTH



LAND DISTURBANCE YELLOWKNIFE



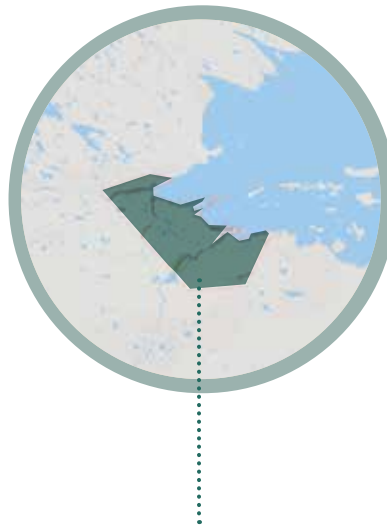
City of Yellowknife
estimated footprint
(area shaded brown)
30 km²

LAND DISTURBANCE
BEHCHOKÛ



Behchokû estimated
footprint
(area shaded brown)
2.4 km²

LAND DISTURBANCE
KUGLUKTUK



Town of Kugluktuk estimated
footprint (area shaded brown)
2.5 km²

	Approx Land Disturbance	How much bigger is the Ekati mine?
YELLOWKNIFE	30 km ²	x 1.3
KUGLUKTUK	2.5 km ²	x 15
BEHCHOKÛ	2.4 km ²	x 16
CAMBRIDGE BAY	1.6 km ²	x 24
ŁUTSELK'E	1.3 km ²	x 29
WHATI	0.8 km ²	x 47
GAMETI	0.8 km ²	x 47
WEKWEETI	0.5 km ²	x 76

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MESSAGE FROM THE CHAIR



I am pleased to present the 2019-20 annual report of the Independent Environmental Monitoring Agency (Agency). The Agency is the public watchdog for the Ekati Diamond Mine and our activities continue to increase with modifications and expansions to the project. The Agency's Annual Report summarizes our activities over the past year and offers recommendations for Dominion Diamond Mines ULC (Dominion) and regulators on how they may improve their environmental management.

This past year the Agency continued to review and provide recommendations on Dominion's environmental management and monitoring plans and activities to ensure that there is good environmental performance at the mine site. A greater focus of our monitoring role in the past few years has been on closure planning and on developing more effective communications to inform communities of key monitoring issues at the mine site, and to bring those comments and concerns we hear from our Society Members to the company and regulators. During our community visits in early 2019 we heard from communities that they wished to spend more time together talking about closure. In response to these comments and concerns the Agency facilitated a wildlife and mine closure workshop in February 2020 focusing on how best to close the roads and waste rock

piles in relation to wildlife movement and usage. The workshop brought together elders, youth and participants from each of our Aboriginal Society Members. The focus of the workshop was to continue the conversation on closure and allow for discussions that include the incorporation of Traditional Knowledge, Inuit Qaujimaningit and community knowledge into mine closure and reclamation planning.

The Agency considered this a valuable exercise and will forward the workshop findings to all involved in the regulatory process and our Society Members. The discussions and recommendations heard from this workshop will be considered by the Agency when submitting future comments on the closure plans. The Agency does not consider this the end of the conversation. We acknowledge requests from the workshop participants to continue future discussions on closure and reclamation in a format like this workshop at the community and regional levels.

On March 19, 2020 Dominion suspended their operations at the Ekati Diamond Mine in response to Covid-19 and went into care and maintenance. A care and maintenance crew stayed on to maintain the mine and ensure monitoring requirements continue during the interim period. On April 21, 2020 Dominion

filed for insolvency protection under the Companies' Creditors Arrangement Act. The Agency continues to communicate with Dominion on a weekly basis for any updates. At the time of writing, Dominion has indicated that they have plans to resume mining operations at Ekati and safely call back workers as the spread of COVID-19 subsides and diamond markets reopen. It should be noted that regulatory and compliance obligations are not dependent on whether the mine is in operation or under care and maintenance. The only exception would be where the regulator provides an exemption from a requirement, recognizing that there are certain unforeseen circumstances and important health and safety considerations that may make usual compliance monitoring difficult.

On behalf of all Agency directors I would encourage you to contact the Agency at any time with your comments and concerns, or if you wish for us to visit your community.

Marsi, mahsi, quiannamik, quana, merci, thank you.



Jaida Ohokannoak
www.monitoringagency.net

RECOMMENDATIONS

HIGHLIGHTS



Each year the Agency provides recommendations to Dominion Diamond Mines ULC, the Wek'èezhìi Land and Water Board, and applicable federal and territorial government departments based on the review of information and comments from the past 12 months.



This section includes Agency recommendations from the past year and the responses we received to those recommendations.

Coarse kimberlite
rejects pile at Ekati mine.



RECOMMENDATION TO DOMINION

Amalgamation of AQMP with AQEMMP

RECOMMENDATION

1

The Agency recommends that Dominion finalize the amalgamation of the current Air Quality Monitoring Plan with the Air Quality and Emissions Monitoring and Management Plan to improve the monitoring of air quality across the entire mine site.

RESPONSE:

Amalgamation of the Air Quality and Emissions Monitoring and Management Plan (AQEMMP) with the Ekati Air Quality Monitoring Plan (AQMP) is ongoing. Dominion began work on an optimization study for the Jay Project in 2018. Further construction of Jay Project components has been on hold since this time. The Jay Project itself is not yet fully underway. Therefore, the AQEMMP program for the Jay Project has not been started. However, integration of some of the monitoring described in the Jay AQEMMP has been initiated as described in the AQMP.



Photo courtesy of Dominion Diamond Mines ULC.

RECOMMENDATION TO DOMINION

Aquatic Response Framework Benchmarks

RECOMMENDATION

2

Selenium concentrations in the Koala watershed fish tissues have risen, likely due to increasing levels of selenium in sediments in lakes directly downstream of the Long Lake Containment Facility (Leslie Lake and Moose Lake). Given this important AEMP finding, the Agency recommends:

- a) Dominion investigate the source(s) (e.g., LLCF discharge) and pathway(s) (e.g., food chain transfer; in-lake processes that increase selenium bioavailability) that are driving increases of selenium in fish tissues; and,*
- b) Once the sources and pathways have been identified, Dominion should use this information to determine mitigation to reduce selenium concentrations in fish tissues and develop early warning triggers to help prevent effects on fish in lakes downstream of impacted lakes and other watersheds. This work should be incorporated into the Fish Response Plan with triggers to be incorporated into the Aquatic Response Framework.*

Response

Dominion understands that selenium concentrations are a concern for many reviewers, and we would like to reassure reviewers that we have been working on this through our current programs. In accordance with Water Licence W2012L2-0001, Schedule 8, Part J, Item 4(c), Dominion has included a description of likely causes of the Action Level exceedance and potential mitigation options, if appropriate, in the corresponding Response Plan. This information can be found in Section 2.3 of the Fish Response Plan, Version 2.0, that is in review with the Wek'èezhii Land and Water Board (the Board). Dominion will be waiting for the Board's reasons for decision before taking any next actions. Additionally, another set of important information about selenium trends in fish tissue will be collected during the 2021 small-bodied fish sampling program. Dominion believes that this additional data combined with the Fish Response Plan will provide further clarity on the next steps for investigation. The next steps may include, if required, the review of Section 2.3 of the Fish Response Plan and updating the mitigation measures as appropriate.

RECOMMENDATION TO GNWT

Enforceable Air Quality Regulations

RECOMMENDATION

3

There has been lack of progress towards developing enforceable air quality regulations specific to the Northwest Territories. The Agency recommends that the Government of the Northwest Territories make greater efforts to develop enforceable Air Quality regulations.

Response

Environment and Natural Resources (ENR) has committed to enacting air regulations. Currently the GNWT is focusing on a review of the Mackenzie Valley Resource Management Act (MVRMA) post-devolution to accommodate the capacity of the GNWT and partner Indigenous governments and organizations. When this is complete, ENR will shift focus to developing air regulations.

RECOMMENDATION TO GNWT

Standardizing Securities Process

RECOMMENDATION

4

In our 2016 Annual Report the Agency recommended that “the Government of the Northwest Territories, in cooperation with the Wek’ezhii Land and Water Board, develop written policies, guidelines, or directives to standardize the process for determining whether, and what portion of security should be held back for future liabilities upon completion of reclamation activities.” In response the GNWT stated that they are aware of the concern and are working towards developing its own policies and guidelines and that they would keep the Agency apprised of any progress. It is now 2020 and there does not appear to be any progress made in this regard. The Agency recommends that the GNWT work with the WLWB on this important topic and provide an update on any progress made since 2016.

Response

Since 2016, the Land and Water Boards, GNWT, and others have worked through requests from diamond mine proponents regarding hold backs against potential future liabilities. These proceedings have provided valuable practical experience in identifying the key questions and issues. As of August 2020, the GNWT and the Wek’ezhii Land and Water Board have agreed to commit resources to jointly develop a standardized process for hold back requests. A work plan is currently under development; the GNWT is available to answer questions from the Agency as needed.

CURRENT CONDITIONS AND EXPLORATION

HIGHLIGHTS

- 🐾 Drilling continued in exploration areas in the main Ekati claim block, with a focus on the Point Lake area.
- 🐾 In 2019 Dominion applied for land use permits to extend and expand exploration at Glowworm Lake and Lac de Gras for another 5 years.

Jay Road, Photo Courtesy
of Dominion Diamond Mines ULC.

IMPORTANT CONCEPTS IN THIS SECTION

(alphabetical order)

Land use permit

A company or individual must have a land use permit if they plan to carry out any land-based activities, if those activities trigger the thresholds outlined in land use regulations.

Mineral exploration

Search for materials that appear in high enough concentrations and amounts to be extracted and processed for profit.

Threshold

A defined point, level, or condition where, if things change beyond that point, further change may cause lasting harm to land and/or water and the beings that live there.

Water licence

A list of conditions required before a company or individual deposit waste water downstream. Conditions include water quality thresholds, monitoring programs and security amounts.

EXPLORATION SUMMARY

In summer and late winter 2019, Dominion did some drilling to explore the Point Lake project area. Dominion plans to adjust their water licence and land use permit to include mining three pipes in one pit at Point Lake.

In summer and fall of 2019, Dominion did more drilling in two large clusters north of the Ekati main camp.

Lac de Gras (Harry Winston) Project

In February 2020, the Mackenzie Valley Land & Water Board approved Dominion's application to replace their land use permit. The 'new' permit allows Dominion to carry out various activities (exploring, drilling, and sampling) and other actions (e.g. storing

fuel, changing equipment, building access roads and a camp). Four new claims were added to the permit area.

Glowworm Lake Project

In February 2020 the Mackenzie Land & Water Board approved a new five-year lease on a large claim block about 70 km east of Ekati mine. Activities are similar to those for the Lac de Gras project.

Changes to land use permits suggest more intense exploration of mining targets in several large mineral claim blocks. These are located quite a long way east and south of Ekati and are roughly the same size as Ekati.



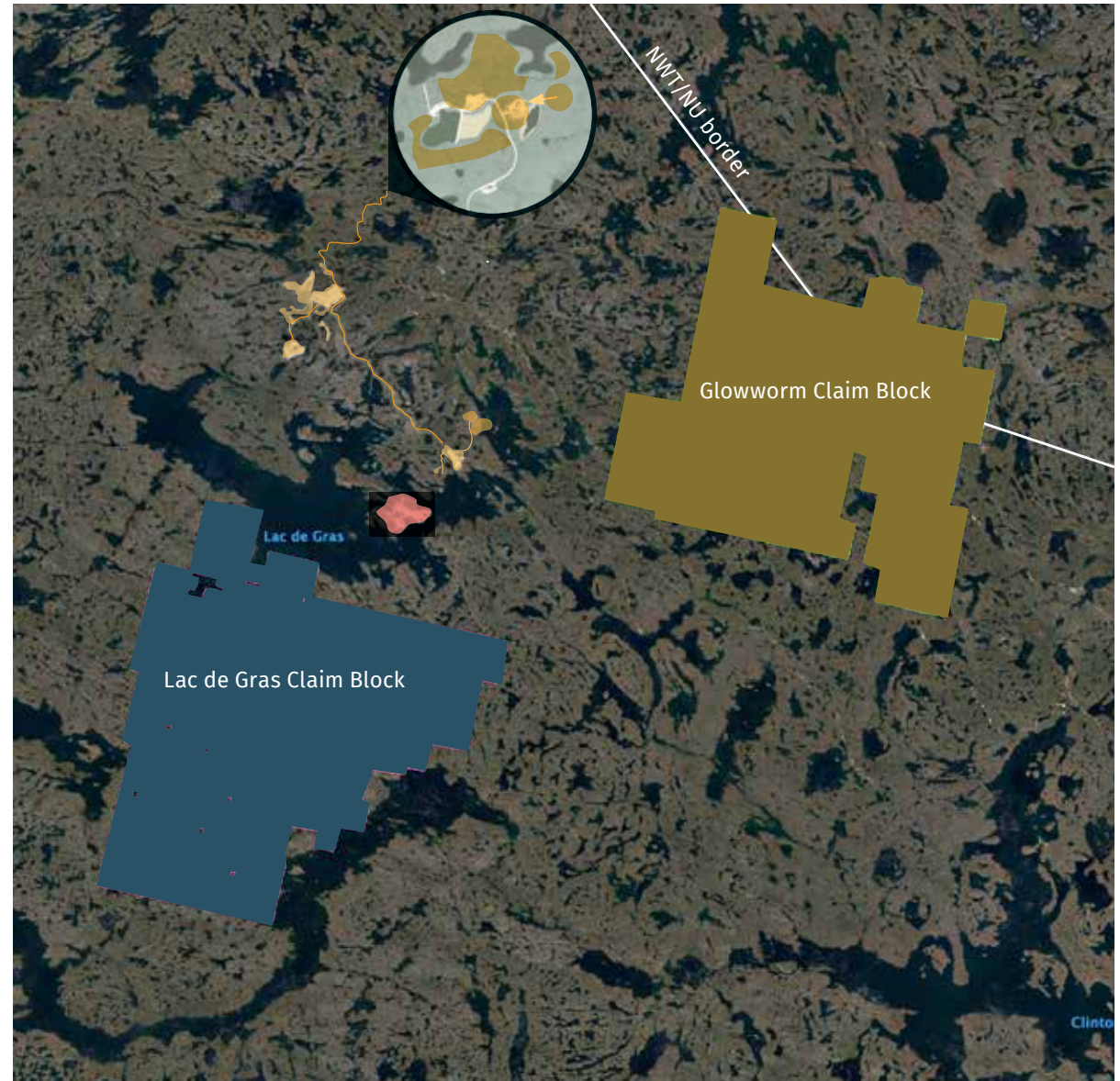
Misery pit including waste rock pile, camp facilities and King Pond.
Photo courtesy of Dominion Diamond Mines ULC.

AGENCY ASSESSMENT



The Agency believes that possible future development of kimberlite pipes in new areas represents a significant expansion of mine operations. We continue to monitor exploration activities in order to track potential future developments.

An early examination of infrastructure at Point Lake suggests narrowing of an already limited travel corridor between existing pits and waste rock piles at Misery and Jay. This may significantly impact wildlife movement in the area.

EKATI MINE SITE AND EXPLORATION CLAIM BLOCKS



LEGEND

-  Ekati mine footprint
-  Diavik mine footprint

MINE UPDATE

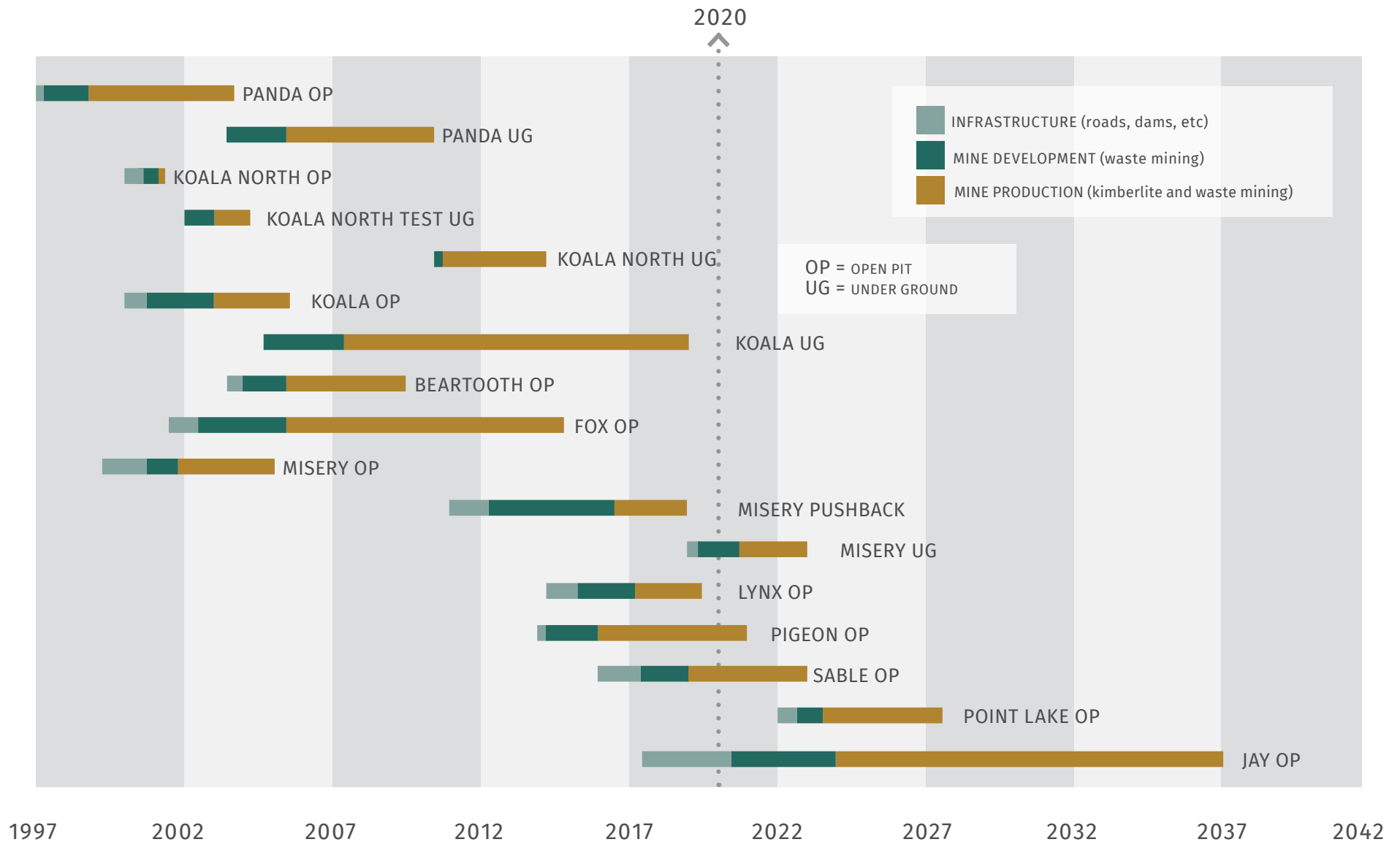


Figure 2 : The Ekati Diamond Mine: Life of Mine Plan

AGENCY ACTIVITIES

HIGHLIGHTS

-  Held three board meetings during the year.
-  Held a workshop for Aboriginal Society Members to discuss wildlife in relation to closure and reclamation at the mine and make recommendations for closure planning.
-  Gave input into 16 Wek'èezhìi Land and Water Board (WLWB) reviews and many other reports and plans.



IEMA Directors during an Ekati site visit.

ACTIVITIES 2019-20

Meetings

During the year the Agency held three board meetings in Yellowknife. At the Annual General Meeting (AGM) in December 2019 there was no quorum. Because of this, we held a Special Meeting of Society Members via conference call on January 24, 2020 to complete official business. The Agency will consider holding next year's AGM at a time when Society Members are more likely to attend.

Annual Ekati Site Visit

The annual site visit was set as two separate one-day visits on July 23 and August 20, 2019. The Agency would prefer a two-day, overnight visit as was done in the past. More recent annual site visits were only one day. The purpose of site visits is to give Agency members enough time to understand mine operations and developments, on the ground.

July 23 visit:

- Toured the Misery area, visited the closed Misery pit, and observed the entry of the Misery Underground project and the Misery Waste Rock Storage Area (WRSa).
- Visited the Lynx pit and area.
- Toured the Ekati processing plant, which the Agency has not seen since the early 2000s.
- Visited the Panda Diversion Channel where we saw vegetation starting to grow around the Channel, as well as fish in the stream.

The August 20 visit was cancelled because of schedule conflicts, and could not be rescheduled before winter.

The Agency looks forward to working with Dominion to make the preferred, two-day overnight site visits possible once more.

Agency Workshop

On February 12 and 13, 2020 the Agency held a workshop for Aboriginal Society Members. The purpose was to discuss wildlife in relation to closure and reclamation at the mine and make recommendations for closure planning. The workshop happened because of feedback and comments about the latest closure and reclamation plan (Interim Closure & Reclamation Plan, Version 3.0 or ICRP 3.0), which the Agency presented during community visits last winter.

Independent facilitators guided the discussion. Agency staff and directors provided information to start the discussion, listened to participants, and answered questions.

By summer 2020, the Agency will share a workshop report with Dominion and the Wek'èezhìi Land and Water Board.

TECHNICAL REVIEW AND INPUT

The Agency participated in 16 Wek'èezhìi Land and Water Board (WLWB) reviews. Here are comments on two of them.

Waste Rock and Ore Management Plan Version 10.1 (December 17, 2019) – This plan automatically classifies diabase as “non-acid generating” and “non-metal leaching”. The Agency has concerns about this. We continue to push for more effective testing to see if waste rock potential to generate acid.

The Agency is also concerned that the plan does not clearly state that Dominion will use only Lynx diabase for construction.

The WLWB approved this plan on March 3, 2020.

They asked Dominion to update the plan to deal with some of the Agency's concerns.

Aquatic Effects Monitoring Program Annual Report 2018 (July 3, 2019) – The Agency's key concerns about this report are:

- Increased mercury levels in lake trout in Kodiak Lake
- Increased selenium levels in slimy sculpin and whitefish in Leslie Lake
- Increased diversity and variety of zooplankton

The Agency knows Dominion has improved each new version of their aquatic response framework. Of note in the latest version, they plan to deal with too-high levels of potassium, chloride, and phosphorus. The Agency fully supported these plans.

Studies and Reports – During the year the Agency commented on many other reports and plans, such as:

- 2018 Aquatic Effects Monitoring Program Report (July 3, 2019)
- 2018 Seepage Survey Report (June 14, 2019)
- Fish Response Plan (March 2, 2020)
- Jay Aquatic Effects Monitoring Program Design Plan V 1.1 (January 16, 2020)
- Misery Underground Land Use Permit Application, Request for Ruling (April 5, 2019)
- Potassium Toxicity Study Report (November 26, 2019)
- Wastewater and Processed Kimberlite Management Plan V 9.0 (April 23, 2019)

AGENCY COMMUNICATIONS

Apart from this Annual Report, the Agency communicates with Society Members and the public through our website, social media, and the twice a year newsletter (*Ekati Monitor*).

The website has good information about environmental management at the mine. We add resources when they become available. The home page has easy access to the latest news.

The Agency works to make the website accessible and up to date to help ensure our work is transparent.

The Agency has a Facebook page and twitter account (@IEMA_NWT). Our followers are slowly and steadily increasing. To celebrate having more than 100 Facebook followers, we had a giveaway contest. The winner, from Fort Providence, won some Agency merchandise. Thank you to all who entered.

The Agency published *Ekati Monitor* Issue 19 in the spring of 2019 and Issue 20 in the fall. We distributed printed copies to our subscriber list, which ranges from schools to community offices across the NWT and Nunavut. We formatted a digital version and emailed both issues to all subscribers.



Participants of the Agency's Wildlife and Closure Workshop watching the Tłıchʼo version of our Agency video.

COMMUNICATIONS BY SUBJECT 2019-2020

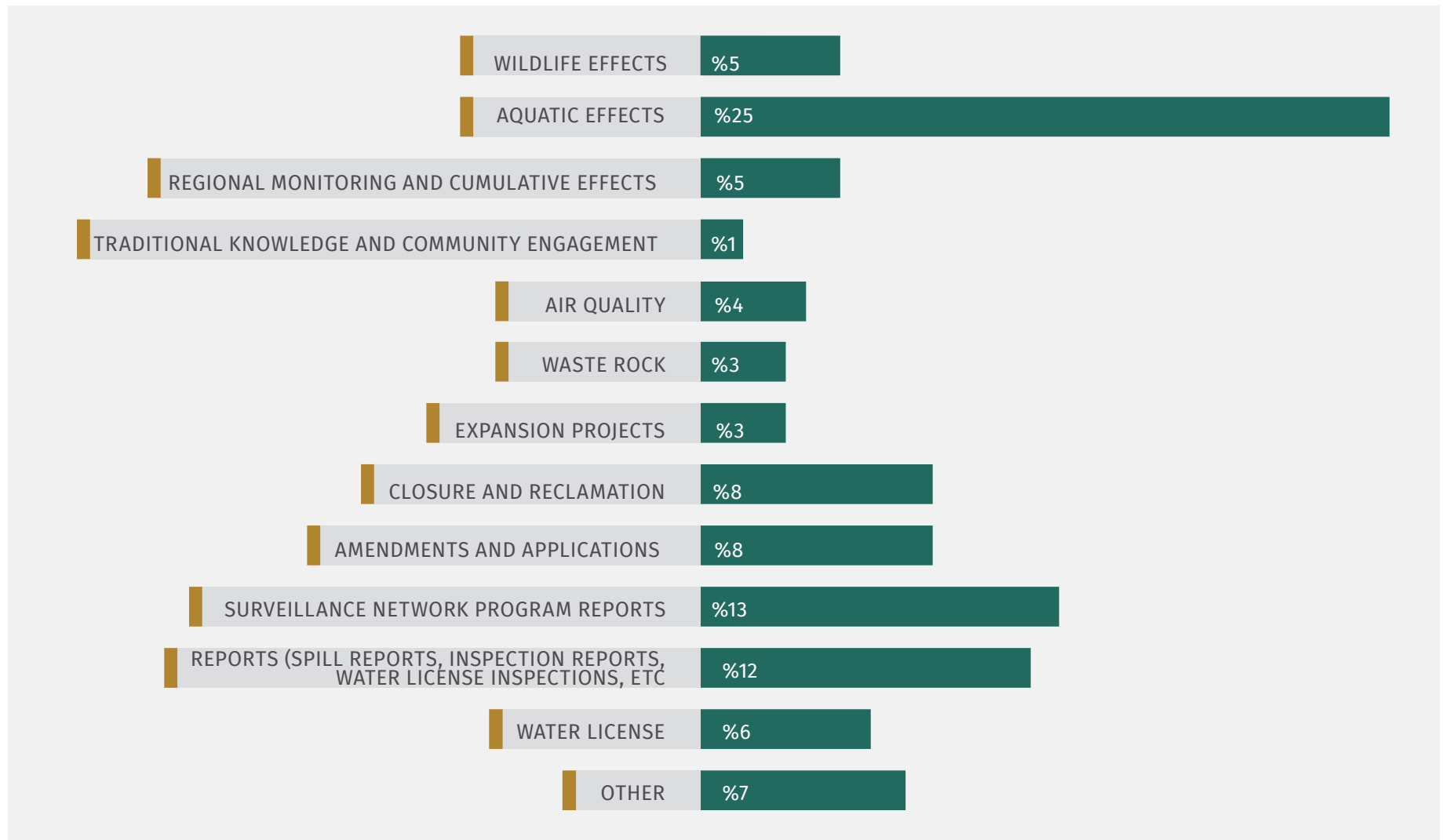





Figure 3: Communications by Subject 2019 - 2020

WILDLIFE EFFECTS

HIGHLIGHTS

-  Incidental observations of grizzly bears, wolves, and caribou have trended higher in recent years.
-  Incidental observations of caribou totaled 9,507 individuals, 88% during winter, and included caribou from the Bathurst and Beverly/Ahiak herds.
-  Traffic and blasting were managed on 134 occasions to reduce disturbance to caribou.

Caribou running along a road at the Ekati mine.
Photo Courtesy of Dominion Diamond Mines ULC.



IMPORTANT CONCEPTS IN THIS SECTION

(alphabetical order)

Adaptive management

A management system with continual monitoring. If a mitigating action does not work, other actions are used to keep the impacts within accepted levels or below thresholds.

Mitigating, mitigation

An action that is supposed to reduce the negative impacts of a condition or situation.

Monitoring

Collecting and analyzing samples and making observations to evaluate change and impacts of change over time; 'keeping an eye' on things all the time.

Threshold

A defined point, level, or condition where, if things change beyond that point, further change can cause lasting harm.

Zone of influence

Area where disturbance from mining activities can cause fewer caribou to occur.

ACTIVITIES

Dominion monitors wildlife that is present at the mine site, and keeps track of species sightings. They focus on caribou, grizzly bears, wolves, wolverines, foxes, raptors, breeding birds, and wildlife habitat.

Habitat Loss from Mine Footprint

During 2019 the mine footprint grew by 79 hectares (0.79 km²). Total habitat loss to the project footprint since 1997 is 3,898 hectares (39 km²), including 141 km of roads.

Waste Management

Waste management practices are supposed to reduce the number of times that food attracts wildlife to landfills and keep wildlife away from dangerous areas (examples, airstrip, high traffic areas, active pits). Educating employees has led to a general decrease in misdirected waste and attractants.

Dominion shipped 100,000+ kilograms of solid waste and 160,000+ liters of liquid waste off site. They diverted 125,000 kilograms of biodegradable material from incinerators to the composter. This saved over 330,000 of diesel fuel.

Wildlife Incidents

Wildlife incidents involve direct contact between wildlife and humans or wildlife and infrastructure.

- 35 incidents with grizzly bears. All needed use of deterrents. This number is much higher than the 1–17 reported from 2011 to 2018.
- 120 incidents with caribou, mainly near the Sable Road, during February, July, and August. Management actions were to stop work or close roads for a time, from one minute to 7.5 hours.

Vehicles were used on eight occasions to “*gently deter caribou from roads*”.

Blasting at pits was postponed or cancelled 14 times because caribou were within 1 km.

Caribou Monitoring

Here is a brief summary of methods to monitor caribou and the results of monitoring.

- Incidental observations (separate from road and power line surveys):
9507 caribou observed during 269 observations on 119 separate days, 88% during winter.
- Monitoring at the Long Lake facility:
Over 1700 caribou observed for six days during late winter and the start of spring migration. Most were bedded, feeding, or standing.
Contrasts with a total of about 700 caribou observed in total from 2000 to 2018, mostly solitary animals, travelling across the facility.
- Wildlife cameras:
89 infrared motion-triggered cameras along Misery, Sable, and Jay roads, Lac du Sauvage Narrows, and an esker near the Jay Road.
No info provided. Expect a report in summer 2020 to re-examine the caribou zone of influence.
- Dedicated surveys along roads and power lines:
7000 caribou in 121 observations over 39 days of road surveys.
4430 caribou in 61 observations during power line surveys.
- Info from collared cows that the GNWT monitors:
Caribou from Bathurst and Beverly-Ahiak herds present
- Behaviour surveys:
Concluded that caribou show “*some tolerance for areas in close proximity to the mine*”.

Larger groups of more than 200 animals were observed near the main mine complex, on the Long Lake facility, near the Fox pit, and along the Misery Road within four to five km of the Misery pit.

Grizzly Bear Monitoring

Two hundred and fifty-two (252) bears were observed on 161 occasions. This includes 48 family groups (two or more bears). Observations occurred across the mine site except for around Sable pit and the northern 10 km of the Sable Road. Many observations were likely the same individual(s) recorded many times. This is the highest number of bears sighted since records began in 2001 and follows an increasing trend over time.

Other Wildlife

- 212 wolves observed on 117 occasions, evenly distributed throughout the site.
Highest number recorded since 2001.
Follows an increasing trend over time.
- 23 wolverines observed.
Similar to the long-term average.
- 148 foxes observed.
Lower than average.
- 23 moose observed.
- Raptor nesting assumed or confirmed in five inactive or underground pits.
Discouraged nesting from three active pits.
- North American Breeding Bird Survey: 26 species, 209 individual birds.

AGENCY ASSESSMENT

Incidental sightings of wildlife have trended higher in recent years. The increase in caribou observations is likely related to the shift in the range of the Beverly/Ahiak herd.

More grizzly bears and wolves were observed. Dominion says this is because mining activity is more de-centralized. Workers travel over a larger area, and are more aware and report more. Increased caribou may play a role in recent trends of seeing more bears and wolves.

Observations of wolverines and foxes are relatively stable or declining. This is an unexpected result, with workers travelling over larger areas and better reporting.

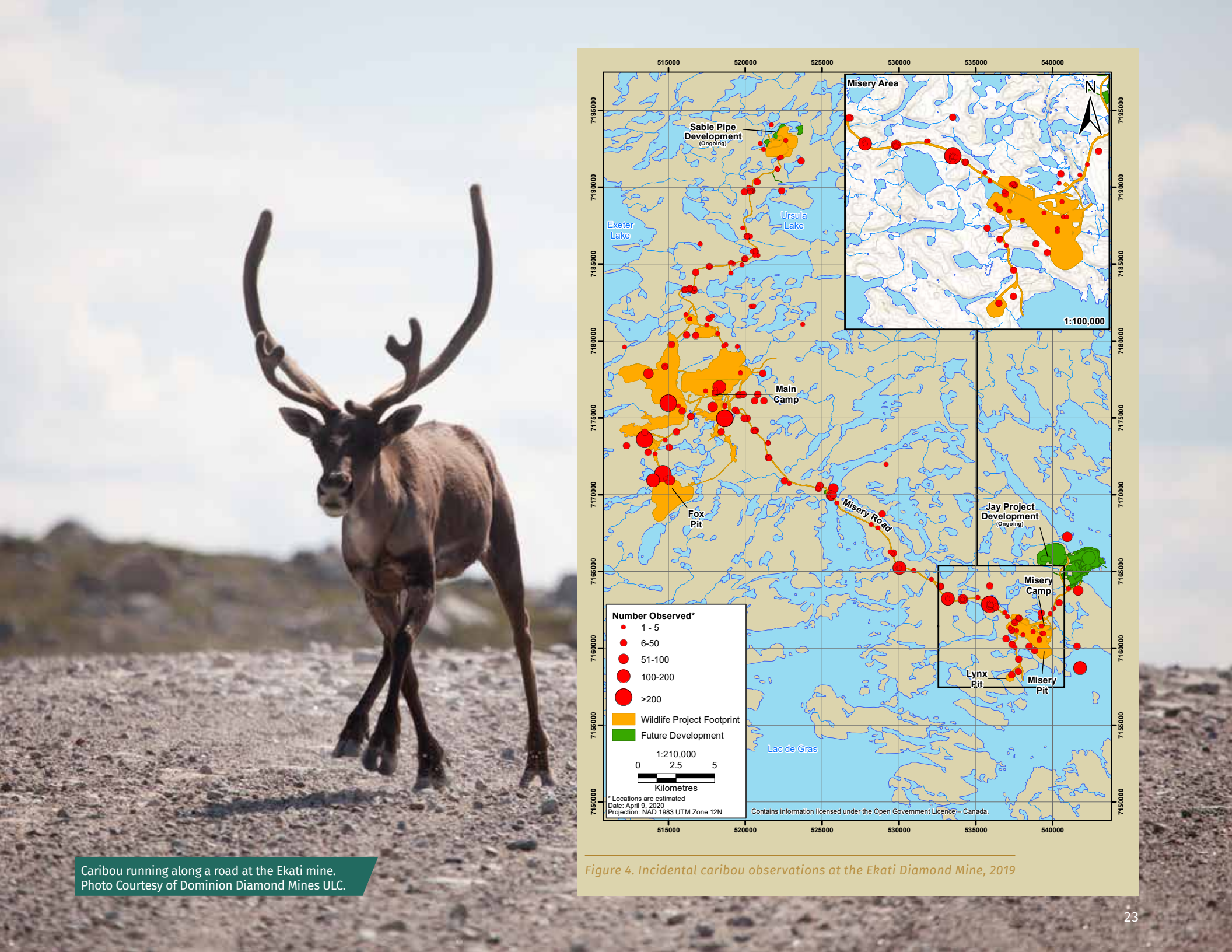
Work and road stoppages for caribou are reported as a total for the year. Dominion does not provide specific data on triggers that stop work or close roads, where and how much of a road was affected, and the outcome of the mitigation. They mention adaptive management but the reporting is incomplete.

Dominion provides limited info on the effectiveness of wildlife mitigation. They do not link specific thresholds with a management action. They do not do any follow-up monitoring to see how effective the action is. They make numerous unsupported claims such as caribou “tolerating” disturbance and “roads do not impede caribou movement”. They present no data to support these claims.

Dominion conducted road surveys nearly every day but presented no data about daily observations. These surveys are distributed evenly among major roads on the site and provide an excellent opportunity to show caribou distribution within the mine site. Dominion could link that info with where they implement enhanced mitigation, and where they could improve monitoring and mitigation.

Dominion also does not integrate data, which would provide a more complete picture of caribou distribution at the mine site. Without these data, the Agency and others have no ability to evaluate how effective a monitoring method is at triggering enhanced mitigation or reducing impacts on wildlife through adaptive management.

Currently Dominion uses ENR collar data in a limited way. They gave money to help install 50 geo-fenced collars “to provide information on caribou movement specific to the Ekati Diamond Mine”. This type of collar increases the fix rate to hourly within 30 km of mine infrastructure and roads. There is no evidence that Dominion used these data or linked it into monitoring and mitigation. For example, they could use individual movements to see how successful caribou are at crossing the Misery Road/power line complex. This type of data could help support or reject their claim that the “power line does not impede caribou movement”.



Caribou running along a road at the Ekati mine.
Photo Courtesy of Dominion Diamond Mines ULC.

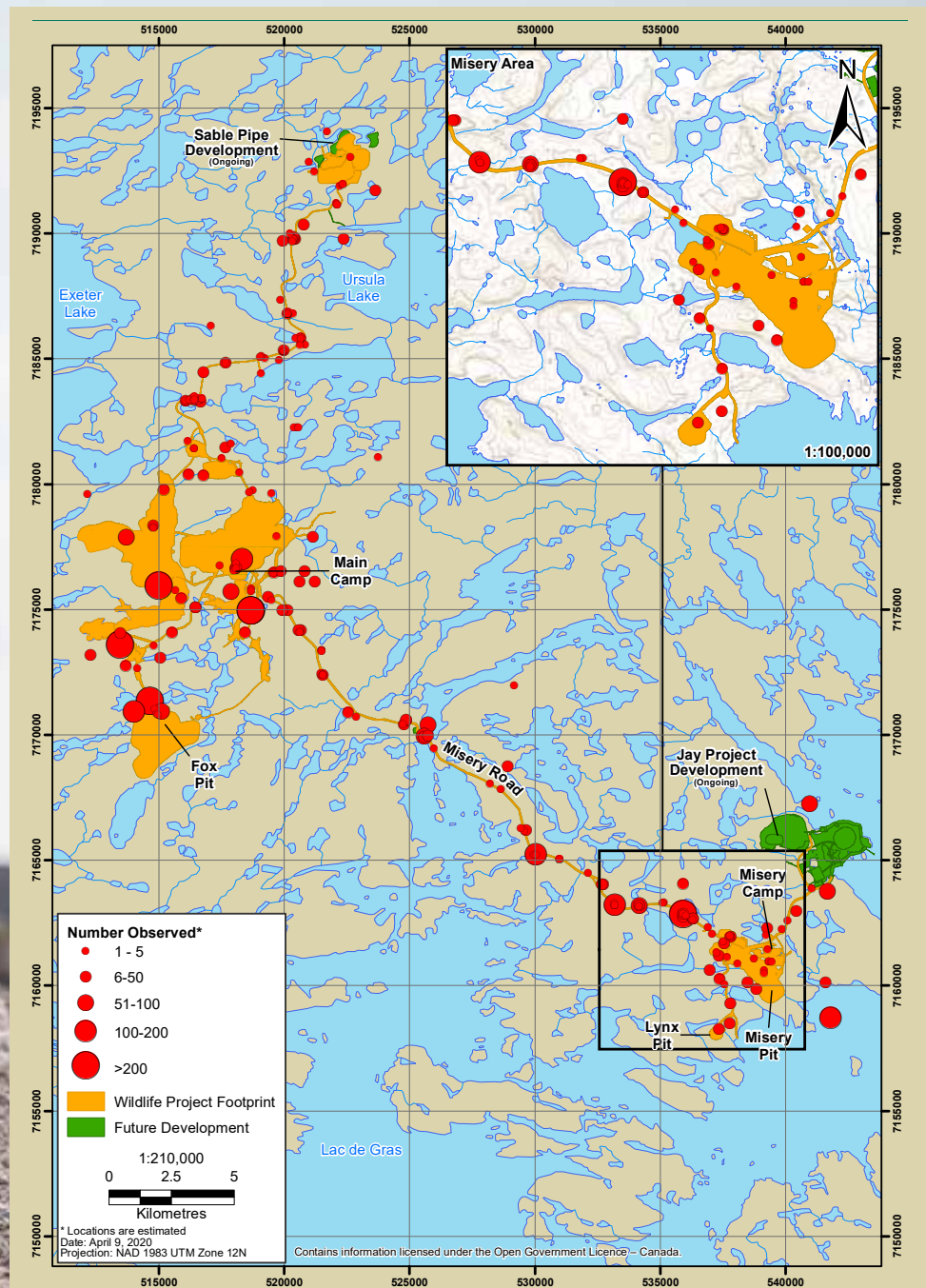





Figure 4. Incidental caribou observations at the Ekati Diamond Mine, 2019

AQUATIC EFFECTS

HIGHLIGHTS

-  The concentration of each chemical in lake water is greater than levels before the mine started, though no greater than the previous four years.
-  Dominion's aquatic response framework has no benchmarks for metals in lake bottom mud, unlike Diavik's framework.
-  The Agency would like Dominion's data collection and analysis to better match methods used at Diavik mine to monitor aquatic effects. Dominion and Diavik need to coordinate methods to monitor Lac de Gras/Lac du Savage.

Sampling at Ekati mine. Photo Courtesy
of Dominion Diamond Mines ULC.



IMPORTANT CONCEPTS IN THIS SECTION

(alphabetical order)

Action level

When the concentration of a substance goes beyond a certain level, defined ahead of time, where the mining company must take action to study, reduce or remove the concern.

Aquatic environment

Water (lakes and rivers), sediments (bottom of lakes and rivers), and all the beings that live in water and sediments (e.g. micro-organisms, fish).

Baseline

A starting point or measurement, to compare and see how each part of the aquatic environment changes over time.

Benchmark

A standard against which to compare or assess things.

Benthic

Animals and plants that live at the bottom of a water body.

Chlorophyll

Green pigment in plants that allow them to absorb energy from sunlight and turn it into food.

Concentration

The amount of a given substance within a defined area or volume.

Discharge

To allow wastewater to flow out from where it was held.

Effluent

Waste water from mine operations (mining process, underground and camp facilities water) that is discharged to the downstream environment if it meets specific water quality standards.

Mitigating

An action that is supposed to reduce or reverse the negative impacts of a condition or situation.

Threshold

A defined point, level, or condition where, if things change beyond that point, further change can cause lasting harm.

Toxic, toxicity

Poison, poisonous.

Variables

All the things that Dominion measures in the aquatic environment to keep track of how things change.

Wastewater

Used water from any part of mining operations, including underground, pits and storage facilities, surface runoff, storm water, sewage, etc.

Watershed

An area of land where rain and snowmelt flows into certain creeks, rivers, and lakes, which in turn flow to larger water bodies.

BACKGROUND

Dominion monitors and studies the aquatic environment downstream of mining operations. They need to show how mining activities affect that environment. They sample lakes and streams and background sites to keep track of changes and trends in water and sediment quality, and the populations and health of organisms that live in water and sediment (e.g. benthic organisms, plankton, and fish). Five watersheds are affected by Ekati mine operations: Koala-Lac de Gras, King-Cujo, Desperation-Carrie Pond, Pigeon-Fay-Upper Exeter, and Horseshoe.

Effluent or wastewater discharged from the mine can affect water quality. Examples of discharge locations:

- Discharging effluent from Long Lake facility to Leslie Lake.
- Pumping processed kimberlite into Koala and Panda pits (started May 2019).
- Discharging effluent from Misery and Lynx sites into the King-Cujo watershed. No water from the King Pond facility was pumped into Cujo Lake in 2019.
- Releasing wastewater from the new Two-Rock Sedimentation Pond at Sable (started Aug./Sept. 2018; no discharge in 2019).

SUMMARY: RESULTS OF AQUATIC EFFECTS MONITORING

This summary focuses on increasing trends and areas of concern for the Agency.

Water Quality

- The concentration of each water quality variable in lakes downstream of the mine is higher than pre-mining levels, though no higher than the previous four years. Further downstream from the Long Lake and King Pond facilities, the change is less. Effluent discharged from mining operations causes local changes in water quality.
- 2019 was the first year to monitor the Sable watershed. Minor changes in water quality were noted, compared to baseline concentrations. These were limited to Horseshoe Lake, the first lake that is downstream from the Sable pit.

Plankton

- The type of species in phytoplankton (tiny plants and bugs in the water) communities in lakes downstream of Long Lake facility has changed in recent years. This is a possible shift back to the pre-mining phytoplankton communities.
- Recent species changes in the zooplankton community in Leslie, Moose, and Nema lakes seem to be stable.
- Cujo Lake has increased chlorophyll a and increased densities of phytoplankton species edible by zooplankton and total phytoplankton.

3-Year Re-evaluation

Wek'èezhii Land and Water Board is reviewing this document. Dominion submitted it on December 13, 2019. Every three years, lake monitoring (the AEMP) is subject to changes in sampling and analysis methods based on previous years' results and newly developed scientific techniques. This re-evaluation may change the methods of monitoring but not the overall goal or objectives of monitoring.

In a workshop in February 2020, Dominion heard ideas and concerns about the AEMP from representatives of Indigenous communities, government regulators and the Agency. Some concerns that came up were about lake bottom sampling methods, no plans for monitoring harvestable fish species in the Horseshoe watershed downstream of the Sable pit, and plans to end the analysis of links between dust and nearby lake water quality.

AQUATIC RESPONSE FRAMEWORK

In the aquatic response framework, pre-set benchmarks and action levels give early warning to Dominion and government regulators about changes in the downstream environment that may cause concern. The action levels are set below thresholds that could have a negative impact on the downstream environment. If monitoring exceeds the action levels, Dominion develops a response plan.

There are three action levels.

- Low action level: a variable exceeds 50% of a benchmark
- Medium action level: a variable exceeds 70% of a benchmark
- High action level: variable exceeds 100% of a benchmark



Example of zooplankton.
Photo Credit: The Canadian Encyclopedia.

Sediment Benchmarks for Lake Bottoms

The framework has no benchmarks for sediment quality. Lakes closest to the Long Lake and King Pond facilities show increasing concentrations of selenium in bottom-feeding fish. These more closely relate to concentrations in sediment than in water.

Regulators have argued that the framework should include sediment benchmarks for selenium. Dominion has been reluctant to do that. They say some variables lack pre-mining data and some are naturally greater than government guidelines. They also note challenges in measuring the level of change in each impacted lake due to different types of sediments and a change in sampling methods.

We note that Diavik has developed sediment benchmarks for their Aquatic Response Framework, with similar sampling conditions.

Response Plans

Response Plans describe specific actions to take when a variable reaches a certain action level. A Response Plan assesses the potential risk of impacts harmful to aquatic life in lakes and rivers and looks for ways to halt or reverse the trend.

In 2019, these water quality variables reached action levels:

- Leslie Lake, Koala watershed: under-ice chloride (low action level) and potassium (medium action level).
- King–Cujo watershed: open-water phosphorus (medium action level)

Dominion is drafting an updated response plan for total phosphorus.

Here is a summary of three Response Plans from 2019-20:

Chloride Response Plan Version 2.1

This response plan confirmed that underground mining and open pit mine water are sources of chloride salt loading. The plan discussed possible mitigating actions. These may not be needed at this time because processed kimberlite is pumped to the Panda Koala pits (not the Long Lake facility) until they fill, then water from these pits will be pumped back to Long Lake Facility. Processed kimberlite includes mine water, the source of increased chloride levels.

Potassium Response Plan Version 3.0

This Response Plan describes mitigating actions to decrease under-ice potassium concentrations in Leslie Lake—from a high action level in 2018 to a low action level in 2019. The decrease was largely due to delaying discharge from the Long Lake facility during the 2018 open-water season.

Processed ore is the main source of potassium in process water. The amount of potassium varies a lot, depending on which pit the ore came from. In 2018 the majority of ore was from Misery pit. In 2019 it was from Misery, Pigeon, and Sable. By 2020 Dominion expects it will mostly come from the Sable pit.

This plan also developed response actions for the medium action level (increasing under-ice water sampling to once every month) and the high action level (study how toxic potassium is to aquatic life; study sodium–potassium ratios in effluent because increased sodium can reduce potassium toxicity).

They also studied effects of using fresh water from a nearby lake instead of reclaimed water from the Long Lake facility, and depositing effluent into Panda and Koala pits.

Fish Response Plan Version 2.0

- Sets a medium action level and high action level for selenium in fish tissue.
- Proposes a site-specific screening value be developed for safe human consumption of fish.
- Sets a medium action level for mercury in fish tissue of 70% for a screening value for safe eating by humans. The methylmercury (the most toxic form of mercury) benchmark (0.46 milligrams per kilo of fish eaten) would not be appropriate for people eating three or more servings of fish per week.

Dominion will conduct a study to investigate communities' rates of eating fish species common to Ekati in order to help develop benchmarks for selenium and mercury in fish tissue that are more appropriate to Indigenous people in the NWT.

JAY AQUATIC EFFECTS MONITORING PROGRAM DESIGN PLAN

Dominion submitted this plan in October 2019 to correct inadequate pre-mining data that the Wek'èezhii Land and Water Board (WLWB) identified in the original version. Most of this plan for the Jay Project is the same as for site-wide aquatic effects monitoring, with these notable differences.

- Dominion will not monitor large-bodied harvestable fish (e.g. lake trout and whitefish). They believe that sampling small-bodied fish (e.g. slimy sculpin, a minnow) is enough to monitor impacts on fish in Lac du Sauvage. Metals tend to accumulate in sediments, where slimy sculpin live. Dominion argues that metals will show up in slimy

sculpin before they become a problem in large-bodied fish, which are higher up the food chain.

- Dominion will use a finer-mesh sampling net to capture more varieties of zooplankton. Reviewers had raised a concern that larger mesh sizes may result in underestimating zooplankton diversity.
- Dominion is not in favour of using sediment coring to sample lake bottom mud.

CUJO OUTFLOW STUDY

This study confirmed that flows and water levels in streams in the King-Cujo watershed are enough to give spring spawning Arctic Grayling access to spawning beds without seasonal discharge from the King Pond facility to Cujo Lake. We need this information to assess if the Misery Underground Project will create problems for fish getting to spawning beds when discharge from King Pond is reduced or eliminated.

SABLE DIFFUSER/TWO-ROCK OUTFALL

Dominion believes turbidity barriers are not needed in Horseshoe Lake. These would contain any sediment disturbed when building the effluent outflow pipe from the Two-Rock Lake impoundment. Dominion also believes that federal departments (Department of Fisheries and Oceans; Environment and Climate Change Canada) agree with them. But they provide no documents to show this.

The Wek'èezhii Land and Water Board (WLWB) rejected this change to the original plan, which was approved in the water license. Dominion also wanted to deposit effluent in a deep part of Horseshoe Lake through a pipe without a diffuser. A diffuser would more efficiently dilute the effluent through the water column.

AGENCY ASSESSMENT

Sable Project—Fish Monitoring

For mercury and uranium in particular, monitoring has found different trends over time in sculpin versus whitefish. This makes it difficult to draw conclusions to predict contaminants in whitefish based on only monitoring sculpin. Without monitoring round whitefish in the Sable watershed, we have no direct or indirect way to assess downstream impacts on whitefish for the eight-year life of the Sable project.

With this uncertainty and community concerns about contaminants in fish, the Agency recommends that Dominion monitor harvestable species in Sable watershed lakes. And if there is concern about impacts of lethal sampling, restrict sampling to trout using non-lethal methods.

These concerns and considerations also apply to plans for the Jay Project, which also lack harvestable fish monitoring.

Lake Sediment Sampling Methods

The Agency is concerned that using an Ekman dredge can mix distinct layers of lake bottom mud when they are raised from the lake bottom. This action can mask concentrations of metals and other elements in the most recently deposited sediments in the uppermost mud layers.

Dominion should evaluate and report possible alternate methods to sample individual layers of sediment from lake bottoms. They should use any effective techniques in future sediment sampling.

Aquatic Response Framework—Sediment benchmark

The Agency recommends that further work is needed to find out how selenium is getting from the sediment into fish tissues. This process needs to be part of the response framework that will include mitigation measures. This could include a sediment benchmark.

Aquatic Response Framework—Fish Response Plan

The Agency has two concerns with the benchmarks for mercury in fish. Until Dominion completes the study of fish consumption rates, they should use a more conservative benchmark for medium and high action level for total mercury in fish.

The Agency believes that setting a Medium Action Level of 70% of the total benchmark for mercury in fish is too high; Dominion does not justify making action levels for fish contaminants conform to the same action levels (70%) for water quality. Water quality response plans use annual water quality monitoring data. Fish response plans rely on data collected every six years for harvestable fish and every three years for minnows. Information gaps and less defined set of data make it harder to identify and predict trends.

The Agency believes that Dominion should monitor harvestable fish more often than every six years.

Under-ice Oxygen in Cujo Lake

Oxygen levels are still below guidelines at depths less than 3.4 m, as it was in previous years. This is consistent with dissolved oxygen profiles in deeper parts of two monitored lakes untouched by Ekati mining, but this is somewhat misleading. Low-oxygen conditions in Cujo were measured at much shallower depths than in two reference lakes. This means that fish have a smaller oxygen-rich habitat in Cujo than in the reference lakes.

Jay Aquatic Environment Monitoring Plan

The Agency wanted to see how monitoring the lake environment for the Jay Project would contribute to monitoring multi-project cumulative effects in Lac de Gras downstream of the Jay Project. For example, Ekati plans could use the same detection limits (how small an amount of a chemical a laboratory can measure) in water quality measurements as Diavik, and to compare sediment quality results when using different sampling devices.

Dominion's plan for the Jay Project does not directly address how to coordinate monitoring

methods with Diavik's plan. It states that it will provide the GNWT all lake effects monitoring data that is useful to evaluate Ekati's contribution to cumulative impacts on Lac de Gras. Diavik's plan has much more detail. The Agency would like Dominion to assess areas of data collection and analysis with the intent to make the two aquatic effects monitoring plans more compatible.

Also, Dominion should state what steps they have taken or intend to take, to coordinate monitoring methods with Diavik to monitor Lac de Gras and Lac du Savage.

Pigeon Stream. Photo Courtesy of Dominion Diamond Mines ULC.



<p>➔ Flow from effluent source to ultimate receiving lake in watershed</p> <p>● increased over time in comparison to reference lake/stream or different from a constant</p> <p>○ elevated but not changing through time</p> <p>◆ upper bound of 95% exceeded the SSWQO, water quality benchmark, or CCME guideline during ice-covered or open water season</p> <p>★ indicates observed mean exceeded the SSWQO, water quality benchmark or CCME guideline during ice-covered or open water season</p>	Variables elevated in Koala watershed										Variables elevated in King-Cujo watershed			
	Long Lake Containment Facility ➔ Lac de Gras										King Pond ➔ Lac du Sauvage			
Parameters Monitored	Leslie	Leslie-Moose	Moose	Moose-Nero	Nema	Nema-Martine	Slipper	Slipper-Lac de Gras	Lac de Gras (S2)		Cujo	Cujo Outflow	Christine-Lac du Sauvage	Lac du Sauvage
pH	○	●	○	●	○	○	○	○	○		●	●	●	
Alkalinity	●	○	●	○	○	○	○	○	○		●	●	●	
Hardness	○	●	○	○	○	○	○	○	○		○	○	○	
Total Dissolved Solids	○	○	○	○	○	○	○	○	○		●	●	●	
Chloride	★	●	○	○	○	○	○	○	○		●	●	●	
Sulphate	○	○	○	○	○	○	○	○	●		○	○	●	●
Potassium	○ ★	○	○	○	○	○	○	○	○		○	○	●	●
Total Ammonia	○	○	○	○	○						●	○	○	●
Nitrite	○	○	○	○	○	○								
Nitrate	○	○	○	○	○	○					○	○		
Total Phosphate-P	●										◆			
Total Organic Carbon	●	●	●	●	●	●	○	●	●		●	●	●	●
Antimony	○	○	○	○	○	○	○							
Arsenic	○	○	○	○	●	●	●	●			●	○		○
Barium	○	○	○	○	○	○	○	○	○		○	○	○	●
Boron	●	●	●	●	●	●					○	○	○	
Molybdenum	○	○	○	○	○	○	○	○	○		○	○	●	
Nickel	○	○	○	○	○	○	○	○			●	○	●	●
Selenium	○	○	○	○										
Strontium	●	●	○	○	○	○	○	○	○		○	○	●	●
Uranium	○	○	○	○	○	○	○	○	○		●	●		

Table 1 – Mining effects on water quality flowing through the Koala and King-Cujo Watersheds.

TRADITIONAL KNOWLEDGE AND ENGAGEMENT

HIGHLIGHTS



The Agency held a community-based Aboriginal Society Member workshop that focused on wildlife in relation to closure of roads and waste rock storage areas.

View of the main camp at the Ekati mine site.
Photo Courtesy of Dominion Diamond Mines ULC.



IMPORTANT CONCEPTS IN THIS SECTION (alphabetical order)

Knowledge holders

Indigenous people recognized within their own communities for their expertise and depth of knowledge and experience.

Traditional knowledge; Indigenous knowledge

The entire interconnected knowledge system of a group of Indigenous people: spirituality, values and beliefs, environmental knowledge, transmission of knowledge, and the code of practices.

WILDLIFE AND MINE CLOSURE WORKSHOP

During community sessions in January 2019, people said they needed more time to talk about Dominion's closure and reclamation plan. So in February 2020 the Agency held a two-day workshop about wildlife and mine closure. Elders and youth, from the Agency's Aboriginal Society Members came together and shared information, ideas, concerns, and recommendations. The focus was on wildlife in relation to closure of roads and waste rock storage areas. The Agency listened, provided technical information, and answered questions. A report was made summarizing the meeting and highlighting the concerns and opinions raised. A copy of the report has been sent to Dominion and regulators. It can be found on our website (monitoringagency.net)

The workshop incorporated Dene and Métis traditional knowledge, Inuit Qaujimajatuqangit, and community knowledge. Knowledge holders stressed the importance of using traditional laws and ways of knowing in developing and carrying out closure work at Ekati. People shared many lessons they have learned while working and negotiating with the mining industry. They shared many general concerns. Here are a few examples:

- Mining companies and operations impact traditional food security; i.e. they create conditions that contribute to the decline of caribou populations.
- Impacts of mining operations include downstream effects and long-range air transport of pollutants, and cumulative effects from multiple developments and climate change.
- Winter roads developed for mineral exploration and development can cause negative environmental impacts. No agency appears to take responsibility to monitor, regulate, and control access on winter roads.
- If a mine changes hands, new owners may not honour previous commitments or work to build relationships with communities.
- Traditional knowledge is not documented and linked to a project in a transparent, respectful, and appropriate way. It isn't clear when a project uses traditional knowledge.
- Mining companies seem reluctant to incorporate Indigenous traditional knowledge into mine development and closure.

Many workshop participants believe that the mining industry needs to be more responsible and accountable to Indigenous communities. They

believe that regulatory boards and agencies need to better involve Indigenous community members in the mine exploration phase. They need to use traditional knowledge in their decisions.

Participants developed some specific recommendations related to Dominion and the closure and reclamation plan. These are tied to their guiding principles, concerns, and lessons learned. Here are some examples.

Recommendations Related to Ekati's Traditional Knowledge Elders Group:

- Ensure that the traditional knowledge elders group meets regularly. The group does not work as imagined by communities. Dominion should learn more about the Diavik traditional knowledge panel, which has functioned for over a decade.
- Provide clear evidence of how the elders group and traditional knowledge informed the closure and reclamation plan.

Recommendations Related to Monitoring and Reclamation:

- Continue monitoring long after closure. Ekati owners must stay on site until the communities are satisfied with reclamation.
- Set up and carry out community-based, long-term monitoring. Ekati's owners should contribute to the cost. Long-term monitoring needs to take place and communities need to lead programs through guardians and community-based programs.
- Clean up the land to almost what it was like before mining began. BHP, the original mine owner, promised that. Cost should not be an issue.
- for ongoing monitoring after the mine closes. Communities need to know how security estimates are calculated for all closure activities.

Recommendations Related to Roads and Airstrips:

- Work with community members to look into technologies and options to prevent erosion and keep dust down.
- Make caribou ramps wider than 30 meters or 98.5 feet. They are too narrow for large herds if wildlife populations increase again.
- Ensure that the entire road length is caribou-friendly, with edges sloped at a minimum of 4:1. Where drainage features allow the natural flow of water to return to the natural state, remove culverts.
- Keep roads no more than 1.5 meters or 5 feet above the ground next to them.
- Keep some roads accessible to ATVs to help with monitoring
- Lay a caribou-friendly layer of gravel over the coarse rock on the side of the roads. The gravel should not contaminate soils or water (e.g. acid or metals).
- Start right now with the work to close roads. Why have another 12 years of impacts to caribou that could be avoided?
- Monitor roads after closure to see how the caribou cross and how water is flowing. Community members need to see it for themselves.
- Consider leaving airstrips during closure. Diamond mines are in a remote area and these may be useful for emergency landings.



Agency Executive Director Marc Casas presents to attendees at the Agency's Wildlife and Closure Workshop in February of 2020.

Recommendations Related to Waste Rock Storage Areas:

- Remove clean waste rock piles and put the material in pits. This reduces the depth of pits and the size of rock piles, which leave huge scars on the land. Participants remarked that they have asked for this consistently. They have trouble accepting that companies cannot afford to put waste rock back into pits.
- Participants recognize that contaminated waste rock should not go in pits with water.
- Fill all future pits with clean waste rock. Expanding and new mines must not be permitted without this condition.
- Do not assess caribou use of rock piles as low, medium, and high. The area was high usage at one time and caribou go everywhere.
- Treat all waste rock storage areas the same for caribou; provide a minimum side slope of 4:1.
- Shape the top of rock piles like a dome to avoid ponding.

Next Steps:

- Dominion should engage and consult communities more often. Traditional knowledge should have its rightful place in informing operations and closure.
- The Agency should hold more community and regional sessions to discuss closure and reclamation, including waste management at closure.
- The Agency should distribute workshop findings to all involved in the regulatory process, to consider changes.
- Dominion, Wek'èezhii Land and Water Board (WLWB), and governments should participate in the next workshop as observers, to listen to participants' words.
- Community hearings should be required when any mine wants to expand their operations beyond their original plan.

AIR QUALITY

HIGHLIGHTS

- 🐾 Air quality and dustfall data are all within GNWT standards.
- 🐾 As soon as possible, Dominion should combine air quality monitoring plans for Ekati and the Jay Project, as they committed to do in 2016. This will improve air quality monitoring and ensure consistency across all mining operations.
- 🐾 The Pilot Study Report shows that EnviroKleen™ is an effective dust suppressant when applied over the year.

Dustfall monitoring stations at the Ekati mine site.
Photo Courtesy of Dominion Diamond Mines ULC.



IMPORTANT CONCEPTS IN THIS SECTION

(alphabetical order)

Ambient air quality

The concentration of pollutants in the surrounding air.

Concentration

The amount of a substance in a defined space; the amount of different pollutants in the surrounding air.

Dust suppression

Actions that prevent or reduce the amount of dust spreading into the air.

Greenhouse gases (GHG)

Gases in the Earth's atmosphere that trap heat. They allow sunlight to pass through and warm the earth, but prevent the warmth from leaving. Most common GHGs: water vapour, carbon dioxide, methane, ozone, nitrous oxide, chlorofluorocarbons.

Meteorological

The science of weather and climate; the conditions of the atmosphere in an area.

Monitoring

Collecting and analyzing samples and making observations to evaluate change and impacts of change over time; 'keeping an eye' on things all the time.

ACTIVITIES

Dominion has monitored air quality at the Ekati site since 1998. They publish monitoring results every three years, with info about snow chemistry and lichens. We expected the next full report in 2021. The covid-19 pandemic has delayed the work related to snow and lichens.

Dominion produced an interim air quality report with info about meteorological conditions, ambient air quality, dustfall, air contaminants, and greenhouse gases.

In 2016 Dominion committed to combine the plan to monitor air quality at Ekati with a similar plan for the Jay Project. This has not happened yet. Dominion says this is because of ongoing delays in the Jay project timeline.

AIR QUALITY MONITORING RESULTS

Dominion states that air quality at the mine site did not exceed any GNWT standards during 2019.

What Meteorological Data Was Collected:

- Annual average temperature: -9.2° C. This is 0.3° C lower than the historic average from 1995 to 2018.
- Spring freshet: late June. Relatively late compared to the usual time of late May or early June.
- Annual precipitation: 289 millimeters. This is 40 mm less than the historic average of 329 mm.

A trend of lower total annual precipitation has occurred over the last few years. 2017 and 2018 are the driest years on record.

- Wind at the mine site comes from all directions, with northwest the most common.

When/Where Was Meteorological Collected:

- Daily at the airport when personnel are on duty
- Year-round at the Koala meteorological station
- Polar Lake station during the open water season
- Wind data collected 364 days, except for 7 days in January, April, and December because the wind sensor froze.

Ambient Air Quality

The Continuous Air Monitoring Building measures air quality for concentrations of:

- Sulphur dioxide
- Nitrogen oxides
- Total suspended particulates
- Fine particulate matter

In 2019 three other sampling stations measured particulates. These stations operated every six days for 24 hours. This schedule follows the National Air Pollution Surveillance Program sampling schedule.

Total Suspended Particulates

Concentrations of total suspended particulates did not go over the GNWT annual standard. Concentrations are generally higher between May and September, when winter snow no longer helps suppress the dust.

Nitrogen Dioxide and Sulphur Dioxide

Concentrations of nitrogen dioxide and sulphur dioxide were below the GNWT standards. Concentrations were higher in winter (November to April) compared to summer due to using more fuel in winter for heating.

Dustfall

Dustfall concentrations at 300 meters (m) from all haul roads were below the GNWT interim objective. Concentrations decrease with distance from a haul road and approach background levels at 300 m.

- Lynx haul road stations: seasonal average rates lower than previous years, likely due to less hauling activities from July to September.
- Sable Road: concentrations higher than 2018 due to more traffic and mining activity at the Sable pit.
- Airport, Long Lake Facility, Misery and Jay haul roads: dustfall concentrations similar to 2018.

In general, concentrations of acid-bearing dust were below critical levels set for several provinces. Concentrations of metal-bearing dust were relative to the amount of total dustfall and highest near the Lynx, Sable, and Misery haul roads.

GHG Emissions

GHG emissions were 25% lower than 2018 mainly due to using waste oil and less diesel fuel.

DUST SUPPRESSION PILOT STUDY

Dominion takes action to prevent or reduce the amount of road dust spreading into the environment. Historic practices relied on chemicals DL-10 and EK-35, and road watering.

To try to improve dust suppression practices, Dominion tried a product called EnviroKleen™. They did a five-year pilot project that ended in 2019. They applied it on the Misery and Sable haul roads, monitored dustfall, and sampled soil and water. They chose EnviroKleen™ because they have experience with it underground and it is non-toxic and water-soluble.

The study shows that, with proper road maintenance and repeated applications over the year, EnviroKleen™ is effective at suppressing dust. For the best effects, it is applied during certain weather and road conditions. Heavy road use and road surface damage make dust more likely. It seems that EnviroKleen™ lasts longer than DL-10 and does not break down as quickly.

Łutselk'e Dene expressed concerns about how much EnviroKleen™ spreads across the surrounding tundra. Dominion collected soil and water samples along the Misery and Sable roads and compared them with samples from Nanuq Lake. Results showed that EnviroKleen™ spreads to a distance of at least 10 m off the road, but concentrations decrease with distance from the road. Concentrations do not increase cumulatively with each application. Dominion detected no EnviroKleen in water bodies closest to Misery or Sable road monitoring stations.

AGENCY ASSESSMENT

The Agency understands the delays with monitoring snow chemistry and lichens, and we agree with the new schedule. We also note that sampling snow chemistry in a year when the mine was not under typical operating conditions would have provided an interesting dataset for comparison.

The Agency recommends that Dominion take action right away to combine the Ekati and Jay plans to monitor air quality. A combined plan will improve air quality monitoring and ensure it is consistent. It will implement thresholds across the site for nitrous oxides, particulate matter, and total suspended particulates.

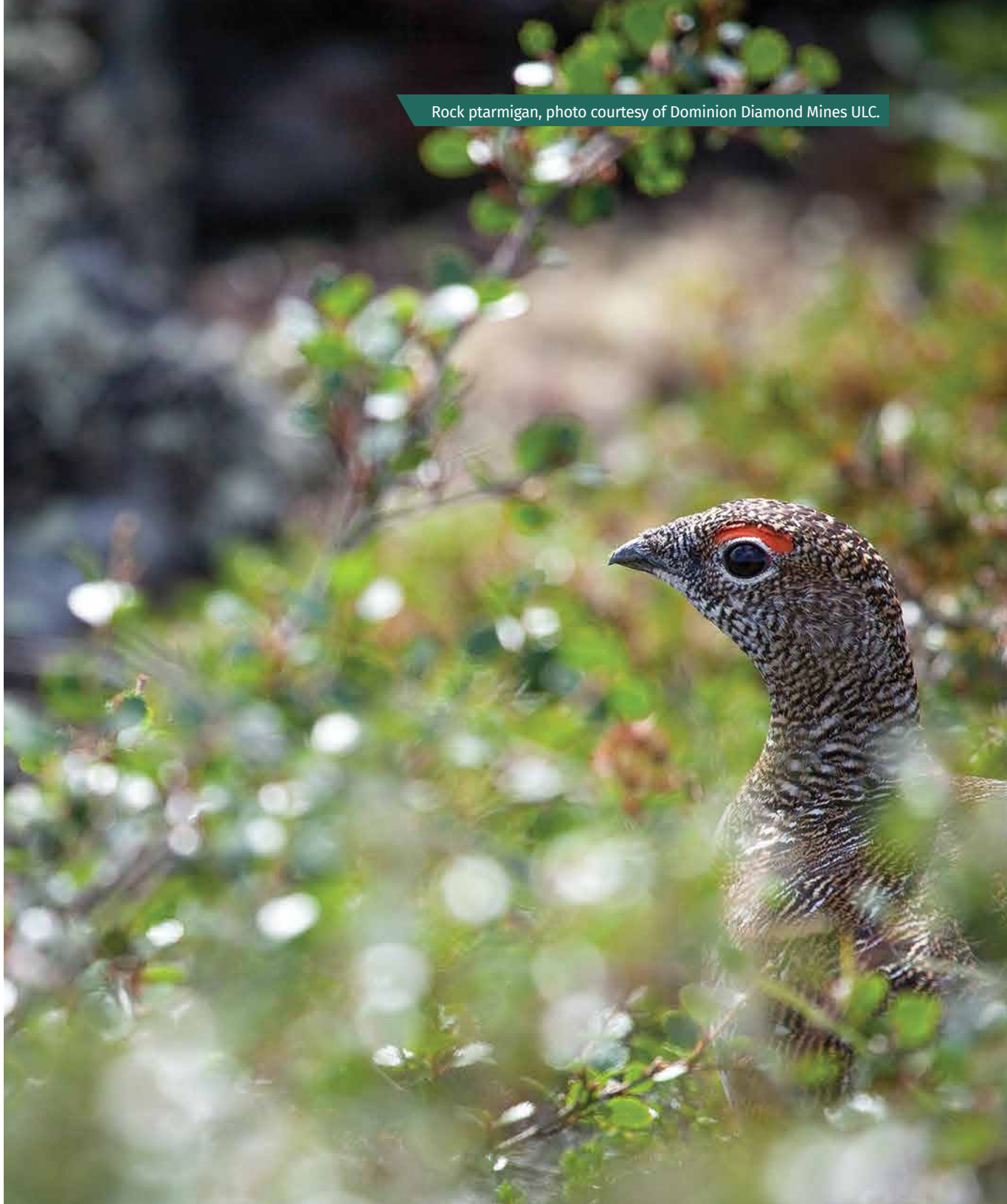
The Agency appreciates the info gained about best practices for using EnviroKleen™. We encourage Dominion to keep monitoring how effective it is. At the same time the Pilot Study Report is unclear how effective EnviroKleen™ is compared to DL-10 or water. Many factors seem to affect EnviroKleen™ that the trial did not consider, such as weather, timing of precipitation, types of equipment, number of applications, and traffic volumes.

Soil samples showed concentrations of EnviroKleen™ 10 m from the Misery Road that are similar to or greater than concentrations on the road. But the report does not explain why this happens or how long it takes for the off-road concentrations to biodegrade.

The report is also not clear if Dominion prefers EnviroKleen™ over other dust suppressants and if they plan to keep using it on the haul roads. The Agency notes that levels of total suspended particulates exceed GNWT standards along the Sable Road, before applying dust suppressants. This shows the need for continued dust suppression. The Agency encourages Dominion to apply EnviroKleen™ to all roads at Ekati, especially the Sable road where there are the most caribou.

The Agency is concerned that the NWT has no enforceable air quality standards and no regulatory system to manage air quality. The 2017-2018 Annual Report stated that the GNWT was actively working to develop an air quality regulatory framework and regulations. The Agency has received no further updates about this. The Agency recommends that the GNWT make greater effort to develop enforceable air quality regulations.

Rock ptarmigan, photo courtesy of Dominion Diamond Mines ULC.



WASTE ROCK MANAGEMENT

HIGHLIGHTS

- 🐾 Important questions persist over using ‘total neutralizing potential’ to evaluate the ability of waste rock to neutralize acid conditions.
- 🐾 Dominion can use Lynx diabase as building material provided they have in place suitable mitigating actions. They cannot use diabase from other pits for building.
- 🐾 Dominion started work on a seepage management framework. The Agency expects the framework to include ecological thresholds, action levels, and adaptive management strategies designed for sources of seepage.



Haul truck at the Ekati mine. Photo Courtesy of Dominion Diamond Mines ULC.

IMPORTANT CONCEPTS IN THIS SECTION

(alphabetical order)

Acid-base accounting

A measure of properties in waste rock that produce acid and neutralize acid; how they balance out. Based on these results people are able to predict the potential water quality of seepage from the waste rock piles

Diabase

The third most common type of waste rock found at the Ekati site, behind granite and metasediment.

Granite

By far the most common type of waste rock found onsite and within the waste rock piles. It is commonly used for construction of roads and laydown areas.

Hydrocarbon impacted soils

Soils contaminated with diesel, gas, oils, or other petroleum products.

Kimberlite / Processed (Waste) Kimberlite/ Coarse kimberlite rejects / Fine processed kimberlite

Kimberlite is the rock that contains diamonds. It is crushed and processed with water to remove diamonds. Once diamonds are removed it is called **Processed Kimberlite** or tailings, which is pumped as slurry to a containment facility (ie LLCF, Beartooth pit, or Panda-Koala pits).

Coarse kimberlite rejects is kimberlite that is low in diamonds, so it is separated from the valuable diamond containing ore and placed

in a pile. Coarse kimberlite is crushed to about size of coarse sand or fine gravel.

Fine processed kimberlite is very small particles of rock (sand-, silt-, clay-sized) leftover as waste from the process that removes diamonds from kimberlite ore.

Landfarm /Landfarming

A place to treat soil contaminated by hydrocarbons (fuel, oils and grease).

Landfarming is a process to treat contaminated soils. The contaminated soils are placed into piles or rows and are turned over now and then to mix with air. This helps bacteria and other natural processes to break down the hydrocarbons.

Mitigation/ mitigating

An action that is supposed to reduce the negative impacts of a condition or situation.

Metasediment

The second most common type of waste rock found in some pits. It has the highest potential to lead to acidic drainage and metal leaching if not managed properly.

SeepageWater that flows through or under the waste rock piles, roads and laydown pads.

Till A coarse collection of clay, sand, gravel, and boulders mixed together and deposited by glaciers.

WASTE ROCK STORAGE AREAS

Waste rock storage areas contain large amounts of waste rock and overburden dug while mining kimberlite. These rock storage areas are permanent. They stay in place when mining ends. They are made to be stable during mine operations and for the long term. Their shape is a 'balance' between area and height. They are built to promote permafrost forming.

Ekati has five waste rock storage areas: Panda/ Koala/Beartooth, Fox, Sable, Pigeon, and Misery/ Lynx. Jay will be the sixth. Another large pile of rock is the storage area for coarse kimberlite rejects from the process plant. It is found next to the Panda/Koala/Beartooth waste rock storage areas. In 2019 Dominion deposited more than 20 million tonnes of waste rock and coarse kimberlite at the storage areas. The table on the next page gives some details.

Table 2 – Ekati Mine Waste Rock and Coarse Kimberlite Rejects Storage.

	Panda/Koala/ Beartooth	Fox	Sable	Pigeon	Misery/Lynx	Jay	Course Kimberlite Rejects
Operational Status	Complete	Complete	Active	Active	Active	Future	Active
Rock Types Contained	Granite, Diabase	Granite, Diabase, Waste Kimberlite	Granite, Diabase	Granite, Diabase, Metasediment, Till	Granite, Diabase, Metasediment	Granite, Diabase, Metasediment	Coarse Processed Kimberlite
Final Designed Area (ha)	428	383	182	66	151	227 (planned)	115
Final Designed Height (m)	40	50	65	70	65	65 (planned)	50
Current Volume (million tonnes)	169	214	33.2	11.6	100	155 (planned)	39.4
Other Features	Waste Hydrocarbon Landfarm, Operations Landfill	Hydrocarbon Impacted Soils	None	None	Operations Landfill, Hydrocarbon Impacted Soils	None	None

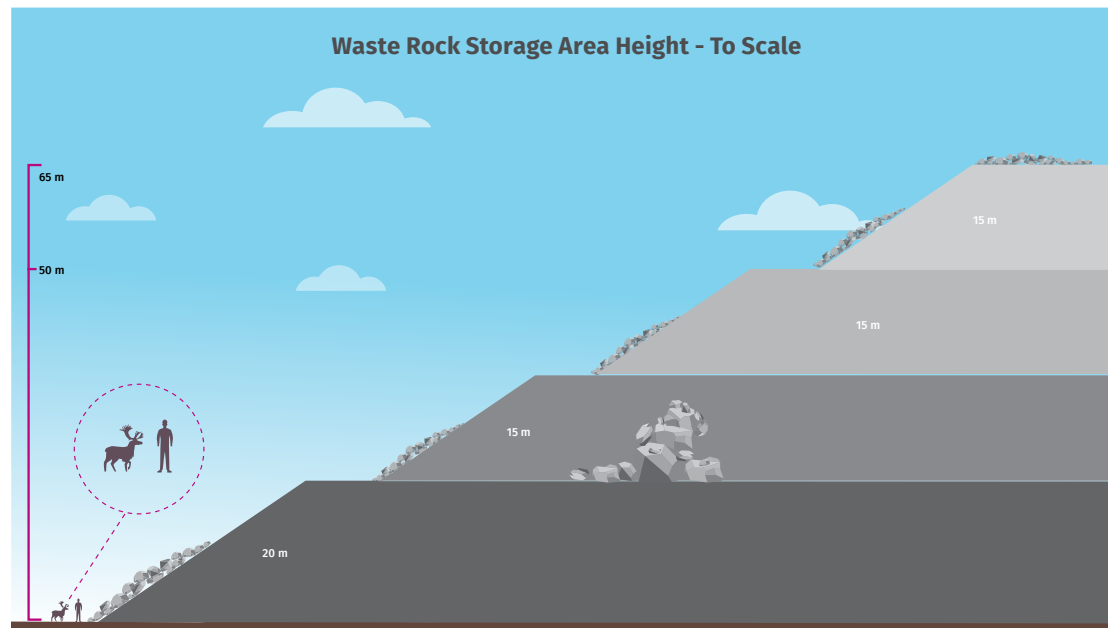
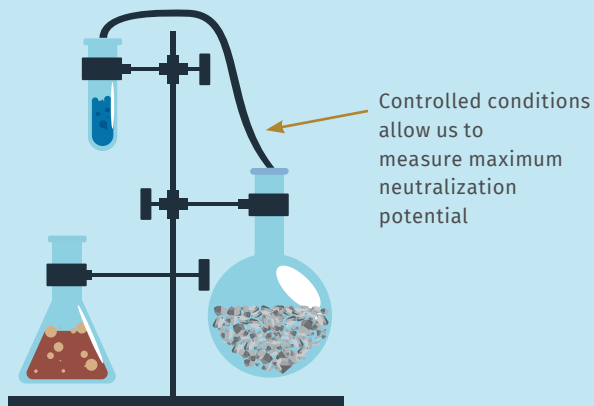


Diagram 1: Waste rock storage area illustration

TOTAL NEUTRALIZATION POTENTIAL (TNP)

In the lab

Controlled conditions
"Best case scenario"



VS

EFFECTIVE NEUTRALIZATION POTENTIAL (ENP)

At the mine site

Taking place in WRSAs
"The reality on the land"

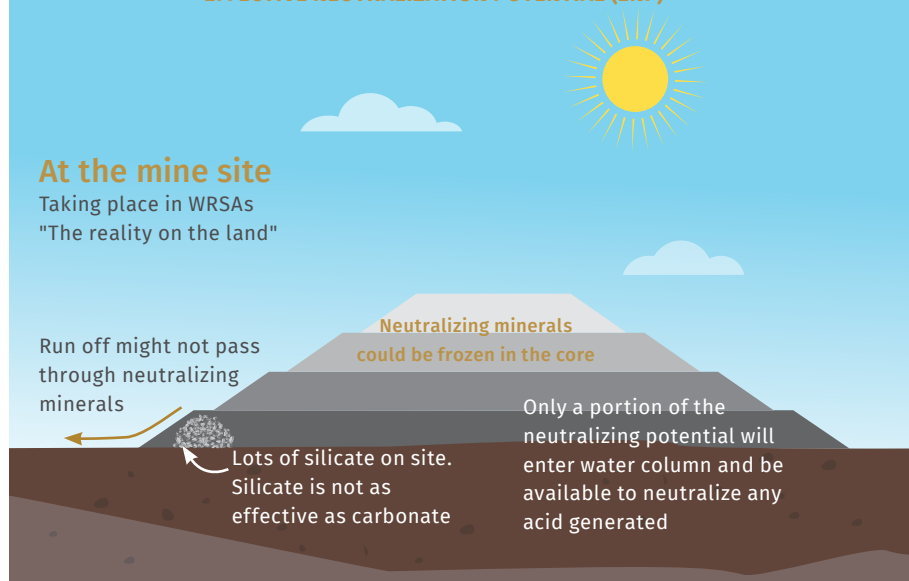


Diagram 2: Neutralization Potential

WHAT IS NEUTRALIZATION POTENTIAL AND WHY IS IT IMPORTANT?

The formation of mine acid drainage and the contaminants associated with it has been described by some as the largest long term environmental problem facing the mining industry. It is a difficult and costly problem as acid generated through oxidation of sulphides and other natural minerals in waste rock can cause metals such as copper and cadmium to leach from WRSAs into adjacent lakes and streams. Fortunately, if sufficient neutralizing minerals are also found in the rock, the acid can effectively be neutralized and the problems associated with acid mine drainage reduced or eliminated.

Carbonate, silicate, aluminium and iron hydroxides and oxides, and aluminosilicate are among the common minerals capable of contributing to the neutralization of acidic solutions, but their reactions and reaction rates vary widely. What specific minerals are present in the rock, their concentrations and the weathering mechanisms taking place under the site specific conditions determine the waste rock's potential to neutralize the cumulative rates of generated acid.

Waste rock at Ekati generally has low amounts of carbonate minerals and relies on silicates to neutralize acid. In general, silicate minerals react slower to acid conditions than carbonate minerals.

Total Neutralization Potential (TNP) is a measure of the total, or cumulative, acid a material is capable of neutralizing. The testing involves dissolving and quantifying all the neutralizing minerals in a rock sample including those that may not contribute similar acid neutralization properties under actual field conditions.

Effective Neutralization Potential (ENP) is a measure of the actual, or effective, neutralization potential residing in rock under the environmental conditions it resides in. Unfortunately, no single available testing method can accurately simulate all the factors that determine actual drainage chemistry under field conditions. This makes the testing difficult, time consuming and more costly.

Waste Rock Monitoring and Acid-base Accounting

Dominion samples and analyzes waste rock and coarse kimberlite rejects for acid base accounting and concentrations of certain contaminants. In 2019 they collected and analyzed 83 samples.

Acid-base accounting is very important. It is a measure of the balance between properties in waste rock that produce acid and those that neutralize acid. Minerals in waste rock can react with water and oxygen to produce acids, including sulphuric acid. This has negative effects on water quality. Also, the acid can leach metals from surrounding materials and bring them into the environment with seepage.

To make good decisions about how to treat and store waste rock, acid-base accounting must be accurate and correct. The wrong information can lead to bad decisions and contaminated land and water.

Total Neutralizing Potential

This test measures the total amount of acid that the rock sample can neutralize. This includes all the minerals that may or may not help neutralize under real-life field conditions.

Effective Neutralizing Potential

This test measures the amount of acid a rock sample can neutralize in the environment it lives in. No testing method can accurately mimic all the factors that affect waste rock in the field. This type of test is difficult, time consuming, and expensive—but more accurate.

Waste Rock Neutralization Potential

In the past and currently, Dominion uses total neutralization potential to measure how well waste rock can neutralize acid. The Agency has repeatedly raised questions about using this practice. We suggest that effective neutralization potential is a more accurate way to measure how well waste rock can neutralize acid.

The Agency also raised this issue during reviews about using diabase as a building material and to cover the Misery waste rock storage area.

This issue is unresolved. The Wek'èezhìi Land and Water Board (WLWB) agreed that uncertainty exists around classifying waste rock. To help clarify things, Dominion started doing tests to measure the effective neutralizing potential of waste rock. They expect to use the results to update the waste rock design for Jay Project. They will include this information in a broader site-wide study into effective neutralizing potential, and provide that to Wek'èezhìi Land and Water Board (WLWB) in 2020.

Mitigating Risks When Using Diabase as Construction Material

In 2018, Dominion first proposed to use diabase as a building material for roads, laydown pads, dykes, and berms in the same way they use granite. They argued that diabase, like granite, has no to low potential to generate acid and leach metals. That using diabase presents no significant risk to nearby land and water.

The Agency assessed the diabase testing information. We found that diabase from Lynx pit and diabase from other pits have different neutralizing potential and sulphur content. WLWB approved using Lynx diabase as a building material.

Dominion must have in place suitable mitigating actions. WLWB did not approve using diabase from other pits.

To respond, Dominion proposed a mitigating program for Lynx pit diabase. They plan to do more rock sampling and chemical analysis, and monitor seepage. WLWB reviewed and approved the program. Dominion must have a new sampling schedule and clarify the trigger that increases seepage sampling of building material runoff. Dominion also needs to provide new evidence if they ever to want to use diabase from pits other than Lynx as building material.

Ground Temperature Cable Installed in Pigeon Waste Rock Storage Area

Dominion is working with the University of Waterloo to examine the geothermal properties in the Pigeon waste rock storage area. They installed a horizontal ground temperature cable to measure heat underground. This is the first horizontal cable at Ekati.

Dominion expects to finish building this waste rock storage area in 2022. At that time they will cover the cable with about 20 meters of waste rock. The cable will provide good information about geothermal conditions along its length, under the waste rock. For example, in the unfrozen active layer and where that layer meets the frozen rock core.

Seepage Management

As a condition of their water licence, Dominion must monitor the quality of seepage from waste rock and kimberlite storage areas. They must report their findings every year. As well, they must report on results of all seepage data collected

since Ekati started operating. They must report their findings to the WLWB every three years. In March 2020 they submitted that report.

During 2019 Dominion continued monitoring seepage at all seep stations, including 14 new ones. They collected samples at all stations with

a measurable flow: 50 during spring freshet, eight after significant rains in July and August, and 17 in the fall.

Monitoring shows that seepage water is different in different areas. Some samples show lots of acid drainage, weathering, and metal leaching from the

waste rock. Also flushing explosive residues and fine rock. Other samples show similar qualities to background surface water reference stations.

Trends in seepage quality from the kimberlite storage areas are more consistent than from the numerous waste rock storage areas. Overall,

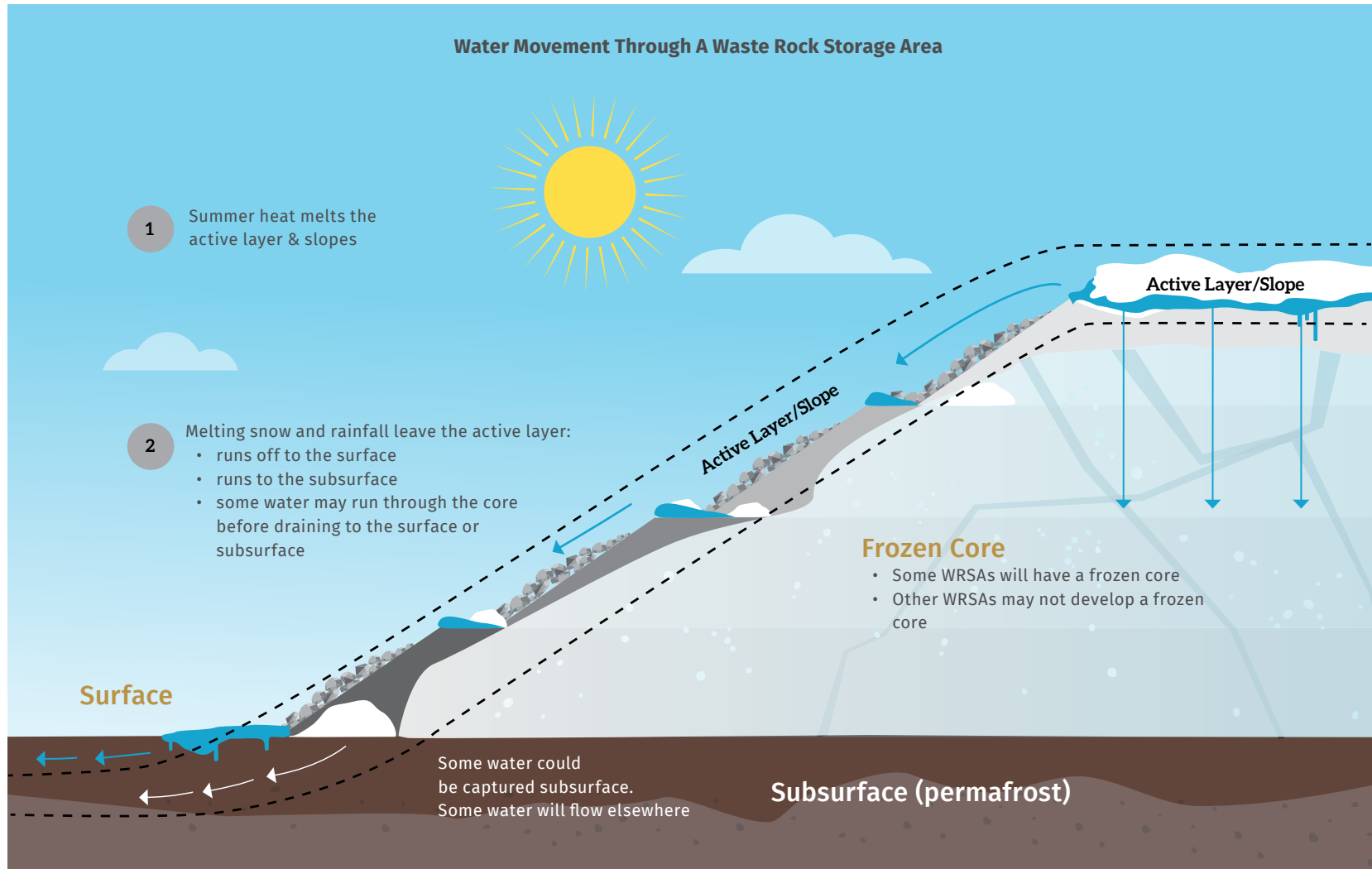


Diagram 3: Seepage

monitoring suggests that seepage flushes fine kimberlite, small particles, and major and trace elements. In part this is due to ongoing discharge of waste kimberlite slurry from the processing plant to the area. Unlike seepage from waste rock storage areas, seepage from kimberlite storage areas is usually alkaline or basic (not acidic).

Dominion must report any seeps that enter the environment that exceed standards in their water licence. They must also report any action they take to correct the problem. In 2019 seepage exceeded these standards four times.

Monitoring Flow Rate of Waste Rock Seepage

Dominion started to monitor the seasonal flow rate of seepage in the Pigeon and Panda/Koala/Beartooth waste rock storage areas. They installed in-stream weirs at two seeps and monitored through the 2018 and 2019 open water seasons.

Preliminary results suggest the following:

- In the older Panda/Koala/Beartooth waste rock storage area a strong rainfall event triggers a sharp short-term spike in seepage flow rate.
- In the newer Pigeon waste rock storage area a similar rainfall event triggers a longer lasting, but lower seepage flow rate.

This effect may be related to age. The core of Panda/Koala/Beartooth storage area is colder and wetter than the Pigeon storage area. It is unclear whether Dominion plans to continue this monitoring.

Groundwater Flow Evaluation

In recent years the Agency has questioned if some seepage is below the surface and untested. In 2019, Dominion did a 'desktop' review of information,

i.e. no fieldwork or analysis. They studied groundwater processes, especially as they relate to areas around waste rock storage areas. The review concluded that most seepage flows on the surface, with a limited amount underground.

AGENCY ASSESSMENT

Some people/experts describe the potential for acid drainage and metal leaching from waste rock as the largest long-term environmental issue in the mining industry. It is a complex and costly challenge.

If waste rock does not contain enough minerals to neutralize acid, sulphides and other minerals can oxidize. In turn this can cause toxic metals to leach from the rock into nearby lakes and streams.

It is very important to manage the potential for long-term acid drainage and metal leaching from waste rock storage areas. A company must carefully develop and apply very specific strategies during mine operations. These have a strong effect on planning for mine closure.

During 2019, little progress was made to resolve outstanding questions about using effective neutralizing potential on waste rock. In their recent decisions, the Wek'èezhii Land and Water Board (WLWB) raised this concern more often. The Agency hopes that the new testing Dominion has started will help resolve this issue.

We cannot compare eight problem seeps in 2018 with four problem seeps in 2019 (exceeded water licence standards). The screening method changed.

In 2019 the Agency suggested that Dominion use a different method to evaluate risk from seeps.

Dominion started to develop a new seepage management framework to replace the current method of finding problem seeps. We expect the framework to include ecological thresholds, action levels, and adaptive management strategies designed for sources of seepage. We support Dominion's efforts to develop this framework and look forward to reviewing it in 2020.

Seepage from waste rock storage areas represents a long-term risk to the environment. Seepage needs to be managed during mine operations and after closure. The risk from seepage depends on three major factors:

- Type and concentration of contaminants leaving waste rock storage areas
- Volume of flow
- Sensitivity of nearby environment

Dominion's existing seepage monitoring provides good information on the type and concentration of contaminants leaving waste rock storage areas. Aquatic effects monitoring assesses the state of nearby lakes and streams. Accurate information on the volume of seepage flow remains unavailable.

Seepage flow monitoring and the subsurface seepage flow evaluation represent welcome measures to start to deal with this issue. The Agency would like Dominion to more accurately and completely evaluate flow patterns—to install instruments that measure real-time surface and subsurface flow at selected seep sites.

WASTEWATER AND PROCESSED KIMBERLITE MANAGEMENT

HIGHLIGHTS



In May 2019, Dominion started depositing fine processed kimberlite into the Panda and Koala pits. This is a big change in the management plan at Ekati and may affect long-term water quality in pits and pit lakes after the mine closes.



Dominion started storing wastewater from the Misery underground and King Pond settling facility in Lynx pit.



Dominion needs more complete and up-to-date monitoring and research to have the data they need for accurate modeling of water quality in pit lakes.

Dyke between cells of the Long Lake Containment Facility.
Photo Courtesy of Dominion Diamond Mines ULC.



IMPORTANT CONCEPTS IN THIS SECTION

(alphabetical order)

Coarse kimberlite rejects

Coarse kimberlite rejects is kimberlite that is low in diamonds, so it is separated from the valuable diamond containing ore and placed in a pile. Coarse kimberlite is crushed to about size of coarse sand or fine gravel.

Effluent

Waste water from mine operations (mining process, underground and camp facilities water) that is discharged to the downstream environment if it meets specific water quality standards.

Fine processed kimberlite

Very small particles of rock (sand-, silt-, clay-sized) leftover as waste from the process that removes diamonds from kimberlite ore.

Slurry

Fine processed kimberlite mixed with water.

Surface minewater

Water that flows or is pumped from surface mine infrastructure, e.g., roads, waste storage areas, truck washing bays, collection sumps

WASTEWATER AND FINE PROCESSED KIMBERLITE

The plan to manage wastewater and fine processed kimberlite applies to the whole site. Activities to manage wastewater and fine processed kimberlite are closely linked.

The process to recover diamonds produces large amounts of fine processed kimberlite. These are very small particles of rock, leftover from processing kimberlite to remove diamonds. It leaves the process plant as slurry—a mix of fine processed kimberlite and water.

The following table summarizes the types of wastewater and processed kimberlite at the Ekati mine site.

Table 3 – Ekati Mine Wastewater and Processed Kimberlite Types.

Category	Type	Description/Sources
Minewater Runoff from facilities and water pumped from mines	Surface Minewater	Water that flows or is pumped from surface mine infrastructure, e.g., roads, waste storage areas, truck washing bays, collection sumps.
	Open pit Minewater	Water that flows or is pumped from open pits.
	Underground Minewater	Water that flows or is pumped from underground workings.
Sewage Toilet waste and greywater	Sewage – Main Site	Sanitary sewage system at the main site.
	Sewage – Remote Sites	Sewage from remote work sites, e.g., Fox pit, Misery Camp.
Processed Kimberlite Waste material from the process plant	Coarse Processed Kimberlite	Coarse kimberlite (> 0.5 mm diameter particles) rejected from the process plant. Trucked to waste rock storage areas.
	Fine processed kimberlite	Fine kimberlite (particles < 0.5 mm diameter) discharged from the process plant in a slurry (fine rock mixed with water).

WASTEWATER MANAGEMENT

Ekati mine has three facilities that manage water. Dominion collects and analyzes water samples at these facilities before they discharge water into nearby lakes. They must make sure that the discharged water complies with the standards in their water licence.

1. Two Rock Sedimentation Pond: Manages water from the Sable site. Discharge goes to Horseshoe Lake in the Horseshoe watershed.
2. Long Lake Containment Facility: Manages water from the main camp, Panda/Koala/Beartooth area, ammonium nitrate storage facility, Polar explosive

building, Fox site, and Pigeon site. Discharge goes to Leslie Lake in the Koala watershed. In this area, water management sometimes relies on short-term storage in the Beartooth processed kimberlite containment area before discharge through the Long Lake facility.

3. King Pond Settling Facility (at the Misery site): Manages water from the Misery and Lynx sites. Discharge goes to Cujo Lake in the King-Cujo watershed.

In future, Dominion plans to use the Misery pit to manage water from the Jay project. Discharge goes into Lac du Sauvage.

To manage surface minewater, Dominion first collects it into sumps for a short time. Then they pump or truck it to one of the three main water management facilities.

Surface minewater runoff from some roads, laydowns, and waste rock storage areas follows natural flow paths, or is directed onto the tundra. This minewater does not go to any water management facility.

Dominion can only build roads and laydowns with materials that have very low acid generating and metal leaching potential.

Table 4 – 2019 management of open pit and underground water is summarized.

Mine Area	Water Management	2019 Volumes (m ³)
Panda, Koala, Koala North Underground	Pumped to Long Lake or Beartooth. Stopped in early 2019. Mining and underground reclamation complete.	22,791 m ³ to Long Lake 0 to Beartooth
Beartooth Open pit	Pumped to Long Lake. Can be used to store fine processed kimberlite and short-term storage from other sources.	79,224 m ³ inflow from Panda/Koala surface sumps and Pigeon open pit. No fine processed kimberlite in 2019.
Fox Open pit	Pumped to Long Lake during operation. Currently accumulating in pit.	0 m ³
Pigeon Open pit	Pumped or trucked to Long Lake or Beartooth.	0 m ³ to Long Lake 74,640 m ³ to Beartooth
Lynx Open pit	Pumped or trucked to kimberlite storage. Stored non-compliant water from kimberlite storage.	9,520 m ³ to kimberlite storage 377,360 m ³ from kimberlite storage
Sable Open pit	Pumped or trucked to Two-rock sedimentation pond.	51,307 m ³
Misery Open pit	Pumped to kimberlite storage.	207,369 m ³
Misery Underground	Pumped to kimberlite storage or Lynx pit.	23,627 m ³ to kimberlite storage

All sewage wastewater is treated in the sanitary sewage treatment plant at the main camp. Sewage from all washroom facilities across the site is trucked to the sewage treatment plant. Treated effluent from the sewage plant flows through a pipe to the process plant and mixed with fine processed kimberlite. Then it is discharged to a processed kimberlite containment area. In 2019, Dominion discharged 67,995 m³ of sewage effluent.

MANAGING FINE PROCESSED KIMBERLITE

In March 2019 the Wek'èezhii Land and Water Board (WLWB) approved Dominion to start depositing fine processed kimberlite in Panda and Koala pits. They started using Panda pit for depositing fine processed kimberlite in May 2019, and did the same in November 2019 in Koala pit. Throughout 2019 they continued to also deposit fine processed kimberlite to the Long Lake facility. In 2019, they put no fine processed kimberlite in Beartooth pit.

The following table lists volumes of fine processed kimberlite and process plant water in each facility in 2019.

Table 5 – Fine processed kimberlite and water deposited into containment facilities 2019.

Facility	Process plant solids – fine processed kimberlite (m ³)	Process Plant Liquids (m ³)
Long Lake Containment Facility	358,903	3,045,439
Panda pit	480,636	2,978,617
Koala pit	149,393	949,967
Beartooth processed kimberlite containment area	0	0

In 2019 the Long Lake facility continued to be a source of water for the process plant. Dominion pumped more than 5 million m³ of water from there to use in the process plant.

The Beartooth processed kimberlite containment area (a pit) is still a place to store minewater. This is a benefit when water quality conditions make it important to divert certain minewater away from the Long Lake facility. For example, water with higher nitrate, chloride, and potassium concentrations goes to Beartooth pit. There it mixes with other water before going to the Long Lake facility. In 2019, Dominion put water from the Pigeon open pit and surface sumps in the Panda and Koala areas in Beartooth pit.

The Long Lake Containment Facility has five cells. Dominion has deposited processed kimberlite into three of these cells. One is full, and the other two still have space. Dikes separate the cells. At the outlet dam for the cell that discharges to Leslie Lake Dominion monitors effluent quality to make sure it complies with their water licence. During July and August 2019, Dominion discharged over three million cubic meters of water to Leslie Lake.

Long Lake Containment Facility discharge point in Cell E.



Wastewater and Processed Kimberlite Management Plan

In March 2019, Dominion submitted the latest plan to manage wastewater and processed kimberlite. This version included a summary of plans to close processed kimberlite containment areas. The plan also noted that Dominion needs to do more research to confirm how deep the water cap needs in the pit lakes that contain fine processed kimberlite.

The closure and reclamation plan for these pits relies on freshwater caps that sit on top of the fine processed kimberlite. The purpose of the freshwater cap is to deal with possible long-term water quality concerns. Dominion has done water quality predictions for a freshwater cap 30 meters deep. These predictions show that long-term concentrations of some contaminants exceed water quality standards.

Dominion has proposed a research plan to evaluate the best depth for the freshwater cap to achieve post-closure conditions that comply with water quality standards. The Wek'èezhìi Land and Water Board (WLWB) told Dominion to revise the research plan and include it in the updated closure and reclamation plan, due mid-2021.

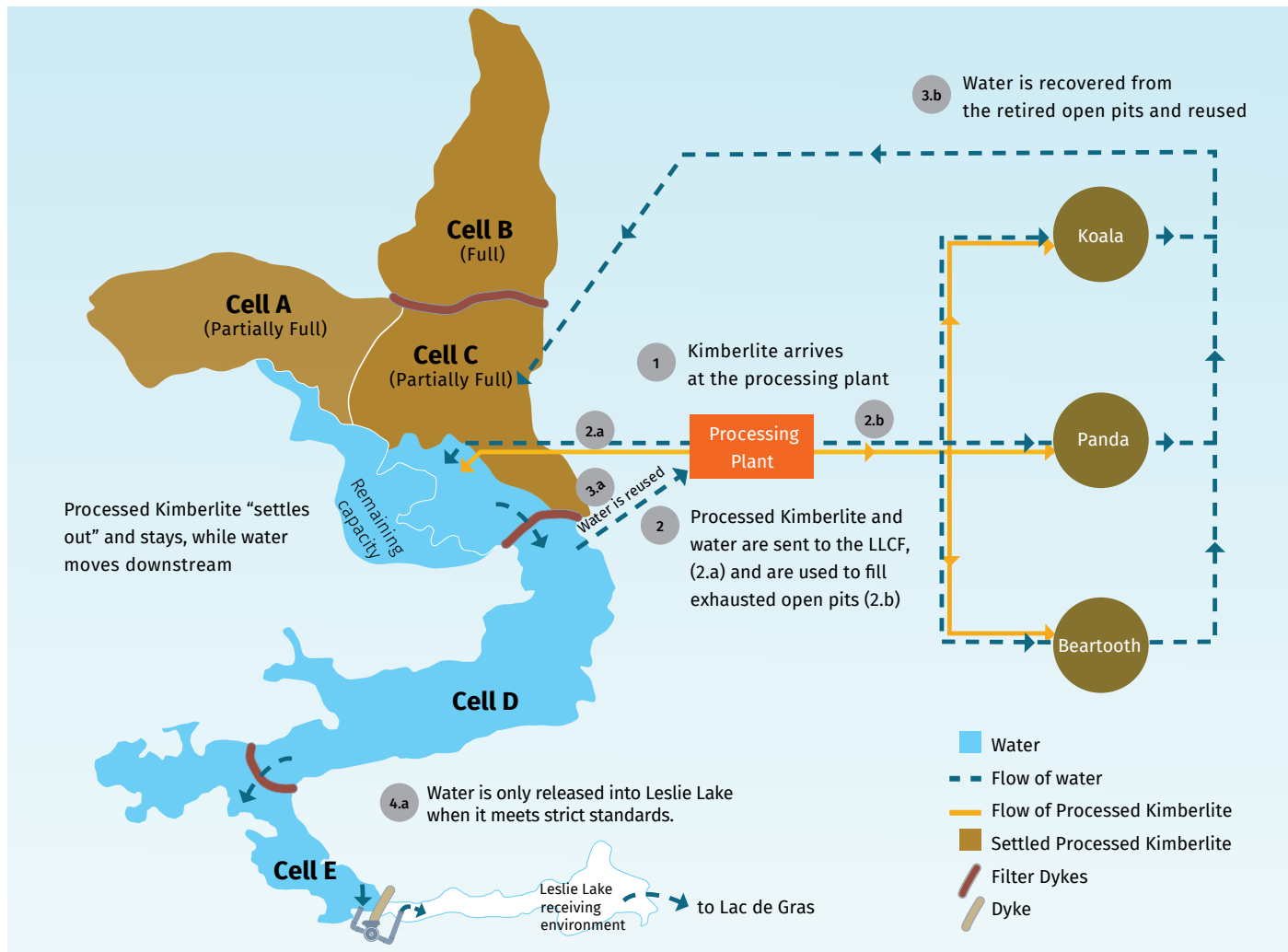


Diagram 4: Wastewater and processed kimberlite at the Ekati mine site

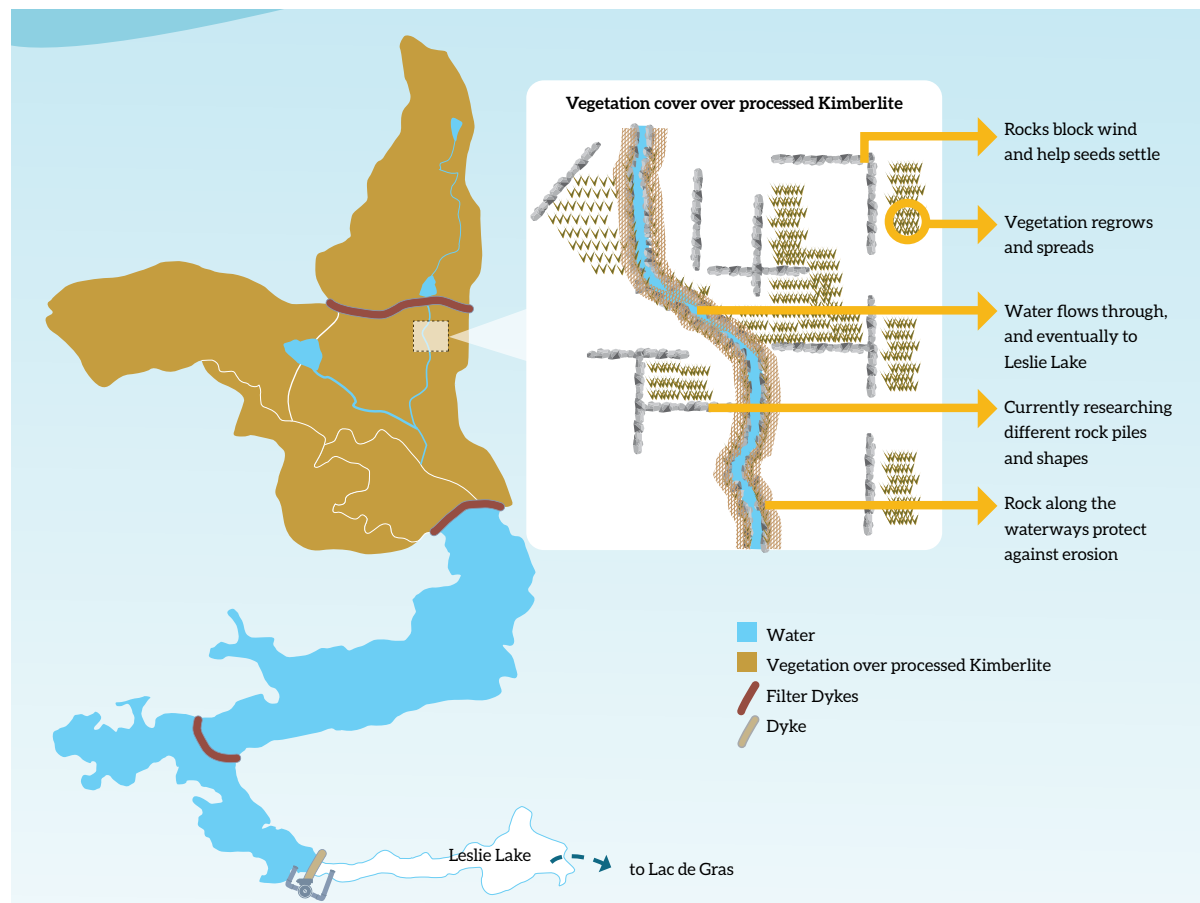


Diagram 5 : LLCF plan closure and reclamation

AGENCY ASSESSMENT

Depositing fine processed kimberlite in the Panda/Koala containment area is a big change in the management plan at Ekati. This may affect long-term water quality in Panda, Koala, and Koala North pits and pit lakes. Reducing discharge of fine processed kimberlite to the Long Lake facility will lead to changes in water quality and water levels there.

The Agency has stated before: water quality predictions for pit lakes relies on many assumptions and estimates of loading from various sources. Loading is the total possible amounts of contaminants in wastewater that enter the pit lakes. Limited or no data support estimates of loading from some sources, e.g. runoff from disturbed areas like roads and laydowns. Loading estimates from waste rock storage areas assume that current runoff and seepage conditions stay the same over the long term. Little or no evidence supports this. Dominion has not completed detailed water and energy balances for waste rock storage areas. Overall, Dominion's assumptions and estimates leave a lot of uncertainty about long-term predictions of water quality in pit lakes. They may underestimate future loading and concentrations.

The Agency considers it critical to have timely and robust monitoring and research to provide data that supports better modelling and predictions of pit lake water quality. This is also important for further analysis about the depth of the freshwater cap. The revised research plan is an opportunity to address these information needs.

CLOSURE AND RECLAMATION

HIGHLIGHTS




-  The Wek'èezhìi Land and Water Board (WLWB) approved the Interim Closure and Reclamation Plan Version 3.0 with conditions. They identified many shortfalls and did not approve some parts of the plan.
-  Dominion must submit an updated closure and reclamation plan within four months of holding a workshop in early 2021.
-  At this stage of Ekati mining operations, it is very important to have a well-developed, detailed and complete closure and reclamation plan, and enough financial security.

Photo Courtesy of Dominion Diamond Mines ULC.



IMPORTANT CONCEPTS IN THIS SECTION

(alphabetical order)

Adaptive management

A management system with continual monitoring so that if a mitigating action doesn't work, other actions are used to keep the impacts within accepted levels or below thresholds.

Conditions

Requirements that need to be met before any action can be taken

Contingencies

A backup plan in case the current approach is not working

Financial security

The amount of money needed to cover the total expected cost of closing and reclaiming a mine site. The Government

holds the money in case the Company leaves without closing it. Portions of security can be returned for reclamation work completed while the mine is operating.

Mitigating, mitigation

An action that is supposed to reduce the negative impacts of a condition or situation.

Monitoring

Collecting and analyzing samples and making observations to evaluate change and impacts of change over time; 'keeping an eye' on things all the time.

Reclamation

The process of returning areas of land and water—disturbed by mining operations—to workable, healthy ecosystems.

INTERIM CLOSURE AND RECLAMATION PLAN V 3.0

In February 2020, the Wek'èezhìi Land and Water Board (WLWB) approved this plan with conditions.

They asked Dominion to develop and submit another version (3.1) with these changes.

- Gather more information.
- Host a workshop on closure objectives and criteria, and include workshop outcomes.
- Clarify closure objectives and some reclamation research plans.

Because the COVID-19 pandemic restricts travel and indoor gatherings, the deadline for the workshop has been pushed to February 2021. Dominion must submit the revised plan within four months of the workshop.

Version 3.0 is the first complete update since 2011. The overall goal that guides closure and reclamation is to:

"Return the Ekati mine site to viable, and wherever practicable, self-sustaining ecosystems that are compatible with a healthy environment, human activities, and the surrounding environment."

ISSUES RELATED TO PLANNING FOR CLOSURE AND RECLAMATION

The WLWB identified several issues that do not meet closure guidelines. These issues need further discussion and work before Dominion submits the next version of the closure and reclamation plan.

- Closure objectives and criteria (criteria are standards that must be met) are a major focus for the upcoming February 2021 workshop. WLWB believes that it is very important to agree on objectives and criteria to move the plan forward. To support the workshop, Dominion must prepare a draft criteria work plan for discussion.
- Dominion needs to include more information and details about contingencies, adaptive management, and post-closure monitoring.
- Dominion's proposed closure objectives need to more clearly explain expected closure outcomes for land use and re-vegetation. Dominion needs clear objectives for re-vegetation to achieve the 'future use' principle. Closure objectives for land use and re-vegetation will be discussed at the closure and reclamation workshop.
- Dominion described nine reclamation research plans in version 3.0. WLWB asked Dominion to revise four of them, including engagement.
 - Research plan # 1 refers to wildlife behaviour and use of the site.
 - Research plan # 4 refers to the cover for Pigeon waste rock storage area.
 - Research plan # 5 refers to waste kimberlite seepage.

- Research plan # 6 refers to placing of different rock types in Jay waste rock storage area.

- Dominion proposed that reclaiming fish habitat is only practical in small areas of the Panda, Koala, Koala North, and Beartooth pits. The WLWB was concerned about this reduction of the original plan for creating pit lakes. They advised Dominion to discuss the issue at the workshop.
- Dominion removed the closure objective about freezing potentially acid-generating waste rock. They stated that no freezing is needed to deal with long-term water quality concerns. The WLWB concluded that current computer modeling (or "mathematical modeling"?) does not support removing the freezing objective. Dominion must discuss this objective at the workshop.

CLOSURE AND RECLAMATION ACTIVITIES—PANDA-KOALA UNDERGROUND

In early 2019, Dominion completed reclamation activities for Panda, Koala, and Koala North Underground. These activities prepared the

pits for storing fine processed kimberlite. Reclamation included removing salvageable and hazardous materials and equipment from the underground and blocking off access. GNWT did a final inspection on February 26, 2019. Dominion started to deposit fine processed kimberlite into the Panda-Koala pits in May 2019.

Some material and equipment was left underground. It was considered not harmful to water quality. Dominion also left 2,310 kg of preloaded emulsion explosives underground. They said the explosives were covered by a rockslide and could not be safely set off or recovered. Dominion does not plan to monitor or report any more about removing materials and equipment from the Panda-Koala underground. Access is no longer possible.

CLOSURE AND RECLAMATION ACTIVITIES—OLD CAMP

Old Camp reclamation activities started in 2014. The final activity in 2018 was removing 250 m³ of soil contaminated with hydrocarbons like oil, fuel and hydrocarbons.

Table 6 – Ekati Mine Reclamation Security Held (December 31, 2019).

Security Item	Amount Held
Water Licence Security W2012L2-0001	\$273,875,482
Ekati Environmental Agreement	\$19,991,424
Jay Early Works Land Use Permit W2016F0007	\$1,480,000
Pigeon Land Use Permit W2016D0005	\$427,000
Total:	\$295,773,906

Monitoring water quality is ongoing to determine the success of reclamation activities. September 2019 monitoring results show water quality exceeded licence standards twice: once for total arsenic and once for dissolved aluminum. Arsenic exceeded standards also in September 2018.

Dominion plans to keep monitoring the area. They state that concentrations will weaken and dilute along the flow path before the water enters Larry Lake.

FINANCIAL SECURITY AND CLOSURE PLANNING

Dominion twice asked to reduce the security because of reclamation work they did to cover

Misery waste rock. In January 2018 they asked for a decrease of \$7.9 million and in March 2019 a decrease of \$9.1 million.

The WLWB did not approve either of these requests. In July 2019 the WLWB set out a process and schedule for Dominion to engage with GNWT to build consensus about closure liability and security. They agreed to a \$7.9 million reduction. WLWB approved this adjustment, but noted they may re-visit this. The adjustment includes an amount held back for uncertainty about the effectiveness of the Misery cover.

The use of diabase rock to cover the Misery waste rock pile was not approved and was not addressed in calculating the hold back. Dominion placed Misery diabase rock in the cover along with the granite. Diabase rock has a greater potential for acid-generating and metal leaching. The WLWB expressed concern about the potential effects on long-term closure outcomes, but did not make any decisions about how to respond.

In February 2020 WLWB approved several security adjustments—reductions and increases—in version 3.0 of the closure and reclamation plan. See the following table. The total difference is a reduction of \$3,560,050.

Table 7 – February 2020 Reclamation Security Adjustments.

Reductions		Increases	
	Rationale		Rationale
\$18,348,713	Reduced cover thickness on Fox WRSA	\$5,468,793	Updates costs for infrastructure decommissioning
\$550,495	Reduced cover thickness on landfill	\$750,000	Post-closure maintenance cost added
\$4,869,995	Reduced pumping times for pit filling	\$684,026	Increased surface area for re-vegetation
\$1,952,106	Updated underground reclamation costs	\$1,642,000	Increased duration of active closure monitoring
		\$946,400	Increased site access costs for active closure monitoring
		\$1,000,000	Helicopter costs for post-closure monitoring
		\$11,670,040	Adjustment for inflation
TOTAL		TOTAL	
\$25,721,309		\$22,161,259	

WLWB also set certain requirements if Dominion asks to adjust security in the future. Dominion must submit more detailed information about inputs and assumptions. They must deal with several areas where the WLWB is concerned that liability may be underestimated.

The GNWT prefers to hold separate securities under the water licence and land use permits. The WLWB preferred that the security be combined under just the water licence. Dominion asked WLWB to authorize splitting the security because GNWT refused to accept a combined security under the water licence.

WLWB expressed concern about the security split. It could make adjustments more difficult and increase the administrative burden and potential for error. Despite these concerns, the WLWB agreed to split the security between the land use permits and water licence because GNWT did not accept the land portion of security under the water licence. In April, Dominion applied for security adjustments to water licence and land use permit, and received approvals in May 2020.

AGENCY ASSESSMENT

The updated, site-wide interim closure and reclamation plan (ICRP) was a positive step in planning to close the Ekati mine. The Agency sees several critical flaws that make the plan inadequate for the present stage of mining at Ekati. We did not recommend approving it. The WLWB acknowledged many issues and concerns that the Agency and other parties raised. The Agency looks forward to participating in the closure workshop and engaging with Dominion to develop the next version of the plan (3.1).

Financial Security

The Agency continues to believe that posted security should match or exceed closure liabilities. As mining and reclamation activities progress, this means effective ways to adjust security—reducing or increasing it. The Agency agrees with WLWB concerns about splitting the security between the water licence and land use permits.

The Agency agrees with the concept of holding back financial security after reclamation activities are finished to deal with monitoring and future risks for those activities. But the process to quantify the holdback is not consistent and not based on any historical guidance. The Agency recommends that GNWT and WLWB cooperate to develop ways to standardize the process to define the amount of security to hold back for monitoring and future liabilities.

The temporary shutdown in March 2020 highlights the importance of having in place a well-developed, comprehensive closure and reclamation plan, and enough financial security. The Agency knows that planning for closure and reclamation is an ongoing process. It evolves and develops as mining progresses. Each new version of the plan should have more detail and provide more certainty and understanding than the last.

Ekati has operated for over 20 years. Several mine components are complete. But Dominion's interim closure and reclamation plan V 3.0 does not include final closure designs. They have not finalized closure objectives and criteria. The Agency believes that it is critical for Dominion to make immediate and substantial progress in the level of detail in its closure and reclamation plan.

Panda Waste Rock Storage. Photo courtesy of Dominion Diamond Mines ULC.

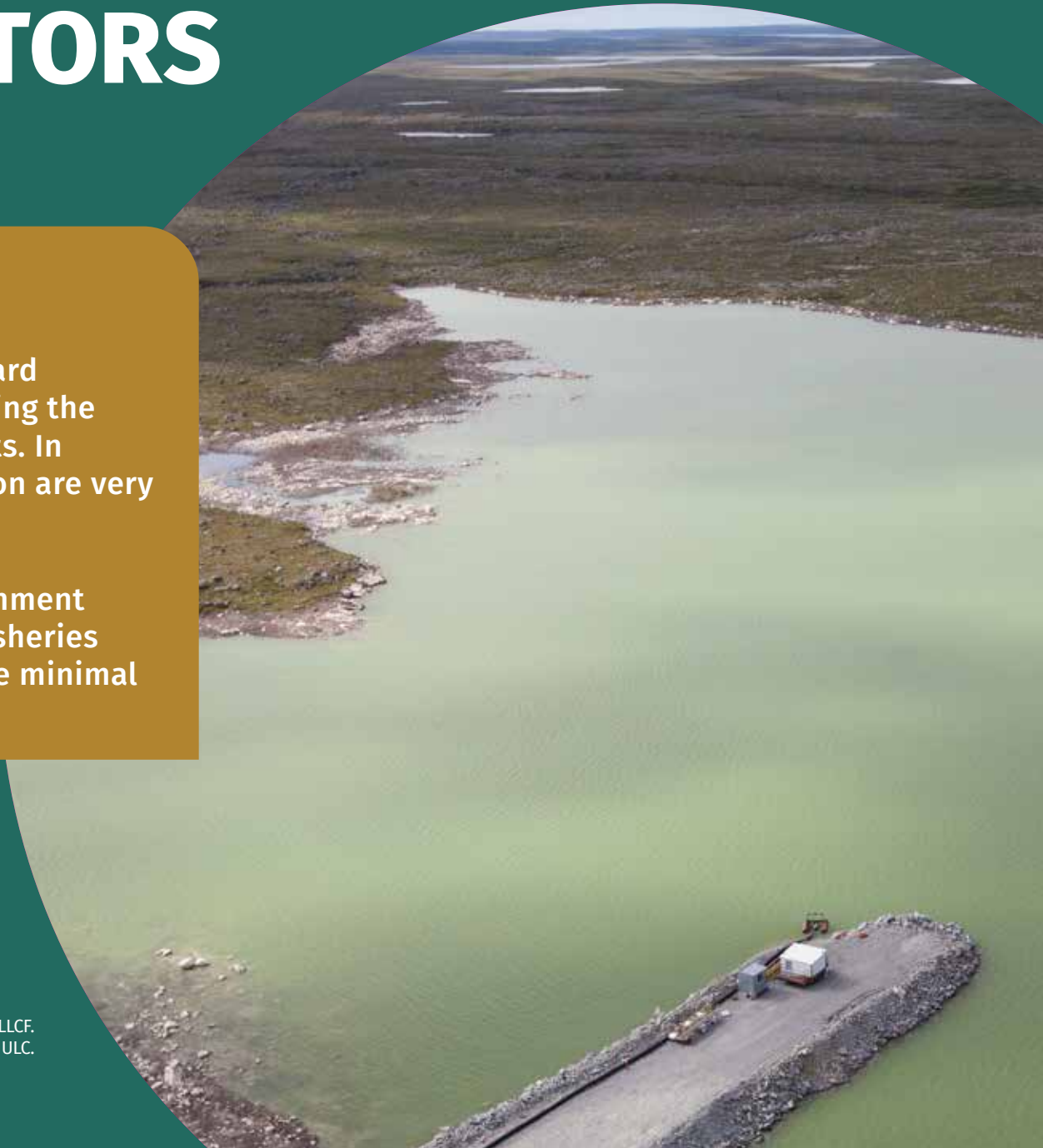


ASSESSMENT OF THE REGULATORS

HIGHLIGHTS

- 🐾 The Wek'eezhii Land and Water Board continues to do a good job regulating the Water Licence and Land Use Permits. In particular their Reasons for Decision are very informative;
- 🐾 The level of engagement by Environment and Climate Change Canada and Fisheries and Oceans Canada continues to be minimal and inconsistent.

Dyke C, looking toward Cell C of the LLCF.
Photo Courtesy of Dominion Diamond Mines, ULC.



IMPORTANT CONCEPTS IN THIS SECTION

(alphabetical order)

Environmental regulation

Environmental regulation is part of environmental management. It is the laws and other tools we use to protect public health and the environment: land, air, water, soil, etc. from damaging impacts of human development and industry.

Financial security

The amount of money needed to cover the total expected cost of closing and reclaiming a mine site. The Government holds the money in case the Company leaves without closing it. Portions of security can be returned for reclamation work completed while the mine is operating.

Holdback of security

The money the government keeps back, to make sure that they can pay for long-term monitoring and any other work needed once reclamation is done.

Reclamation

The process of returning areas of land and water—disturbed by mining operations—to workable, healthy ecosystems.

Regulators

Government agencies responsible for environmental regulation.

Return of security

The money the government pays back to the company, once they finish certain work related to reclamation.

The Independent Environmental Monitoring Agency is the public watchdog for environmental management at the Ekati mine. We monitor the performance of the mine operator and the agencies responsible to regulate activities at the Ekati mine. These regulatory agencies include:

- Department of Lands, GNWT
- Four divisions of the Department of Environment and Natural Resources, GNWT: Water Resources; Conservation, Assessment, and Monitoring; Wildlife; Environment
- Three federal government departments: Crown-Indigenous Relations and Northern Affairs, Fisheries and Oceans, Environment and Climate Change
- Wek'èezhìi Land and Water Board: created under the Tłıchǫ Agreement; the legal authority to manage decisions about land and water use within the area known as Wek'èezhìi

GENERAL OVERVIEW

During 2019-2020, the majority of regulators' time and expertise focused on issues related to:

- Waste rock and ore management
- Aquatic effects monitoring
- Misery waste rock storage area

The Agency identified some instances where regulators performed well and some instances where they can improve.

DEPARTMENT OF LANDS, GNWT

This department is responsible to inspect water licences and land use permits. This year they did three water licence inspections, compared to one a month in past years. They did six land use permit inspections, similar to past years.

The department had limited personnel available to inspect water licences, which may contribute to the lower number. With COVID-19 and Ekati in care and maintenance from late winter to early summer, we expect fewer inspections in 2020.

The inspectors' input at Agency board meetings was informative. They help us understand the activities needed to ensure Dominion complies with their water licence and land use permits.

DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES, GNWT

This department and the Lands Department need to work with the Wek'èezhìi Land and Water Board (WLWB) to develop policies, guidelines, and directives to standardize the process to define return of security and holdback of security. This is a big priority. The public needs to know that all costs for liabilities and monitoring are covered. The proponent needs to know the process and factors that affect financial security.

Water Resources Division

This division consistently provides detailed comments and analysis when needed. For example, they offered good input (through a consultant) at the three-year evaluation workshop regarding aquatic effects monitoring.

Conservation, Assessment and Monitoring Division

This division is responsible to ensure that Dominion follows the intent of the Environmental Agreement (EA). They have done a reasonable job, but could do more to enforce the reporting requirements. For example, the Agency raised concerns with the Annual Summary Report. These concerns were acknowledged but the document was not changed. The latest version of the Environmental Impact Report is now over a year late. We understand that Dominion is responsible to address comments and respect timelines, but we feel this division could be more forceful to ensure Dominion fulfills their responsibilities. Despite a lengthy delay, the updated EA has been finalized, signed, and distributed.

Wildlife Division

The Bathurst Caribou Range Plan was approved in August 2019. It will help provide some guidelines and recommendations for developers and regulators. The recommendations are non-binding, so we wait to see what effect this will have.

Environment Division

The NWT has no territorial air quality management regime. This is relevant to more than the Ekati mine. The Agency was hopeful in 2016 when the department proposed a draft framework with regulations, expecting it to be in place the next year. That did not happen and we are not aware of any further progress on this initiative.

CROWN-INDIGENOUS RELATIONS AND NORTHERN AFFAIRS CANADA

This federal department transferred their responsibilities to manage land and water to the GNWT when devolution happened in 2014. So their role is much smaller now. The Agency was pleased that they sent a representative to our Annual General Meeting this year. We hope they continue to participate into the future.

FISHERIES AND OCEANS CANADA

This federal department continues to have minimal involvement with the regulatory process. They provided some useful comments on the Aquatic Effects Monitoring Plan, but did not comment on the Fish Response Plan. They have valuable expertise locally and nationally that could benefit the Ekati regulatory process, but the way they interpret their mandate limits their ability to provide expertise regarding possible effects of the Ekati mine on fish in the downstream environment.

ENVIRONMENT AND CLIMATE CHANGE CANADA

This federal department continues to be involved in similar ways as in past years. They provided detailed comments on some but not all of the plans related to aquatic effects monitoring. The Agency notes that their comments are well thought out. We believe that the regulatory system would benefit from their involvement with all relevant submissions.

WEK'ÈEZHÌI LAND AND WATER BOARD (WLWB)



The WLWB continues to do a good job managing the water licence, land use permits, and management plans. In particular their 'Reasons for Decision' documents were helpful.

The Agency notes that in the past year the WLWB took a long time to do conformity checks before they release some documents to reviewers. We agree that conformity checks are needed, but we feel some of them could happen more quickly.

As noted above, the WLWB needs to work with the GNWT to develop policies, guidelines, and directives to standardize the process to define return of security and the holdback of security. This is a big priority. The public needs to know that all costs for liability and monitoring are covered. The proponent needs to know the process and factors that affect financial security.

ASSESSMENT OF DOMINION DIAMOND MINES ULC

HIGHLIGHTS

-  The Agency notes ongoing issues with Dominion being late when they submit reports and when they respond to Agency comments.
-  The Agency is disappointed in Dominion's lack of attention to some requirements under the environmental agreement, especially related to the plain language summary report and the environmental impact report.

Sable waste rock storage area.
Photo Courtesy of Dominion Diamond Mines ULC.



IMPORTANT CONCEPTS IN THIS SECTION

(alphabetical order)

Comply, compliance

Following the rules or an order.

Monitoring

Collecting and analyzing repeated observations and measurements to evaluate change and impacts of change. ‘Keeping an eye’ on things all the time.

Reclamation

The process of returning areas of land and water—disturbed by mining operations—to workable, healthy ecosystems.

GENERAL OVERVIEW

With minor exceptions, Dominion continues to operate the Ekati mine in compliance with its water and land use licences and permits.

Despite this, the Agency notes a worrying trend that hopefully can improve in the near future.

- Dominion’s overall responses to the Agency’s technical comments are disappointing, and lack detail and rationale to support their position. The Agency has noted this for the past few years.
- Dominion is often late submitting some reports. Some of their responses to Agency comments were delayed.

The Agency believes in resolving key issues through dialogue. For example, technical sessions or workshops facilitate open discussion of relevant topics. On a positive note, the Agency is encouraged that Dominion has started work on a Seepage Response Framework. We look forward to reviewing that in 2020.

ENVIRONMENTAL AGREEMENT

The Agency is disappointed by Dominion’s apparent lack of regard for some of the requirements under the Environmental Agreement (EA). Here are some examples.

Every year Dominion is supposed to submit a plain language summary report of monitoring results for that year. The Agency noted that the 2019 summary report does not include important results related to fish toxicity. We note that the health of fish is of particular interest to Indigenous and other northerners. The Agency

AGENCY ANNUAL SITE VISITS

In the last few years the Agency’s annual site visits have been unsatisfactory. Dominion has explained that this is mostly due to fewer flights in and out of the site. With several newer developments and the concerns about waste rock piles, the Agency sees site visits as critical to understanding ongoing mining activities.

The Agency and Dominion reached a compromise this year. We scheduled two one-day visits, one in July and one in August. The July visit went well and a number of directors attended. The August visit was cancelled.

The Agency believes that two separate one-day visits is a workable solution for future years. But we prefer a single two-day, overnight visit. This maximizes on-site time and minimizes travel time to and from the site.

INTERIM CLOSURE AND RECLAMATION PLAN VERSION 3.0

The Agency organized a community workshop about the latest closure and reclamation plan. The purpose was to have more discussion about wildlife movement around waste rock storage areas and roads after the mine closes.

The Agency discussed the workshop with Dominion. Due to a workshop they held at the same time, Dominion did not attend, but agreed to review and consider the outcomes. The Agency hopes that Dominion will attend future workshops and meetings that the Agency holds on these (and other) important topics.

DIRECTOR BIOGRAPHIES



JAIDA OHOKANNOAK | CHAIRPERSON

APPOINTED BY KITIKMEOT INUIT ASSOCIATION IN 2003

For over 20 years, Jaida Ohokannoak has lived and worked in small northern communities. She currently resides in Yellowknife. Jaida has significant experience, knowledge and expertise in environmental assessment, research, monitoring and renewable resource management. She believes mining can be conducted in an environmentally responsible manner to the benefit of both industry and local peoples without long-term adverse impacts to the environment.



JESSE JASPER

APPOINTED JOINTLY BY GOVERNMENTS OF CANADA AND THE NWT, AND DOMINION DIAMOND IN 2016

Jesse Jasper retired in 2011 after 39 years of service. Since 1971 he has worked exclusively in northern Canada, focusing on land and water resource development, water monitoring studies to evaluate impacts on development. He coordinated a number of reviews and technical presentations for environmental impact assessments, including NWT Diamond Project, which is now the Ekati Diamond Mine. Jesse represented INAC and EC on a number of boards, including the Mackenzie River Basin Board, the NWT Water Board, and the Mackenzie Gas Project.



EMERY PAQUIN | VICE CHAIRPERSON

APPOINTED JOINTLY BY THE GOVERNMENTS OF CANADA AND THE NWT, AND DOMINION DIAMOND IN 2015

Emery Paquin is an independent environmental consultant living in Yellowknife. He has more than 35 years of environmental management experience with the northern mining industry and territorial government, and served six years as a Member on the Inuvialuit Water Board.



TIM BYERS

APPOINTED BY AKAITCHO TREATY 8 FIRST NATIONS (YKDFN AND LKDFN) IN MAY 2001

Tim Byers is an independent consultant living in Manitoba. He has been working on projects in the Canadian Arctic since 1980. He specializes in studies of fish, Arctic seabirds and marine invertebrates and has assisted Aboriginal communities in documenting their indigenous environmental knowledge. He would like to see more Aboriginal youth engaged in environmental sciences and Traditional Knowledge used more effectively in environmental monitoring, research and impact assessments.



KIM POOLE | SECRETARY/TREASURER

APPOINTED BY THE TĪĪCHQ GOVERNMENT IN 2015

Kim Poole first served as an Agency Director from 2006 – 2015 (jointly appointed by the Governments of Canada and NWT and BHP Billiton), but was reappointed by the TĪĪCHQ Government in 2015. Kim is an independent wildlife biologist with over 35 years of experience in the Northwest Territories, Nunavut and British Columbia in the areas of wildlife and wildlife habitat research, and assessment and mitigation of environmental impacts related to the mining, forestry, and tourism industries.



RONALD ALLEN

APPOINTED JOINTLY BY GOVERNMENTS OF CANADA AND THE NWT, AND DOMINION DIAMOND IN 2017

Ron Allen has been living and working in a variety of Arctic communities since the 1970s and has worked with community groups and organizations on local cultural values, concerns and aspirations related to renewable resources. Ron moved to the Northwest Territories as a Renewable Resources Officer and transferred to Fisheries and Oceans Canada in the 1980s where he worked as a Fishery Officer and Habitat Inspector. Later, he worked as Area Manager and Area Director, delivering and managing multiple-sector operational programs including Habitat Assessment, Fisheries Management, Conservation and Protection, Science, and Administrative Services.



BILL SLATER

APPOINTED BY THE NORTH SLAVE MÉTIS ALLIANCE IN 2018

Bill Slater is an independent environmental consultant with an engineering education. He is based in Whitehorse, where he has lived and worked for over 25 years. Most of his work is for First Nation governments, as a technical advisor on mining and mine closure projects. His technical focus areas include environmental effects assessment, mine closure, water quality and water management.



2019-2020 **ANNUAL REPORT**

A PUBLIC WATCHDOG FOR ENVIRONMENTAL
MANAGEMENT AT THE EKATI DIAMOND MINE

PLAIN LANGUAGE

INDEPENDENT ENVIRONMENTAL
MONITORING AGENCY



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