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DISTRIBUTION LIST

12 June 2014

Subject: 2013 Environmental Agreement Annual Report for the Diavik Diamond Mine

Attached please find for review the Diavik Diamond Mines Inc. (DDMI) Environmental Agreement Annual Report (EAAR) for 2013. This document is intended to meet the commitments outlined in Section 12.1(c) of the Environmental Agreement.

On 28 March 2014, DDMI received a letter from Aboriginal Affairs and Northern Development Canada (AANDC) indicating that the content of the revised 2012 EAAR was satisfactory; however, the AANDC Minister also requested that DDMI respond to the outstanding issues raised by the Parties during the review. The attached table identifies comments received by the Parties and indicates the relevant section of the 2013 EAAR report in which a response is provided.

Please contact the undersigned should you have any questions or wish to discuss the report.

Yours sincerely,

Gord Macdonald
Principal Advisor, Sustainable Development

Attach.

cc: Brenda McDonald, EMAB
Laurie McGregor, GNWT

Table 1: Summary of DDMI Response to Reviewer Comments from 2012 EAAR

Comment	**Party**	**Response Location**	**Additional Information**
Use of figures, charts & tables would be beneficial	YKDFN & EMAB	Throughout	Additional figures, tables & charts have been added to most sections
Include an additional reference section at the end of the document for readers to easily find more information, organized by category	NSMA	pg. 57	Titled, "References for Further Information"
Ensure that maps, labeled images, and graphs are adequately readable	NSMA	Throughout	Image and font size for images have been increased
This report be a stand-alone report that includes results summary, rather than just referencing other documents	YKDFN	Section 4	More comprehensive program summaries have been added, though references to other reports are still included
Is any dust monitoring done further than 2000 meters from the mine site	LKDFN	pg. 22 & 23	The lichen monitoring program samples for dust on vegetation at distances of up to 40 km away from the mine site
What is meant by natural or background dust deposition	LKDFN	-	Natural dust deposition can occur due to erosion by wind and water, e.g. from an esker
How often are SNP stations checked for technical issues, have there been any issues with samples taken, have any equipment issues occurred or been resolved	LKDFN	pg. 36 & 37	Previously included in the "Summary of Operational Activities" section of past reports
Community concerns that aerial surveys impact the migration routes of the caribou and disturb them	LKDFN	pg. 24	Suspended during 2013 in response to community concerns
Move away from simply determining the ZOI and move in the direction identifying *why* the ZOI exists	LKDFN	pg. 24 & 25	Results from behavioural observations & explanation of new approach to analysis of caribou data
Interested in reasons for wolverine presence or lack of presence.	LKDFN	pg. 29	DDMI monitors wolverine presence and summarizes possible reasons for observations in any given year
Interested in effects on wolverine population and predictions as to what it might mean if a top predator in the food chain is declining in abundance.	LKDFN	-	Mine monitoring focuses on impacts from mining in the local study area; the GNWT is responsible for managing and monitoring wildlife populations

DISTRIBUTION LIST

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2013 Environmental Agreement Annual Report

Diavik Diamond Mines Inc.

Document #: ENVI-388-0514 R0

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Rio Tinto
Dominion Diamond Corporation
Diavik Diamond Mine

Table of Contents

A Message from Diavik's President

It is my pleasure to introduce to you the latest version of Diavik's Environmental Agreement Report that summarizes the monitoring and management activities that happened at the mine during 2013.

The following pages highlight Diavik's vision of creating a legacy of responsible environmental practice for long-term community benefit. Diavik is dedicated to controlling environmental risks for our people and communities. To support Diavik's objective of continually trying to reduce the environmental footprint of our mine, we have started some new initiatives that will build on the success of our wind turbine installation and further help to reduce our energy footprint for 2013 and beyond.

Another important goal for Diavik is to incorporate both scientific and Traditional Knowledge (TK) into our environmental monitoring and planning processes. I am very proud of the cooperative efforts taken by the Environmental Monitoring Advisory Board in transitioning the administration of the Traditional Knowledge (TK) Panel to Diavik during 2013. The direct relationship between Diavik staff and TK Panel members and facilitators has allowed for an increased understanding of closure plans, priorities and considerations of all parties. The TK Panel continues to work hard to come up with ideas on how TK can influence and be incorporated into various aspects of mine closure planning, such as reclamation of the Processed Kimberlite Containment area. Diavik also arranged for a TK research program that focused on assessing the type of landscapes caribou prefer for forage, use and migration, and to assess lichen conditions at various sample sites to see how dust from the mine potentially affect caribou use of the area.

This report is a summary of many other reports and plans that Diavik provides to regulators and communities and, as such, may not answer all of your questions. We are committed to providing information in an open and honest manner and have therefore provided a list of reports that contain additional information. I look forward to continuing to work with our community partners to operate and close the Diavik mine responsibly, leaving behind a positive community and environmental legacy.

Marc Cameron

Executive Summary

The Diavik diamond mine is located on the East Island of Lac de Gras, in Canada's Northwest Territories, approximately 300 kilometers northeast of the capital city of Yellowknife. There are a lot of different types of wildlife in the area. The environment is considered pristine and sacred for the communities who have used this area in the past, which is why Diavik carried out a comprehensive Environmental Assessment before beginning mining.

Diavik signed an Environmental Agreement ("the Agreement" or EA) with 5 Aboriginal organizations and the federal and territorial governments in 2000. The Agreement says what Diavik is to do to protect the environment while operating the mine. There was also an Advisory Board formed as part of the Agreement; the Board is a public watchdog of the regulatory process and the implementation of the EA. The Diavik diamond mine was in its eleventh year of operations during 2013, and all mining was done underground this year.

This report summarizes the results of Diavik's environmental monitoring and management programs during 2013. Copies of the reports listed can be found on-line in the EMAB library (http://www.emab.ca/Library.aspx) or Wek'èezhìi Land and Water Board public registry (http://www.mvlwb.ca/Boards/WLWB/SitePages/search.aspx?app=W2007L2-0003).

Environmental Monitoring and Management

Many companies, including Diavik, have an Environmental Management System (EMS) that provides a structure to identify, control, measure and improve the environmental performance of day-to-day operations at the mine. Diavik's EMS is checked against the ISO14001 criteria each year by people who work for a company specializing in this. Diavik passed the review in 2013 and maintained our EMS certification. The EMS includes procedures for operational controls, environmental monitoring, communication plans and the recording of information.

The EA says that Diavik's environmental plans and programs are to be 'adaptable', or able to change in response to results. A company that conducts adaptive management would consider possible changes to decrease proven impacts, as necessary.

Diavik's management plans and monitoring programs follow the EMS improvement cycle, where changes have been made based on the results received. Examples include: installation of equipment and buildings that reduce and monitor emissions, building on lessons learned from past re-vegetation research and several changes to the lake-wide water sampling program.

Re-vegetation

It takes a long time for grasses and plants to grow in the sub-arctic. For this reason, Diavik started doing research in 2004 that looks at the best types of native plants, soil and additives that could be used for plant growth at the mine site after closure. Diavik also wanted to research how best to grow native plants and if surface features such as boulders affect plant development.

The next phase of this research starts in 2013, and will continue through to 2016 with the goals of determining: how best to grow plants from seed, how effective different planting methods are on plant growth and the type of conditions that improve plant growth over time. Efforts to incorporate Traditional Knowledge (TK) into this work will also be undertaken. The research will look at how effective it is to use different planting techniques in patches around the mine site at closure, as this is something that has worked well for other large sites. This work will also include more monitoring of the research plots from 2004, to see how well they are doing over time.

Monitoring Program Activities

Caribou

Various methods are used to monitor caribou and the results of these programs are summarized below.

- Zone of Influence (ZOI—the size of area where caribou avoid the mine): no ZOI monitoring was conducted in 2013, based on feedback from communities and because they do not provide direct feedback on operation and management of the mine.
- Movement patterns predicted in the Environmental Assessment have shown to be correct—to the west of Diavik in spring and to the east in fall – but caribou were slower to move south in 2013, compared with past years.
- A total of 90 behavioural scans (watching caribou to study their reaction to mining or other activities) were done in 2013, and community members helped out.
- There were no caribou deaths due to mining activities in 2013. One dead caribou that appeared to have been killed by a wolf was found on the northwest side of the mine site.

Wolverine, Grizzly Bear and Falcons

- Wolverine snow track surveys were done in 2013 with the help of a community assistant. A total of 26 tracks were spotted over 150 km surveyed.
- The wolverine DNA study is only conducted in certain years and was not done in 2013; the next sampling session for this program is planned for spring 2014.
- No wolverine mortalities occurred in 2013.
- The second year of the grizzly bear DNA sampling program was done in cooperation with the EKATI mine during 2013. The number of posts with grizzly bear hair was between 46% to 57%.
- There were 67incidental sightings of grizzly bear around the mine area in 2013 and one 2.5 year old female was relocated with assistance from the GNWT.
- In 2013 there were 4 peregrine falcon nests found on the mine site.
- The remains of 2 dead peregrine falcons were found on site; one was thought to have been electrocuted, the other was unknown.

Vegetation, Dust and Air Quality

Snow samples are taken every spring and they are melted to test for water quality and the amount of dust. Dust particles are also captured in collectors and checked to see if there are patterns in the amount and location of dust from the mine.

- Dust and snow samples were taken and tested in 2013.
- A new Air Quality Monitoring Program was started in 2013, including the installation of new sampling equipment.
- The Permanent Vegetation Plots (PVP's) were sampled again in 2013.
- The lichen sampling program was done again in 2013, with continued efforts to incorporate TK into the program.
- In 2013, the amount of greenhouse gasses generated from fuel use equalled 192,544 tonnes of carbon dioxide (CO_2*e*), and the wind turbines reduced emissions by 10,726 tonnes CO.*e*.

Water

Diavik continued to do the Aquatic Effects Monitoring Program (AEMP) in 2013. The AEMP studies different parts of the lake in different years in order to identify possible effects to Lac de Gras from mining activities. The following parts of the lake were monitored in 2013:

- Water chemistry (quality);
- Sediment (lake bottom) chemistry (quality);
- Plankton (tiny plants and animals in the water - amount and type); and,
- Benthic invertebrates (small bugs that live on the lake bottom - amount and type).

Changes to the lake are mostly caused by an increase in nutrients from the groundwater and blasting. Diavik tries to reduce the amount of nutrients that reach Lac de Gras by using blasting controls, careful selection of blasting materials as well as water management and treatment.

Fish

Slimy Sculpin (small fish that live in Lac de Gras) were sampled during the summer of 2013. The condition of the fish were observed and compared between the exposure (near mine) and reference areas.

Community Engagement

Diavik values opportunities to share updates on environmental monitoring and closure planning progress with community members. Diavik works with each PA organization to try and determine a suitable method and time to carry out such events. Community meetings, open houses and school visits are some of the methods used to achieve this over the years. The following table summarizes engagements that Diavik conducted in partnership with the Participation Agreement (PA) organizations during 2013.

Diavik also tries to bring community members to the mine site so that they can see the mine and observe the surrounding environment with their own eyes. While it is impossible to bring everyone to site, the hope is that those who have been involved share their experience with others back home in the community. Diavik organizes TK Panel and working group meetings with community members and leadership in order to involve communities in closure planning and Traditional Knowledge programs.

Table A: Community Engagements During 2013

Community Updates/ Implementation Meetings	YKDFN, 28 November & 10 June; 25 March (mine site)	Tłı̨chǫ, 27 February & 4 April	LKDFN, 24 February (mine site); 1 March, 14 June	KIA, 9 September	NSMA, 28 October (mine site)
TK Meetings	Yellowknife, 1-4 February	Yellowknife (TK Panel), 24-28 February	Mine Site (Tłı̨chǫ Research Institute), 12-17 August	Mine Site (TK Panel), 24-28 October	
Closure Meetings	Tłı̨chǫ (Kwe Beh), 27 August	LKDFN, 11 December	KIA, 28 January	YKDFN, 28 November	
Environment Programs	Seasonal Community Staff: Charles Mantla, Melissa Catholique (April to September)		Community Assistants: Joseph Judas, Albert Boucher, Harry Apples - 12 to 17 August (Lichen); Earl Evans, Joy & Joel Dragon – 15-20 Sept (Caribou); Jimmy Nitsiza James Lafferty, Benjamin Pea'a – 18-24 Sept (Caribou)		

New Technologies & Energy Efficiency

It has been just over 1 year since 4 wind turbines were installed on the west side of the Diavik mine site. The turbines started running on 28 September 2012. In 2013, a total of 3.8 million litres (1 million gallons) of fuel was saved. The turbines have flashing lights to help deter wildlife and bird mortality studies completed in 2013 found that no birds were killed by the turbines.

Two new incinerators began operating at the mine site in October 2012. Testing of the emissions that are produced when the garbage is burned was done over a 10 day period by an external lab. The lab results have yet to be interpreted and no further testing has been planned.

Diavik started an energy management strategy in 2013, in an effort to reduce fuel use and emissions. A waste oil burner was installed at the mine site and approved for use by the GNWT in March 2014. Some of the other programs include:

- Reduce processing times in the plant that separates the diamonds from the rock;
- Determining which buildings do not require heat and light during winter months;
- Reduce temperature set point of underground mine air heaters;
- Improving heat recovery from generators; and,
- Vehicle idling policy to reduce the number of hours trucks run in cold temperatures.

Compliance and EMAB

The Inspector for Diavik's water license and land leases works for Aboriginal Affairs and Northern Development Canada (AANDC) in Yellowknife. During 2013, the Inspector visited the mine site 9 times and no environmental risks were noted by the Inspector. The environmental management plans that are required under the water license were reviewed and, where necessary, updated. Copies of Diavik's monitoring and management programs, and any related correspondence, can be found on-line in the EMAB library or Wek'èezhìi Land and Water Board public registry.

There were no direct communications or letters expressing concerns from the public about the mine or its operations during 2013. After receiving feedback on a revised approach to the Environmental Agreement Annual Report (EAAR) from reviewers, the Minister of AANDC deemed the original 2012 report to be unsatisfactory on 19 December 2013. DDMI was then required to submit a revised version of the 2012 report, which the AANDC Minister confirmed to be satisfactory on 28 March 2014. The AANDC Minister also requested that Diavik respond to the outstanding issues raised by the Parties during the review of the 2012 Annual Report. The 2013 EAAR includes such responses in the appropriate sections of the report.

The Environmental Monitoring Advisory Board (EMAB) and Diavik exchanged letters relating to topics such as the budget, administration of the Traditional Knowledge (TK) Panel, reviews of various environmental monitoring programs and changes to the EAAR. EMAB established a TK Panel in the fall of 2011 and during the summer of 2013, the Board supported transferring the administration of the Panel to DDMI. The TK Panel's primary focus is the consideration and incorporation of Traditional Knowledge into mine closure planning. The first meeting of the TK Panel with Diavik occurred at the mine site in October 2013 to discuss reclamation of the Processed Kimberlite Containment area.

Summary

Diavik is celebrating 11 years of operations and is proud of the many positive accomplishments that have been a part of the development of this mine. Relating to the environment, the biggest successes during 2013 included:

- Successful operation of 4 wind turbines that reduced fuel use by 3.8 million litres
- Monitoring program improvements for air quality in consultation with Parties to the EA
- Closure planning recommendations founded in Traditional Knowledge through the direct administration of the TK Panel
- Effective environmental management practices leading to a reduction in the closure security deposit
- Continued good performance in meeting water license criteria and minimizing our environmental impacts

Thank you/Marsi Cho/Masi Cho/Quana to the Kitikmeot Inuit Association, Tlicho Government, Yellowknives Dene First Nation, Lutsel K'e Dene First Nation and the North Slave Metis Alliance for the efforts of their staff, businesses and individual members who worked with Diavik staff in 2013.

K’àadè Gıgǫndı Nek’ǫ̀ą

Diavik diamond sǫǫ̀mbak’è k’àmbatsǫ̀ǫ̀ ts’ǫhk’e Ek’atì k’e goʔǫ̀, Canada k’ezhì Edzanèk’e k’e, Sǫǫ̀mbak’è ts’ǫ 300 km goʔǫ̀. Akǫ nèk’e tıch’àadìı kaʔa łǫ gohłı̨. Akǫ nèk’e ndè sìı nezı̨ hǫt’e eyıts’ǫ ı̨neè whàà gots’ǫ kǫ̀ta yagola gıt’àt’ı̨ xè sìı gıgha sìı wet’aʔà hǫt’e, eyıt’à Dıavık sǫǫ̀mbak’è wexè hoı̨wo kwe ndè wegondı hazhǫ deghà nàgehtsı̨.

Dıavık dìı ndè wexòedı nàowo k’e dı̨zì dek’enegı̨ʔǫ (“ełèk’èa gıwǫ nàowo” hanìle dè EA) 2000 k’e sı̨laı kǫ̀ xè nàowo gehtsı̨ eyıts’ǫ Federal eyıts’ǫ Edzanèk’e ts’ǫ government sìı gıxè. Dìı nàowo yìı edànì Dıavık sǫǫ̀mbak’è k’e eghàlagìde nııts’ǫ̀ dìı hanì ndè xòegıhdı gha nàowo gııtǫ̀. Eyıxè sìı, dǫne dageèke gha sìı gehkw’e ı̨lè; dìı dǫne dehkw’e sìı edànì eghàlagìde xogıhdı gha hǫt’e eyıts’ǫ edànì ndè wexòedı gha sìı wexòegıhdı. Dıavık dıamond sǫǫ̀mbak’è dìı xo 2013 k’e, hot’a 11 xo ajà, eyıts’ǫ hazhǫ ndè gotł’a zǫ eghàlagı̨̀nda.

Dìı nı̨htł’è hòlı̨ sìı, yatıı nek’ǫ̀ą t’à hòlı̨, edànì Dıavık ndè wexòegıhdı gha nàowo gııtǫ sìı weghà eghàlagìde eyıts’ǫ edànì 2013 xo k’e eghàlagı̨̀nda wegondı hǫt’e. Dìı wegondı jǫ satsǫ̀ wet’à ets’eètł’è yìı sìı dek’ehtł’è, EMAB nı̨htł’è gehła akǫ wek’ahta (http:www.emab.ca/Lıbrary.aspx) hanìle dè Wek’èezhìı Ndè eyıts’ǫ Tı Xòegıhdı gha Dehkw’edǫ akǫ wek’ahta ha dìle (http://www.mvlwb.ca/Borads/WLWB/SıtePages/search.aspx?app=W2007L12-003).

Ndè Xòedı eyıts’ǫ La Wexòedı

Dìı hanı la gohłı̨ sìı Dıavık lanı, ajǫneh hazhǫ dìı edànì la wexòedı nàowo gııtǫ gohłı̨ hǫt’e, wet’à edànì asìı la wegondı nàgehtsı̨ xè wek’egeèzhǫ, wexòegıhdı, wexègıhdzà eyıts’ǫ deèʔǫ̀ nezı̨ agele ha dzę tąt’e dìı nàowo wexògıhdı. Dıavık gıts’ǫ EMS xo tąt’e wek’agehta gıts’ǫ ISO14001 weghàa dǫne dìı hanı la deghàa gık’ezhǫ wek’e eghàlagìde. 2013 xo k’e Dıavık la weghǫ̀geèda hò, asìı hazhǫ esanı̨le gedı ı̨lè eyıts’ǫ EMS hazhǫ esanı̨le gedı t’à wegha nı̨htł’è gǫǫ̀chı. Dìı EMS sìı edànì asìı k’ets’ehndı gha hǫt’e, ndè wexòedı nàowo gha, edànì ełexè gots’ende nàowo eyıts’ǫ edànì gondì ts’ıhchı dek’enèts’ètł’è gha hǫt’e.

Dìı Ndè Wexòedı Nàowo dìı hanì dek’etł’è, Dıavık ndè xòedı nı̨htł’è eyıts’ǫ edànì la wek’e eghàlagìde nı̨htł’è sìı, ‘ładı̨ adle gha dìle’, hanìle dè ładı̨ adle ha gedı nı̨dè hagele ha. Dìı hanì la eghàlagìde asìı ładı̨ agehʔı̨ dè wet’à asìı mǫhdaà deèʔǫ̀ ade haàle gha agehʔı̨ ne t’à wet’aʔà.

Dıavık edànì la wexògıhdı nı̨htł’è eyıts’ǫ ndè wexòedı la wheʔǫ sìı, EMS weghàa asìı deèʔǫ̀ nezı̨ ade ha agehʔı̨, edànì asìı wek’egezhǫ ghàa la mǫhdaà ładı̨ anàgehʔı̨. Akìhò: wet’à eghàlats’eda goht’ǫ edek’ıìzhe eyıts’ǫ kǫ̀ mǫhdaà sìı tłe sìı t’aget’ı̨le gha eyıts’ǫ ı̨dı edànì asìı ładı̨ agı̨la sìı wexòegıhdı ghàa nàowo ładı̨ anàgehʔı̨, tł’oh nàeshe lanì ts’ǫ eyıts’ǫ tı whehtǫ ts’ǫ tı gıhchı la sìı ładı̨ agı̨̀la.

Tł’oh-Nàeshee

Edzanèk’e tł’oh eyıts’ǫ ıt’ǫ̀a ıwhą nàesheele. Dìı hanì ts’ıɂǫ̀, Dıavık 2004 xo k’e dìı gondı wedaǹageta wexè hoıwo, tł’oh edàwhıt’ı t’a nezı dehshee ha hǫnı, ndè edàwhıt’ı eyıts’ǫ sǫǹmbak’è wedaàtǫ tł’axǫǫ̀ dè tł’oh ayìı weta agı̨̀la dè wet’à nezı dehshee ha hǫnı gedı t’à wedanàgeta. Dıavık sìı, tł’oh edàwhıt’ı akǫ nèk’e ne sìı nezı dehshee ha hǫnı gedı wedaǹgeta eyıts’ǫ ahsı̨̀ kwe nechà akǫ tł’oh wemǫ whela dè wet’à nezı dehshee haàle nìı sìı gedı t’à wedanàgeta.

La goda wheɂǫ sìı dìı xo k’e 2013 k’e wexè hòewı ha, 2016 ts’ǫ̀ weghàlats’eda ha, dìı hanì la ts’ehtsı ha: edànì asìı dehshee wets’ǫ jìa ts’ǫ dehshee, edànì asìı ładı ts’ehshee wet’à ładı dehshee ha dìle nìı eyıts’ǫ edląwa tł’axǫǫ̀ dè ahsı̨̀ tł’oh ładı dehshee ha nìı hazhǫ wek’ahoeta ha. Eyıts’ǫ dǫne nàowo sìı k’è dìı la weta agele ha. La wedaàtǫ tł’axǫǫ̀ dè sǫǹmbak’è wemǫ edànì ndè k’e tł’oh dehshee hazǫ wedanàgeta ha, dìı wet’à dìı ndè wemǫ nezı ndè dehshee net’à wegehdza ha. Eyıxè, 2004 adı ndè wexòedı ılè sìı dìı haıwa nehòwo sìı gha wek’agehta.

Asìı Wexòedı K’e Eghàlagìde

Ekwǫ̀

Asìı ładı t’à ekwǫ̀ wexòegıhdı wegondı gohłı eyıts’ǫ eyìı wegondı jǫ ızhı dek’ehtł’è.

- Adı ekwǫ̀ at’ıle (ZOI—adı ekwǫ̀ at’ıle): 2013 xo k’e adı ekwǫ̀ at’ıle gha wek’ahòetǫle, kǫ̀ta dǫne edàgedı ghàa eyıts’ǫ dzę tąt’e sǫǹmbak’è edànì eghàlats’ìde weghǫ gots’ǫ̀ gogedele eyıts’ǫ edànì sǫǹmbak’è edànì weghàlats’eda ha gogedıle ts’ı̨̀ɂǫ̀ weghǫ esagogedıle.
- Edànì ekwǫ̀ k’eɂa ha ts’edı t’à ndè wexòedı nıhtł’è weyìı dek’enèts’ı̨̀tł’è ılè sìı, ehkw’ı ats’edı nǫ - tǫdòa ekò Dıavık ts’ǫ dąąnıhts’ıı ts’ǫhk’e eyıts’ǫ xat’ǫ̀ k’àmbatsǫǫ̀ ts’ǫhk’e – hanìkò 2013 xo k’e ınèe lanìle ekwǫ̀ ts’ehwhı̨̀ą k’eɂà ılè.
- 90 ts’ǫ̀ ekwǫ̀ edànì sǫǹmbak’è eghàlats’ìde t’à edànì k’ehòeɂa gha wek’ats’ehtǫ (sǫǹmbak’è eghàlagìde t’à edànì ekwǫ̀ k’ehòeɂa wedanàts’eta) 2013 xo k’e wek’e eghàlats’ı̨̀nda eyıts’ǫ kǫ̀ta gots’ǫ dǫne gots’àgı̨̀ndì.
- 2013 xo k’e sǫǹmbak’è wek’e eghàlats’ìde k’eha ekwǫ̀ wı̨̀ızı łaıwole. Sǫǹmbak’è ts’ǫhk’e chık’è nıhts’ıı ts’ǫhk’e ekwǫ̀ ıłè łaı̨̀wo wets’aɂı, eyìı t’a nǫdı t’a ekwǫ̀ łaı̨̀who.

Nǫ̀gha, Sahcho eyıts’ǫ Tatsea

- 2013 xok’e kǫ̀ta ts’ǫ dǫne gots’àgedı t’à, zha k’e nǫ̀gha kè gha wegondı nàts’ehtsı. 150 km k’e 26 nǫ̀gha kè wegondı nàts’ehtsı.
- Nǫ̀gha edàwhıt’ı wek’ejǫ gha wets’ǫ DNA sıyąwa dè zǫ wegondı nàts’ehtsı, eyıt’à tǫdoa 2014 k’e dè zǫ achı wegondı nàts’ehtsı ha;
- 2013 xo k’e nǫ̀gha wı̨̀ızı esajale.
- Dìı nàke xo ts’ǫ Ek’atì sǫǹmbak’è wexè dìı xo 2013 gha sahcho wegondı nàts’ehtsı. Dechı hazhǫ nàı̨̀ɂa ts’ǫ 46%- 57% ts’ǫ̀ weghàà nàts’ehtsı.
- 2013 xo k’e sǫǹmbak’è wemǫ 67 sahcho gìaɂı eyıts’ǫ ıłè 2.5 weghoo sahchots’è sǫǹmbak’è gà nıìge t’à asìıch’àeɂǫdǫ gots’àgı̨̀ndı t’à achı ahsı̨̀ ts’ǫ̀ nàgehchì.
- 2013 xo k’e tatsea 4 sǫǹmbak’è ndè k’e wet’o wegogıhɂǫ.
- Tatsea nàke ełaı̨̀dè wegogıhɂǫ; ıłè t’a k’ak’ǫtł’ì t’à ełaıwo, ıłę, edàjà wek’egezhǫle.

Asìı Yàeshee, Ehtł'è eyıts'ǫ Nı̨hts'ıı

Tǫdòa ekìyeh tąt'e zha wek'ahòeta gha nàts'ehtsı̨ eyıts'ǫ tı wek'ahòeta gha zha nats'ehxı̨ eyıts'ǫ ehtł'è edàtlǫ sìı gha wek'ahòeta. Ehtł'è nàts'ehtsı̨ sìı gha tǫą yìı nàtsı̨ eyıts'ǫ ahsı̨ ehtł'è edàtłǫ ıchı sìı wegondı gohłı̨lıì eyıts'ǫ sǫǫ̀mbak'è wemǫ edànì ehtł'è wek'eweèts'ıı gha wegondı nàtsı̨.

- 2013 xo k'e ehtł'è eyıts'ǫ zha wegondı gha wek'agehtǫ.
- 2013 xo k'e nı̨hts'ıı wek'ahòeta gha asìı wegoò wek'e eghàlagı̨nda, eyıxè wet'à wegondı nàtsı ha satsǫ̀ wegoò edeyìgı̨wa.
- 2013 xo k'e adı̨ tł'oh nàgehshee k'è achı̨ wek'agehtǫ.
- 2013 xo k'e adzı̨ı̨ achı̨ wek'ahòetǫ, eyıxè dǫne wenàowo sìı dìı la weta wheʔǫ agele ha gehdzà.
- 2013 xok'e, tłehloò edàtłǫ gehtsı̨ sìı, dìı hatłǫ hǫt'e 192,544 tonnes of carbon dioxide (CO_2*e*), eyıts'ǫ wet'à nı̨hts'ıı ehtsı̨ dìı hatłǫ tłehloo ı̨zhì ajà 10,726 tonnes CO.*e*.

Tı

2013 xo k'e, Dıavık ı̨ła dìı la wek'e eghàlagìde, asìı hazhǫ tè nàdè wexıìdı ch'àa wexòedı gha wegondı nàgehtsı̨ (AEMP). Dìı AEMP edlatłǫ xo ts'ǫ̀ tı hazhǫ ładı̨ ts'ǫ̀ wek'agehtǫ, ahsı̨ sǫǫ̀mbak'è wets'ı̨ʔǫ̀ ek'atì wexìıdı nìı gedı t'à wek'agehta. 2013 xo k'e, dìı asìı hatłǫ wek'agehtǫ:

- Tı edànaehtso (nezı̨ nìı);
- Ehtł'ètì (tè gotł'à ts'ǫ̀ ehtł'è) edànì łeta ełexè gohłı̨ (nezı̨ nìı);
- Tè asìı nàdè (tł'oh nechàlea eyıts'ǫ tıch'àadìı tè nàdè – edàtłǫ eyıts'ǫ edàwhìt'ı̨); eyıts'ǫ,
- Tehtsàtsòa tè gotł'à nàdè (tehtsà nechàlea tè gotł'à nàdè – edàtłǫ eyıts'ǫ edàwhìt'ı̨).

Tè gotł'a tı ndè gotł'a k'etł'ò ghà eyıts'ǫ kwe nàgehk'e wets'ı̨ʔǫ̀, tè asìı łǫ at'ı̨. Hadech'à Dıavık ek'atì wegà goı̨walea kwe nàgehk'eale gha gehdza, adı̨ kwe nàgehk'e gha wexòegıhdı eyıxè tı wexòegıhdı eyıts'ǫ edànì senàdle ha.

Łıwe

Łıwetsòa (Ek'atì yìı łıwetsòa nàdè) 2013 Łık'è wek'agehtǫ. Łıwe edànì wegaht'ı̨ weghàgı̨nda eyıts'ǫ edànì ełexèt'e nìı gha (sǫǫ̀mbak'è gà goı̨walea) eyıts'ǫ adı̨ hanı gohłı̨ gha wek'agehtǫ.

Kǫ̀ta Xè Łegehdì

Edànì ndè wexòedı wegondı nàgehtsı̨ sìı eyıts'ǫ edànì sǫǫ̀mbak'è wedaàtǫ tł'axǫ̀ dè edànì Dıavık sǫǫ̀mbak'è senàgogele ha wegondı t'à dǫne xè gogedo gıgha sìı wet'aʔà hǫt'e. Dıavık kǫ̀ta tąt'e goxè nàowo gıìtǫ sìı eyìı gıxè edànì ayìı denahk'e nezı̨ la wek'e eghàlagìde lìı gı̨wǫ t'à dǫne xè eghàlagìde. Į̀dı edlatłǫ xo gots'ǫ edànì kǫ̀ta dǫne xè łegehdì, gını̨htł'èkǫ̀ dǫne t'ala gha enèxaı̨tǫ eyıts'ǫ nı̨htł'èkǫ̀ ts'ǫ̀gıìdè t'à dǫne xè gogèado. 2013 xo k'e, dǫne edàtłǫ goxè łegeadì wegondı jǫ nı̨htk'è wek'e dek'etł'è.

Dıavık dǫne sǫǫ̀mbak'è edànì la k'e eghàlagìde goghàgeda gha akǫ dǫne nàgede agogehʔı̨ sìı gehdzà eyıts'ǫ dedı̨ whacho gı̨nda t'à gıghàda gha gı̨wǫ. Dǫne hazhǫ akǫ sǫǫ̀mbak'è ts'ǫ̀ dǫne negogewa ha wı̨ı̨ndıle hò, amìı akǫ nahtła sìı, ayìı gìaʔı̨ weghǫ dekǫ̀ta nàgı̨nde nı̨dè weghǫ deèt'ı̨ı̨ xè gogede ha gı̨wǫ. Dıavık dǫne nàowo wegondı nàgehtsı̨ gha sìı dǫne xè eghàlagìde eyıts'ǫ kǫ̀ta dǫne łą̀ dehkw'e sìı xè łegehdı eyıts'ǫ kǫ̀ta gots'ǫ Kw'ahtı̨ndeè kw'ahtıa sìı xè sǫǫ̀mbak'è wedaàtǫ tł'axǫ̀ dè edànì senàgogele ha dǫne xè gogede ha eyıts'ǫ dǫne nàowo t'à sìı xè eghàlagìde.

Nı̨htł'è A: 2013 Xo K'e Kǫ̀ta Dǫne Xè Łegèadì

Kǫ̀ta Dǫne Xè Łegèadì/ Wexè Hòewı Gha Łegehdì	Sǫǫ̀mbak'è Got'ı̨ı̨, 28 November & 10 June; 25 March (sǫǫ̀mbak'è)	Tłı̨chǫ, 27 February & 4 April	Łıtsohk'è, 24 February (sǫǫ̀mbak'è); 1 March, 14 June	Hotenda, 9 September	Edzanèk'e ts'ǫ Waàk'ǫ̀ą, 28 October (sǫǫ̀mbak'è)
Dǫne Nàowo weghǫ Łegehdì	Sǫǫ̀mbak'è, 1-4 February	sǫǫ̀mbak'è (Dǫne Nàowo), 24-28 February	sǫǫ̀mbak'è (Tłı̨chǫ Research Institute), 12-17 August	sǫǫ̀mbak'è (Dǫne Nàowo), 24-28 October	
Wedàetı̨ Gha Łegehdì	Tłı̨chǫ (Kwe Beh), 27 August	Łıtsohk'è, 11 December	Hotenda, 28 January	Sǫǫ̀mbak'è Got'ı̨ı̨, 28 November	
Ndè Wexòedı Weghǫ Łegehdì	Sı̨ Tąt'e Dǫne Gots'àdı: Charles Mantla, Melissa Catholique (April to September)		Kǫ̀ta Ts'adıdǫ: Joseph Judas, Albert Boucher, Harry Apples - 12 to 17 August (Adzı̨ı̨̀); Earl Evans, Joy & Joel Dragon – 15-20 Sept (Ekwǫ̀); Jimmy Nitsiza James Lafferty, Benjamin Pea'a – 18-24 Sept (Ekwǫ̀)		

Asìı Wegoò Wet'à Asìı Deèɂǫ̀ Nezı̨ Etłe

Dıavık sǫǫ̀mbak'e goɂǫ ts'ǫ dąąnı̨hts'ıı ts'ǫhk'e dìı hot'a 1 xo agòjà, dìı wet'à nı̨hts'ıı ehtsı̨ gha satsǫ̀ nàı̨̀ɂa agı̨̀la xè edek'ègı̨̀wa. Dìı satsǫ̀ September 28, 2012 ts'ǫ etle ajà. 2013 xo k'e, 3.8 mıllıon lıtres tłeh hatłǫ k'egendı ajà. Dìı satsǫ̀ weka k'ak'ǫ ats'ǫ nàek'ǫ wet'à tıch'àadìı akǫ at'ı̨ haàle gha adlà eyıts'ǫ 2013 xo k'e chı̨ą wexòedı la hagedı, dìı satsǫ̀ etłe t'à chı̨ą wı̨ı̨̀zı ełaı̨̀wole gedı.

October 2012 akǫ sǫǫ̀mbak'è wet'à asìıch'ıı wek'eèk'ǫ satsǫ̀ nàke etłe ajà. Eyìı satsǫ̀ asìı k'ehk'ǫ̀ dè łǫ edàtłǫ ehtsı̨ wek'agehta gha 10 dzę ts'ǫ̀ dǫne ahsı̨̀ ts'ǫ wegondı nàgehtsı̨ t'à wek'agehtǫ. Eyìı wegondı ı̨ła deghà wek'ahòetǫle eyıts'ǫ achı̨ wek'ahòeta gha wegha dzę ızıle.

Dıavık 2013 xo k'e edànì asìı etłe yazèa dek'aɂı̨̀ wet'àhot'ı̨ gha, tłeh hanı eyıts'ǫ tłehloò dek'aɂı̨ wet'àget'ı̨ gha la wexè hoı̨̀wo. Tlehdoò wet'ahòt'ı̨le wek'eek'ǫ gha satsǫ̀ negı̨̀ɂǫ eyıts'ǫ March 2014 GNWT dìı satsǫ̀ wet'àts'et'ı̨ gha hęɂę gogedı. Asìı la mǫhdaà ładı̨ sìı:

- Kwe ts'ǫ lamǫǫ̀kwe hazhe sìı, ı̨whągǫǫ̀ axot'ı̨ agojà;
- Xo k'e nı̨dè kǫ̀ ayìı t'a ts'ehkǫ̀ąle eyıts'ǫ akǫ sìı gha k'ak'ǫ ts'ı̨wǫle hats'edı;
- Ndè gotł'a ts'ǫ̀ edàehdı gha sìı dek'aɂı̨ agehɂı̨;
- Edànì eèdı achı̨ wet'ànàts'et'ı̨ gha deèɂǫ̀ weghàlageda; eyıts'ǫ,
- Sìì edza nı̨dè satsǫ̀behchı̨ı̨̀ sadzeè edagǫwa ts'ǫ̀ etłe hale gha nàowo gohłı̨.

Wek’èats’ı̨t’e Gha eyıts’ǫ EMAB

Dıavık gha tı gha nı̨htł’è goghàledǫ elı̨ sìı, Sǫ̀ǫ̀mbak’è Sǫ̀ǫ̀mba Nàledǫ gha eghàlada (AANDC). 2013 xo k’e sǫ̀ǫ̀mbak’è yık’ata gha 9 ts’ǫ̀ akǫ nahtła eyıts’ǫ ndè k’e asìı hagoja dìı t’à weghǫ nı̨htł’è yehtsı̨le. Edànì ndè wexòedı gha nı̨htł’è weghà eghàlagìde sìı weghǫgı̨̀nda eyıts’ǫ adı̨ yazèa ładı̨ adle ha sìı gedı t’à segı̨̀la. Dıavık gıts’ǫ edànì ndè eyıts’ǫ la wexòegıhdı gha nàowo gııtǫ sìı eyıts’ǫ weghà eghàlagìde wegondı eyıts’ǫ weghǫ nı̨htł’è whela sìı dǫne t’ala sìı jǫ nı̨htł’è ghàgenda ha dìle. EMAB nı̨htł’è gehła wek’aata ha dìle hanìle dè Wek’èezhìı Ndè eyıts’ǫ Tı gha La K’e Gehkw’e sìı wegondı sìı gehła weghàda ha dìle.

2013 xo k’e, dǫne t’ala sìı dìı sǫ̀ǫ̀mbak’è weghǫ nanègìde t’à weghǫ gots’ǫ̀ gogı̨ndele hanìle dè nı̨htł’è egı̨̀ıtł’è sìı t’à edànì dǫne eghàlaede gedı t’à sìı asìı weghǫ gots’ǫ hagedıle. Dìı nı̨htł’è hòlı̨ sìı, xo tąt’e ndè wexòedı weghǫ nı̨htł’è hòlı̨ dǫne mǫhdaà weghǫ hayagı̨htı t’à December 2013 Sǫ̀ǫ̀mba Nàledǫ gha k’àowo dìı nı̨htł’è 2012 deghà seèdlale dìı. Eyıt’à DDMI achı̨ nı̨htł’è nàgeètł’è gogedı t’à 2012 nı̨htł’è senàgı̨̀la, eyıtł’axǫ̀ǫ̀ March 28, 2014 k’e Sǫ̀ǫ̀mba Nàledǫ nı̨htł’è esąnı̨le dìı. Eyıxè sìı, Sǫ̀ǫ̀mba Nàledǫ dìı hadı 2012 xo tąt’e nı̨htł’è hohłè hò, eyìı nı̨htł’è gehtsı̨ sìı weyìı dǫne mǫhdaà asìı weghǫ hagı̨htı ı̨lè sìı, weghǫ sèałe gohdı. 2013 xo k’e, dǫne asìı weghǫ nanègìde sìı eyìı dìı nı̨htł’è weyìı dek’eèhtł’è.

Dìı Ndè Wexòedı Gha Dǫne Dehkw’e sìı (EMAB) eyıts’ǫ Dıavık asìı weghǫ nanègìde weghǫ nı̨htł’è ełets’ǫ̀ agı̨̀la, sǫ̀ǫ̀mba wenàowo ts’ǫhk’e, edànì dǫne nàowo wenı̨htł’è wek’ehòdı gha ts’ǫhk’e, ndè wexòedı nı̨htł’è kaʔa ts’ǫhk’e eyıts’ǫ EAAR edànì asìı mǫhdaà ładı̨ agı̨̀la weghǫ nı̨htł’è egı̨̀tł’è. EMAB 2011 xo k’e dǫne, dǫne nàowo k’e eghàlagìde ha dǫne gı̨zì DDMI ts’ǫ̀ negı̨̀la. Edànì dǫne nàowo sǫ̀ǫ̀mbak’è wedaàtǫ tł’axǫ̀ǫ̀ dè edànì ḍone nàowo weta whela agele t’à sǫ̀ǫ̀mbak’è wedàetı̨ ha negògı̨̀la eyıts’ǫ 2013 łık’è k’e, dìı dǫne dehkw’e sìı gıla hazhǫ DDMI ts’ǫ̀ agı̨̀la. Dìı sǫ̀ǫ̀mbak’è edànì dǫne nàowo xè wedàetı̨ ha zǫ dǫne nàgogı̨̀wa. Dǫne nàowo k’e eghàlagìde ha gehkw’edǫ eyıts’ǫ Dıavık October 2013 k’e edànì kwech’ıı łaàtł’ò k’è senàgele ha akwełǫ̀ ełexè łegèadì.

Yatıı Į̀whą

Dìı hot’a Dıavık 11 xo gots’ǫ dìı la wexè hòı̨̀wo gots’ǫ hatłǫ wek’e eghàlagìde eyıts’ǫ dìı sǫ̀ǫ̀mbak’è wets’ı̨ʔǫ̀ asìı łǫ nezı̨ hagojà. Ndè wets’ǫhk’e, 2013 xo k’e, dìı hanı:

- Satsǫ̀ wet’à nı̨hts’ıı ehtsı̨ 4 wet’àhòt’ı̨ ajà ts’ǫ 3.8 mıllıon lıtres tłeh k’aʔı̨̀ wet’àts’èt’ı̨ ajà
- Ndè wexòedıdǫ gıxè eghàlats’ìde t’à nı̨hts’ıı wexòedı la deèʔǫ̀ nezı̨gǫ̀ǫ̀ adla
- Dǫne nàowo t’à eghàlats’ìde gha dǫne nììzha sìı xè edànì sǫ̀ǫ̀mbak’è wedàetı̨ gha ełexè eghàlats’ìde
- Ndè wexòedı nàowo deghà wek’è eghàlats’ìde t’à sǫ̀ǫ̀mbak’è wedàetı̨ gha weghàlada sǫ̀ǫ̀mba sìì hotł’o łǫ nèts’ı̨lale agogı̨̀la
- Tı gha nı̨htł’è gǫ̀ǫ̀chì weghà ats’ǫ deèʔǫ̀ nezı̨ wek’e eghàlats’ìde eyıts’ǫ ndè sìì esawòde sǫ̀ǫ̀ hǫwǫ t’à wexòedı

Kǫ̀ta gots’ǫ dǫne hazhǫ gıts’ǫ̀ eyıts’ǫ dǫne gıgha eghàlagìdedǫ, dǫne degha eghàlagìdedǫ yalı̨ eyıts’ǫ amìı seè 2013 xo k’e Dıavık gha eghàlaı̨̀nda sìı ts’ǫ̀ Mahsì Cho/Marsí Cho/Quana. Dìı dǫne agets’edı Kıtıkmeot Inuıt Assocıatıon (Hotenda Got’ı̨ı̨̀), Tlıcho Government (Tłı̨chǫ Gha K’aodeè), Yellowknıves Dene Fırst Natıon (Sǫ̀ǫ̀mbak’è Got’ı̨ı̨̀), Lutsel K’e Dene Fırst Natıon (Łıtsohk’è Got’ı̨ı̨̀) eyıts’ǫ North Slave Metıs Allıance (Edzanèk’e ts’ǫ Waàk’ǫ̀ą).

Atanguyan Naetomik Okaohen

Daivik-kon pinikotikhanik oyagaktakvean inikaktok uvani East Island-mi Lac de Gras-mi, Kanataom Nunateagani, kanitoani 3-hanat kilamitamik ugahinikaktok tonungata kivalikheani kavamakakvoeyum Yalonaem. Pikaktok amigaetonik aalatkenik angutikhavaloknik nunami. Avataoyok halomateaktok ihomagiyaoteakhonilo nunagiyaoyonetonin atoktonik ukuniga nunanik taemani, talvuna Diavik-kon havaakakhimavun iloengaomayomik Avataoyok Ilitokhakniganik oyagaktaligeaktinagin.

Diavik-kon saenikhihimayun Avatilikinikun Agikatigegunmik ("Agikatigegun" EA-lunen) talimalo Nunakakaktunin timeoyun kanatamilo nunateamilo kavaman 2000-mi. Agikatigegun okaktok Diavik-kon kanogileogutikhaenik ila hapomiyaagani avataoyok oyagaktakhimaktilogin. Pikaktoklo Ihomakhakheoktinik Katimayinik hatkikhimayun ilagagun Agikatigegutim; Katimayin inuknin amikhiyi maligoagakhanik aolanigagun atokpaleanigagulo una EA-goyok. Diavik-kon pinikotikhanik oyagaktakvik laevani ukeoni havakveohimaliktok 2013-mi, tamaetalo oyagaktaktun pihimayun nunam iloanin talvani ukeomi

Una unipkaak naegligeakhogo pihimayok kanoginiganik Diavik-kon avataoyokmik amigiyotigiyaenik monagiyotigiyaeniklo havaanik 2013-mi. Ayikotaen unipkaan naniyaolaktun kagitaoyami uvani EMAB-mi titigakakvikmi (http://www.emab.ca/Library.aspx) uvalunen Wek'èezhìi Nunalikiyin Imalikiyilo Katimayin kitulika makpigaaginik tutkumavikmi (http://www.mvlwb.ca/Boards/WLWB/SitePages/search.aspx?app=W2007L2-0003).

Avataoyomik Amikhiyotin Monagiyotilo

Amigaetun havakvoeyun , Diavik-kulo, pikaktun Avataoyomik Monagiyotinun Atoktamiknik (EMS-mik) kanogileoguhikhamik pikaktok tikaogeagani, monagilogo, naonaeyaklogo, ihoakhivaaliklogolo avatilikiyotinun havaan uplotoagaagan aolanigani oyagaktakveom. Diavik-kon EMS-giya naonaeyagaovaktok ISO14001-mi atogeakakniga ukeotoagaagan inuknin havaktonik ukuniga havaakakloaktoni. Diavik-kon anigukhiyun ihivgoektaoniganik 2013-mi pihimaenakhogolo EMS-mik naonaepkotigiyaktik. EMS ilakaktok piyotikhanik aolanikun monagiyotinik, avataoyomik amihiyotinik, tohaomayutinun opalogaeyaotinik titigakniginiklo hivonikhiyutikhanik.

EA okaktok Diavik-kon avatilikinikun opalogaeyaotaen havaagilo 'ihoakhaenageakaktun', aalagugeaganilunen upiyotimik kanogiligaalakpan. Havakveoyok havaakaktok ihoakhaotikhanik monagiyotinun ihomagiyakakneakok aalagulaakniginik mikhivaaligeagani aktutaoyun kaoyimayoayun, piyageakakan.

Diavik-kon monagiyotinun oplaogaeyaotean amigiyotinulo havaagin maligoagutoayun EMS-mi ihoakhivaaligutikhanik havaoheoyun, aalagukhimavun hunalikaa piyotikakhotik kanogilivaleanigagun piyaohimayonik. Ayikotaa ilaoyok: ileogaknigin pikotin iglukpaelo mikhivaaligutaoyun amigiyotaovlotiklo poyuvalokik, atokpaleavlogin kaoyimaliktatik taemani naotikteoyutikhanik ilitokhaeyotimiknin malguklo aalaguknigin tattimi imagiknigagun naonaeyaeyotinik havaami

Naotiktoevaagutin

Naonahaalikpaktun naoteavaloen ukeoktaktomi. Talvuna, Diavik-kon ilitokhaelikhimayun 2004-mi naonaeyaonmik nakunikhanik naoteanik, nunanik avugiyakhaelo atulaaktun naotean naoyaagani oyagaktakvikmi umiktaakan. Diavik-kon ilitokhaeyomahimayulo kanok neotiktoeyaamikni naoyukhanik nunamilo ila oyagaaloen aktoknikakmagaa noatean naoniginik.

Tuklik havaakhak umani ilitokhaonmi 2013-mi aolaktigeakneaktok, atokhimaklonilo 2016-mun naoyaeyaeyomavlotik: kanok nakunikhamik naotikoeyaami naoteakhanin, kanok ihoakmagaa aalatken neotiktoeyutin naotean naonigini kanogiligaagalo naotean naoteakniginik ukeoni. Pinahoakneaktulo ilaleotiyaagani Igilgaan Kaoyiayaenik (TK-nik) havaamun piyaoneakulo. Ilitokhaon naonaeyaeneaktok kanok ihoakmagaa atogeagani aalatken neotiktoeyotin nunavalokni haneani oyagaktakveom umikpan, ila una nakuteakman aheni agitkiyani iglukpakakvikni. Una havaak ilakakneaktok amigiyotinik ilitokhakhimahonik 2004-mi, naonaegeagani kanogilivaleaniginik ukeoni.

Amigiyotinun Havaam Hulilogaagutin

Tuktun

Aalatken piyotin atoktoahimayun amigiyaagani tuktun kanogiliyuhelo ukoa havaan naetomik okaotaoyun aaleoyoni hamani.

- Agitilaaga nunan tuktun atogeokpagaan oyagaktakvikmin: amigihimagitun 2013-mi, piyotigivlogin tohaktatik nunagiyaoyonin piyoenmatalo tohagakhanik aolanikun monagiyoheagulo oyagaktakveom.
- Aolanigin humulikaa nalaotaagaoyun Avataoyomik Ilitokhaknigagun taemaetogiyaoyun – oalikheani Diavik upingaami kivalikheanilo ukeokhami – kiheani tuktun kayometun nutigeamikni hivugaanun 2013-mi, ihomagivlogin atokhimayoni ukeoni.
- Ataotimun 90 kanogileokniginun ihivgeokhiyotin (kungeakhogin tuktun kanogileokneakmagaa oyagaktaktilogin aheniklo hulilogaagutinik) pihimayun 2013-mi, nunagiyaoyonetun ikahokhimayun uvuna.
- Pikagitok tuktunik tukuhimayonik oyagaktakvikmi hulilogaagutinin 2013-mi. Ataohik tuktu tukutaohimayuyaaktok amakunin naniyaoyok tunungata oalikheani oyagaktakveom.

Kalven, Akhaen, Kilgavelo

- Kalven apunmi tumaen ilitokhaktaoyun 2013-mi ikayoktikakhotik nunagiyaoyomin ikayoktimik. Ataotimun 26-goyun tumin takuyaoyun 150-kilamitami ilitokhagoayomi.

- Kalven DNA-ginik ilitokhaotin pivaktun ilagini ukeoni 2013-mi pihimayun; tuklik naonaeyaevikhak havaami opalogaeyaktaoyok upingaami 2014-mi atoligeagani.
- Kalviknik tukoyokakhimagitok 2013-mi ukeomi.
- Tuklea ukeok akhaen DNA-ginik naonaeyaehimayun havaamik havakatigivlogin EKATI-mi oyagakheoktin atoktilogo 2013-mi ukeok. Kaveonigin napaktitaoyun akhaen heaginik pikatun 46%-min 57%-mun amigaenigin.
- 67-nik amigaektokhotik takohimayun akhanik haneani oyagaktakveom 2013-mi ataohiklo malguknik napaaniklo ukeokaktomik aknalukmik naniyaohimayok ikayoktikakhotik GNWT-konin.
- 2013-mi hitaman kilgaven uploen naniyaohimayun oyagaktakvikmi.
- Ilakoen malguk tukohimayuk kilgavek naniyaoyuk iglukpakakvikmi; ataohik koakhalaknahogiyaoyok, aepaataok naloyaoyok.

Naoteavaloen, Puyoen, Hilavlo Halomaniga

Apotin ilitogakhan pihimayun upingaatoagaagan aoktoktitaovaktun naonaeyageagani imagikniga kanogaaloklo heogagaknigani. Pilovaloelo piyaohimayun katitigutini naonaeyagaovlotiklo kanogilivakmagaa kanogaalok numilo pilovalokakmagaa heogavaloknik oyagaktakvinin

- Pilovaloen apotilo naonaeyaktaohimayun 2013-mi.
- Nutaak Hilam Halomaniganik Amigiyotinun Havaak atolikhimayok 2013-mi, ileogakniginiklo nutaan naonaeyaotinun pikotinik.
- Naotiktogaoyun Nunan naonaeyagaoyun huli 2013-mi.
- Tuktun nikaenik naonaeyaotinun havaak pihimayok huli 2013-mi, ilagiyomaenakhotilo Igilgaa Kaoyimayaenik havaami.
- 2013-mi, agitilaaga puyuvaloen ignikotinin ohoktoktonin ayikotaa 192,544 tangoyok paovalokni anokimilo algukahtutinun atoktun mikhivaaligutaoyok puyuknik ima 10,726 tanik.

Imak

Diavik-kon havaakhimaginaktun Imakmik Aktoknigagun Amigiyotinun Havaamik 2013-mi. Una naonaeyaotaoyok aalatkenik ilaginik tattin aalatkeni ukeoni tikaokhiyaagani aktokniginik Lac deGras-mik oyagaktakvikmi havaanin. Ukoa ilagin tattin amigiyaohimayun 2013-mi:

- Immam hunakakniga (imagikniga);
- Makloen (tattim natkani) avugeknigin (imagikniga);
- Kumakun (mikaloen naotean kumakun Imakmi – amigaenigin kanogitunigilo); unalo,
- Kumaguvaloen natkanetun (mikaen kumagun natkanetun tattim – amigaenigin kanogitunigilo).

Aalaguknigin tattin piyotikakloaktun amigaekpaleaniginik naovaaligutikhan nunamin imavaloknin kagaktitaeyotinilo. Diavik-kon mikhinahoaktitinahoakpaktun aginiginik naovaaligutikhan tikitpaktonik Lac de Gras-mun atokhotik kagaktitaeyoninik monagiyotinik, pinahoaknigilo kagaktitaeyotikhan ihoaktun imavaloelo monaginiganik halomaktikniganiklo.

Ikaloen

Kanayun (mikaen ikaloen Lac de Gras-metun) naonaeyagaoyun aoyaotilogo 2013-mi. Kanoginigin ikaloen ihivgeoktaohimayun naonaeyagaovlotiklo aktoktaonigin (haneani oyagaktakveom) naonaeyakveoyulo nunan.

Nunagiyaoyun Upipkaknigin

Diavik-kon atogumaenaktun pivikhakakniginik okakatigegutikageagani nutaaguktikniginik avataoyomik amiginigagun umikpalo opalogaeyaotikhan havaagiyaoniginik nunagiyaoyonilo ileoyonik. Diavik-kon havakatikaktun atuni PA-ni timeoyonik ihomaleogutikageagani ihoaktomik atoktukhamik pivikhaaniklo havaagiyaagani ukoa hulilogaagutin. Nunagiyaoyoni katimaveoyun, havakvikni polakpaktonik sikukviknulo polaknigin ilagin ukoa piyotikhan una atogeagani atoktukhani ukeoni. Una naonaepkun naetomik okaohigiyaen upiyotaen Diavik-kon ikayoktikakhotik Ilaoyun Agikatigegutini timeoyonin atoktilogo 2013 ukeok.

Diavik-kon katipkaenahoakhimayulo nunagiyaoyoni ilaoyonik oyagaktakvikmun takoyaagani haneani avataoyok nanminik takolotik. Ayoknagaloaktilogo tamaeta katitaagani oyagaktakvikmi, ihomayun ukoa ilaohimayun okaohikakogaloakhogin takoyamiknik aalanun inuknun agilgagumik nunagiyamiknun. Diavik-kon ihoakhaeyun Igilgaan Kaoyimayaenik Nalaktinik ihoakhaeyilo katimaniginik nunagiyaoyonilo ilaoyonik hivolikhoktiniklo ilaoteageagani nunagiyayonin umiktiknigagun opalogaeyaotini Igilgaalo Kaoyimayaenik havaani

Naonaepkun A: Nunagiyaoyun Upipkaknigin Atoktilogo 2013-mi Ukeok

Nunagiyaoyun Kaoyipkaknigin/ Atokpaleanigagun Katimanigin	Yalonaemi Itkilgin, November 28-mi June 10-milo; March 25-mi (oyagaktakvikmi)	Tłı̨chǫ-kon, February 27-mi April 4-milo	LK-mi Itkilgin, February 24-mi (oyagaktakvikmi); March 1-min June 14-mun	KIA-kon, September 9-mi	NSMA-kon, October 28-mi (oyagaktakvikmi)
Igilgaan Kaoyimayaenik Katimanigin	Yalonaemi, February 1-min 4-mun	Yalonaemi (Igilgaan Kaoyimayaenik Nalaktin), February 24-min 28-mun	Oyagaktakvikmi (Tłı̨chǫ –kon Ilitokhaevik Iglukpak), August 12-min 17-mun	Oyagaktakvikmi (Igilgaan Kaoyimyaenik Nalaktin), October 24-min 28-mun	
Umiktigutinun Katimanigin	Tłı̨chǫ –kon (Kwe Beh), Auguts 27-mi	LK-mi Itkilgin, December 11-mi	KIA-kon January 28-mi	Yalonaemi Itkilgin, November 28-mi	
Avatilikinikun Havaan	Ilaenaani Ukeom Nunagiyaoyoni Havaktin: Charles Mantla, Melissa Catholique (April-min September-mun)		Nunagiyaoyonik Ikayoktin: Joseph Judas, Albert Boucher, Harry Apples – August 12-min 17-mun (Tuktun Nikaenik); Earl Evans, Joy & Joel Dragon – September 15-min 20-mun (Tuktun); Jimmy Nitsiza, James Lafferty, Benjamin Pea'a – September 18-min 24-mun (Tuktun)		

Nutaan Ihoakotivaloen Aolayotilo Aolanikateaknigin

Ataohik ukeok aniguktok hitaman anogitutin alguyaktutinun ihoakotikhan iliyaotilogin kivalikheani Diavik-mi oyagaktakveom. Anogitutin atulikhimayun September 28-mi 2012-mi. 2013-mi, ataotimun 3.8 –milean letaoyun (1 milean kalaoyok) okhokyoan atogitun) Anogitutin ikomayaktaktonik kulikaktok angutikhan tikmiyalo haneanugitaagani, ilitokhaotin inikhimayun 2013-mi naonaegutoayok tikmeanik tokoyokakhimagitok anogitutinin.

Malguk nutaak ikolatiyutik atulikhimayuk oyagaktakvikmi October-mi 2012-mi. Ilitokhaknigin puyoen ikolagiveom ikagun ikolatigaagata pihimayok kulini uploni aalanin ilitokhaeyinin. Ilitokhaevikmi kanoginigin naonaeyaktaoyageakaktun huli opalogaekhimagitulo ilitokhaevaageamikni hivunikhami.

Diavik-kon atulikhimayun aolayutinik monaginigagun atuligumayaamiknik 2013-mi, atokpalaagitaagan okhovaloknik poyukpalaagitaaganilo. Ikagunik okhovaloknik ikulatiyun iliyaohimayok oyagaktakvikmi agiktaovlonilo atoknigagun GNWT-konin March-mi 2014-mi. aalat havaan ilakaktun ukuniga:

- Pinagikpaklogin oyakikivikmi ahivaktiknigin pinikotikhan oyakanin;
- Noanaeyaklogin kitun iglukpaen unakhimayageakagitun kuliktoklotiklo ukeomi tatkikheoni;
- Unaknigin atpakpaaliklogin nunan iloani oyagaktakvikmi unakutin;
- Ihoakhivaaliklogin unaknigin agnikotin atuvaageagani; unalo
- Akhalutin ikomaenagitaagani nutkagatilogin ikaknigin ikumaniginun akhalutin ikiklivaaligeagani alapaaknaktilogo hila.

Maligoateaknik EMAB-lo

Ihivgeokhiyi Diavik-kon imanik atokniginik laeseoyomik nunaniklo atukavutinun havakatikageagani Nunakakaktonik Havaagoyun Ukeoktaktomilo Pivaleanikun Kanatami Yalonaemi. Atoktilogo 2013 ukeok, ihivgeokhihi polakhimayok oyagaktakvikmik naenik amihoektokhotik avataoyomilo ihomalutoayonik pikagitogiyaa ihivgoektim. Avataoyomik monagiyotinun opalogaeyaotin piyageakaktun ilagani imaknik atoknigagun laeseoyomi ihivgeoktaoyun unalo, piyageakaligaagan, nutaaguktiktaovlotik. Ayikotaenik Diavik-kon amigiyotinun monagiyotinulo havaagin, hunalolikaa piyotikaktun ukuniga titikan, naniyaolaktun kagitaoyami EMAB-kon titigakakveani Wek'èezhìi – kolunen Nunalikiyin Imalikiyilo Katimayin kituniklikaa naonaepkotikakveanin.

Pikagitok tohaomayotinik titikaniklunen okaohikaktonik ihomalutaoyonik inuknin oyagaktakvikmik aolanigagulo atoktilogo 2013 ukeok. Tohaktaakhimaligamik nutaaguktiknigagun piyotikhak Avatilikinikun Agikatigegutaoyomik Ukeotoagaagan Unipkaamik ihivgeokhiyonin, Ministaoyok Nunakakaktonik Havaagoyun Ukeoktaktomilo Pivaleanikun Kanatami ihomagiyaen hivulen 2012-mi unipkaan naamaginiginik December 19-mi 2013-mi. Diavik-kon talvuna piyageakakhimakmata tunihiyaamikni nutaamik 2012-mi unipkaamik, Nunakakaktonik Havaagoyun Ukeoktaktomilo Pivaleanikun Kanatami Ministaoyum naamaginigakhogin okakman March 28-mi 2014-mi. Ministaoyoklo pikohimayaen Diavik-kon keoyotikageagani ihoakhageakaktonik huli ihomagiyaoyonik Ilaoyonin ihivgeokhitilogin 2012-mi Ukeotoagaagan Unipkaamik. 2013-mi EAAR-kon ilaopkaeyun keoyotini piyageakaknigini oegoeni unipkaam.

Avataoyomik Amigiyotinik Ihomakhakeoktin Katimayin Diavik-kulo titikiyotiyun piyotikaktonik okaoheoyonik ila ukeomik maniknik atoknigagun, monagiyotinik Igilgaan Kaoyimayaenik Nalaktin, ihivgoekniginik aalatken avataoyokmik monagiyotinun havaanik aalagukniginiklo EAAB-mi. Avataoyomik Amigiyotinik Ihomakhakeoktin Katimayin hatkikhiyun Igilgaan Kaoyimayaenik Nalaktinik ukeokhami 2011-mi aoyamilo 2013-mi, Katimayin ikayoktun nuniginik monaginigagun Nalaktun Diavik-konun. Igilgaan Kaoyimayaenik Nalaktin taotukloaktaa ihomagiyaonigin atuliknigilo Igilgaan Kaoyimayaenik oyagaktakvik umiknikhagun opalogaeyaotinik. Hivulik katimanik Igilgaan Kaoyimayaenik Nalaktin Diavik-kulo pihimayok oyagaktakvikmi October-mi 2013-mi okaohigiyaagani utiktivaaknigin nunan ilitkohenun Oyakikiyotiniklo Oyagaktaanik Atagukvik nunan.

Naenageaklogo

Diavik-kon kuvahutikaktun 11-ni ukeoni oyagaktakhimalikmata kuveahutikakhotiklo amigaetonik ihoaktonik inikhimayamiknik havaanik ilagihimayaenik pivaleanigagun oyagaktakvikham uma. Piyotikaktonik avataoyomi, aginikhan iniktaohimayun 2013 ukeok atoktilogo ukoniga ilakaktun:

- ◊ Aolanikateaknigin hataman anigitutin alguyaktutinun ihoakotin atokpalaagutaogitok 3.8-milean litanik okhoknik;
- ◊ Amigiyotini havaanik ihoakhivaligutikhanik hilam halomanigagun okakatikakhotik Ilaoyonik Avatilikinikun Ilitokhaotini;
- ◊ Umiktigutinun opalogaeyaotin atulikoyaoyun tungavikaktun Igilgaan Kaoyimayaenik uvuna monagiyotigagun inmik Igilgaan Kaoyimayaenik Nalaktilo;
- ◊ Ihoaktun avataoyokmik monagiyotinun pitkuhikhan mikhivaaligeagani uniktiknigagun akiligegutaoyok ihomaloknaegeagani; unalo
- ◊ Atokhimakniganik nakoyonik havaohiknik maliteageagani imaknik atoknigagun laesoeyokmi pikoyaoyun mikhivaaligeaganilo avataoyomik aktoknigiyakun.

Koanakon tamakmik nunagiyaoyoni ikayoktigiyavun havaagiyaenik havaktigiyamik, manikhakheoktun inoelo ilaoyun havakhimayun Diavik-koni havakteni 2013-mi ukeomi. Ukoa ilakaktun Kitikmeoni Inoen Katimayenik, Tlicho-kon Kavamanik, Yalonaemi Itkiliknik, Lutsel K’e –mi Itkiliknik, Tunuhikheanilo Kavlonaakan Itkilgin Katimayen.

K’áuldhër bets’ı̨ hanı nedúé.

Dıavık Tsą́ą̨́mbak’é Ɂedza Nḗné k’e Canada k’éyá ɂek’akú ts’ën sayızı̨ nuek’e theɂą, 300 km Beghúúldescheé ts’ën. Horelyǫ́ k’éch’aı̨́díı ɂełk’éch’a nádé ɂeyër náre. Ɂeyı nḗné náre besezudí ɂat’e, ɂeyër náre háyorı̨la dáthela síı, yet’á dáyet’ı̨ yuníızı̨, ɂeyıt’á Dıavık tsą́ą̨́mbak’é la hunídhı tthe, ɂeyı Dıavık hayų́ yek’ónıka, *Envıronmental Assessment* húlye.

2000 k’é, Dıavık bezí nı̨́ı̨ɂą hı̨lé, sųláa Dëne Sų́łıné ɂełk’éch’a ní ts’ḗn k’áuldé xél, tth’ı Federal Government chu, Terrıtorıal Government chu dırı bezí nı̨́ı̨la síı, Envıronmental Agreement xa. Mıne beghálaada dé, dırı bezí níhı̨ı̨la síı, Dıavık ní hałnı háɂą, ɂeyı halɂı̨. Dırı yakı beyághe, Advısory Board hálı̨. Dırı board hálı̨ síı, ɂasíe hałnı xa theɂą, Envıronment Assessment xél. 2013 k’é Dıavık 11 ghaye ts’ën bedareką dırı ghaye k’e níya ts’ḗn ɂeghálaada.

2013 kúk’e ɂeretł’ís hálı̨ hı̨lé t’at’ó Dıavık ní hałnı-ú tth’ı t’at’ó yeghálaheena xa. Dırı ɂeretł’íse thela ɂat’é computor yé EMAB lıbrary hát’e-le dé wek’éezhíí ní chu kué chu board publıc regıstry.

 (http://www.emab.ca/Library.aspx)
(http://www.mvlwb.ca/Boards/WLWB/SitePages/search.aspx?app=W2007L2-0003).

Ní hadı-ú tth’ı t’at’ó beghálaada.

Tsą́ą̨́mbak’é łą, Dıavık húlí, ní hadı xa ɂeretł’íse thela ɂat’e t’at’ó ní k’e ɂeghalaada-ú tth’ı ɂasíı hadı-ú nezǫ ts’ḗn ɂeghálaada ní bązı̨́ dzın hanéłt’o tsą́ą̨́mbak’é ɂeghálaada síı. Dëne ɂasíı k’édárelyą síı ɂayı la bązı̨́ ghay ɂą́lt’o dáyenełɂı̨ ɂat’e Dıavık xa. 2013 k’e Dıavık EMS Certıfıcatıon betł’achúth hı̨lé ɂat’e nezǫ ɂeghálaana. Dırı EMS beyághe ní hadı-ú t’at’ó ɂeghálaada-ú tth’ı ɂexél hadı.

Dırı ní hadı ɂeretłís ɂadıu ɂasíı ɂedǫ́ nalye xaduíle la t’at’élesíı gháré. ɂeyı company hát’o yeghálaana síı k’aɂǫ́ yełɂı̨ ɂat’e ɂasíı tsę́dhı̨ ch’á.

Dırı ní hadı ɂeretł’ís begháré ɂeghálaada ɂatthe naí ɂasíı ɂedǫ́ nalyá hı̨lé ɂat’e dırı ɂeretł’ís hálı̨ tł’ą́. Dırı tłes beschëné chu kuę́ yízı̨ ɂeghálaada chu belëré hadı háɂą, tth’ı t’ą́chái bek’óneka-ú tth’ı kuę́ beghálaada síı ɂedǫ́ nalye ɂakó hát’e program húlı̨.

T'ánchái naneshe

Hazúuk’e ɂedza dúé thaá háɂą t’ánchái dáníye xa, hát’e t’á Dıavık t’ánchái k’ech’á k’óneka nızën chu dırı tsambak’é bedáréką tł’ą́ dé ɂayı t’á nezǫ síı yek’eneshe xa. Dıavık nezǫ tsḗn t’ánchái dáníshe horéłdzá hát’ólí tthe tsó t’á nezǫ-le ɂako hą.

2013 beghálaada xa 2016 tsḗn t’at’ú t’ánchái nezǫ dáníye xa ɂake nechíle tsën, nezǫ ɂako nezǫ-le ɂako badı hálo thaá hųɂą́ dé. Dırı beghálaada síı dëne ch’áníé ɂełá xél beghálaada xa. Dırı t’at’ó beghálaada síı net’ı̨ hálo t’á t’ánchái nezǫ síı dáníye xa tsambak’é bedáreką tł’ą́ dé dırı t’at’é la síı nezǫ hılé ʔat’e yuwé ʔání tsambak’é dáthela síı bexa. 2004 tsën yek’óneka ʔat’e dırı la síı net’ı̨ xa t’at’ó ʔasíı xa.

Ɂasíı Beghálaada Hadı.

ʔetthḗn

T’at’ó ʔetthḗn badı síı ʔeretł’ís yághe thela ʔat’e.

Tsambak’é náre ZOI húlye ʔat’e dırı ʔetthḗn tsambak’é ch’azį́ ʔat’į́ 2013 k’e ʔetthḗn bek’óneka-le, háyurı̨la dáthela síı dáıdı-ú degháré nuexél hadí-le tsamba k’é t’anúdhı síı. Dırı ní hadı Ɂeretł’ís yághe ʔetthḗn tat’ó dzérétł’í síı ʔełtth’ı ʔat’e Dıavık ts’ḗn nás ʔat’ı̨-ú łuek’é dé sayıze tsḗn natł’í -2013 k’e búret’ı̨ ʔetthḗn natł’íle natł’el ná tsḗn.

Háyorį́la tsën dëne beníríltł’ís 2013 k’e tsamba k’é nárı̨ ʔetthḗn beba ʔedlát’e ʔeghálaada dé tsamba k’é bet’á ʔetthḗn łaı̨dé hųlį́-le, 2013 kúk’e. Tsamba k’é ts’ën tthį́zı̨ ʔı̨łághe ʔetthḗn nunı t’á łaį́dhër k’é húlkı̨.

Nághaı, Sas cho, tth’ı Jíze cho.

- 2013 k’e háyorį́la ts’ën dëné beníríltł’ís nághaı ké k’óneka xa yath yé daų́ʔá síı. Dëne xél ʔeghálaana xa hayǫ́ t’á 26 beké bóret’ı̨, 150km ts’ḗn.
- 2013 k’é nághaı bek’óneka ʔį́le, náı ghay yį́ ʔǫ́łı̨. Hát’o ʔeghálaada t’á, hát’o la hałé hadé, łuk’é k’e 2014.
- 2013 k’e nághaı łaį́dhër hųlį́-le.
- 2013 k’e Ekatı Mıne xél ʔeghálaada, sas cho bek’óneka bedëlé xa. ʔedǫ́ náke ghayé beghálaada. Dechën łą náı̨tthı sas cho ghá náłtsí xa. T’ánıłt’ı hílchú síı, 46% ts’ën 57% ts’ḗn.
- 2013 67 sas cho het’ı̨, tsą́ą́mbak’é náre. ʔı̨łághe sas cho 2.5 ʔedílkı̨ hı̨lé, GNWT bexél.
- 2013 k’e tsą́ą́mbak’é nárı dı̨ı̨ jízecho t’oghe húlʔą.
- Náke jízecho bedhıyé húlkı̨ tsąmbak’é nárı. ʔı̨lághe jízecho bą́łch’á k’e *shock* ʔajá-ú dı, nıhı̨ı̨dhën, wełá bek’óreją-le.

T’áncháı, Ts’ḗr, tth’ı Nı̨łts’ı t’at’e.

Łuk’é núdhër dé yath hílchu ku ts’ḗn naughı̨-ú, tth’ı ku horéldzáı-ú t’at’e síı xa-ú tth’ı ts’ḗr xa net’ı̨. Tsą́ą́mbak’é dáthela síı, satsán hųlı̨ ts’ḗr dzérédhır dé xa la k’é t’anıltth’ı-ú tth’ı t’a ts’ḗn ts’ḗr nıshal síı, ʔeyı satsán hųlı̨.

- 2013 k’e ts’ḗr chu yath chu hílchú hı̨lé, horéldzá xa.
- 2013 k’e nı̨łts’ı t’at’e síı xa la húnį́dhër hı̨lé, tth’ı satsán degódhé bet’á ʔeghálaada xa níıt’ą.
- T’ánchái dáníshe xa yehoréldzáı hı̨lé nadlı̨ 2013 k’e.
- 2013 k’e ʔetthḗn nı k’ónı̨ka nadlı̨, dëne ch’ánıé bexél ʔeghálaadá.
- 2013 k’e tłes dzérédhır síı tłes beschëné ts’ën ʔełéníłt’e 192,544 tonnes carbon dıoxıde (CO_2*e*), tth’ı wé sastsán nı̨łts’ı hełtsı síı tłes k’áʔǫ́ yełʔı̨ ʔat’e 10,726 tonnes CO.*e*.

Kue.

2013 k’e Dıavık la húnį́łthër hįlé, kue hadı xa. Tsą́ą̨mbak’é theʔą síı ʔek’akú k’e ʔeyı ku nárı yeréłdzá ʔat’e t’at’e síı xa. 2013 k’e tth’ı ku huréldzá nadlį.

- Ku nezǫ ʔako, nezǫ-le ʔako bek’óneka;
- Ketł’a tth’ı t’at’e síı xa net’į; tth’ı
- T’a ketł’a nádé síı gúaze-ú t’áncháyaze-ú gu benế́n hųlį síı-ú tth’ı tehgúaze t’a bérelʔį síı-ú t’aníłtth’ı síı xa net’į.

Ku ʔedų́ ʔat’į́ síı núk’e ní kú beyághe ʔasíı dáthelel ku yé nįlį chu ní nálk’éth chu ʔeyı bet’á ʔat’e. Dıavık k’áʔǫ́ yíle horéłdzá t’aníłtth’ı nutrıents ʔek’akú yé ką́lį síı, ní nálk’éth gháré ʔaké badı gháré ʔasíı nálk’éth xél tth’ı ku xél ʔeghálaada chu badı xél.

Łue.

Łue dánechílaze bek’óneka hįlé ʔek’akú k’e sıne 2013. Tsą́ą̨mbak’é náre łue bek’óneka t’at’e síı xa, ʔeyı gháré ʔeyíle ku ts’ën łue net’į xa snı síı.

Háyorį́la Náyakı.

Dıavık bexa háʔą dé háyorį́lat’ıné xél halnı, t’at’ó ní hadı-ú bedárį́kį́ xa nų́dhër dé. Dıavık PA xél ʔeghálaana ʔat’e, t’ó hų́zǫ́ síı, hát’o ts’ế́n la hałé xa. Háyorį́la náyakı k’é-ú hų́ka nats’ídílú, tth’ı ʔeretł’ís kuę́ nats’ídílú, hát’ó t’a beghálaídá hįlé ʔatthe. 2013 k’e ʔeretł’ís hálį Dıavık PA xél ʔeghálaana xa.

Dıavık tth’ı háyorį́lat’ıné tsą́ą̨mbak’é ts’ế́n dzéyurılı horéłdzá nat’į́, denı gháré dáyenłʔį xa benaá t’á t’aų́t’e síı xa. Tsą́ą̨mbak’é nárı horelyǫ́ dëné dzérelyı xadúé húlí, t’ą ʔeyër náadel síı benế́né k’e níhįįdel dé dëne xél xadáyelnı xa. Dıavık háyorį́lat’ıné xél náyakı-ú tth’ı k’áuldé xél náyakı-ú dëne ch’ánıé xél ʔeghálaana-ú dırı tsą́ą̨mbak’é bedárekį́ t’ázį́.

Ɂeretł’ís A: Háyorį́la Náyakı 2013 k’e

Háyorıla t’anudhı síı	YKDFN, 28 ɂeyun dzın zá & 10ɂeghés zá; 25nıłts’ıcho zá (tsąą́mbak’é náre)	Tłįchǫ, 27 sá nedúwe zá & 4degáy mar zá	LKDFN, 24 sá nedúwe zá (tsąą́mbak’é náre); 1 nıłts’ıcho zá, 14ɂeghés zá	KIA, 9 łuédaltı zá	NSMA, 28 bek’e t’anchaı nátł’ır zá (tsąą́mbak’é náre)
Dëne Ch’ánıé Náyakı	beghuldesché, 1-4sá nedúwe zá	beghuldesche (TK Panel), 24-28 sá nedúwe zá	Mine Site (Tłįchǫ Research Institute), 12-17dzınedhaze zá	Mine Site (TK Panel), 24-28 bek’et’anchaı nátł’ır zá	
Bedárį́kį́ xa Náyakı	Tłįchǫ (Kwe Beh), 27 dzınedhaze zá	LKDFN, 11 këth yatı zá	KIA, 28 ɂełets’elts’un zá	YKDFN, 28 ɂeyun dzın zá	
Ní Hadı xa La.	Xaı ɂą́t’o La Dëné: Charles Mantla, Melissa Catholique (April to September)		Háyorį́lat’ıné Níríltł’ís: Joseph Judas, Albert Boucher, Harry Apples - 12 to 17 August (ɂetthḗn nı); Earl Evans, Joy & Joel Dragon – 15-20 Sept (ɂetthḗn); Jimmy Nitsiza James Lafferty, Benjamin Pea’a – 18-24 Sept (ɂetthḗn)		

Satsán gódhé bet’á ɂat’į tłes k’áɂǫ́ xa.

ɂedǫ́ ɂįłágh ghayé ɂasíı Dıavık dįį satsán náįtthı nįłts’ı hełtsı xa tsąmba k’é gá nás ts’ḗn. 2012 łuedaltí zaá 28 k’e satsán nįłts’ı hełtsı hetł’él ɂajá. 2013 k’e 3.8mıllıon lıtres 1 MILLION háníłt’ı tłes bek’áadí. Satsán nįłts’ı hełtsı síı bek’e lıghts níílya k’ech’ąídíı yech’ázį́ ɂat’į xa 2013 k’e ɂįyezé-u chëth-u jísecho tth’ı beba hunílale dódí ɂeyı satsán bet’á.

2012 bek’e t’ánchái nátł’ír zaá k’e náke tsánk’ḗn gódhé xél ɂeghádálaana ɂajá. Dırı ɂasíı ch’ël bek’órek’ą́ síı łǫna dzın ts’ḗn belëré hadı ɂayíle dëne yeghádálaheena. Dırı dëne yek’e ɂeghádálaheena sıí ɂeghádálaada kų́é ts’ën ɂałǫ́ yoréłdzá háɂą ɂałǫ́ háyįį́la-le.

2013 k’e Diavik energy xél ɂeghálaada xa húnį́dhër, t’áníłt’e tłes t’áhat’į síı k’áɂǫ́ ɂalye xa. 2014 nįłts’ıcho zaá k’e łesdó nárełk’ą́ níıt’ą hįlé tsąmba k’é GNWT ɂę́ hédı.

- Kų́é yízį ɂeghálaada síı tthe lúzé chu tthe chu ɂełch’as ɂalɂį k’áɂǫ́ yíle xa.
- Ghaye dé ɂedláberelɂį kų́é hadhël chu lıghts chu bedį xa.
- Níyáa ɂeghálaada síı hadhël k’áɂǫ́ xa yíle horéłdzá.
- Hadhël hádhı ch’á satsán hekoth nezǫ nalye xá horéldza.
- Tłes beschëné dzérétł’í síı ghay ɂedza ɂedza dé k’áɂǫ́ yíle xa.

Compliance tth’ı EMAB

Dırı ní chu kué chu xél ʔeghálaana síı Dıavık xél Aborıgınal Affaırs chu Northern Development Canada k’éyághe beghúledescheé..2013 k’e ınspector tsąmba k’é náaya 9 tımes ʔasíı t’á huníla-le dódí hénı. Dırı kué ts’ḗn ʔeretł’íse k’éyá Ní hadı xél dëne xél hadı. Dıavık ts’ḗn ʔeretł’ıs ʔałǫ́ beghą k’óríya rįʔį dé dırı EMAB lıbrary chu wek’eezhíı ní chu kué chu board publıc regıstry .

2013 k’e háyorįlat’ıné beba ʔasíı nezǫ ʔeghálaada tsąmba k’é. Hát’ólí Mınıster of Aborıgınal Affaırs ʔadı-ú 2012 ní hadı ʔeretł’ís nezǫ-le, t’a yexél ʔeghádálaheena síı háıdı, këth yakı zá k’e 19 2013. Hát’e-á Dıavık ʔeretł’ís gódhé narįtł’ís-ú nįłts’ıcho zá k’e 28 2014 ʔeyı Mınıster beba nezǫ

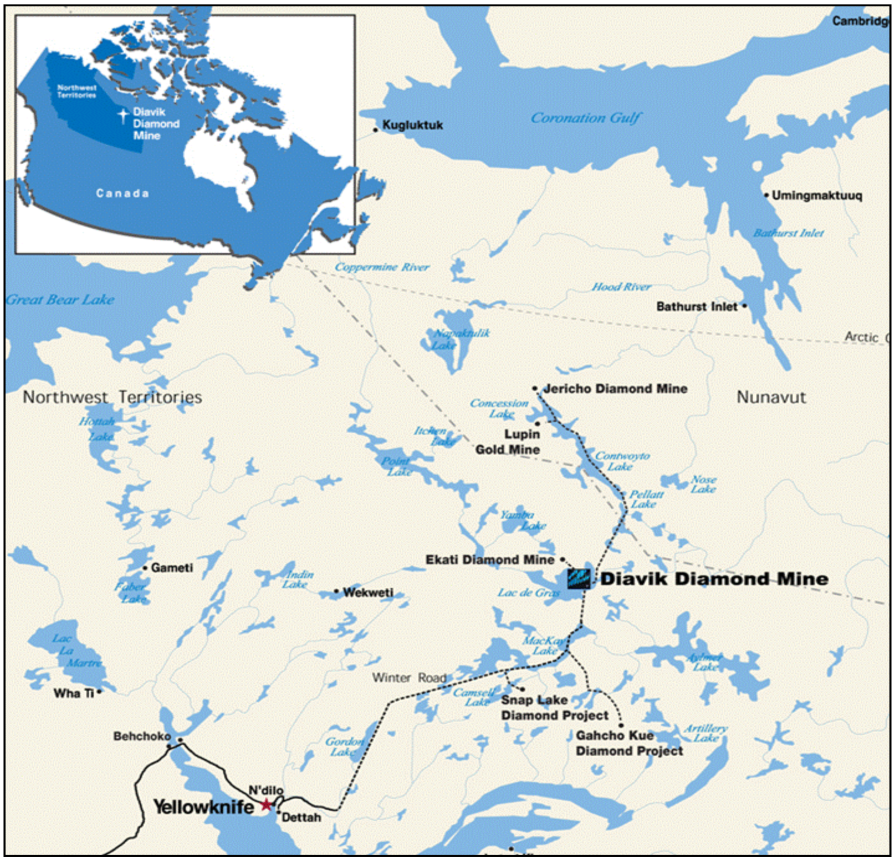
EMAB chu Dıavık chu ʔets’erıtł’ís tsąmba chu dëne ch’ánıé xa t’at’ú beghálaada síı xa. 2011 xaıt’ázį́ EMAB dëne ch’ánıé k’e déhtth’ı xa dëne ʔełá nį́la. 2013 k’e EMAB hádı-ú Dıavık dëne ch’ánıé ts’ḗn k’áldher lílu. Dëne ch’ánıé belá síı tsąmbak’é bedárekį́ t’ázį́ nų́dhër dé dëne xél nádáyaıłkı xa t’at’ó yíle síı xa. 2013 bek’e t’áncháı nátł’ír zá k’e tsamba k’é ʔełá níhıdél, dırı tthe harelyǫ́ nátł’és síı t’at’ó beghálaada síı xá tth’ı t’a ní tsį́dhër síı.

Hanı Nedúé.

Diavik ʔedǫ́ ʔįłáadhël ghayé ts’ḗn bedáreką nezǫ ts’ḗn la hełtsį tsamba k’é nárį. Kú dırı la nezǫ heełtsį síı ní bázį́ 2013 k’e dı beyáa thela ʔat’e.

- Dįghį satsán nįłts’ı hełtsı síı tłes k’áʔǫ́ yełʔį 3.8 mıllıon lıtres t’á.
- ʔasíı nezǫ badı dé dëne xél hadı ní hadı dëné xél.
- Tsamba k’é bedárıkį́ nų́dhër dé t’ą́ ní hałnı k’e déłtth’ı síı bexél háʔą. Tsamba łą k’ëdhı ch’á ní ʔake nezǫ baídı tsędhı ch’á bedárę́kį́ nų́dhër dé. Nezǫ ts’ḗn la heełtsį ní chu kué chu tsę́dhı ch’á.
- Thank you/Mársi Cho/Masi Cho/Quana horelyǫ́ háyorįlat’ıné tth’ı la k’é dáthela síı ts’ḗn, t’a nuexél ʔeghálaįná 2013 k’e. ʔeyı síı, Kitikmeot Inuit Association, Tlicho Ní ts’ḗn K’áuldhër, Yellowknives Dene First Nation, Lutsel K’e Dene First Nation tth’ı North Slave Metis Alliance.

Diavik Diamond Mine Location Map



List of Acronyms (abbreviations found in this report)

AEMP	Aquatic Effects Monitoring Program
ARD	Acid Rock Drainage
AANDC	Aboriginal Affairs and Northern Development Canada
BOD	Biological Oxygen Demand
CCME	Canadian Council of Ministers of the Environment
DDMI	Diavik Diamond Mines Inc.
EA	Environmental Agreement or Environmental Assessment
EAAR	Environmental Agreement Annual Report
EMAB	Environmental Monitoring Advisory Board
EMS	Environmental Management System
ENR	Environment and Natural Resources
GNWT	Government of the Northwest Territories
ISO	International Standards Organization
ICRP	Interim Closure and Reclamation Plan
LDG	Lac de Gras
MVLWB	Mackenzie Valley Land and Water Board
NIWTP	North Inlet Water Treatment Plant
NTU	Nephelometric Turbidity Units (measurement of water turbidity)
PA	Participation Agreement
PK/PKC	Processed Kimberlite/ Processed Kimberlite Containment
PVP	Permanent Vegetation Plot
QA/QC	Quality Assurance/Quality Control
SNP	Surveillance Network Program
SOP	Standard Operating Procedure
TEK/TK/IQ	Traditional Ecological Knowledge/Traditional Knowledge/Inuit Qaujimajatuqangit
TP	Total Phosphorous
TSP	Total Suspended Particulates
TSS	Total Suspended Solids
WLWB	Wek’èezhìi Land and Water Board
WMMP	Wildlife Monitoring and Management Plan
WTA	Waste Transfer Area
ZOI	Zone of Influence

Definitions

Abundance – a count or measurement of the amount of any one thing

Action Level - a level of environmental change which, if measured in an aquatic effects monitoring program, results in a management action well before effects that could be harmful to the lake can happen

Adaptive Management - a systematic way of learning from monitoring results or management actions with the intent to improve operating or management practices

Benthic Invertebrates – small bugs without a backbone that live in the sediments on the bottom of a lake or river; can include flies, worms, clams, etc.

Density – total amount of a given substance within a defined area

Deposition Rate – the speed at which something settles on to a surface, e.g. how slow/fast a piece of dirt falls through water to settle on the bottom of a lake

Distribution – how any one thing may be spread out over an area

Effluent – cleaned/treated water from the sewage or water treatment plant that is discharged from the plant after cleaning

Enrichment – addition of an ingredient that improves quality; if too much is added, it may then start to reduce quality

Environmental Assessment – process to review potential environmental impacts for a project that is being considered for development and decide if the project can be developed

Eutrophication – water bodies like a lake receive a lot of nutrients and then start to grow a lot of plants within the water

Habitat Compensation – replacement of natural habitat lost during construction of the mine; done using man-made features to improve areas of natural habitat

High-level Effects – change noticed between different areas that may start to be higher than an agreed-up standard

Interim Closure & Reclamation Plan – a document that outlines ways to close a mine, including what needs to be done with water, land and wildlife. ‘Interim’ means that it is less detailed than a final plan, as there are still questions to answer before the final design or plan can be done.

Low-level Effect – early-warning level where little change is detected

$mg/dm^2/y$ – milligrams per decimeter squared per year, the amount of dust deposited in a given area each year

Mitigation Measures – things that are done to control or prevent a risk or hazard from happening

Moderate Effect – some change noticed between different areas that may start to be higher than an agreed-up standard

Monitoring – a way to check on performance and compare it against an expected result, e.g. is anything changing

Parameters – chemical and physical signs that can be used to determine water or soil quality

Plume – an area in air, water or soil that is affected from a nearby source, e.g. a plume of smoke around an erupting volcano

Prediction – an educated guess of what will happen in the future, can be based on existing knowledge or experience where possible

Progressive Reclamation – starting to repair certain areas of land damage by mining activity while the rest of the mine is still operating; focus is on areas where mining activities are complete

Research – a structured way to test questions on unknown features of the environment, e.g. reasons why a change may be happening

Risk Assessment – a way to identify possible harmful effects by looking at how harmful the effect could be and how often it could occur. After risks have been identified, management actions are defined.

Sediment Chemistry – the mineral content of dirt particles that sit on the bottom of the lake

Seepage – a release of water or other liquid material that flows through or out of a containment area

Total Suspended Particulates - small particles in the air that measure 100 micrometers in size (which is slightly larger in size than the diameter of a human hair at 75 micrometers)

Trophic Status – a measure of lake productivity based on how many plants are in the lake

Water Quality – an overall characterization of the chemical (nutrients or metals), physical (temperature) and biological (algae) features of water in a lake or river

1. Environmental Agreement Annual Reporting Commitments

Section 12.1 of the EA outlines the content to be reported annually to the Parties, the Government of Nunavut, and the Advisory Board on June 30th (submission date revised from March 31st in 2003), as outlined in Table 1.

Table 1: Summary of EA Commitments in Relation to the 2013 EAAR

EA Commitment	Plain Language Interpretation (from EMAB)
Comprehensive summary of all supporting information, data and results from the Environmental Monitoring Programs and all studies and research	A full summary of all supporting information, data and results from the Environmental Monitoring Programs, plus all studies and research related to these
Rolling summary and analysis of environmental effects data over the life of the Project; compare results to predictions in environmental assessment & CSR, and illustrate any trends	A summary that adds in data of each year and an analysis of environmental effects data over the life of the Project - to show patterns over the years
Comprehensive summary of all compliance reports required by the Regulatory Instruments	A full summary of all reports on how Diavik has followed all rules and regulations in the Regulatory Instruments
Comprehensive summary of operational activities during the preceding year	A full summary of mining activities during the year up to the annual report
Actions taken or planned to address effects or compliance problems	The ways Diavik is fixing any environmental effects or problems following rules and regulations
Comprehensive summary of operational activities for the next year	A full summary of mining activities for the next year
Lists and abstracts of all Environmental Plans and Programs	Lists and summaries of all Environmental Plans and Programs
Verification of accuracy of environmental assessments	A check that environmental assessments are correct
Determination of effectiveness of mitigative measures	A report on how well steps to lessen effects are working
Comprehensive summary of all adaptive management measures taken	A full summary of all adaptive management steps taken
Comprehensive summary of public concerns and responses to public concerns	A full summary of public concerns and responses to public concerns
Comprehensive summary of the new technologies investigated	A full summary of the new technologies Diavik has looked into

EA Commitment	**Plain Language Interpretation (from EMAB)**
Minister's comments, including any Minister's Report, on the previous Annual Report	The Minister's comments on the Annual Report from the year before, including any Minister's Report
Plain language executive summary and translations into Dogrib, Chipewyan, and Innuinaqtun using appropriate media	Plain English executive summary translated into Dogrib, Chipewyan, and Innuinaqtun

2. Introduction

Diavik and the Environmental Agreement

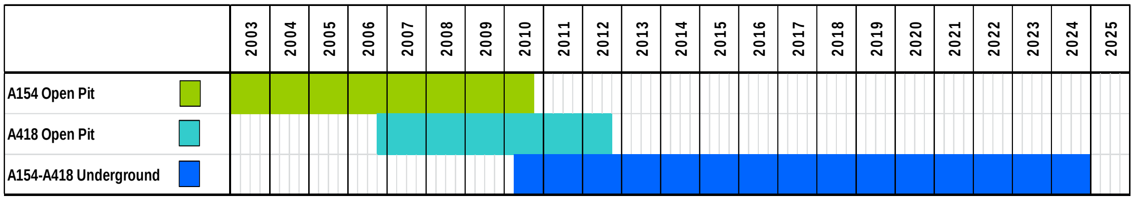
The Diavik diamond mine is located on the East Island of Lac de Gras, in Canada's Northwest Territories, approximately 300 kilometers northeast of the capital city of Yellowknife. The lake is roughly 60 kilometers long and drains into the Coppermine River all the way north to the Arctic Ocean. Diavik Diamond Mines Inc. (DDMI) undertook an Environmental Assessment that started in 1998 through the Canadian Environmental Assessment Agency. The mine has been operating since 2003, and protecting the environment around the mine continues to be important.

Diavik signed an Environmental Agreement ("the Agreement" or EA) with 5 Aboriginal organizations and the federal and territorial governments in 2000. The Agreement says what Diavik is to do to protect the environment while operating and closing the mine.

There was also an Environmental Monitoring Advisory Board (EMAB) formed as part of the Agreement; the Board is a public watchdog of the regulatory process and the implementation of the EA.

The Diavik diamond mine was in its eleventh year of operations during 2013, and it is now an all-underground mine. A third kimberlite pipe (A21) has been approved for mining, but DDMI's plans to mine this pipe are currently on hold. The figure below shows a timeline of Diavik's mine plan, which shows mining activities planned for the next several years. Additional operational activities that are planned for 2014 include: PKC dam raise, Pond 5 liner repairs, process pipeline and pump repairs, pump and power station installation for the underground mine, and a continued reduction in the overall mine footprint.

Diavik's Planned Schedule of Operations



Notes:

- Feasibility of the A21 Kimberlite continues to be assessed.
- Mining schedule as of March 2013 - subject to change due to market conditions, further mineral resource evaluation, ongoing mine planning updates, etc.

This report summarizes the results of Diavik's environmental monitoring and management programs during 2013. Complete copies of the numerous reports that Diavik submits each year can be found on-line in the EMAB library (http://www.emab.ca/Library.aspx) or Wek'èezhìi Land and Water Board public registry (http://www.mvlwb.ca/Boards/WLWB/SitePages/search.aspx?app=W2007L2-0003).

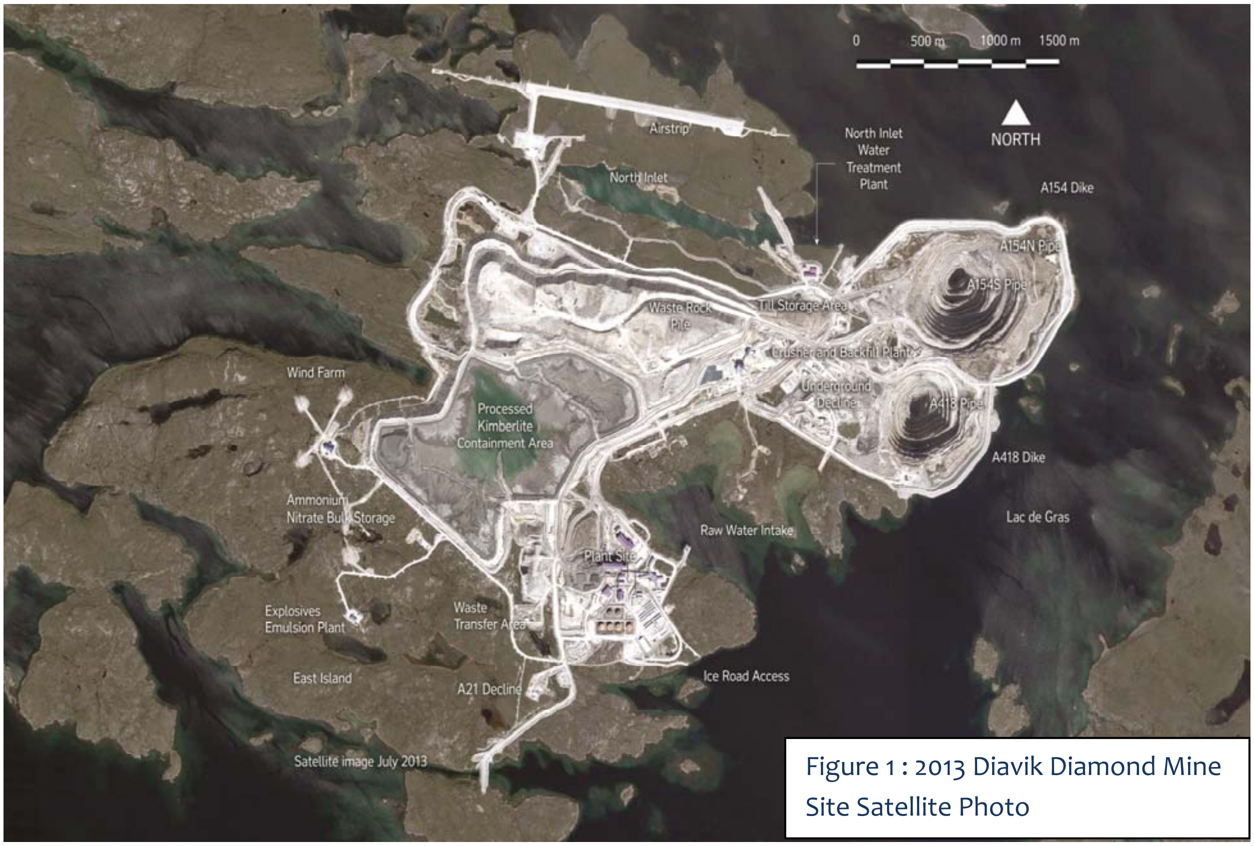


Figure 1 : 2013 Diavik Diamond Mine Site Satellite Photo

3. Environmental Programs and Plans - 2013

Diavik's Environmental Management System (EMS) is designed to meet the internationally-recognized ISO 14001 standard. First certified in 2004, audits (reviews) are done every year by an independent, external organization that checks Diavik's performance against the standard. The EMS and the ISO 14001 standard are based on the idea of continual improvement, and this theme is the foundation for Diavik's environmental objectives, targets, plans, programs and procedures. Diavik passed this review again in 2013 and maintained our EMS certification.

This section contains an outline of the various environmental plans and programs that Diavik follows. For each plan/program, a brief outline is provided that explains why the program is being done and/or how it is completed. Many of these plans and programs are the same from one year to the next. As stated in Diavik's Water License, plans that have not changed do not require updates; those that have been updated and submitted for regulatory approval during 2013 are identified in Table 3. Additionally, Appendix I contains a list of mitigation measures and adaptive management actions that have been implemented during mine operations.

Monitoring Programs

Monitoring programs are designed to track changes to the environment as a project develops, and are usually linked to predictions from an Environmental Assessment. Monitoring programs required for Diavik are summarized within the water license (W2007L2-0003), Fisheries Authorization or EA.

Aquatic Effects (Lake Water Quality & Fish Health)

The Aquatic Effects Monitoring Program (AEMP) is the primary program specified in the water license for monitoring the aquatic environment of Lac de Gras.

The AEMP is designed to measure short and long-term changes in Lac de Gras, check results against predictions, measure the performance of operations and determine the effectiveness of mitigation (preventive) measures. Every year Diavik collects different types of samples in Lac de Gras. These samples may include lake water (chemistry/quality), sediment (chemistry/quality), benthic invertebrates (type and amount of bugs that live in the sediment on the bottom of the lake) and plankton (type and amount of tiny plants and animals that float in the water). There are 37 sample locations in Lac de Gras (Figure 2) and these may be sampled under ice cover and during open water, depending on the year and type of sample. Samples were collected twice – once from under the ice (10 to 19 April 2013) and once during the open water season (18 August to 7 September 2013).

Sampling efforts focus on sampling stations in Lac de Gras that are located closer to the mine (where effects would first be expected to be measured). There are also sampling stations far away from the mine (where effects would take much longer to measure). Comparing information from both places allows changes in the lake caused by the mine to be measured over time (temporal) and can be measured near the mine site and further away (spatial).

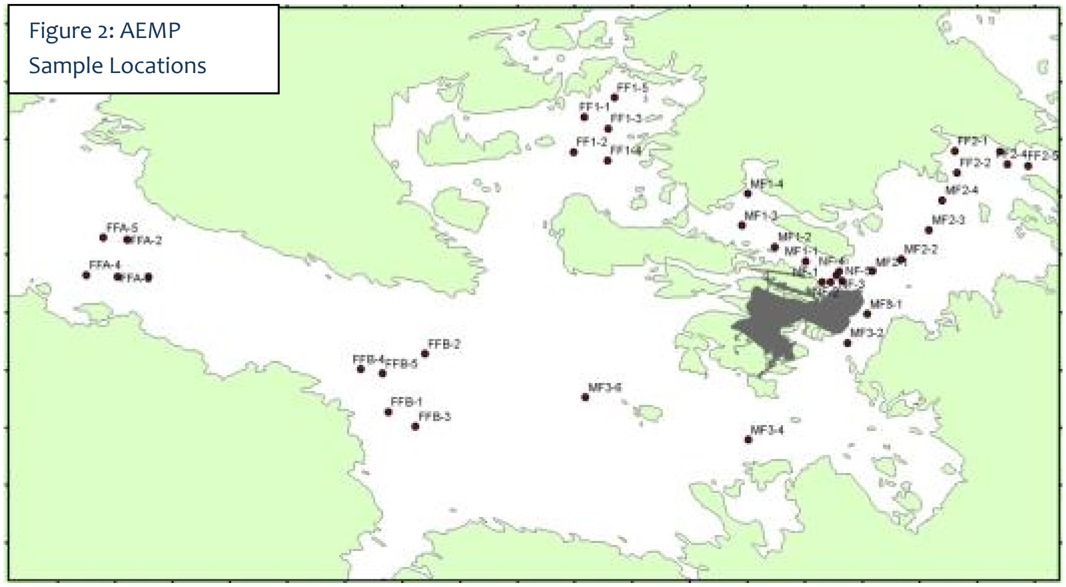


Figure 2: AEMP Sample Locations

During the Environmental Assessment that was completed before the mine was built, it was predicted that the mine would cause some effects on the lake. The purpose of the AEMP is to see if those predictions were correct and to make sure the effects don't harm the fish in Lac de Gras. For example, it is expected, and was predicted, that increasing nutrient levels in the lake would affect aquatic organisms because Lac de Gras is historically a nutrient-poor lake (oligotrophic), and plants and animals in the lake are used to surviving with limited nutrients. When growth-encouraging nutrients, such as phosphorus (which is naturally found in the groundwater) and nitrogen (left over from blasting chemicals), are introduced into the lake, it can potentially lead to increased plant growth that reduces the amount of oxygen available to other plants and animals in the water. To reduce such effects, Diavik has strict water management practices and a Water Treatment Plant to treat mine water before it is discharged back into Lac de Gras.

Even the best technology cannot completely remove all chemicals from the treated mine water that is put back into the lake. For this reason, when certain effects are measured that were not predicted, Diavik may conduct Special Effects Studies as part of the AEMP. Special Effects Studies are conducted to focus on specific areas based on data and results from the AEMP (e.g. a plume delineation program to determine the area of the treated effluent in Lac de Gras).

Through an inclusive process administered by the WLWB, the AEMP was updated and revised in 2013. The document, titled "Diavik Diamond Mine Aquatic Effects Monitoring Program Study Design Version 3.3", contains the final 2013 AEMP design specifications and methods (it says what Diavik will do to complete the AEMP and how it will be done). The design of the field sampling program was approved by the WLWB, and a change in the classification of effects/action levels was completed in 2013 (Tables 2, 3 and 4). The range of possible effects for various environmental risks to Lac de Gras has been categorized according to Action Levels. The effect classifications were developed to meet the goals of the Response Framework for Aquatic Effects Monitoring that was written by the WLWB. The goal of the Response Framework is to ensure that the level of environmental change, measured by the aquatic effects monitoring program, results in a management action well before effects that could be harmful to the lake can happen.

Table 2: Action Levels for Water Chemistry, Excluding Indicators of Eutrophication

Action Level	Magnitude of Effect [a]	Extent of Effect	Action/Notes
1	Median of NF greater than 2X median of reference areas (open water or ice cover) and strong evidence of link to Mine	Near-field (NF)	Early warning.
2	75th percentile of NF values greater than normal range [b]	Near-field	Establish *Effects Benchmark* if one does not exist.
3	75th percentile of MZ values greater than normal range plus 25% of Effects Benchmark [c]	Mixing zone (MZ)	Confirm site-specific relevance of Effects Benchmark. Establish *Effects Threshold*. Define the Significance Threshold if it does not exist. The WLWB to consider developing an Effluent Quality Criteria (EQC) if one does not exist
4	75th percentile of MZ values greater than normal range plus 50% of Effects Threshold [c]	Mixing zone	Investigate mitigation options.
5	95th percentile of MZ values greater than Effects Threshold	Mixing zone	The WLWB to re-assess EQC. Implement mitigation required to meet new EQC if applicable.
6	95th percentile of NF values greater than Effects Threshold + 20%	Near-field	The WLWB to re-assess EQC. Implement mitigation required to meet new EQC if applicable.
7	95th percentile of MF values greater than Effects Threshold + 20%	Mid-field (MF)	The WLWB to re-assess EQC. Implement mitigation required to meet new EQC if applicable.

Action Level	Magnitude of Effect [a]	Extent of Effect	Action/Notes
8	95th percentile of FFB values greater than Effects Threshold + 20%	Far-field B (FFB)	The WLWB to re-assess EQC. Implement mitigation required to meet new EQC if applicable.
9	95th percentile of FFA values greater than Effects Threshold + 20%	Far-field A (FFA)	Significance Threshold.

a – Calculations are based on pooled data from all depths.

b – The normal range will be based on AEMP Version 2.0 data; however, the normal range for open-water will be based on the August 15 to September 15 period only.

c – Indicates 25% or 50% of the difference between the benchmark/threshold and the top of the normal range.

Table 3: Action Levels for Biological Effects

Action Level	Plankton	Benthic invertebrates	Fish Health	Extent	Action
1	Mean biomass or richness significantly less than reference area means	The mean of a community index [b] significantly less than reference area means	Statistical difference from reference indicative of toxicological response[c]	Near-field	Confirm effect
2	Mean biomass or richness significantly less than reference area means	The mean of a community index [b] significantly less than reference area means	Statistical difference from reference indicative of toxicological response	Nearest Mid-field station	Investigate cause
3	Mean richness less than normal range	The mean of any measurement endpoint[b] less than normal range	A measurement endpoint beyond the normal range	Near-field	Examine ecological significance Set Action Level 4 Identify mitigation options
4	TBD[a]	TBD[a]	TBD[a]		Define conditions required for the Significance Threshold
5[d]	Decline in biomass or richness likely to cause a >20% change in fish population(s)	Decline of community indices[b] likely to cause a >20% change in fish population(s)	Indications of severely impaired reproduction or unhealthy fish likely to cause a >20% change in fish population(s)	Far-field A (FFA)	Significance Threshold

a – To be determined if an Action Level 3 effect is reached.

b – Refers to indices such as total density, richness, Simpson's diversity index, Bray-Curtis index and densities of dominant taxa.

c – Such a response could include a decrease in recruitment (fewer young fish), smaller gonads, reduced fecundity, changes to liver size, changes in condition, increased incidence of pathology, reduced growth, reduced survival.

d – Significance Threshold.

Table 4: Action Levels for Chlorophyll *a*

Action Level	Magnitude of Effect	Extent of Effect	Action/Notes
1	95th percentile of MF values greater than normal range [a]	Mid-field (MF) station	Early warning.
2	Near-field (NF) and MF values greater than normal range	20% of lake area or more	Establish *Effects Benchmark*.

Action Level	Magnitude of Effect	Extent of Effect	Action/Notes
3	NF and MF values greater than normal range plus 25% of Effects Benchmark[b]	20% of lake area or more	Confirm site-specific relevance of existing benchmark. Establish *Effects Threshold*.
4	NF and MF values greater than normal range plus 50% of Effects Threshold [b]	20% of lake area or more	Investigate mitigation options.
5	NF and MF values greater than Effects Threshold	20% of lake area or more	The WLWB to re-assess EQC for phosphorus. Implement mitigation required to meet new EQC if applicable.
6	NF and MF values greater than Effects Threshold +20%	20% of lake area or more	The WLWB to re-assess EQC for phosphorus. Implement mitigation required to meet new EQC if applicable.
7	95th percentile of MF values greater than Effects Threshold +20%	All MF stations	The WLWB to re-assess EQC for phosphorus. Implement mitigation required to meet new EQC if applicable.
8	95th percentile of FFB values greater than Effects Threshold +20%	Far-field B (FFB)	The WLWB to re-assess EQC for phosphorus. Implement mitigation required to meet new EQC if applicable.
9	95th percentile of FFA values greater than Effects Threshold+20%	Far-field A (FFA)	Significance Threshold.

a – The normal range will be based on AEMP Version 2.0 data, from the August 15 to September 15 period only.
b – Indicates 25% or 50% of the difference between the benchmark and the top of the normal range.

The types of samples taken and the methods for obtaining samples has remained largely the same, but the frequency with which samples are taken is provided in Table 5. An annual report of the results is submitted in March, and a multi-year analysis is submitted every 3 years (next due in October 2014).

Table 5: AEMP Sampling Schedule

	AEMP Version 3.0						AEMP Version 4.0					
	2012		2013		2014		2015		2016		2017	
Component	IC	OW	IC	OW	IC	OW	IC	OW	IC	OW	IC	OW
Water Quality - Mixing Zone Boundary [a]	√	√	√	√	√	√	√	√	√	√	√	√
Effluent Plume (conductivity)	√	√	√	√	√	√	√	√	√	√	√	√
Water Quality - Routine, Nitrogens and Metals (basic program)	√	√	√	√	√	√	√	√	√	√	√	√
Water Quality - Routine, Nitrogens and Metals (comprehensive program)			√	√					√	√		
Total Phosphorus, Total Nitrogen	√	√	√	√	√	√	√	√	√	√	√	√
Chlorophyll *a*		√		√		√		√		√		√
Phytoplankton				√						√		
Zooplankton				√						√		
Sediment Quality				√						√		

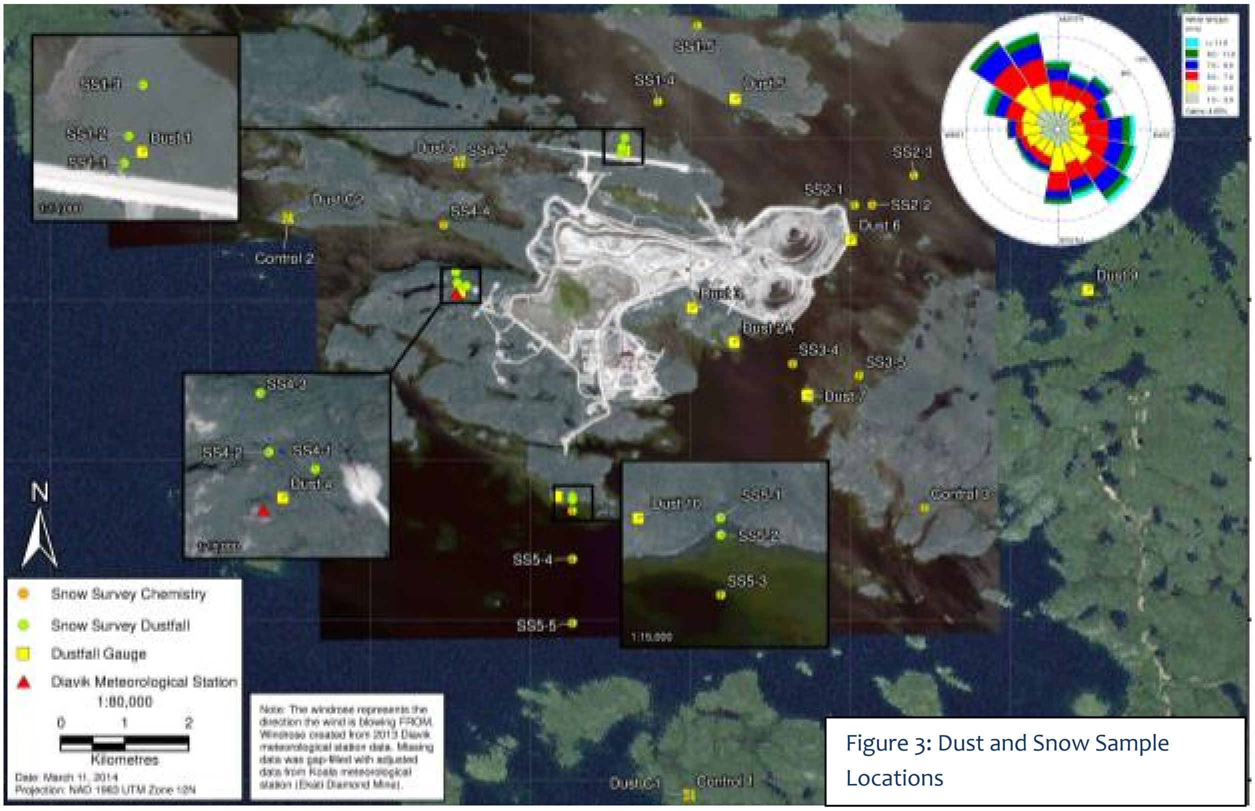
	AEMP Version 3.0						AEMP Version 4.0					
	2012		2013		2014		2015		2016		2017	
Component	IC	OW	IC	OW	IC	OW	IC	OW	IC	OW	IC	OW
Benthic Invertebrates				√						√		
Large Bodied Fish - Palatability and Tissue Chemistry		√						√				
Large Bodied Fish - Fish Tissue Mercury						√						√
Large Bodied Fish - Fish Health										[b]		
Small Bodied Fish - Fish Health				√						√		
Dust Deposition	√	√	√	√	√	√	√	√	√	√	√	√
TEK Program		√						√				
Annual AEMP Report [c]	√		√		√		√		√		√	
AEMP Three-year Summary Report[d]					√						√	
AEMP Updated Design Document						√						√

Notes: IC = ice-cover period; OW = open-water period. a - Water quality sampling at the mixing zone boundary is conducted on a monthly basis. b - Sampling to be conducted only if triggered by 2013 small-bodied fish results. c – Annual AEMP reports will be submitted in March. d - 3-year summary AEMP reports will be submitted in October.

Air Quality (Dustfall & Emissions)

Air, wildlife and water quality concerns related to dust in the air, on the ground or in the water from mining activities were identified by all parties to the Diavik Diamond Mine EA as a concern. As part of the environmental monitoring program and commitments outlined in the Environmental Effects Assessment report and Comprehensive Study Report, Diavik has developed a program to measure dust deposition resulting from mining activities that has been ongoing since 2001. The program goal is to understand dust deposition rates caused by project activities, and the program provides data to support the Wildlife Effects and Aquatic Effects monitoring programs. The objectives of annual monitoring for dust deposition are to:

- Measure dust deposition rates at various distances from the mine, using snow core samples and dust gauges; and,
- Determine physical and chemical characteristics of dust that may be deposited from mining activities.



Note: The windrose represents the direction the wind is blowing FROM. Windrose created from 2013 Diavik meteorological station data. Missing data was gap-filled with adjusted data from Koala meteorological station (Ekati Diamond Mine).

Figure 3: Dust and Snow Sample Locations

The sampling stations for the Dust Deposition Monitoring Program (Figure 3) were established through a transect approach (series of sample locations that extend outwards on ice and land in five generally straight lines from the mine site) and include:

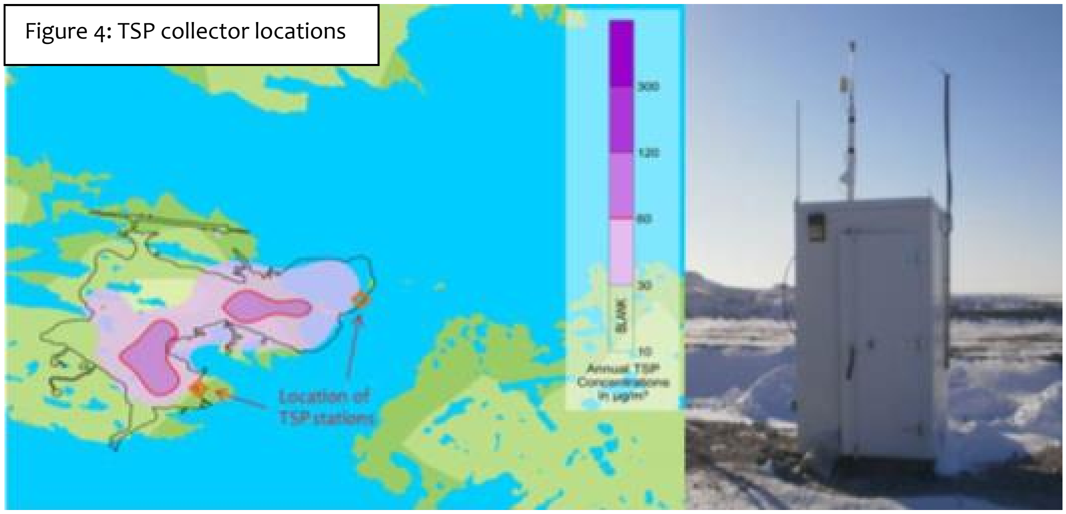
- 12 permanent dustfall gauges - fixed-location sampling devices that collect dustfall for analysis all year long; and,
- 24 seasonal snow survey stations - GPS locations where Diavik collects snow samples to measure the amount of dustfall deposited over the winter (24 samples) and the water quality of the snow where dust was deposited on the lake (16 samples).

They are sampled each year and results have been compared with the British Columbia (BC) dustfall objective for the mining, smelting, and related industries. This objective is used by some mines in the Northwest Territories (NWT) for comparison purposes only, as there are no standards or objectives for the NWT. An annual report is submitted in March as an appendix to the AEMP report.

For the past couple of years, Diavik has been discussing the development of an Air Quality Monitoring Plan with communities, EMAB and government. This plan was finalized and implemented in 2013, and includes:

- Updated dispersion model for life-of-mine emissions predictions based on current operating plans;
- Installation and operation of 2 continuous ambient air sampling stations for Total Suspended Particulates (TSP – small particles in the air that measure 100 micrometers in size, which is slightly larger in size than the diameter of a human hair at 75 micrometers).

Figure 4: TSP collector locations



One of the goals of monitoring is to assist in identifying trends in dust deposition beyond the disturbed area of the Mine. The dispersion modelling was used to determine appropriate locations for TSP monitoring stations. Stations were located in areas near to the edge of the mine footprint (as a power source is needed) and considered the prevalent winds and predicted TSP deposition patterns (Figure 4). The monitoring of TSP concentrations is continuous, and hourly concentrations are recorded. TSP monitoring will be conducted continuously for one year, after which the program will be re-assessed to determine the suitability of the monitoring locations and if monitoring is still required.

Surveillance Network Program (Water Quality at the Mine Site)

Diavik monitors water quality around the mine site in accordance with the Surveillance Network Program (SNP), which is a component of Diavik's water license. The SNP outlines where Diavik collects water samples, how often samples are collected, and what parameters (metals, nutrients and other water quality characteristics) are to be measured. The SNP includes sample stations for:

- North Inlet Water Treatment Plant (NIWTP) effluent;
- Lac de Gras water near the NIWTP effluent discharge;
- Pit Water;
- Underground Water;
- PKC Water;
- North Inlet Water;
- Collection Ponds;
- Seepage and Groundwater Stations; and
- Sewage Treatment Plant effluent.

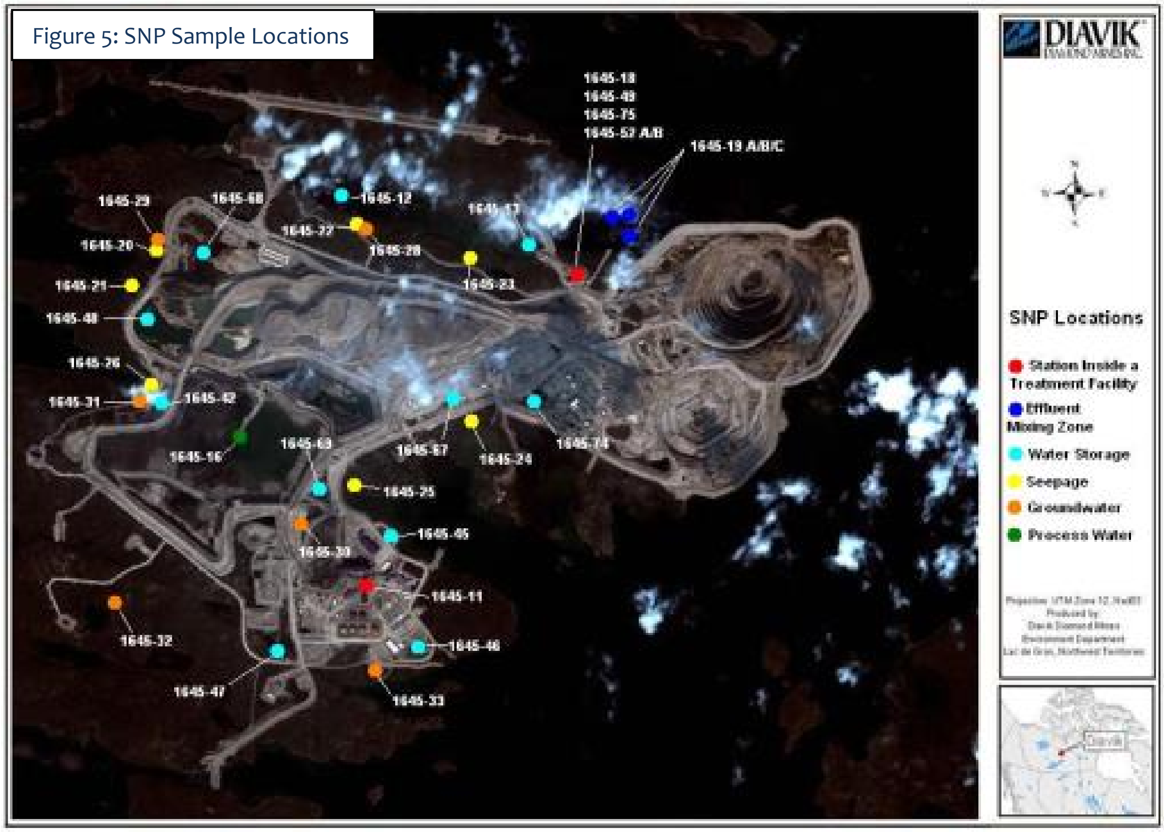


Figure 5: SNP Sample Locations

The SNP also outlines sampling requirements for discharges to Lac de Gras during dewatering activities, but no dewatering activities (e.g. dike construction) occurred in 2013. Each month Diavik submits an SNP report to the WLWB outlining the previous month's SNP results. SNP data for the year is also compiled and presented in the Type 'A' Water License Annual Report.

Diavik monitors dams and dikes around the mine site for seepage. The dikes and dams are designed to hold back water; however, some seepage through these structures is expected. The purpose of the survey is to check areas of potential seepage so that Diavik can take appropriate measures to address seepage issues. The monitoring includes regular inspections of the dam and dike structures and collection of water samples. Water samples are collected as part of regular monitoring (seepage stations and groundwater wells) and when a new seepage is observed. Typically, seepage occurs from May through to the beginning of October. The PKC contains enough water that it does not completely freeze in the winter, and therefore seepage can occur all year round. Each year, Diavik submits a Seepage Survey Report to the WLWB in March, detailing seepage monitoring and sampling from the previous year. Diavik regularly updates the AANDC Inspector of how Diavik is (or plans to) address seepage issues at the mine site.

Diavik has a drainage control and collection system to intercept seepage before it enters Lac de Gras; these are called collection ponds, and they are monitored as part of the seepage survey. There are some times where runoff from other areas of the mine may not go into a pond and will enter Lac de Gras, but it is usually a small amount of water for a short period of time.

Wildlife & Plant Monitoring

As per the EA, Diavik developed a Wildlife Monitoring Program to check the accuracy of predictions in the Environmental Assessment and to assess the effectiveness of actions that have been taken to reduce impacts to wildlife. This program was developed based on information from four years (1995 – 1998) of wildlife baseline studies, community consultation, recommendations developed during the Environmental Assessment, and years of project activity monitoring. This program takes into consideration wildlife and wildlife habitat-based technical issues raised by the Environmental Monitoring Advisory Board (EMAB) and Environment and Natural Resources (ENR) during early reviews of this program. The program is now referred to as the Wildlife Monitoring and Management Plan (WMMP).

The WMMP is a method for observing, mitigating and improving procedures for wildlife and habitat management at the mine site. The WMMP is therefore closely linked with Diavik policies and guidelines, management plans and standard operating procedures (SOPs). There are several SOPs to protect wildlife and these are evaluated as part of the WMMP.

The program includes monitoring the following:

- Vegetation/Wildlife Habitat;
- Caribou;
- Caribou Advisory;
- Caribou Mitigation Effectiveness;
- Grizzly Bear;
- Wolverine;
- Waste Management;
- Raptors; and
- Waterfowl.

The Wildlife Monitoring and Management Plan is adaptive. It can be changed in response to changes or unexpected outcomes that are identified from monitoring or from new information. An annual report is submitted in March, and a more detailed statistical review of the data, the Analysis of Environmental Effects for Wildlife, is conducted every three years (scheduled for submission in May 2014).

Management & Operations Plans

Management and operations plans are site-specific documents that identify potential environmental issues and outline actions to minimize possible impacts that could result from mining activities. They are to be reviewed by DDMI each year and updated as required (i.e. if something changes). Table 6 lists the management and operations plans required under DDMI's water license, provides a brief summary of the purpose of the plans and identifies which plans were updated for 2013.

Table 6: Management & Operations Plans for the Diavik Mine

Plan & Version Number	Purpose	Updated in 2013 (Y/N)	Updates
Ammonia Management Plan, v5	To assist in achieving the lowest practical amount of ammonia from explosives that would enter the mine water and waste water streams. The plan details how ammonia management performance is evaluated, and includes details of ammonia management techniques.	No	N/A
Interim Closure & Reclamation Plan v3.2	Outline closure goals (overall vision for what the organization would like to achieve), objectives (steps the organization needs to take to achieve the goals – specific and measureable) and criteria (a standard against which success is measured), and includes engineering designs and research programs for closure of all the major components of the mine. Because it is a plan that evolves over time, it does not yet include final closure designs or details on specific after-closure monitoring programs.	Yes	- Community engagement in 2013 - Closure research - Changes to design concepts (PKC) - Seepage water quality estimates - Reduced closure security value - Mine footprint reductions
Waste Rock Management Plan v6	Rock types that surround the kimberlite may have minerals in them that can cause water to become acidic when it runs over the rock, so methods to test, identify, separate and contain the rock are provided in order to reduce the chance of acidic runoff.	No	N/A
Hazardous Materials Management Plan, v17	Describe procedures for the safe and efficient transport, storage, handling and use of chemicals for mining. Prevention, detection, containment, response, and mitigation are the key elements in the management of hazardous materials. The plan also describes how hazardous materials will be removed from site during closure.	Yes	• Hazardous Materials Storage list (Table 1-1) • Roles & responsibilities • Legal operating name
Operational Phase Contingency Plan, v18	Describe response procedures for any accidental release (spill) of hazardous or toxic substances, as well as procedures for water management. The OPCP outlines the responsibilities of key personnel and gives guidelines for minimizing impacts to the environment, including contingencies for the underground mine.	Yes	• Addition of Appendix E – Underground Spill Management & Reporting

Plan & Version Number	Purpose	Updated in 2013 (Y/N)	Updates
Water Management Plan, v12	Describe how water around the site is moved, treated, monitored and controlled in different areas around the mine site. Also includes a 'water balance', which gives Diavik an idea of the amount and location of water on site at any given time, so that plans can be made for handling and treating water.	Yes	- Departmental responsibilities - References to open pits, Ponds 6 & 7 - Water balance - List of SOP's removed as they change frequently - Addition of fish screen to water intake for dust control
Waste Management Plan, v17	Identify the types of waste generated on site and outlines methods for the minimization, collection, storage, transportation and disposal of wastes in a safe, efficient and environmentally compliant manner. Includes on- and off-site disposal options.	Yes	- Use of waste petroleum products in a waste oil boiler at the Backfill Plant
Processed Kimberlite Containment Facility Operations Plan, v2.1	Outline how to handle the water and solids within the PKC facility. Includes information on PKC design, dam construction, monitoring and characterization programs for water, ice & solids stored within the PKC. The plan also explains contingency and mitigation measures for the facility.	No	N/A
North Inlet Water Treatment Plant (NIWTP) Operation Manual, v1	Provide background information about the plant (area layout, design parameters, etc.), operational requirements of the plant (as it relates to water management both on site and within the plant) and plant maintenance requirements.	No	N/A
STP Facility Operations Plan, v3	A guide for operators of the plant that outlines the design and layout, operating guidelines and requirements, performance monitoring techniques and requirements, contingency planning, preventative maintenance and closure of the plant.	No	N/A

4. Results: Summary of Rolling Effects & Monitoring Program Changes

This section gives a summary of monitoring information and changes that have occurred to each program over time. Many of the changes have been made in response to data collected, observed deficiencies in study designs or based on feedback from various stakeholders. The Environmental Assessment included predicted indicators that would either stay the same over time or would change over time to pre-calculated predicted levels. The predictions for each indicator have been included in this section, followed by a summary of the information collected to verify those predictions over the years. Graphs and figures or tables are given where practical to show the trends over time. Where indicator trends are not similar to those predicted, DDMI has included a brief discussion of possible reasons. Further details can be found in the full reports that Diavik produces for each topic.

Climate and Air Quality

Will the mine development affect air quality around Lac de Gras?

EA Predictions:

- Ambient air quality objectives will not be exceeded; and

- The mine will be a very minor contributor of greenhouse gases.

Observations:

As predicted, dust deposition decreases as one moves away from the mine. The rate of dust being deposited is affected by activities at the mine (for example, higher dust deposition is typically measured at the airport compared to the west part of East Island where there is very little activity) as well as by wind direction (because wind carries the dust). These trends have been measured each year since dust monitoring began in 2001. Dust suppressants have been investigated for use on the airstrip, but the small runway size and nearness to the lake have prevented the safe use of such chemicals.

- In 2013, dust fall levels were lower than in previous years, with the exception of the area close to the airstrip (common with gravel runways) and an area downwind of the prevailing winds (Figure 6). The British Columbia (BC) dustfall objectives for the mining industry were used as a comparison against Diavik's dustfall levels, as there are no criteria for the NWT. Values recorded for each of the 12 dust gauges and 22 of the 24 snow survey stations were below the BC objective range of 621 to 1,059 mg/dm^2/y. The two stations that exceeded the BC objective were located beside the airstrip.

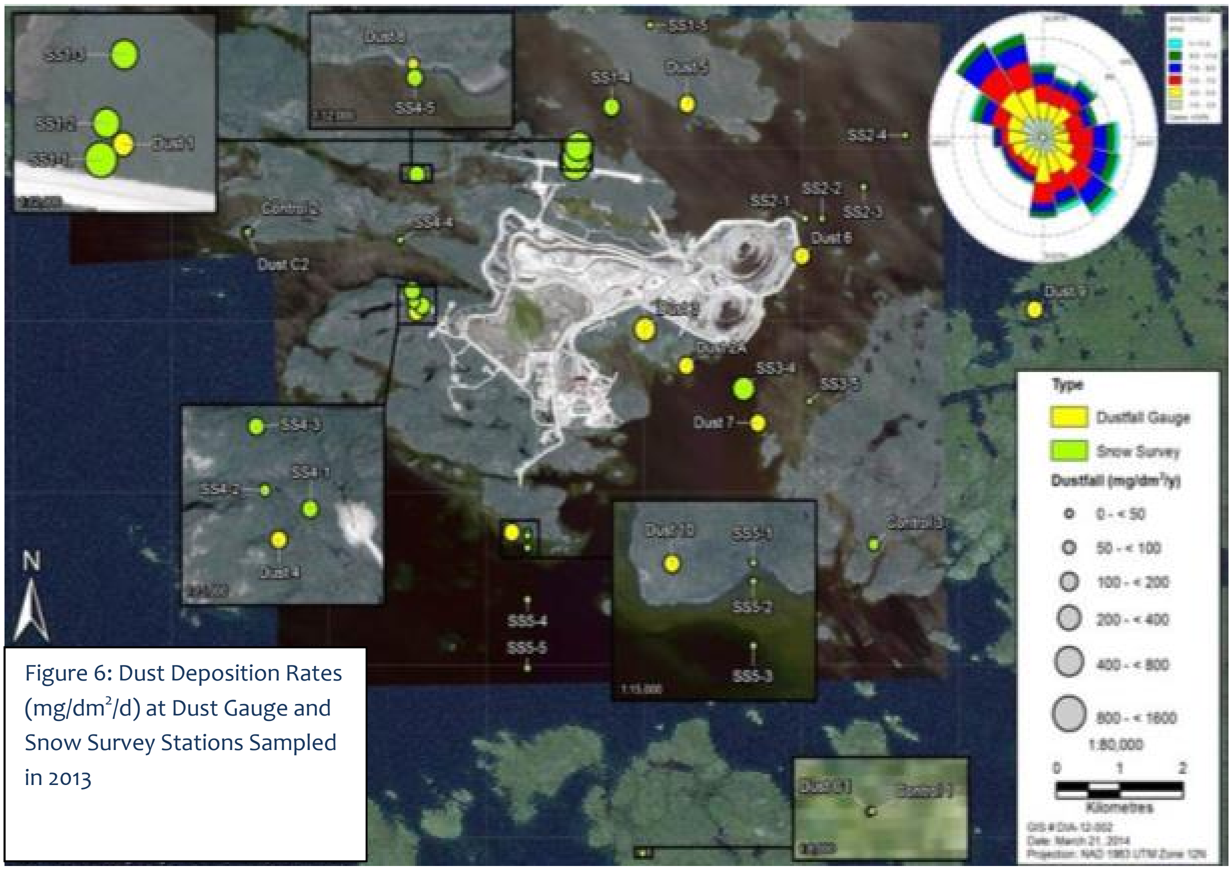
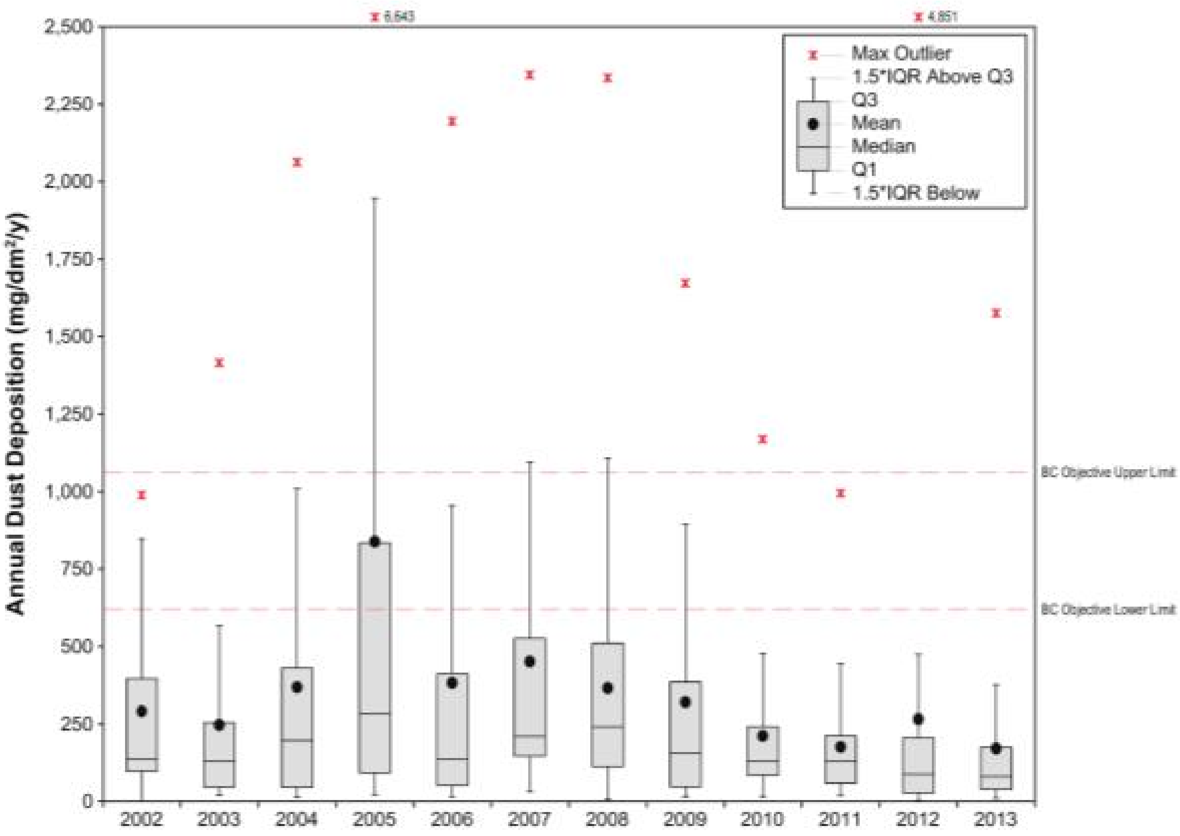


Figure 6: Dust Deposition Rates (mg/dm^2/d) at Dust Gauge and Snow Survey Stations Sampled in 2013

- In 2012 there was a decrease in dust levels at 7 of the 12 dust gauges as construction slowed down and Diavik transitioned from an aboveground to underground mine. Dust levels were still higher than predicted, most notably 250 meters (750 feet) from the airstrip. Dust levels were also higher near the PKC area, due to construction activities.

  For the past seven years, overall dust deposition rates have been more than what was predicted by models in the Environmental Effects Report, because that model did not account for additional construction and operational activities planned for underground mine development. However, all except one of the average dust deposition levels remained below the BC Objectives for mining (Figure 7).

Figure 7: Annual dust deposition rates compared to BC Objective for Mining - 2002 to 2013



- Snow water chemistry analyses (measurements of chemicals in the water from melted snow collected from 26-28 April 2013) indicate that the concentrations of regulated parameters (the chemicals in the Water License that Diavik must keep below set levels) measured in 2013 were below the maximum allowable concentration outlined in the Water License (Table 7) and also generally decreased for all parameters, except nickel, in comparison with past results.

Table 7: Summary of 2013 Snow Water Chemistry Analysis

Distance from Mine	Aluminum	Ammonia	Arsenic	Cadmium	Chromium	Copper	Lead	Nickel	Nitrite	Phosphorus	Zinc
Water License Limit	**3.0 mg/L**	**12.0 mg/L**	**0.1 mg/L**	**0.003 mg/L**	**0.04 mg/L**	**0.04 mg/L**	**0.02 mg/L**	**0.1 mg/L**	**2.0 mg/L**	**n/a**	**0.02 mg/L**
101-250 m	0.153	0.039	0.00012	0.000005	0.00114	0.00046	0.00024	0.0025	0.0033	0.0175	0.002
251-1000 m	0.531	0.083	0.0002	0.000011	0.00275	0.00156	0.00079	0.0065	0.0103	0.139	0.0043
	0.146	0.027	0.00007	0.000005	0.00081	0.00036	0.0002	0.0022	0.0037	0.0202	0.0019
	0.862	0.12	0.00044	0.000015	0.0101	0.00271	0.00253	0.0305	0.0079	0.0982	0.0094
1001-2500 m	0.13	0.034	0.00008	0.000005	0.0008	0.027	0.00022	0.0018	0.0032	0.0091	0.0015
	0.094	0.032	0.00011	0.000005	0.00053	0.00035	0.00016	0.0013	0.002	0.0174	0.0012
	0.108	0.052	0.00018	0.000005	0.00041	0.0131	0.00072	0.0009	0.002	0.0112	0.002

Distance from Mine	Aluminum	Ammonia	Arsenic	Cadmium	Chromium	Copper	Lead	Nickel	Nitrite	Phosphorus	Zinc
	0.072	0.055	0.00006	0.000005	0.00074	0.00038	0.00011	0.0025	0.0025	0.0143	0.0012
	0.103	0.05	0.0001	0.000005	0.00115	0.00334	0.00023	0.0035	0.002	0.0081	0.0014
	0.24	0.076	0.00009	0.000005	0.00396	0.0006	0.00047	0.0129	0.0046	0.0514	0.0025
	0.061	0.025	0.00008	0.000005	0.00106	0.00047	0.00015	0.0036	0.0022	0.0139	0.0017
	0.044	0.02	0.00004	0.000005	0.00082	0.00028	0.0001	0.003	0.0023	0.0065	0.001
>2500 m (Control)	0.028	0.019	0.00003	0.000005	0.00049	0.0003	0.00006	0.0011	0.002	0.0062	0.0015
	0.057	0.022	0.00006	0.000005	0.00068	0.00024	0.00009	0.002	0.0039	0.007	0.0013
	0.139	0.015	0.00013	0.000005	0.00217	0.00057	0.00024	0.0068	0.002	0.019	0.0033

- Diavik began revisiting air quality modelling (last completed in 1998 as part of the Environmental Assessment) to further assess dust deposition and other air quality parameters. During 2012, input on a revised model and monitoring approach was obtained from Environment Canada and the GNWT, and the prediction of deposition rates was completed. An Air Quality Monitoring Program was finalized and implemented during 2013.

  Analysis of the trends in TSP can be used to inform dust control practices and changes to monitoring programs. Diavik will analyze and present the TSP data, and calculate the average annual TSP concentration, from both monitoring stations each year. The 24-hr and average annual data will be examined for trends or variations and compared with updated air dispersion modelling assessment predictions, which will each be clearly indicated on graphs. Seasonal influences or other events may result in elevated TSP concentrations, so such occurrences will be compared with known site activities to assist with identification of a possible source. Weather data also plays a key role in the interpretation of air quality data; for example, wind direction and wind speed directly affect the direction and dispersion of TSP. Important weather information that may help to explain the TSP results will also be presented. and will be used to update and modify the dust management SOP's incorporated in the Environmental Management System (EMS) if necessary.

  TSP monitoring and emissions data collected during each year will be summarized in an annual report and entered into the National Pollutant Release Inventory (NPRI). After a period of one year, TSP monitoring will be re-assessed to determine the suitability of the monitoring methods, locations, interpretation and reporting. Diavik does not yet have sufficient experience with TSP monitoring results to develop site-specific action levels, so these will be considered at the end of the first monitoring year. The specific results for the 2013 monitoring year have not been included in this report, as the annual report is to be submitted to EMAB and the GNWT on 30 June of the following year (i.e. 30 June 2014). Results may be used to update or modify dust management SOP's that are a part of the mine site EMS.

- Total greenhouse gas emissions for Diavik in 2013 were 192,544 tonnes of CO_2*e*, a slight reduction from previous years, with the exception of 2012 (184,817 CO_2*e*). *"CO2 e"* is an abbreviation of 'carbon dioxide (CO_2) equivalent'. CO_2 is a greenhouse gas, but there are many more greenhouse gases. To make it easier to understand greenhouse gases, a standardized method is to report all of the greenhouse gases from a site together as if they were equal to a set volume of CO_2; this is the *CO2e* referred to above. The 2013 emissions level was largely because of a new fresh air raise for the underground mine. Diavik needs to heat and pump fresh air down into the mine, and diesel fuel is used to do this. However, the wind turbines were able to offset carbon dioxide emissions by 10,726 tonnes in 2013.

Vegetation and Terrain

How much vegetation/land cover will be directly affected by the mine development?

EA Predictions:

- Approximately 12.67 km^2 of vegetation/land cover will be lost at full development; and

- Slow recovery of vegetation following mine closure.

Observations:

- There was a very slight increase in direct vegetation/habitat loss in 2013 due to mine development. Total habitat loss to date from mining activities is 10.12 km^2. This is within the predicted amount of 12.67 km^2. The map below shows the land disturbed over time on the Diavik mine footprint. The table below shows a running total of the habitat loss to date.

Table 8: Cumulative Habitat Loss Each Year

Predicted Vegetation Habitat Loss (km^2)	**Up to 2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
12.67	3.12	5.88	6.32	7.30	8.15	8.86	9.40	9.66	9.78	9.65	9.71	10.1	10.12

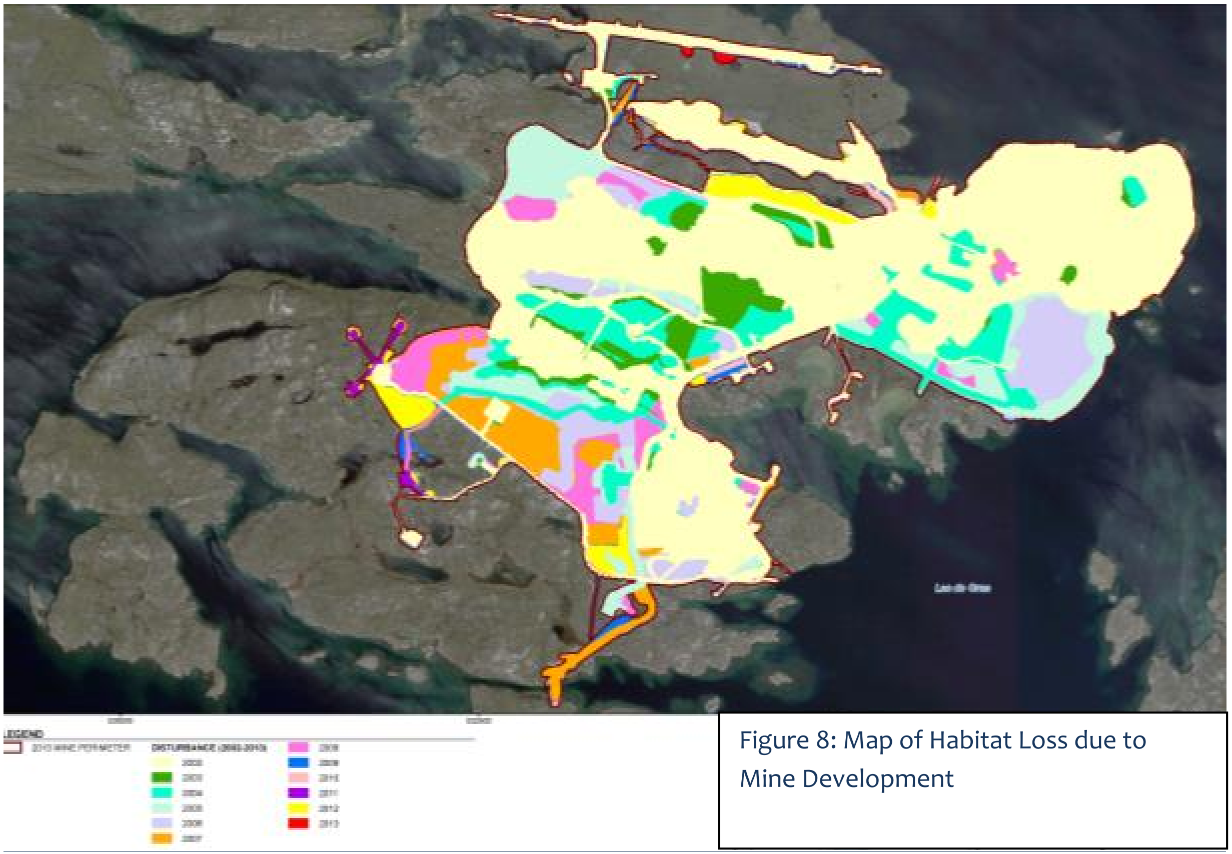


Figure 8: Map of Habitat Loss due to Mine Development

<u>How will the vegetation communities outside the mine footprint be changed as a result of mine development?</u>

EA Prediction:

- Localized changes in plant community composition adjacent to mine footprint due to dust deposition and changes in drainage conditions.

Observations:

- Permanent vegetation plots (PVPs) were established close to and far from the mine site in 2001 to monitor if there are differences in vegetation and ground cover near the mine and farther away from the mine. The program is conducted every 3 years and in 2004, the program expanded to include 15 mine plots and 15 reference plots (far from the mine). In each of these areas, 5 sample plots for each of 3 vegetation types (heath tundra, tussock-hummock and shrub) were set up so as to reduce within site variability of plant communities (which was high) and increase the likelihood of capturing true change in plant abundance between mine and reference areas over time. Figure 9 shows the PVP locations.

  Results from the 2013 study showed that dust on vegetation may be changing the amount (abundance) and types (composition) of some plant species in vegetation types near the mine. Lichen cover on heath tundra and shrub mine plots continues to decrease over time, while the average numbers of vascular plants (e.g. grasses, small plants) in these same areas are increasing. This has also been observed in other studies looking at the effects of road dust on different types of plants.

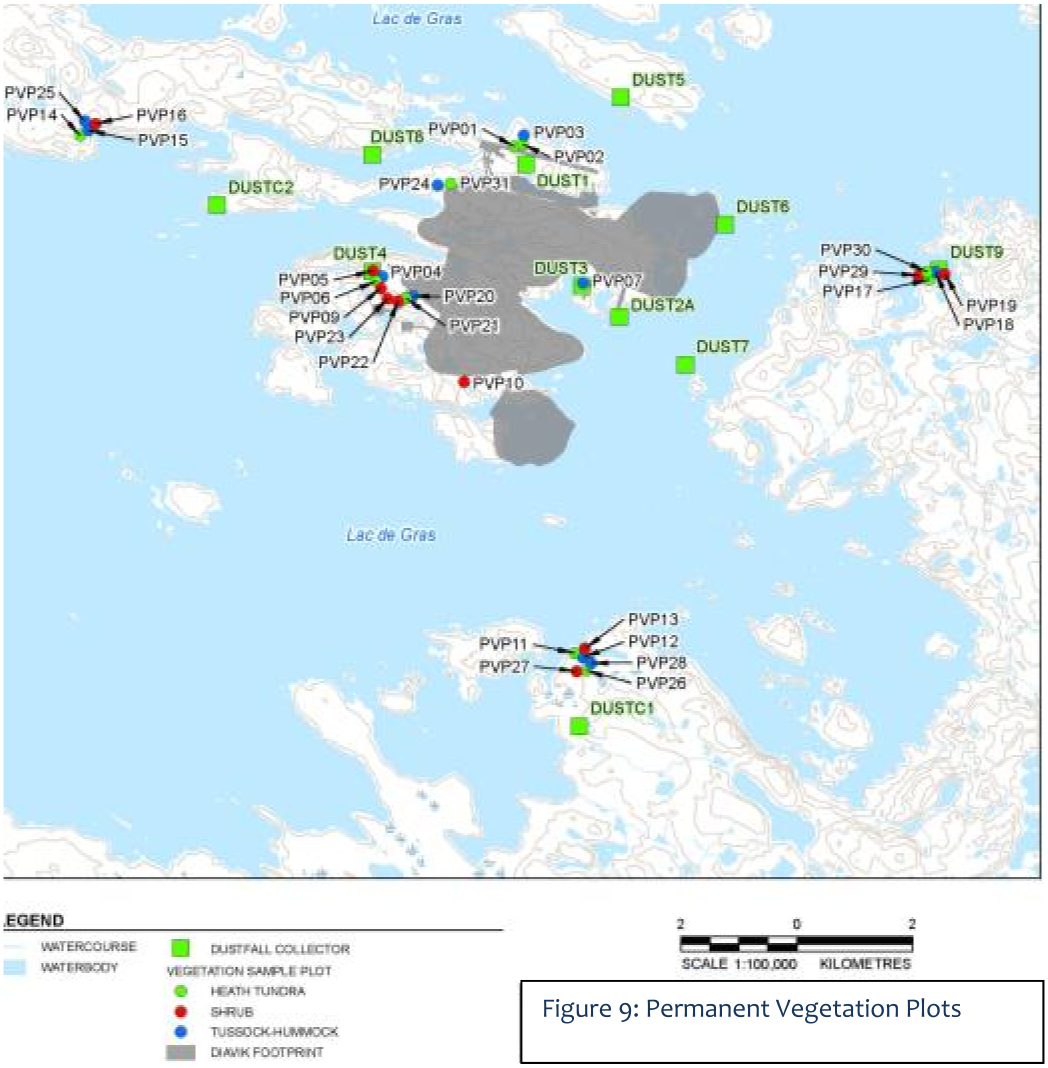


Figure 9: Permanent Vegetation Plots

Observations of PVPs done in 2010 showed that there were more grasses and flowering plants closer to the mine versus further from the mine, and there was also lower soil lichen cover and higher litter cover values closer to versus further from the mine. During the previous sampling year, there was no ecologically significant difference in vegetation and ground cover between mine and reference plots for each of the plant communities assessed. The map below shows the locations of the PVPs.

- A lichen study was conducted in 2013 to determine the amount of metals in lichen from dust deposition closer to and further away from the mine. Sample areas for lichen near the mine were in the same areas as the dust collectors, while the sample sites further away from the mine were chosen by TK holders at a distance approximately 40 km (24 miles) away, as noted on Figure 10.

The 2013 sampling program had a scientific component focusing on metal levels in lichen and soil, as well as a TK component focused on assessing the type of landscapes caribou prefer for forage, use and migration, and to assess lichen conditions at various sample sites to see how dust from the mine potentially affect caribou use of the area. During the program, Elders noticed dust on lichen in near-mine areas, but did not see dust on lichen in areas further from the mine. The analysis of metal concentrations in lichen confirmed the Elder's observations, as the amount of most metals in lichen samples near the mine were significantly higher than those further from the mine. The Elders suggested that caribou would avoid near-mine sites because of poor food quality. It should be noted that the amount of metals found in lichen during the 2013 sampling program was lower than those found in 2010; this means that a follow-up risk assessment is not necessary as the level of exposure to metals remains at a safe level for caribou. Similar to the PVP program, lichen is sampled every 3 years, with 2016 being the next year this program is scheduled.

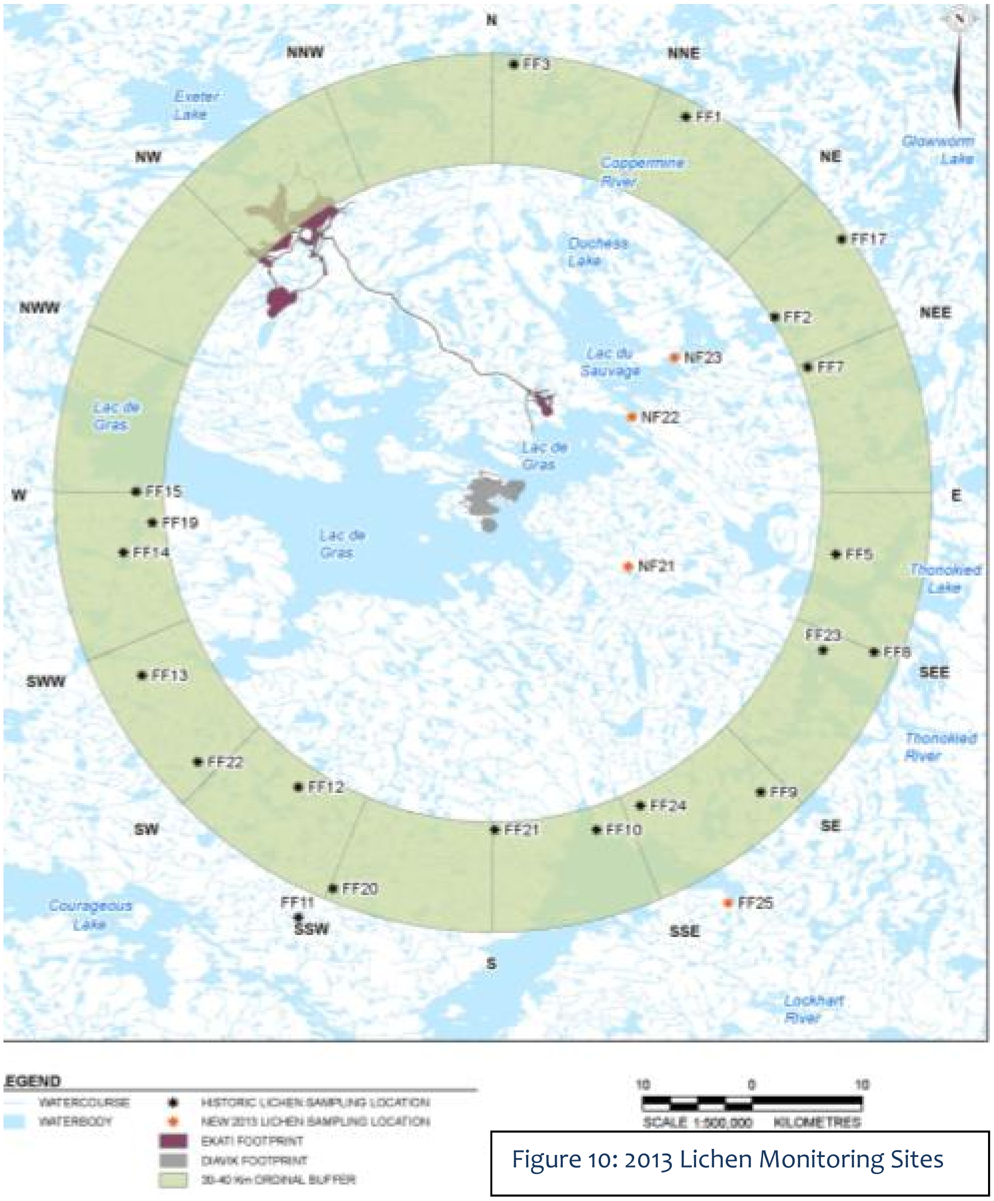


Figure 10: 2013 Lichen Monitoring Sites

- The 2010 lichen study also looked at the metals data to find out how much dust caribou are exposed to (could eat) by eating the lichen with dust on it. With the exception of 4 metals, concentrations of all other parameters were higher close to the mine, as was expected. Aluminum levels were slightly high but the assumptions made for the risk assessment were very conservative (meaning that it was assumed that caribou feed in the area of the mine 100% of the time). Based on the risk assessment performed, the level of exposure to metals was within safe levels for caribou.

Wildlife

Will the distribution or abundance of caribou be affected by the mine development?

EA Predictions:

- At full development, direct summer habitat loss from the project is predicted to be 2.97 habitat units (HUs). (A habitat unit is the product of surface area and suitability of the habitat in that area to supply food for caribou and cover for predators);
- The zone of influence (ZOI) from project-related activities would be within 3 to 7 km;
- During the northern (spring) migration, caribou would be deflected west of East Island and during the southern migration (fall), caribou would move around the east side of Lac de Gras; and
- Project-related mortality is expected to be low.

Observations:

- There was no direct summer habitat loss in 2013 from the mine footprint. The total loss to date is 2.6 HUs (see table below). This is less than the loss that was predicted.

Table 9: Caribou Habitat Loss by Year

Predicted Caribou Habitat Loss (HUs)	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Loss to Date
2.97	0.39	0.59	0.28	0.15	0.32	0.23	0.15	0.18	0.13	0.04	0.00	0.02	0.13	0.00	**2.6**

Caribou summer habitat loss was greatest in 2001, when the majority of haul roads and laydown areas for mine infrastructure were constructed. The loss of habitat in 2008 was associated with expansion of mine infrastructure to support underground mine development. Plant loss for the species that caribou use was within the expected (predicted) amount at the end of 2010, as there was little additional development of the mine footprint.

- Golder (2005) completed a comprehensive analysis of the Diavik and EKATI caribou data from 1998 through 2007, within the regional study area for the Diavik mine. The results indicated that the estimated Zone of Influence (ZOI - the size of area where caribou avoid the mine) on the probability of caribou occurrence around the Diavik mine ranged from 22 km to 26 km for the northern and southern migration periods. In 2006, Diavik expanded the study area for aerial surveys to assess the possibility of a larger ZOI. Based on feedback received during 2008 and 2009, Diavik revised their aerial survey in 2009 in order to survey a larger, combined footprint in cooperation with the EKATI mine. These surveys were done weekly from July to October, until caribou were no longer seen in the area. Each line flown during the aerial survey was spaced 8 kilometers apart and covered a distance 30 km away from mine development.

  An external, independent review of the Diavik and EKATI survey data was done by Boulanger et al. and the results indicated a ZOI of approximately 14 km. This ZOI prediction is largely supported by stakeholders. While it is double the size of the original prediction, it does not appear to be directly related to the level of activity at the mine site. It is not known what kind of influence large lakes like Lac de Gras have on the distribution of caribou, but it is likely a contributing factor to the ZOI.

  Aerial surveys have been suspended since 2009 (with the exception of 8 July to 13 October 2012), based on recommendations from the Advisory Boards for each of the mines, as well as feedback from communities relating to concerns over aircraft disturbance as a potential stressor for the caribou. Diavik and EKATI requested to omit the zone of influence requirements for the caribou monitoring program in 2013 and this was approved by ENR on 2 May. Additional analysis is being done for caribou movement in the Lac de Gras area. It looks at the response of caribou to mines and natural environmental factors such as wind direction, landscape, habitat, lakes, and insect harassment using high frequency GPS collar locations of Bathurst caribou during 2009 to 2013. This will be presented in the Analysis of Environmental Effects for Wildlife in May 2014. Because aerial surveys do not provide feedback on the operation and management of the mine, it is recommended that they continue to be suspended in favour of other studies that will either examine possible reasons that may cause caribou to avoid the Mine, and/or support the GNWT Barrenground Caribou Management Strategy. The GNWT (Environment and Natural Resources) plans to convene a stakeholder working group to discuss conditions under which aerial surveys should be reinstated.

- Diavik staff also completes caribou behavioural observations, or scans, throughout the summer. The goal of the program is to generate enough observations to test possible impacts to caribou based on how they behave closer to and further from the mines. For the past few years, DDMI has had community Elders and youth participate in this work and contribute their input and knowledge to the program results. Caribou behavioural observations/scans (ground-based) were conducted a total of 90 times in 2013, 86 in 2012, 104 in 2011, 83 in 2010 and 89 in 2009. Diavik works with EKATI mine to collect and share data that covers distances from less than 2 km to greater than 30 km from mine infrastructure.

A summary of key behaviours from the 2013 data has been included in Table 10 and compared with the results from the GNWT caribou surveys done in the post-calving and summer ranges. Behaviour of caribou groups from DDMI's observations were consistent with those observed from 2007 to 2009 by the GNWT. Diavik intends to focus caribou activity budgets to distances between 2 and 30 km from the site, and would also consider installing and monitoring insect trap stations in the study area, with assistance from the GNWT. This information could be used to better understand the influence of human and natural factors on changes in caribou behaviour. Further information will be included in the 3-year analysis scheduled for release in May 2014.

Table 10: Average percent of time spent on bedded, feeding and resting behaviours by caribou groups

Activity	**DDMI With Calves (38 grps)**	**DDMI Without Calves (52 grps)**	**GNWT Summer Range (2007-9)**
Bedded	15.1%	14.7%	12.8%
Feeding	49.2%	49.5%	44.2%
Moving	32%	28.6%	27.2%
Other	3.7%	7.2%	15.8%

During the early years of this monitoring, Diavik had limited opportunities to study caribou behaviour on the ground through scanning observations; in 2003, 2004, 2005, 2006, 2007 and 2008, ground observations of caribou behaviour were successfully completed for 12, 14, 5, 8, 24 and 7 caribou groups, respectively.

- Data from satellite-collared animals record cows in the Bathurst herd west of the mine site during the northern migration (Figure 11a). Collar maps for the 2013 southern migration suggest that cows remained further north than usual and all collars were still north of Diavik at the end of October (Figure 11b). The previous comprehensive analysis showed that from 2002 to 2010, with the exception of 2006, agrees with the EER prediction that the majority of collared caribou would travel beside or through the southeast corner of the study area (Golder, 2011).

Figure 11a: 2013 North Migration

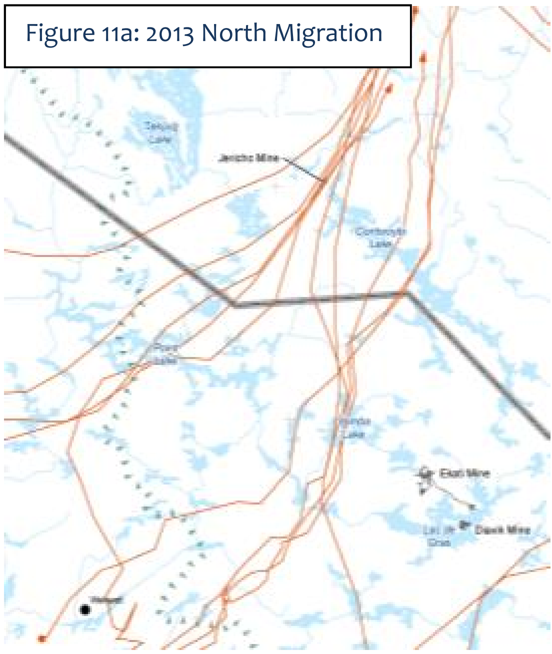


Figure 11b: 2013 South Migration

- There were no caribou mortalities or injuries caused by mining activities in 2013, however one dead caribou that appeared to have been killed by a wolf was found on the northwest side of the mine site. There has been only one caribou mortality caused by mining activities (2004) since baseline data began being collected in 1995.

- The level of caribou advisory monitoring remained at "no concern" (no caribou or fewer than 100 caribou) for 365 days in 2013, as it did in 2012.

  For all days in 2008, 2007, 2006, 2005, 2004, and 2003, the sign remained at "no concern'. The sign was changed to 'caribou advisory' from 7-27 October 2011 due to a herd of approximately 200 caribou on the southwest side of the east island. On one day in 2009 (29 April) the board was at "Caribou Advisory" due to 150 animals off the south road. "Caribou Advisory" was also posted for 29 October 2010 when 120 animals were spending time on the south side of the island. The sign was at 'no concern' for 362 of 365 days in 2002.

- Caribou road, rock pile and PKC surveys were conducted between 5 August and 30 October 2013, with no caribou seen. Surveys were conducted a total of 59 times during 2011 and 2012, and 54 times in 2010. Few caribou have ever been observed during PKC or road and rock pile surveys. For this reason, it has been recommended to only conduct these surveys when collar data indicate that caribou are within 5 km of the mine, or when caribou are reported on the island by employees, environment staff or pilots.

- No caribou herding events took place in 2013 or 2012. In 2011, caribou were required to be herded away from mine infrastructure three times. There were also two herding events in 2009 – one for 27 animals near the airstrip with an incoming flight and one for a single caribou walking on the Type I rock pile. Very few herding events have been required since the mine began operating.

Will the distribution or abundance of grizzly bears be affected by the mine development?

EA Predictions:

- Approximately 8.7 km^2 of grizzly bear habitat will be lost and there will be some avoidance of the area, but the abundance and distribution of grizzly bears in the regional area will not be affected measurably;
- The maximum zone of influence from mining activities is predicted to be 10 km; and,
- Bear mortalities due to mine related activities are expected to average 0.12 to 0.24 bears per year over the mine life.

Observations:

The table below shows the grizzly bear habitat that has been lost to date (in square kilometers), which falls within what was predicted. Plant loss for the species that grizzly bear use was also within the expected amount at the end of 2013.

Table 11: Grizzly Bear Habitat Loss by Year

Predicted Grizzly Habitat Loss (km^2)	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**Loss to Date**
8.67	1.25	1.62	0.94	0.42	0.93	0.69	0.43	0.50	0.26	0.12	0.00	0.06	0.39	0.03	**7.57**

- There were a total of 67 grizzly bear visits to site from 17 May to 30 August 2013, including a sighting of 2 cubs. One bear relocation took place on 30 August 2013 with help from the GNWT. The grizzly bear had been observed on the island for several weeks and was not responding to deterrents. The grizzly bear was tranquilized and moved 90 km southeast of the mine. The GNWT determined that the grizzly bear was a 2.5 year old female. A tag was placed on the bear's right ear (#G759) and there were no further incidental observations of bears on East Island after this relocation.

Table 12: Average Camp Population and Number of Incidental Grizzly Bear Observations, 2002-2013

Year	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
Average # people in camp	1100	470	397	646	716	747	979	562	579	630	629	537
# Grizzly Bear Seen on island	5	19	24	43	21	41	5	22	44	56	97	67

- The calculated mine mortality rate for grizzlies since 2000 is 0.07, which is below the range predicted. One mortality occurred at the mine in 2004.
- Grizzly bear habitat surveys were conducted from 2001 to 2008, but they were not successful at determining a ZOI for bears within the study area. Diavik started looking at safer ways to get similar information and ran a trial study for hair snagging techniques (i.e. no DNA

analysis) using the old habitat plots in 2010. A total of 47 hair samples were collected. EKATI mine also conducted a pilot program in 2011 to test a different post design and lure than what was used in the trial study conducted by DDMI in 2010. The two mines then jointly reviewed the results of both pilot (trial) programs in consultation with communities and regulators and Diavik submitted a request to remove the Zone of Influence monitoring requirement; this was supported by GNWT-ENR and EMAB.

A new study design and methods were developed to study grizzly bears in the Diavik and EKATI mine areas, as well as for De Beers Canada Inc. properties. TK/IQ was used to identify the preferred habitat of grizzly bear and then determine the location in which to set the 113 posts to collect hair samples. Community assistants were also involved with post construction and deployment. The study was conducted in the summers of 2012 and 2013, in cooperation with the EKATI mine, and De Beers joined in 2013. The number of posts with grizzly bear hair varied throughout the 6 sampling sessions each year. In 2012, it ranged from 20% to 44% of posts, while in 2013 it was between 46% to 57%. A comprehensive analysis of the results from both phases of this study for Diavik and EKATI will be completed and distributed for review in June 2014. Once all 3 mining companies have completed the field work and data analysis for this program, decisions about the methods and timing of future monitoring will be made.

Will the distribution or abundance of wolverine be affected by the mine development?

EA Predictions:

- The mine is not predicted to cause a measurable shift in the presence of wolverines in the study area; and
- Mining related mortalities, if they occur, are not expected to alter wolverine population parameters in the Lac de Gras area.

Observations:

- Wolverines were observed on East Island 3 times during 2012.

Table 13: Wolverine Observations, Relocations and Mortalities, Baseline to 2013

	Baseline[a]	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Days with Wolverine Visits	27/year Total = 82	25	36	4	38	14	43	31	19	46	21	28	4	11	3
Relocations	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0
Mortalities	1	0	1	0	0	0	0	0	0	1	0	0	0	2	0

[a] Includes wolverine occurrences recorded at three different camps (i.e. Diavik, Kennecott, and/or Echo Bay Road camps) annual numbers are not available for baseline investigations.

- The number of occurrences of wolverine on East Island in 2008 was higher compared to other years (46); however it is important to realize that many of the sightings were of a male animal that was denning under South Camp and another wolverine that had a snow den on the west side of East Island.

- Snow track surveys began in 2003, and have been conducted with the assistance of community members, as available. In 2008, Diavik revised the wolverine track survey in favour of an increased number of transects of standard length compared to the surveys completed in previous years. They are 4 km straight lines that are randomly distributed throughout the study area, but some bias is placed on tundra areas identified as preferred habitat for wolverine based on TK.

  Diavik conducted wolverine snow track surveys in 2013 and employed a seasonal Environmental Technician from a northern community to assist with the survey. A total of 26 tracks were found from 2 to 6 April 2013, with an average track density of 0.17 (per kilometer) for all transects. Over the years the number of tracks identified has remained relatively consistent.

Table 14: Wolverine Track Index, 2003-2013

Year	Survey Period	Number of Tracks	Distance Surveyed (km)	Track Index (Tracks/km)
2003	April 10 – 12	13	148	0.09
2004	April 16 – 24	22	148	0.15
2004	December 2 - 8	10	148	0.07
2005	March 30 – 31	7	148	0.05
2005	December 7 – 12	18	148	0.12
2006	March 30 – 1	5	148	0.03
2008	April 30 – May 2	15	160	0.09
2009	April 2 – 4	11	156	0.07
2010	No community assistant available			
2011	March 30 – April 3	23	156	0.15
2012	March 28 – April 3	22	160	0.14
2013	April 2 – 6	26	156	0.17

  In years when snow track surveys are completed for wolverine, Diavik is considering increasing the frequency that transects are surveyed, up to three times, between February and April. The purpose of repeating the surveys would be to account for imperfect detection of wolverine snow tracks.

- Diavik participates in a joint research program with the GNWT and EKATI mine in certain years. This program was conducted at Diavik in 2005, 2006, 2010 and 2011. There have been a total of 50 individuals (25 males, 25 females) identified in the Diavik area in 4 years of the program. The next round of DNA sampling is planned for spring 2014, and the results will be shared after they are analyzed and compared with past data.

Will the distribution or abundance of raptors be affected by the mine development?

EA Predictions:

- Disturbance from the mine and the associated zone of influence is not predicted to result in measurable impacts to the distribution of raptors in the study area; and
- The mine is not predicted to cause a measurable change in raptor presence in the study area.

Observations:

- Productivity and occupancy surveys were conducted annually in the Daring Lake, Diavik and EKATI study areas, cooperatively with the GNWT and EKATI mine, from 2000-2010. The falcon monitoring results from Daring Lake have been used as control data for productivity from an undisturbed area. Previously identified potential nesting sites were visited by helicopter in May to determine if nesting sites were occupied, and again in July to count any young in the nest.

  Nest occupancy remained relatively high in the Lac de Gras region throughout those 10 years (raptors were preferentially using the area within 14 km of the mine), supporting the prediction that mine activity levels would have a negligible impact on the presence and distribution of raptors in the study area. Annual changes in nest success were also not related to the level of activity at the mine site.

  As a result of these findings, discussions during the wildlife monitoring program review process from 2009-2011 supported a change in falcon monitoring methods to align with the Canadian Peregrine Falcon Survey (which in turn is aligned with the North American Peregrine Falcon Survey). This survey is conducted across Canada (and North American) every five years, with 2015 being the next planned monitoring year.
- Chick production in past years has ranged from zero to seven in the DDMI study area. Observations made over the years were consistently similar to those of the control site at Daring Lake, where productivity and occupancy rates have changed little since baseline.

Table 15: Falcon Nest Occupancy and Production at Diavik and Daring Lake, 2000 to 2010

Year	Survey Area	Total Sites	Occupied	Productive	Total Young
2000	Diavik	6	2	2	5
	Daring	-	-	-	-
2001	Diavik	6	2	0	0
	Daring	13	3	1	3
2002	Diavik	6	4	1	3
	Daring	18	10	9	15
2003	Diavik	6	1	0	0
	Daring	10	5	3	4
2004*	Diavik	6	5	4	7
	Daring	12	6	1	2
2005*	Diavik	6	3	1	2
	Daring	10	5	1	1

Year	Survey Area	Total Sites	Occupied	Productive	Total Young
2006*	Diavik	6	3	0	0
	Daring	10	4	1	3
2007*	Diavik	6	3**	2	7
	Daring	10	1	2	8
2008*	Diavik	6	5***	2	3
	Daring	12	6	3	4
2009*	Diavik	6	4	2	5
	Daring	12	5	3	6
2010*	Diavik	8	6	3	7
	Daring	12	5	3	7

- Daring Lake data originates from the Daring Lake research station (S. Matthews, personal communication, ENR).
- *Diavik data includes spring (occupancy only) and summer (productivity only) monitoring data. Previous occupancy values based on productivity survey only.
- **Occupancy data for May provided by BHPB and GNWT – site DVK 11 not checked
- ***Does not include additional site (DVK 19-1) found occupied during the June survey

- Since May 2005, peregrine falcons have been seen nesting on Diavik buildings and pit walls. A total of 38 pit wall/mine building inspections were carried out in 2013, with 4 nests found. One peregrine falcon nest was observed in 2012, but no raptors were found nesting at the mine site in 2010 or 2011.

Table 16: Nests Observed on Mine Infrastructure and Open Pits in 2013

Area	Species	Date	Active Nest	Observations
A418 Lookout #1	rough-legged hawk	July 5	Yes	one chick observed on July 5; no activity after July 5
A418 Lookout #2	rough-legged hawk	May 31 to August 16	Yes	two adults observed on 31 May; one fledgling observed on July 19; fledgling observed flying on 16 August
Site Services Building	peregrine falcon	June 7 to August 23	Yes	nest observed on 7 June; two fledglings seen on 22 July; three fledglings observed flying on August 12 and 23
Boiler House	common raven	June 21 to July 5	Yes	nest seen on 21 June with two chicks; four fledglings observed on 27 June and 1 July; nest was no longer occupied on 5 July

- Two falcon mortalities occurred at the Diavik Mine site in 2013. On 20 July 2013, a peregrine falcon carcass with 3 wounds was found by the A154 dike; it is suspected to have hit a power line. On 17 November 2013, a juvenile carcass that had been heavily scavenged was found below the ore storage area in the A154 pit. There was no nearby infrastructure that would indicate that the mortality resulted from the Mine. No falcons died because of mine operations from 2009 to 2011, but one peregrine falcon was found dead in 2012.

Will the distribution or abundance of waterfowl be affected by the mine development?

EA Predictions:

- At full development, 3.94 km^2 of aquatic habitat will be lost; and

- The mine is not predicted to cause a measurable change in waterfowl presence in the study area.
- Early open water or early vegetation growth might attract waterfowl during spring migration.

Observations:

- By the end of 2007, a total of 2.56 km^2 of shallow and deep water habitat had been lost due to mine development, and there have been no additional shallow or deep water areas developed since that time. Therefore the total area of water habitat loss remains below predictions.
- East Island shallow bays (natural bays in Lac de Gras) and mine-altered water bodies (ponds that have been changed or created for the mine site) have been surveyed annually, on a daily basis, over a 5 week period during the peak spring migration (late May to late June) for waterfowl presence from 2003 to 2013. The results of surveys indicate that Mine-altered water bodies are used by water birds, including ducks, geese, gulls, loons and shorebirds, during spring. However, the range of dates when water birds are first detected do not support the predictions that waterfowl or shorebirds are using mine-altered water bodies earlier than the East and West bays. As there is no similar control site that can be used for the shallow bays (they are a unique feature of the region), detailed statistical analysis on waterfowl presence is not conducted. Over the years, almost 20 different species of shorebirds have been observed, in addition to 5 species of dabbling ducks, 14 types of diving ducks and 4 kinds of geese. Each year, the shallow bays have the highest abundance of birds, followed by the north inlet.

  Diavik has consulted with Environment Canada about removing the requirement to monitor bird species abundance and diversity at East and West bays, given the results to date. Environment Canada has agreed to these changes, and other stakeholders will be consulted. Diavik plans to continue to monitor health risks to water birds at mine-altered water bodies and review opportunities to contribute to regional monitoring databases through either participation in the Program for Regional and International Shorebird Monitoring (PRISM) or the North American Breeding Bird Survey (NABBS).

- Diavik has been operating 4 wind turbines in September 2012. During consultations with Environment Canada (EC) prior to installation, it was noted that no post-construction follow up monitoring for bird fatalities is required. However, Diavik voluntarily implemented a post-construction monitoring program in 2013 to assess the potential direct impacts the wind farm may have on birds. Surveys for bird carcasses below the turbines were undertaken to estimate bird strikes. Monitoring was completed by Diavik personnel twice per week, within a 50 meter radius of each turbine using the Baerwald Spiral method. In 2013, a total of 23 inspections were completed at the wind farm during post-construction mortality monitoring between 11 June and 23 August and no bird carcasses were observed. Instead of continuing with the more formal Baerwald surveys, Diavik now plans to monitor for bird mortalities at the wind turbines as part of the overall site compliance monitoring program.

- No birds have been killed at the mine site from 2011 to 2013. Four other project-related bird mortalities have occurred, one each in 2010, 2009, 2005 and 2002.

Fish and Water

At Diavik, fish and water are monitored through the AEMP, discussed in detail in Section 3 of this report. The discussions below regarding fish and water come from the results of the AEMP.

What effect will the mine development have on water quality?

EA Predictions:

- Water will remain at a high quality for use as drinking water and by aquatic life (i.e. meet CCME thresholds);
- Localized zones of reduced quality during dike construction;
- Nutrient enrichment is likely from the mine water discharge (and may change the trophic status of up to 20% of Lac de Gras);
- Post-closure runoff expected to influence quality of two inland lakes.

2013 Observations:

Revisions to the Aquatic Effects Monitoring Program resulted in 2013 being the year where the majority of sampling requirements for the program are conducted; this runs on a 3-year cycle (refer to Table 17). A summary of the results from the sampling conducted during 2013 is outlined below. Overall, the program determined that nutrients (nitrogen and phosphorus) released into Lac de Gras from the treated mine water discharge continue to increase in Lac de Gras, near the East Island.

- Mine effluent had an effect on 15 water quality variables (conductivity, total dissolved solids, dissolved calcium, chloride, dissolved sodium, sulphate, ammonia, nitrate, aluminum, barium, chromium, molybdenum, silicon, strontium, and uranium). The data showed a trend where the amount of chemical in each sample was highest close to the mine and lowered with increasing distance from the mine. Each of the 15 variables reached Action Level 2, which means that an Effects Benchmark is to be determined. To be cautious, variables that reached Action Level 2 and had an existing Effects Benchmark (AEMP v3.3) were also tested to see if they met Action Level 3 criteria; none of those variables met the criteria.

Table 17: Effects Benchmarks Already Established for Select Water Quality Variables (AEMP v3.3)

Variable	**Units**	**Effects Benchmarks**[(a)]	
		Protection of Aquatic Life	**Drinking Water**
Total dissolved solids	mg/L	5	500
Chloride	mg/L	1	250
Sodium	mg/L	-	200
Sulphate	mg/L	10	500
Ammonia (as nitrogen)	µg/L	3	-

Variable	Units	Effects Benchmarks[(a)]	
		Protection of Aquatic Life	Drinking Water
Nitrate as nitrogen	µg/L	3	10000
Aluminum (total)	µg/L	-	100/200
Barium	µg/L	100	1000
Chromium	µg/L	1 (Cr VI)	50
Molybdenum	µg/L	7	-
Strontium	µg/L	300	-
Uranium	µg/L	1	20

a = Unless noted, benchmarks are derived from current CWQGs and Canadian Drinking Water Quality Guidelines; the Effects Benchmark shall be the lower of the two values.

- Results relating to eutrophication indicators (chemicals and small plants that show early signs of increasing nutrients) suggest that the mine is causing an increase in nutrients in Lac de Gras as there were greater concentrations of some nutrients and small plants closer to the mine versus further from the mine.

Figure 12a: Chlorophyll *a* in LDG, 2013

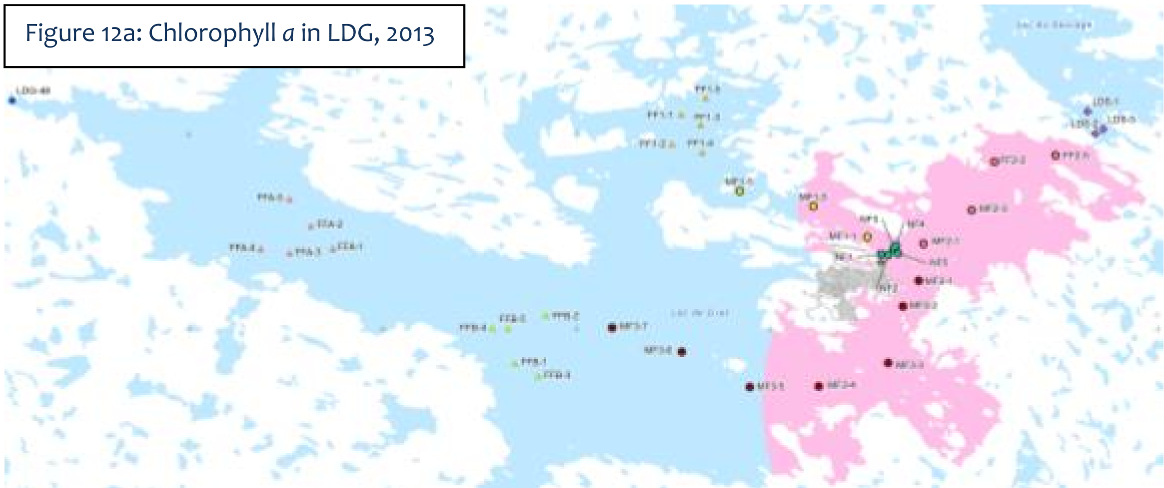
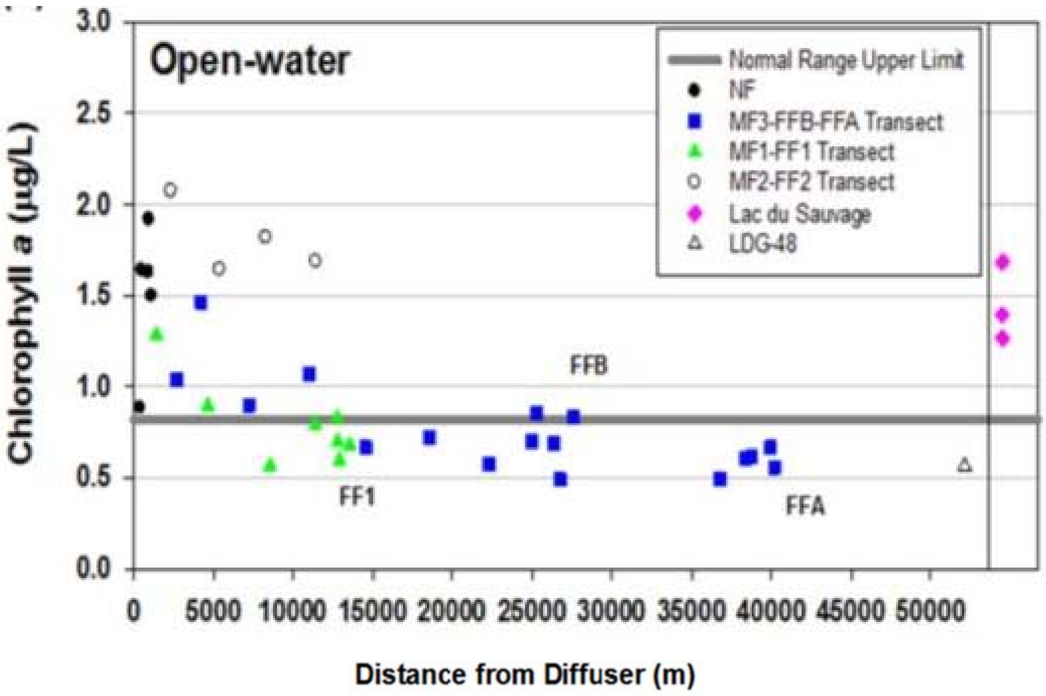


Figure 12b: Total Phosphorus in LDG, 2013

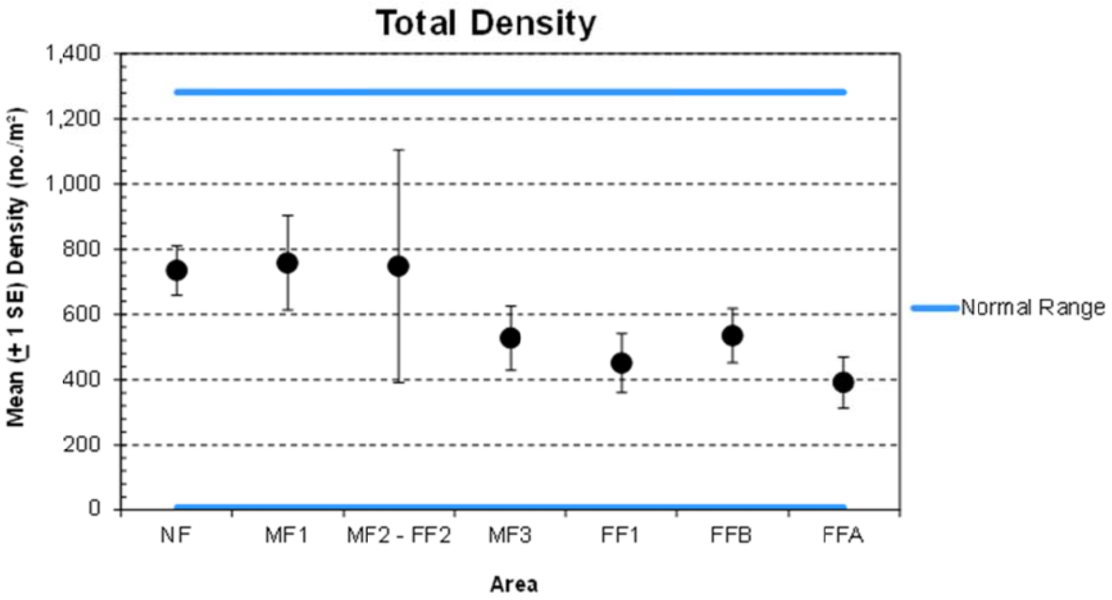
For example, algae (chlorophyll *a*) concentrations were higher than the normal range for Lac de Gras, and the higher amount of algae was found in over 20% of the lake. For this reason, the magnitude of the eutrophication effect is Action Level 2 (requiring an Effects Benchmark to be set) of the Response Framework. The approved AEMP (v3.3) has established an Effects Benchmark for chlorophyll *a* at a concentration of 4.5 µg/L; current results are below this value (Figure 12).

Figure 13: Chlorophyll a Concentrations in Lac de Gras According to Distance from the Treated Water Discharge during the Open-water Period, 2013



- The 2013 monitoring results for plankton communities (tiny plants and animals) in Lac de Gras suggest that there is a mine-related increase in nutrients because there was a difference in the amount and type of them in the exposure area (close to the mine) when compared to the reference areas (further from the mine). There was however no evidence of toxicological damage, so no Action Level (e.g. 1) has been reached.
- Effects of the mine discharge on bottom sediments (mud at the bottom of the lake) in the exposure area of Lac De Gras were evident for 13 metals (aluminum, bismuth, boron, calcium, chromium, lead, lithium, magnesium, potassium, sodium, tin, titanium, and uranium), as areas near the mine had higher average amounts than those further from the mine. Of these 13 metals, three had average amounts that were higher than what would normally be found in the lake. When comparing these results to sediment quality guidelines, it is unlikely that the amounts found in Lac de Gras sediments would be harmful to fish and plants.
- Differences in the total amount of benthic invertebrates (small bugs that live on the lake bottom) were noted between the exposure area (close to the mine) and reference areas (further from the mine). This suggests an increase in nutrients, rather than a harmful effect, so no Action Level was reached. Benthic invertebrates are measured by density, which means counting the number of animals in a given area (Figure 14).

Figure 14: Total Amount of Benthic Invertebrates at Sampling Areas in Lac de Gras, 2013



- The Weight of Evidence assessment is meant to rank impacts to Lac de Gras using the data collected by the AEMP, as summarized in the bullet points above and in the Fish section below. Impacts from different parts of the program (e.g. Fish Health) are rated as being: negligible/none (score of 0), low (1), moderate (2) or strong (3). They are also categorized as either 'toxicological' (harmful response) or 'nutrient enrichment' (increased nutrients).

Table 18 Weight-of-Evidence Results, 2013 AEMP

Ecosystem Component	EOI Rating
Toxicological Impairment	
Lake Productivity	0
Benthic Invertebrates	0
Fish Population Health (see below)	1
Nutrient Enrichment	
Lake Productivity	3
Benthic Invertebrates	3
Fish Population Health (see below)	1

- Graphs and figures that better represent the findings of the AEMP over multiple years will be presented following the end of each 3-year monitoring cycle (e.g. 2014, 2017, etc.).

- SNP samples are taken at various frequencies, depending on location, as outlined in the Water License. Sample results are checked, analyzed and submitted monthly to the WLWB for external review. Any issues with the results are flagged and, if a problem is suspected or undesirable trends are noted, an investigation is done to determine the cause of the problem. It may be related to equipment (e.g. contaminated bottle) or treatment methods (e.g. overuse of a chemical). During 2013, a batch of preservative that is provided by an external lab and added to water samples prior to shipping was found to be contaminated. After investigation, a total of seven metals (cadmium, chromium, cobalt, iron, manganese, molybdenum, and nickel) were found to be in higher concentrations than normal when the contaminated preservative was used, starting in July 2013. Further tests were then done to determine which sample results were incorrect because of this contamination. These seven metals from a total of 114 specific samples (21 samples from 1645-18, 24 samples from 1645-19 and 69 samples from the open water AEMP) were removed from the 2013 AEMP and SNP datasets, and these values were also not used in any analyses.

2012 Observations:

The Aquatic Effects Monitoring Program was successfully revised leading up to the 2012 monitoring season. As a result, only certain aspects of water quality and fish monitoring are conducted in each year. A summary of the results from the sampling conducted during 2012 is outlined below. Overall, the program determined that nutrients (nitrogen and phosphorus) released into Lac de Gras from the treated mine water discharge are causing some enrichment in Lac de Gras, near the east island. A Traditional Knowledge study on fish and water health was also conducted as part of the AEMP during the summer of 2012.

Specific results of note from the 2012 Aquatic Effects Monitoring Program include:

- The analysis of effluent and water chemistry data collected during the 2012 AEMP field program and from relevant sites from the Water License SNP program stations indicated similar trends as observed in 2011, including an increase in arsenic and iron concentrations. Effect levels will be determined during the comprehensive AEMP program in 2013.
- Results to date of the plankton monitoring program, which examines changes in the amount, number and types of tiny animals (zooplankton) and algae (phytoplankton) that live in the water of Lac de Gras (LDG), indicate a pattern consistent with weak nutrient enrichment from mine effluent.
- Results of the eutrophication indicators component of the AEMP were similar. Based on the measured higher amounts of phytoplankton (chlorophyll *a*) and total phosphorus (TP) in the near field area relative to the reference areas, the observed enrichment effect has been given a "moderate" effect level designation. Zooplankton biomass resulted in a "low" effect level designation. In the following figures, the areas shaded in pink show the area of the lake that has been affected, e.g. 24% of LDG for Chlorophyll *a* and less than 1% for TP in 2012. The coloured lines represent the depth of water in the lake: Green = shallow (0-6 m/0-20 ft), Yellow-Orange = moderate (8-20m/25-65 ft) and Red = deep (30-50m/100-165 ft). The sample stations denoted by circles are exposure areas whereas those denoted by a triangle are reference areas.

Figure 15a: Chlorophyll *a* in LDG, 2012

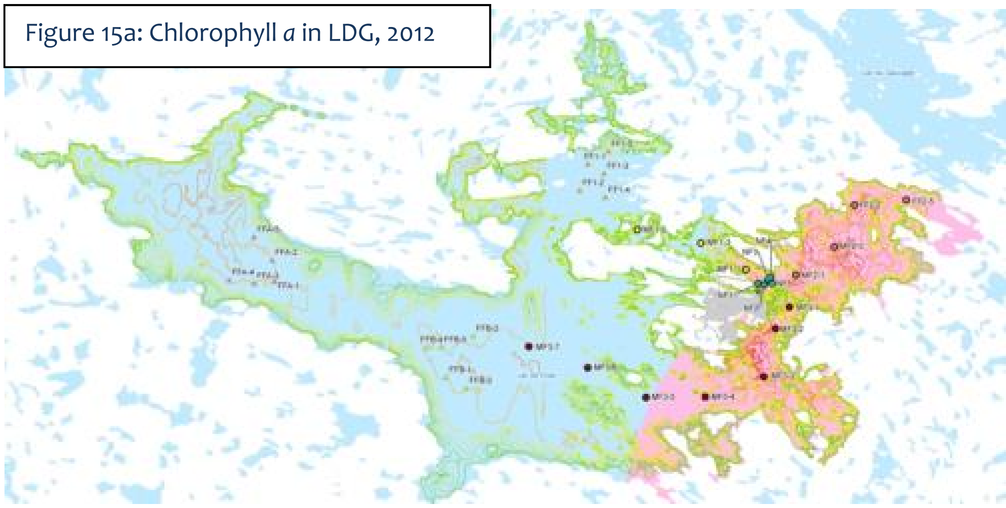
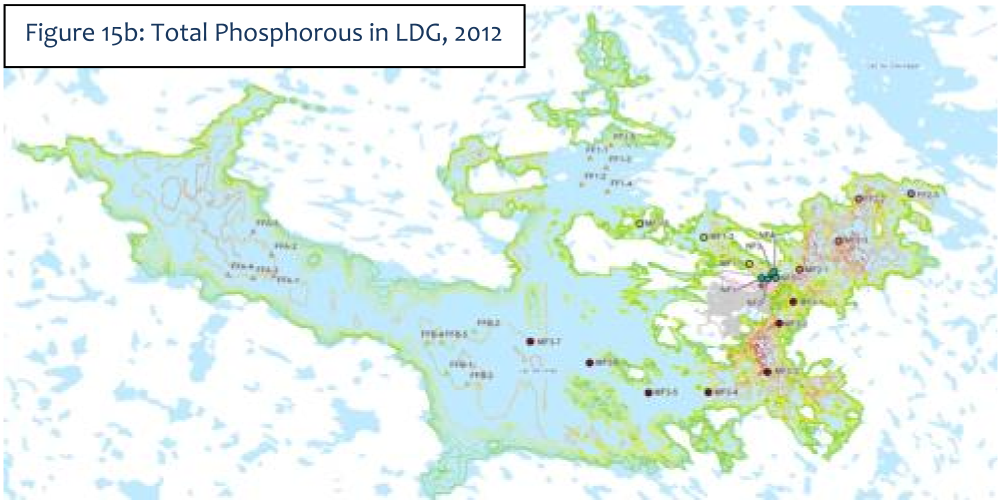


Figure 15b: Total Phosphorous in LDG, 2012



- Toxicity testing on the treated mine water that is discharged back to Lac de Gras was done four times in 2012, as part of the SNP program in the Water License. No concerns or issues were noted with any of these tests.
- The results from the 2012 TK camp provided feedback on the context and process for sharing Traditional Knowledge as well as on the health of the fish and water in Lac de Gras. Camp participants noted the importance of TK's context, which is situated in, and interconnected with spirituality (e.g., human-animal transformations), codes of conduct (e.g., respect for and obedience of one another), and connection to the land, animals, and ancestors. Customs and practices (e.g., drumming, feeding the fire and water) and stories about the journey-based creation of unique landscape features (e.g., mountains, islands, and waterbodies) underscore this context of TK. So, the importance of the setting in which knowledge is shared and of being respectful to others becomes important to ensure proper transfer of knowledge.
- TK camp participants noted the environmental indicators that they use to assess water quality, such as condition of the shoreline and clarity of the water. Additionally, a tea test was used to assess water quality and participants noted that tea made from water of a poor quality results in film or scum on the surface of the cup. None of the water samples from Lac de Gras had this scum or film and all the samples tasted acceptable to participants.

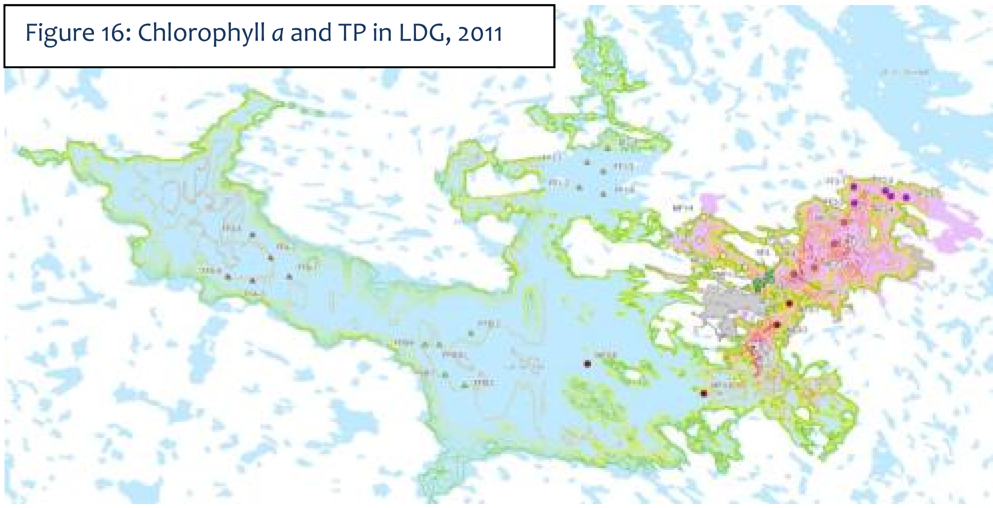
2011 Observations:

The Aquatic Effects Monitoring Program was successfully implemented in 2011. Overall, the program determined that nutrients (nitrogen and phosphorus) released into Lac de Gras from the treated mine water discharge are causing mild enrichment in the bay east of the east island.

Specific results of note from the 2011 Aquatic Effects Monitoring Program include:

- The analysis of effluent and water chemistry data collected during the 2011 AEMP field program and from relevant sites from the Water License SNP stations continued to show a low level effect on water chemistry in the lake resulting from the mine.
- Analysis of the number and types of small organisms that live on the bottom of the lake (benthic invertebrates) indicated a range of effect terms, from no effect to a high level effect, depending on what was analyzed. Low level or early-warning effects were detected for some species between the reference areas and exposure areas. Effects on total density (amount) and other benthic species density were classified as moderate level. A high level effect was found for the amount of one species. Benthic invertebrate monitoring results show effects of mild nutrient enrichment.
- Results to date of a special study to examine changes in amount, number and types of tiny animals (zooplankton) and algae (phytoplankton) that live in the water of Lac de Gras show a pattern consistent with nutrient enrichment from the mine. Results of the eutrophication indicators part of the AEMP were similar. Based on the measured higher amounts of algae (chlorophyll *a*) and total phosphorus near the mine versus farther from the mine, this effect remains at a "moderate" level effect designation. Higher zooplankton biomass near the effluent continued to result in a "high" level effects designation.
- Moderate nutrient enrichment from the mine water discharge has been shown for 15.5% of Lac de Gras, based on the amount of algae and phosphorous measured in the lake. This is below the predicted level of 20%.

Figure 16: Chlorophyll *a* and TP in LDG, 2011



- Results of the Lake Trout study suggest that there has been a slight increase in mercury in Lake Trout muscle tissue since 2005. This increase is seen in both Lac de Gras and Lac du

Sauvage. The increase in mercury from before the mine was built resulted in a low level effect classification.

- A technical analysis confirmed the nutrient enrichment effect and concluded that there continues to be strong evidence for a mild increase in lake productivity, and associated enrichment of the benthic invertebrate community, as a result of nutrient increases in Lac de Gras. There is some evidence suggesting low-level impairment to the small organisms on the bottom of the lake due to contaminant exposure but these findings have a high uncertainty because the link to contaminant exposure is not strong. The slight increases in mercury levels in fish tissue since 1996 have occurred in both Lac de Gras and Lac du Sauvage (upstream from the mine), and it is not likely that the increase is linked to mine operations. Diavik continues to monitor mercury levels in big and small fish in the lake, as well as monitoring for other possible sources of mercury. This helps to try and find out what may cause any increases that do happen and catch any possible issues.

2010 Observations:

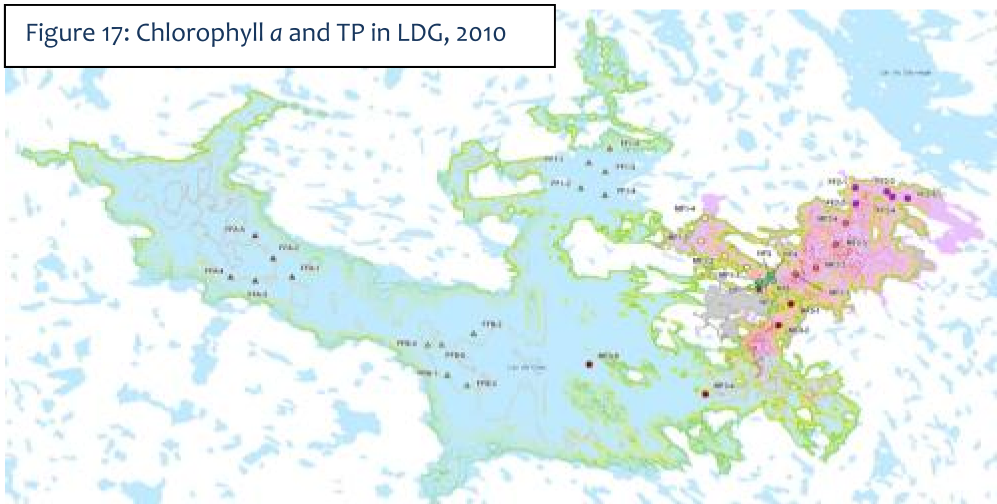
The Aquatic Effects Monitoring Program was successfully implemented in 2010. Overall, the program determined that nutrients (nitrogen and phosphorus) released into Lac de Gras from the treated mine water discharge are causing mild enrichment in the bay east of the east island.

Specific results of note from the 2010 Aquatic Effects Monitoring Program include:

- The analysis of effluent and water chemistry data collected during the 2010 AEMP field program and from relevant sites from the Water Licence SNP stations showed a low level effect on water chemistry in the lake resulting from the mine.
- Results of the sediment analysis did not identify conditions that are likely to affect fish, bug or plant life in the lake through enrichment or harm. Bismuth and uranium were, however, assigned "high level effects" designations as both areas near the mine and at least one halfway down the lake had average concentrations greater than the areas farther from the mine. Measured levels of bismuth and uranium are unlikely to pose a risk to fish, bugs or plant life.
- Analysis of the number and types of small organisms that live on the bottom of the lake (benthic invertebrates) indicated a range of effect terms, from no effect to a moderate level effect, depending on what was analyzed. Low level or early-warning effects were detected based on statistical differences between the reference areas and exposure areas. Effects on total density and other benthic species density were classified as moderate level. Early-warning/low level effects were detected for the amount, distance and density of one species. Benthic invertebrate monitoring results are indicative of nutrient enrichment.
- A study was completed in 2010 to specifically delineate the spatial extent of the treated effluent (a "plume") in Lac de Gras. The plume extent was similar between summer open-water and winter ice-cover conditions, but concentrations near the discharge point were higher during winter ice-cover conditions.

- One possible explanation for the 2007 finding of elevated mercury in small fish (Slimy Sculpins) was increased mercury being released from sediments because of nutrient enrichment from the treated mine effluent. A sediment core study was done to look in to this and it showed that this explanation was not likely, based on the results.
- Results to date of a special study to examine changes in amount, number and types of tiny animals (zooplankton) and algae (phytoplankton) that live in the water of Lac de Gras indicate a pattern consistent with nutrient enrichment from treated mine effluent. Based on the measured higher amounts of algae (chlorophyll *a*) and total phosphorus near the mine versus farther from the mine, this effect has been given a "moderate" level effect designation. Higher zooplankton biomass near the effluent resulted in a "high" level effects designation.

Figure 17: Chlorophyll *a* and TP in LDG, 2010



- Results for the small fish study indicate a pattern consistent with an increased availability of food and nutrients in the sampling areas near the mine compared to the areas farther from the mine. Despite the moderate-level effects seen in the fish tissue chemistry for bismuth, strontium, titanium and uranium, there was no evidence that tissue metals concentrations were negatively affecting fish health.
- Mercury levels in small fish (Slimy Sculpin) at sampling sites near the mine were lower than reported in the 2007 AEMP. There was no significant difference between samples taken near the mine and those taken farther away from the mine in 2010, most importantly in relation to tissue concentrations of mercury. The reason for the differences between the 2007 AEMP results for mercury and the 2010 results is unknown; however, a different analytical laboratory employing slightly different methods was used in 2010.
- A technical analysis confirmed the nutrient enrichment effect and concluded that there is strong evidence for a mild increase in lake productivity, and associated enrichment of the benthic invertebrate community and fish community, as a result of nutrient increases in Lac de Gras. There is little evidence of harm to lake productivity as a result of any contaminant exposure. Although there is some evidence suggesting potential low-level contaminant issues with benthic invertebrate and fish communities, these observations have a relatively high amount of uncertainty.

2009 Observations:

The Aquatic Effects Monitoring Program was successfully implemented in 2009. There were only a few quality control samples (extra samples taken to test the accuracy of field and/or lab techniques) that were missed because of scheduling issues.

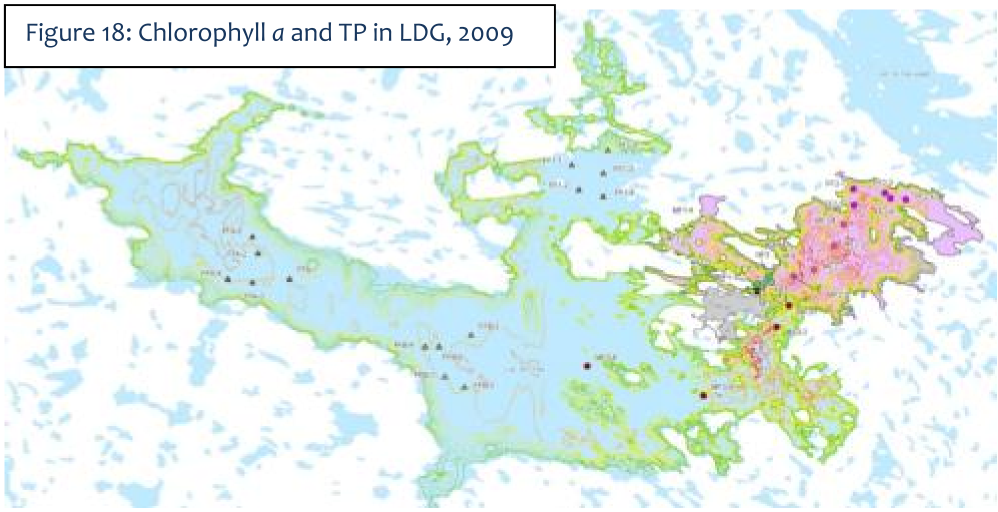
Similar to 2008, the 2009 Aquatic Effects Monitoring Program showed nutrient enrichment (increased levels of phosphorous and nitrogen in the water available for algal growth, where increasing algal growth is a sign of eutrophication, or increased lake productivity) in areas of the lake. Nutrient enrichment is the main change in Lac de Gras that leads to most of the other changes we see relating to the different animals that live in the water.

Specific observations that were noticed in the 2009 data include:

- The analysis of effluent (treated water discharged back in to the lake) and water chemistry (quality) data collected during the 2009 AEMP field program and from relevant stations from the Water License Surveillance Network Program stations indicated an early warning/low level effect on water chemistry within Lac de Gras resulting from the Mine. This means that there is a difference between samples taken near the mine and those taken farther away from the mine, but is within the expected range. Some values may be slowly increasing over time, though, so it is important to monitor for any changes that may occur from one year to the next.
- Results of the sediment analysis did not identify conditions that are likely to affect aquatic life through enrichment or impairment. Most of the metals and nutrients measured in the sediment had an early warning/low level effect on sediment chemistry. However, bismuth was assigned a "high level effect" designation; this means that samples near the mine and at least one sample part way across the lake had average concentrations that were higher than those of the reference area at the other end of the lake.
- Analysis of the number and types of benthic invertebrates (small organisms that live on the bottom of the lake) indicated a range of effect designations, from no effect to a high level effect, depending on what was analyzed. Low level/early warning effects were detected based on significant differences between the reference areas further from the mine and the exposure areas near the mine in eight of twelve benthic invertebrate community variables compared (variables include things like the number of species found, whether one species was found more than another, number of organisms in a given area, number of midges, etc.). Total invertebrate densities, as well as two species densities (Pisidiidae and Heterotrissocladius sp.) were higher closer to the mine than the range measured in areas farther from the mine. Densities of Pisidiidae near the mine and part way across the lake were greater than the range measured in areas at the other end of the lake; for that reason, it was assigned a high level effect. These results relate back to the nutrient enrichment happening in the lake.
- Findings to date on a special study to examine changes in amount, number and types of zooplankton (tiny animals) and phytoplankton (algae) that live in the water of Lac de Gras show a pattern linked to nutrient enrichment from mine effluent. Because there are higher amounts of phytoplankton (chlorophyll a/algae) and total phosphorus in areas near the mine compared with

areas farther from the mine, this effect has been given a "moderate" level effect designation. Higher zooplankton biomass (the amount of small animals in an area) near the effluent resulted in an early warning/low level effect designation; this means that there is a difference between the areas closer to and further from the mine, but that it is within the expected range.

Figure 18: Chlorophyll *a* and TP in LDG, 2009



- A weight-of-evidence (WOE) analysis compares all the information collected (water quality, sediment quality, benthic invertebrates, etc.) to try and answer two questions:
  - Could damage to aquatic animals happen due to chemical contaminants (primarily metals) released to Lac de Gras?
  - Could enrichment occur in the lake because of the release of nutrients (phosphorus and nitrogen) from treated mine effluent?

  The weight-of-evidence analysis confirmed nutrient enrichment and concluded that there is strong evidence for a mild increase in lake productivity due to nutrient enrichment. There was not a lot of evidence of damage to aquatic animals as a result of contaminant exposure. The observation of potential low-level harm of the benthic invertebrate community has a fairly high amount of uncertainty.

2008 Observations:

The Aquatic Effects Monitoring Program was successfully implemented in 2008. There were only a few open water sediment/benthic samples that could not be obtained due to hard/rocky lake bottom and some water quality and plankton stations that were not sampled in the third open water period due to inclement weather. Special Effects Studies for mercury detection limits (measuring mercury at very low levels), chromium VI (a compound Diavik investigated because it could be a concern at lower levels compared to other forms of chromium) and trout fish tissue metals levels (based on previous AEMP studies that showed possible elevated level of metals in fish) were also completed.

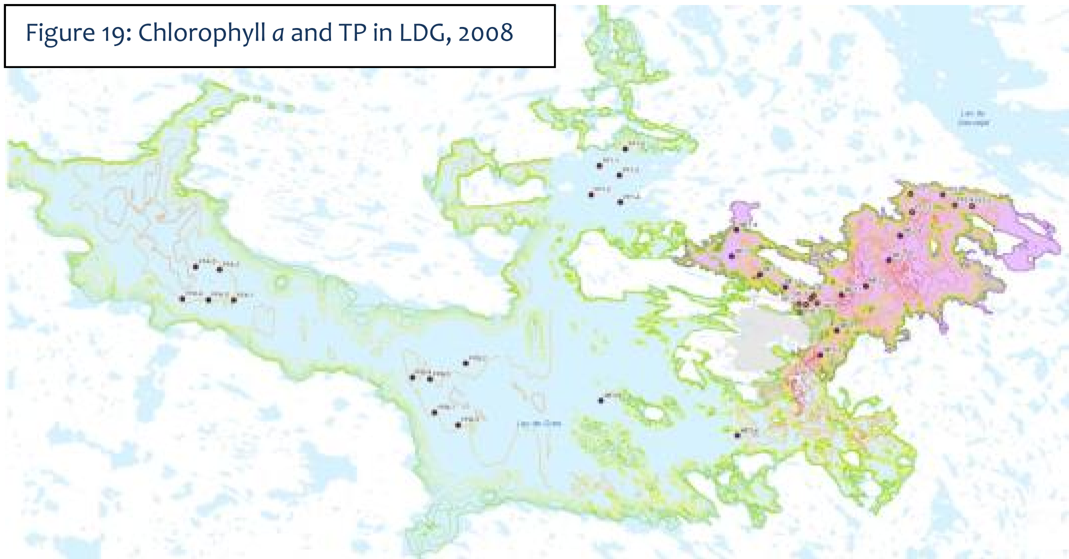
Overall, the 2008 Aquatic Effects Monitoring Program determined that nutrients (nitrogen and phosphorus) released into Lac de Gras from the treated mine water discharge are causing mild nutrient enrichment in the bay east of East Island.

Nutrients are essential to the growth of plants and animals in land and in the water. Adding nutrients to natural waters can result in increased production of plants or algae. Too many nutrients can cause environmental problems generally known as nutrient enrichment or eutrophication. These problems include increased oxygen consumption in the water by algae (fish need this oxygen too) and a reduction in the amount of light getting to plants at the bottom of the water body.

Other results of note from the 2008 Aquatic Effects Monitoring Program include:

- The analysis of effluent and water chemistry data collected during the 2008 AEMP field program and from locations around the mine site (from Surveillance Network Program) indicated a low level effect on water chemistry within Lac de Gras resulting from the mine.
- Results of the sediment analysis did not identify conditions that are likely to affect aquatic life through enrichment or impairment. Bismuth and uranium (metals) were however assigned "high level effects" designation as both near-field and at least one mid field area had mean (average) concentrations greater than the reference area (sites far away from the mine) range.
- Analysis of the number and types of small organisms that live on the bottom of the lake (benthic invertebrates) indicated a range of effect designations, from no effect to a high level effect, depending on the variable analyzed. Low level or early warning effects were detected based on differences between the reference areas (far away from the mine) and exposure areas (near the mine) in eight of eleven benthic invertebrate community variables compared. Density (number of individuals in a specified area) of the midge Procladius in the near-field area were greater than the range measured in the reference areas and was assigned a moderate level effect. Density of Sphaeriidae in the near-field and mid field areas greater than the range measured in the reference areas and was assigned a high level effect. Both results are indicative of nutrient enrichment.
- The fish liver tissue analyses from 1996, 2005, and 2008 has not indicated that there has been an increase in the concentration of metals, including mercury, in lake trout over that period and therefore a no effect classification has been assigned for lake trout usability.
- Findings to date on a special study to examine changes in amount, number and types of tiny animals (zooplankton) and algae (phytoplankton) that live in the water of Lac de Gras indicate a pattern consistent with nutrient enrichment from mine effluent. Based on the measured higher amounts of phytoplankton (chlorophyll a) and total phosphorus in the near field areas compared with the reference areas this effect has been given a "moderate" level effect designation. Higher zooplankton biomass near the effluent resulted in a "high" level effects designation.

Figure 19: Chlorophyll *a* and TP in LDG, 2008



- Mercury and chromium VI levels in the treated mine water discharge, both subject of special studies in 2008, were determined to be at concentrations below the best analytical detection limits available.

- The AEMP confirmed that there is a nutrient enrichment effect and concluded that there is strong evidence for a mild increase in lake productivity due to nutrient enrichment. There is negligible evidence of impairment to lake productivity as a result of any contaminant exposure. The observation of potential low-level impairment of the benthic invertebrate community has a relatively high degree of uncertainty.

No changes to the monitoring program design are recommended at this time. Items have been identified for consideration during the program review that will follow the implementation of the program in 2010. Special studies on dust sampling frequency, mercury detection limits, and chromium VI are now complete. The mine effluent plume delineation survey (a study of the area where treated water from the mine mixes with Lac de Gras water) originally planned for 2009 is proposed to be conducted in 2010 so that the survey can evaluate the effectiveness of the new treated mine water discharge line that is being installed as part of the water treatment plant expansion that has been ongoing since 2007.

Follow-up special studies from the 2007 program finding of elevated mercury levels in slimy sculpin will include a 2009 joint research program with Fisheries and Oceans Canada to assist in understanding if mercury in the slimy sculpin tissue is related to the treated mine water discharge (if nutrient enrichment may affect mercury uptake in fish), and a repeat of the small-bodied fish survey in 2010.

2007 Observations:

- Effluent and water chemistry data collected indicated a low-level effect on water chemistry within Lac de Gras from the mine.

- Lakebed sediment chemistry data indicated a potential low-level effect for lead, and a potential high level effect for bismuth and uranium on sediment chemistry within Lac de Gras from mine activities, although benthic results suggest that sediment exposure concentrations are unlikely to pose risk to aquatic life.

- Benthic invertebrate analyses indicate a low-level nutrient enrichment effect on benthic invertebrates within Lac de Gras.
- The fish study indicated a pattern consistent with an increased availability of food and nutrients in near-field and far-field exposure areas compared to far-field reference areas. Elevated barium, strontium, mercury and uranium in slimy sculpin was assigned a moderate-level effect.
- Dike monitoring results revealed potential dike-related minor changes to water quality and concentrations of lead and uranium in sediment. Overall, analyses suggest benthic communities near the dikes are more likely responding to habitat variation than to changes in water quality or sediment chemistry.
- Eutrophication indicators showed a moderate-level nutrient enrichment effect within Lac de Gras, with the mine being a significant contributor to this effect.
- As with the previous year's results, despite the proximity of SNP Station 1645-19 to the effluent diffuser (60m), open-water and ice-cover water quality results remain within Canadian Council of Ministers for the Environment (CCME) Guidelines for the Protection of Aquatic Life.
- Ice-cover concentrations at SNP Station 1645-19 still tend to be higher and more variable than open-water concentrations. This is likely a result of increased wind driven lake circulation in the open-water, resulting in better initial dilution or mixing.

2005/2006 Observations:

Due to pending changes to the AEMP, data reports were completed for the 2005 and 2006 programs, however, a report of the analysis and interpretation was not submitted.

2004 Observations:

- As with the previous year's results, despite the very close (60m) proximity of SNP Station 1645-19 to the effluent diffuser, open-water and ice-cover water quality results remain within Canadian Council of Ministers for the Environment (CCME) Guidelines for the Protection of Aquatic Life.
- Ice-cover concentrations at SNP Station 1645-19 still tend to be higher and more variable than open-water concentrations. This is likely a result of increased wind driven lake circulation in the open-water, resulting in better initial dilution or mixing.
- Data analysis was conducted following the approved four step process. The results of the first step of the data analysis methods identified that there were changes in the concentrations of six parameters. Total arsenic and total nickel results were compared with original EA predictions (data analysis step 3). Measured changes are within the levels

predicted in the environmental assessment and are below levels that would cause environmental effects.

- As with the previous year, the results for several of the parameters indicated a possible change when the actual reason for the positive results was a low baseline statistic. There are also locations (LDG50) or parameters (nitrite at LDG46) where baseline data are not available and so the data analysis is not possible. Finally there are parameters where baseline detection limits have dominated the baseline statistic and could result in changes not being detected. It is therefore recommended that the Diavik Technical Committee, with Diavik, reset trigger values for the step 1 analysis on a parameter-by-parameter basis.

2003 Observations:

- Despite the very close (60m) proximity of SNP Station 1645-19 to the effluent diffuser, open-water and ice-cover results remain within CCME Guidelines for the protection of aquatic life.
- Ice-cover concentrations at SNP Station 1645-19 tend to be higher and more variable than open-water concentrations. This is likely a result of increased wind driven lake circulation in the open-water resulting in better initial dilution or mixing.
- Data analysis was conducted following the approved 4 step process. The results of the first step of the data analysis identified specific monitoring locations where there were changes in the concentrations of seven water quality parameters. Of these, only total arsenic could be identified as possibly being caused by the NIWTP effluent (data analysis Step 2). Measured changes in total arsenic are within the levels predicted in the environmental assessment (data analysis Step 3) and are below levels that would cause environmental effects.
- The results for several of the parameters indicated a possible change when the actual reason for the positive results was a low baseline statistic. There are also locations (LDG50) or parameters (nitrite at LDG46) where baseline data are not available and so the data analysis is not possible. It is therefore recommended that in the future the data analysis method be modified so that the baseline references are from the combined mid-field and far field sites instead of each individual monitoring site. This change would reduce the number of false positives results.

2002 Observations:

- Water quality at all Lac de Gras monitoring locations, including sites immediately adjacent to effluent diffuser remained high.
- Increases from location specific baseline levels were measured for turbidity and suspended solids at 3 mid-field monitoring stations, however all remained within typical baseline values for the area.
- Predicted nutrient enrichment effects were not realized although phytoplankton biomass was determined to have increased over baseline at one far-field location but not at any mid-field locations.

- No trends or specific concerns were noted for zooplankton, benthic invertebrates and sediment quality, based on two sampling results.
- Snow chemistry results were all below discharge limits.

Previous Years Observations:

- Localized increases in turbidity, suspended solids and aluminium were measured due to dike construction.
- Water and sediment quality, zooplankton, phytoplankton and benthic invertebrate results were generally consistent with baseline, however some results, particularly benthic invertebrate numbers, showed larger year-to-year variability.

What effect will the mine development have on fish?

EA Prediction:

- On a regional scale the only effect on the fish population of Lac de Gras would be due to angling;
- The effect of increases in metal concentrations in fish flesh would be negligible (i.e. metal concentrations in fish flesh would not exceed consumption guidelines (500 ug/kg for mercury);
- Mercury concentrations will not increase above the existing average background concentration of 181.5 µg/kg; and,
- Local effects due to blasting, suspended and settled sediment from dike construction, increase in metal concentrations around dikes and post-closure runoff.

Observations:

- Slimy Sculpin were sampled in 2013. Differences in the body size (length and weight) of the fish, as well as the condition factor (how ‘fat’ the fish is, or length in relation to weight), relative liver size, and relative gonad size were observed in fish caught near the mine compared to those in areas further from the mine. This demonstrates a potential toxicological response (a reaction to exposure). These observations are not consistent with the results of previous fish surveys in Lac de Gras or with the other findings of the AEMP that all indicated a nutrient enrichment response. Overall, the fish data indicate that an Action Level 1 (confirm the effect) has been reached, which means this study will be repeated in 2016.

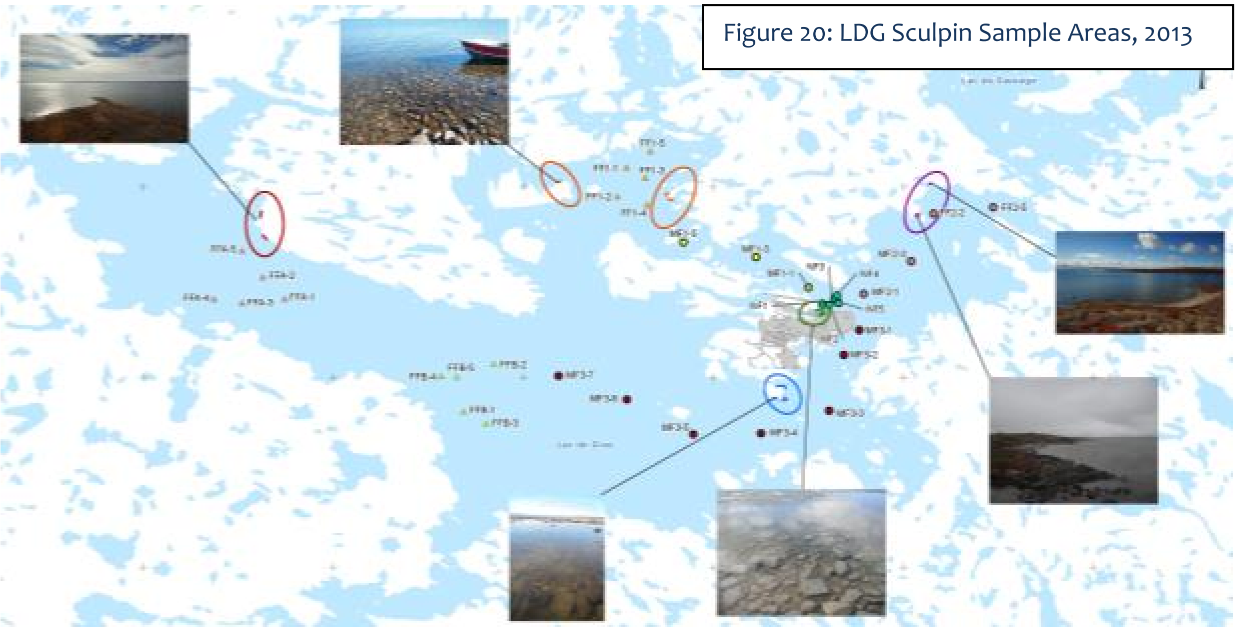


Figure 20: LDG Sculpin Sample Areas, 2013

- M-lakes and West Island Fish Habitat Restoration programs were started in 2009 in order to make up for the fish habitat lost to dike/pit construction. This is a requirement from the Department of Fisheries and Oceans. Streams in these areas were improved to encourage fish use and movement between smaller inland lakes and Lac de Gras. Construction was finished in 2012 and monitoring of these areas was ongoing during summer 2013.

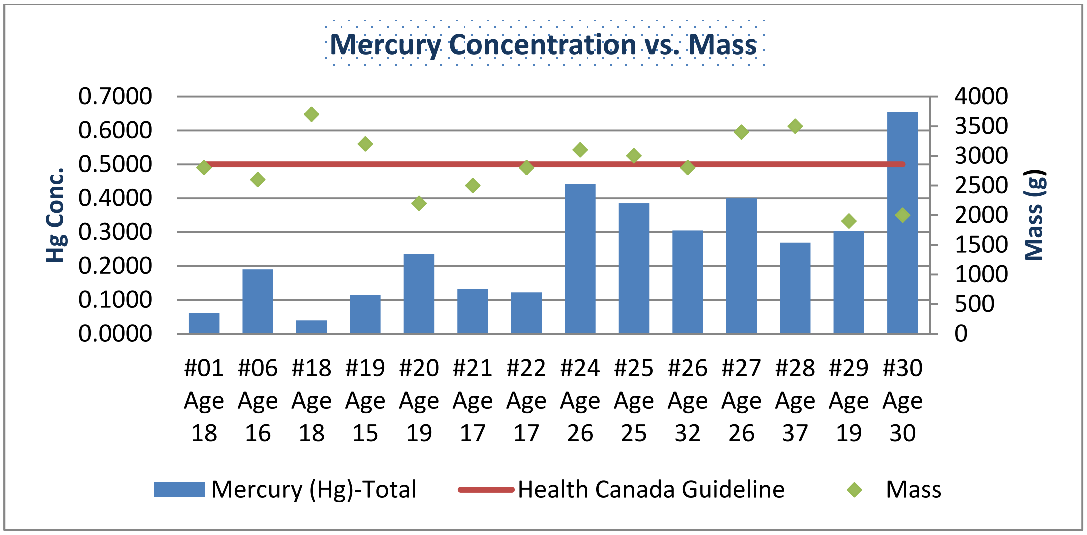
- An increased amount of mercury was detected in tissue from small fish (slimy sculpin) taken from the lake in 2007. In 2008, Diavik conducted a study to further evaluate the elevated mercury in fish tissue, this time studying large-bodied fish (lake trout). The fish liver tissue analyses indicated that there is no concern relating to the concentration of metals, including mercury, in lake trout, but that some very large/old fish did show higher levels of mercury than smaller fish, as can be expected. A mercury study was also completed on treated mine water discharge and determined that concentrations are below the best analytical detection limits available.
- Based on the results of the 2008 trout survey, it was determined that mercury levels were safe for consumption and that the fish palatability study could be done in 2009. Participants from each of the community groups for the Diavik mine participated in the fish palatability study at site. Four fish were cooked for tasting using the same methods as previous studies, and fish tissue and organ samples were taken for metals testing, including mercury. Each of the four fish that were cooked for the palatability study also had metals samples submitted for testing. Results for the metals levels in the fish tested during the 2009 fish palatability study showed mercury levels below Health Canada's guideline for consumption and that fish were okay for eating.

- Additional follow-up special studies included a 2009 joint research program with Fisheries and Oceans Canada (DFO) to assist in understanding if mercury in the slimy sculpin tissue (identified in 2007) is related to the treated mine water discharge. Results from this study did not support the idea that higher levels of mercury may be because of increased mercury being released from sediments with nutrient enrichment from the treated mine effluent.

- The small-bodied (slimy sculpin) fish survey was also done again in 2010. Results show that there is some change to size and condition of the fish that would be consistent with nutrient enrichment (more availability of food and nutrients); this was found closer to the mine. There were some metals in the fish tissue that could have a moderate effect on fish, but there did not appear to be any impacts to fish health. Mercury levels in the fish tissue were lower than previously reported in 2007 and were within the expected range. A different lab was used to analyze the tissue samples, but the reason for the differences between the 2007 and 2010 studies is not known.
- A large-bodied (lake trout) fish survey was done in 2011 to test mercury levels in fish. The results from this study showed that mercury levels are increasing slightly in both Lac de Gras and Lac du Sauvage. The average mercury concentration in lake trout from Lac de Gras was similar to that found during 2008. This number is a length-adjusted number because mercury concentrations increase with size and age. The lake trout in Lac du Sauvage were found to have average mercury concentrations higher than those found during 2008; this lake is upstream from Diavik. A low-level effect was given for fish mercury levels, though it doesn't appear to be linked to the mine.
- From 2003 until present, the fish from Lac de Gras have tasted good according to participants in the community-based monitoring camps that are held in some summers. Scientific testing for metals levels in fish tissue and organs that were caught during these camps were also as expected - the results showed no concerns.

  Participants from the 2012 Traditional Knowledge fish camp, conducted as part of the AEMP, noted that the status of the fish in Lac de Gras near the Diavik mine is good. Thirty-nine fish were caught and, of these, two fish were identified as being of poorer condition, noting that these fish were skinny and, in the case of one, had a larger head. Another fish was also observed as having some intestinal worms and being of poorer condition. Participants noted that this tends to occur in all fish populations and that the fish are not eaten. Those that were tasted as part of the palatability study resulted in scores of 1 (excellent for eating, looks better than fish usually caught) or 2 (good for eating, looks similar to fish usually caught) from all participants.
- Global concern over mercury levels has increased due to human activity and industrial processes. Increased levels have been noted in the past in small fish in Lac de Gras (Diavik 2007), as well as in other lakes located throughout the Northwest Territories (http://www.hss.gov.nt.ca/health/environment-and-your-health/mercury-levels-fish).
  Mercury levels are used as one of the main health indicators for the fish palatability study. The figure below shows the results that were observed in fish sampled during the 2012 AEMP TK program.

Figure 21: Mercury Levels in Fish from LDG, Diavik TK Camp 2012



One clear result that we can see on the graph is the difference in mercury concentrations between a whitefish (bottom feeder) and a lake trout (predator fish). Six whitefish were caught and the one tested (#18) had the lowest mercury level of any fish sampled and, when compared to a lake trout of similar same age and size, the mercury level in the trout was 1.5 times higher than that of the whitefish. Additionally, we can see that the two fish identified as being skinny and unsuitable for eating (Fish 29 & 30) by community participants had quite high mercury concentrations with lower than average body weights and ages of 19 and 30, respectively. The fisheries biologists noted an enlarged gallbladder on Fish 29 and intestinal worms in the stomach of Fish 30, both of which can be indicators of poor health from a scientific perspective. This provides a good example of how science and TK can arrive at a similar result.

- Since 2000, no fish have been taken by recreational fishing from Lac de Gras by Diavik.
- Fish habitat utilization studies showed that lake trout continue to use both natural and man-made shoals near the A154 dike.
- A Blasting Effects Study was done starting in 2003 and showed no effects on fish eggs.

Other observations made in past years include:

- Sediment deposition rates measured during the construction of the dikes were below levels predicted in the Environmental Assessment.
- In 2002, 2526 fish were salvaged from inside the A154 dike pool and released in Lac de Gras. 526 fish were salvaged from the North Inlet and released to Lac de Gras.

In 2006, 725 fish were salvaged from inside the A418 dike pool and released in Lac de Gras.

Runoff and Seepage:

There are known locations where seepage and runoff occur at the Diavik mine site. There have historically been 22 seepage stations that included: 7 survey stations, 5 groundwater monitoring stations and 10 collection ponds. In 2013, 4 groundwater and all 7 survey stations were discontinued. Working with the WLWB, Diavik's program was changed in the fall of 2013 to include:

- 2 surface runoff stations;
- 1 groundwater station;
- 4 seepage collection wells (within the PKC dams), and;
- 10 collection ponds.

Seepage is monitored and managed by DDMI staff and the AANDC Inspector is kept informed of seepage issues, as well as the short and long term plans for monitoring and repairs. No seepage was seen or sampled during 2013 as the upstream water collection systems successfully captured and diverted any runoff. In comparison, seepage was sampled 5 times during 2012.

- PKC East Dam – four areas were identified that had some minor seepage from the east dam of the PKC in 2012. In 2013, a pump was installed that could lower the East PKC Dam water level to the point where seepage could no longer exit the dam.

- PKC West Dam – seepage was observed in this area in 2009 and 2010. A dam was built upstream of the seepage in August 2010 in order to re-direct it to Pond 4; no seepage was seen during 2011 or 2012, indicating that the dam worked. Seepage from the PKC West Dam into Pond 4 was noted but it was reduced in 2013 by carefully planning the placement of process water and solids, as well as by attentive management of water levels in the main PKC pond. The Pond 4 liner was also repaired in 2012.

- Pond 5 – a bulge was observed in the Pond 5 liner (a liner is placed inside of a dam to prevent water from flowing through the dam) in 2008 from water building up behind it. Diavik released the pressure by making two small holes in the liner and maintained water levels below those holes from 2009-2012. As a result, there was no seepage observed downstream of Pond 5 in 2013. In late 2013, the discharges from the Pond 5 sumps were tied into the East Side Pipeline.

- PKC Seepage Interception Wells – DDMI installed 8 wells in the PKC dam rockfill during the PKC raise in 2010; the purpose of these wells is to intercept potential seepage from the PKC. The wells are placed in areas where the landscape would mostly likely direct seepage. The wells can be pumped down if water collects within them. Three of the wells were pumped down in 2013 and this was likely the reason for the reduced seepage noted south of the PKC. Seven additional Seepage Monitoring/Collection Wells were installed in the PKC Dams and North Country Rock Pile in 2013; 3 of them include pumps to move water, as required.

- Pond 13 – to collect any seepage that may flow from Pond 13, a culvert was installed through the road downstream and a pump system was put in to place in 2009. No seepage was observed to enter the lake from 2011 to 2013, and temperature instruments in the pond showed that the ground remained frozen throughout the summer.

- Pond 2 – an area of Pond 2 that had previously leaked but been fixed in 2006, experienced a small leak again in 2011. It was found that the advancing rock pile had encroached on the dam that was constructed and caused a seep. Water levels in Pond 2 were kept below the area where seepage could occur for all of 2013.
- North Inlet East Dike – instruments used to monitor the dike temperature (an indicator for possible seepage) showed a warming trend in 2008. In 2009 and 2010, DDMI installed an additional 33 thermosyphons (cooling equipment) in the dike to promote freezing, as well as two new thermistors (temperature gauges) to improve monitoring coverage. DDMI did a test in 2011 to lower the north inlet level and see if the dike was holding back water. The areas where instruments were added to improve freezing showed success. There was another area identified during this test that could be improved with additional instruments; an additional 14 thermosyphons and 2 thermistors were installed during 2012. All areas of the North Inlet East Dike that are near the thermosyphons stayed frozen with no evidence of seepage in 2013.

What effect will the mine development have on water quantity?

EA Prediction:

- Water supply to the mine is not limited and use of the resource will not cause changes in water levels and discharges from Lac de Gras beyond the range of natural variability.

Observations:

The figure below shows the purpose and amounts of fresh water used from 2000 to 2013. DDMI recycles water from the PKC and North Inlet as much as possible in order to reduce the amount of fresh water needed; in 2013, this amounted to 1.8 million m^3 of recycled water. Baseline information indicated that the water level of the lake normally fluctuates between level 415.5 m and 416.0 m on an annual basis. The table below shows water levels at various dates since 2004. Use of water from Lac de Gras by Diavik is not causing changes in water levels beyond natural variability. Further information can be obtained from the Water Management Plan.

Figure 22: Freshwater Use Volumes from 2000-2013

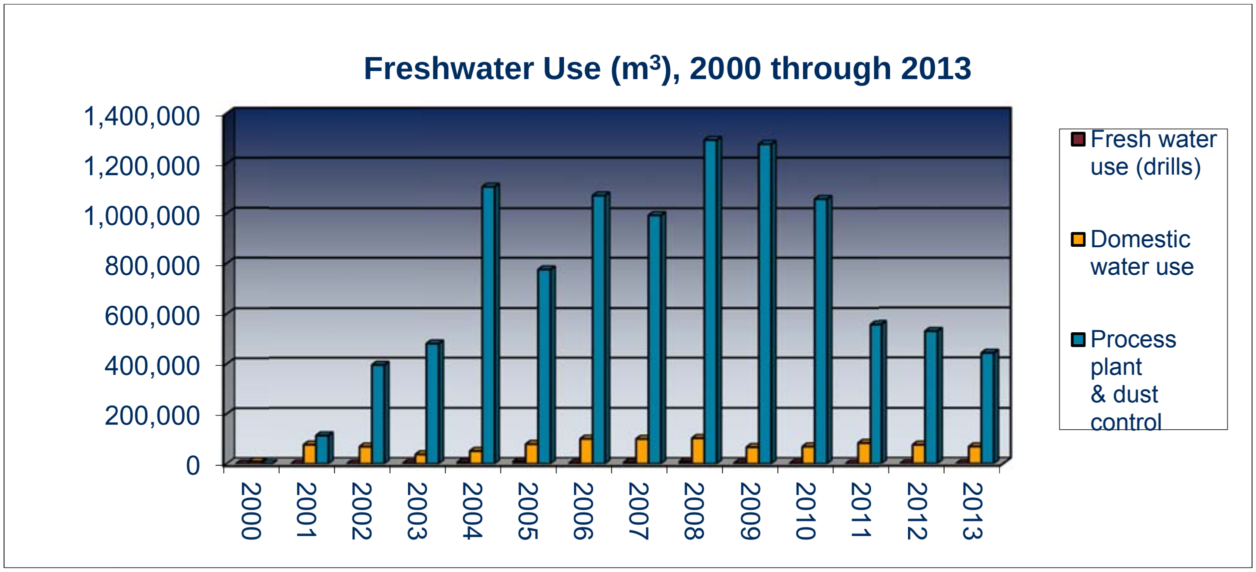


Table 19: Lac de Gras Water Levels

Date	Elevation (m.a.s.l)	Date	Elevation (m.a.s.l)
September 21, 2004	415.31	April 1, 2005	415.26
June 20, 2005	415.41	August 2, 2005	415.59
September 7, 2005	415.52	October 15, 2005	415.42
May 25, 2006	415.47	June 24, 2006	415.60
August 28, 2006	415.76	July 7, 2007	415.62
August 21, 2008	415.50	October 15, 2008	415.69
June 13, 2009	415.33	September 28, 2009	415.61
October 21, 2010	415.46	October 15, 2011	415.21
July 15, 2012	415.67	August 13, 2013	415.52

5. Operational Activities

The information below provides a summary of the operational activities that occurred during 2013. More detailed information can be found in the Type 'A' Water License annual report.

- Required SNP stations were sampled during each month. Where samples were unable to be obtained (e.g. safety concerns, weather, equipment issues), samples were re-scheduled or postponed.

- The Tibbitt to Contwoyto Winter Road operations were successful and Diavik trucked 3,149 loads to the mine site, and backhauled stored hazardous wastes for off-site recycling or disposal.
- An ice road was constructed from the mine site to the M-lakes and West Island fish habitat restoration sites in February to remove extra stored materials and equipment leftover from these projects.
- Quarterly toxicity samples from stations 1645-18 and 1645-18B were collected in March, June, September and December with no concerns identified.
- The AEMP was conducted in April and August.
- Annual snow core surveys were completed in April.
- Wolverine track surveys were done in April with the help of a community assistant.
- The old incinerators at the Waste Transfer Area were removed in April.
- Three MLC (electrical sub-stations) installations were completed underground in May: D8975N, A9105 and A9085
- Waterfowl Surveys commenced in May and were completed in June.
- Inspections for raptor nest sites on mine infrastructure & pit walls ran from May to October.
- One MLC installation was completed underground in June: A9065
- In June, a screen was added to the water intake pipe in Lac de Gras that is used for dust control.
- The PKC dam raise begin in June and will continue into 2014.
- The next phase of Diavik's re-vegetation research with the University of Alberta began in June 2013 and will continue through to 2016.
- The grizzly bear DNA research program was conducted in cooperation with EKATI mine from June to September. Community participants provided TK and assisted with conducting the program.
- 40 trailers in bad shape were landfilled in July, as approved by the WLWB and the AANDC Inspector; this is part of Diavik's efforts to continually reduce the mine footprint over time.
- The D8975 Pump Station (for water) was completed underground in July.
- A total of 30 SLR Bulkheads (EXPLAIN) were completed on various levels (D9075, D9100, A9180 and A9145) between July and November.
- The SNP seepage monitoring program was amended in August 2013.
- In October, a fuel storage tank was installed in each of the 2 open pits, near the underground access locations, as approved by the AANDC Inspector.

- The sewage sludge collection cell was relocated to the till stockpile (beside the rock pile) from the Waste Transfer Area in August.
- Wind turbine bird mortality monitoring was completed in September with no dead birds found.
- Caribou activity budgets/behavioural observations were done from September to October, with the assistance of TK holders and youth from the communities.
- The A9065 Pump Station was completed underground, and the Batch Plant upgrade was completed on surface in November.
- A Wye Sump (a system with 2 lines; the primary and an emergency line where the pump is operated by battery) was installed underground at A9065 in December.
- 1.9 km of the PKC Dam was raised and lined to the 465 m elevation.
- Monitoring for the M-lakes and West Island Fish Habitat Restoration programs was ongoing during summer 2013.
- The average camp population for the year was 532.
- The final open pit bottom elevations are 9055 (A154) and 9125 (A418); the surface of the water on Lac de Gras is 9415.32.
- A total of 9,037 m was developed underground, including 4,102 m of waste rock and 4,935 m of ore development.

References for Further Information

Water Quality

- Monthly Surveillance Network Program (SNP) Reports
- 2013 Type A Water License Report
- 2013 Seepage Survey Report
- 2013 Aquatic Effects Monitoring Program (AEMP) Monitoring Report
- AEMP Study Design, Version 3.3 (2013)
- Three Year AEMP Results Summary for 2007 to 2010

All reports: http://www.mvlwb.ca/Boards/WLWB/SitePages/search.aspx?app=W2007L2-0003

Wildlife

- 2013 Wildlife Monitoring Report (EMAB Public Registry)
- 2012 Wildlife Monitoring & Management Plan (EMAB Public Registry)
- 2014 Comprehensive Analysis – PENDING
- 2012 Grizzly Bear DNA Study Design (EMAB Public Registry)
- 2013 & 20114 Grizzly Bear DNA Study Report - PENDING

Vegetation

- 2013 Wildlife Monitoring Report, Appendix A: Comprehensive Vegetation and Lichen Monitoring Program (EMAB Public Registry)

Traditional Knowledge

- 2013 Wildlife Monitoring Report, Appendix G of Appendix A: Traditional Knowledge Study for Diavik Soil and Lichen Sampling Program (Tłı̨chǫ Government, 2013)

Air Quality

- 2013 AEMP Monitoring Report, Appendix 1: Dust Monitoring Report (http://www.mvlwb.ca/Boards/WLWB/SitePages/ search.aspx?app=W2007L2-0003)
- Air Quality Monitoring Program (EMAB Public Registry)
- 2013 Air Quality Monitoring Report – PENDING
- National Pollutant Release Inventory (http://ec.gc.ca/inrp-npri/donnees-data/index.cfm?do=facility_substance_summary&lang=en&opt_npri_id=0000018241&opt_report_year=2011)

Socio-economics /Sustainable Development

- 2013 Socio-economic Monitoring Agreement Report (http://www.diavik.ca/ENG/resources/661.asp)
- 2013 Sustainable Development Report (http://www.diavik.ca/ENG/resources/661.asp)

Management & Operating Plans (as per Table 3)

http://www.mvlwb.ca/Boards/WLWB/SitePages/search.aspx?app=W2007L2-0003

Appendix I

Summary of Adaptive Management & Mitigation Measures

Table I-A - Adaptive Management & Mitigation

Aspect	Compliance	Adaptive Management Response	Mitigative Measures	Effectiveness of Measures
Waste	- Minimize waste management issues. - Maintained dump site for inert waste materials. - Waste rock is managed to reduce the chance of acid runoff	- All domestic and office wastes are incinerated at the waste transfer area. - Use of clear plastic bags in all areas for domestic and office space waste. - New WTA facility incorporated access road around the facility to allow equipment access and snow removal during winter to reduce opportunities for animals to climb over the fence; fencing angled and extended further in to ground to prevent access to burrowing animals; extensions placed on gate & gate automated in an effort to prevent animal access; improved sump facilities for contaminated soil containment area. - New incinerator housed in a building to further prevent animal attraction & rewards. - New, more efficient incinerator that burns more cleanly & completely. - Inert solid waste facility (landfill) access restricted. - Liner repairs conducted in areas where seepage from the dam was found. - More instrumentation was added in some areas to monitor dam and rock pile temperatures and movement. - Seepage monitoring stations changed in response to observations over the years. - Re-vegetation research is testing the use of waste rock as a substrate for plant growth.	- All employees and contractors are provided orientation on proper waste management. Color-coded collection bins and posters for non-food waste around site. - DDMI Environment Staff conduct regular toolbox meeting discussions regarding waste management. - Regular waste inspections are conducted by Environment Staff at the Waste Transfer Area and Landfill. A site-wide compliance inspection is completed weekly. - Site Services implemented clear plastic bags in all domestic and office areas to allow staff to verify contents prior to disposal. - Surface Operations staff collecting waste bins inspect bins prior to pick-up and notify Environment department to arrange for sorting. - Gate installed at inert solid waste facility to limit access to dump area. - Waste rock is classified according to sulphur level and is tested and sorted prior to disposal. - The waste rock pile is designed to encapsulate the rock with the highest sulphur content, and the PKC contains the waste kimerlite rock; each of these areas are surrounded by collection ponds to capture any seepage or runoff. - Granite (lowest sulphur content) is the rock permitted for use as a construction material at the mine site. - Instruments were installed to monitor performance of structures such as the PKC dam and the rock pile. - Extensive lab and field (test piles) experiments are done to test how the rock pile will perform. - Sewage sludge holding cell relocated to prevent human health concerns.	- During Inspector's visits in 2013, no concerns were raised regarding food waste, or the landfill. - Bear visits on East Island decreased from 2012, & bears sightings were not associated with waste management areas. - Improper disposal of waste is identified during DDMI waste inspections (including food waste) despite training and awareness sessions with site staff, but it is minimal when compared to the volume of waste disposed. - Sulphur testing has been an effective means of rock segregation. - Installation of seepage collection wells has proven effective. - Seepage and runoff events have occurred in the past, but there were no such events in 2013. - Monitoring efforts and data were helpful in designing seepage program changes.

Aspect	**Compliance**	**Adaptive Management Response**	**Mitigative Measures**	**Effectiveness of Measures**
Water	- Effluent is treated before being discharged to Lac de Gras, or is recycled. - Ammonia levels within water license limits. - Prevent seepage water entering Lac de Gras - Seepage water quality to be within license limits. - Decrease freshwater use. - Have fish and water quality that are safe for use.	- Review loading and blasting procedures and materials for opportunities to reduce ammonia levels in pit and underground water. - Re-use North Inlet water as supply water to facilities at the mine site. - Treatment plant expanded and some components re-designed to accommodate additional water flow from underground. - Evaluated the use of treated effluent for dust suppression. - Conducted a study with the University of Alberta to evaluate the biological removal of ammonia and other nitrogen compounds in the North Inlet. - Special Effects Studies (SES) are completed when unexpected effects are measured during the AEMP. - Established Action Levels to respond to findings of various parameters of the AEMP. - Evaluate seepage prevention or interception methods upstream or downstream of areas of concern. - Investigate, assess and repair site infrastructure where seepage issues arise, and where possible.	- The North inlet provides retention time for mine water before treatment, allowing for ammonia reduction by natual attenuation; mine water discharge located far away from treatment plant intake. - Influent and effleunt in the NIWTP is monitored consistenly via instream sensors (immediate feedback) and the SNP for parameters that are indicators of water treatment effectiveness. - Daily sampling of pit, underground & effluent water to produce trends & track compliance. - Plant able to automatically stop discharging treated water that meets or exceeds DDMI's *internal* limits (which are set below the water license limits). - Sulphuric acid is available for secondary treatment of water with high ammonia levels. - Ammonia Management Plan followed to minimize ammonia loss; includes use of blast hole liners to reduce ammonia dissolution in water and limiting holding times for loaded blast hole patterns to 4 days for wet holes and 2 days for sump blasts. - Batch and paste plants utilize treated effluent as a water source instead of fresh water. - Sumps and pumps installed underground to collect and transport water to the North Inlet. - Ability to re-use water from the North Inlet and PKC, prior to treatment, to reduce freshwater intake volumes. - Frequent visual inspections of areas downstream of dams, dikes & ponds. - Seepage intercepted with the use of sumps installed downstream of seepage areas. - Repairs to damaged infrastructure to prevent future seepage. - Source water (North Inlet, Collection Ponds, PKC) chemistry around site are monitored as part of the SNP. - On-going SES to determine mercury concentration/availability in fish and sediments within Lac de Gras. - Traditional Knowledge study of fish and water health completed in 2012.	- Ammonia levels in 2013 were well below the license limit of 12 mg/L. - Ammonia levels in mine water and effluent have remained low over time. - Parameters regulated in the Water License in NIWTP effluent & snow samples remain well below discharge criteria. - No seepage events occurred in 2013.

Aspect	Compliance	Adaptive Management Response	Mitigative Measures	Effectiveness of Measures
Wildlife	- Minimize wildlife-related compliance issues.	- Wildlife monitoring programs are adjusted based on results of previous years of studies. - Review of wildlife monitoring programs has been done with all 3 mines, Monitoring agencies, government and communities. - Study area expanded for caribou based on potentially larger mine zone of influence than predicted. - Participation in a regional wolverine DNA study with BHP-Billiton and GNWT to gain further insite on the wolverine population in the Lac de Gras region and around the mine. - Monitoring methods for grizzly bear changed to consider a more regional objective, while being safer for field crews. - Pit wall & infrastructure surveys for raptors that may nest in the pit or on other structures was added to the raptor monitoring program. - Raptor surveys changed to align with the North American Peregrine Falcon Survey. - Nests relocated or work activity ceased in response to wildlife presence. - Bird mortality monitoring conducted after installation of wind turbines. - Building installed to contain new incinerator and prevent wildlife attraction. - New Waste Transfer Area designed to minimize opportunities for scavengers to enter the area and access attractants/rewards. - Inclusion of community members in wildlife monitoring programs to allow consideration of both TK and science when evaluating impacts.	- Orientation and environmental awareness training related to wildlife on site is provided to all employees. - Employees notify Environment department of any wildlife sightings; these are then recorded. - Caribou advisory board & site-wide radio notifications for caribou presence on island. - Waste inspections conducted regularly. - Waste management system in place. - Caribou are herded away from high-risk areas, such as the airstrip, as requried. - Bears are deterred from the mine site, as required. - Problem wildlife is relocated or destroyed, in consultation with the GNWT. - Wildlife reporting system is in place site-wide, for wildlife observations. - Wildlife have the 'right-of-way' on site. - No hunting or fishing is permitted by employees. - Buildings are skirted and higher-risk areas are fenced or bermed in an effort to deter animal access. - Surveys are completed to look for caribou on roads, the rockpile and PKC when caribou are getting close to the mine. - Wind turbines equipped with flashing beacons designed to reduce wildlife impacts. - Mine-altered pond water levels are kept low to discourage use by waterfowl. - Re-vegetation research has been on-going for 10 years and will help to determine habitat available for wildlife after closure. - TK Panel focuses on wildlife concerns when considering closure planning options and operational monitoring programs.	- Mine-related wildlife incidents and mortalities have remained low over the years. - A female grizzly was relocated during 2013. - The remains of 2 peregrine falcons were found near the dikes in 2013. - No bird mortalities were found near the wind turbines. - No herding events took place for caribou in 2013.

Aspect	Compliance	Adaptive Management Response	Mitigative Measures	Effectiveness of Measures
Dust	- Isolated higher deposition levels due to construction activities (dust deposition is expected to decrease as construction activities at Diavik decrease and the mine switches from open pit to underground operations).	- Evaluate dust control measures used to minimize dust released from construction and operations. - Evaluate the use of treated mine effluent for dust supression, which would reduce fresh water use from Lac de Gras. - Evaluate dust suppressants that can be used in key areas to reduce dust levels. - Assess vegetation and dust sample locations to provide better coverage of the area for improved data collection. - Recalculate dust emission predictions to consider underground mining methods and construction activities. - Use of BC Objectives for Dustfall at mining operations as a comparison for DDMI levels.	- Dust suppression on roads and mine areas using water during non-freezing periods. - New crusher comissioned in 2009 is contained inside a building and has an advanced dust control and collection system. - Dust suppressant used on the apron, taxiway and helipad (approved by both the Lands Inspector and Transport Canada). - Addition of vegetation monitoring stations to improve ability to detect potential changes to cover or composition. - Modified lichen monitoring program to obtain more samples from further distances & link metal levels to caribou exposure. - Use of blast mats to control dust in smaller-scale blasts. - Transition to a completely underground mine has reduced dust levels from previous years.	- Control of dust from crusher, small blast areas and roads. - Dust suppressant continued to be used on the airport's taxiway, apron and helipad in 2013. - The transition from open pit to underground mining reduced dust levels from blasting. - Dust levels are generally below the BC Objectives for mining operations.
Air Quality	- Measure consumption of applicable sources of GHGs - primarily diesel combustion. - Meet Internal GHG Reduction Targets. - Report GHG Emissions to regulatory agencies and within Rio Tinto.	- Evaluate new technologies and equipment that may allow for pollution controls/ reduced emissions. - Wind power generation research. - Determine energy draws, optimal use and options to reduce power requirements for buildings on site. - Various fuel consumption reduction initiatives, e.g. no idling. - Review of air quality monitoring program and equipment requirements. - Added monitoring of TSP in 2013.	- Use of low sulphur diesel. - Archaeological assessment for areas where wind turbines could be installed. - Installation of Delta V fuel consumption monitoring system for all key power consuming buildings on site. - Boiler optimization program. - Installation of 4 wind turbines, integrated into the power distribution system, to reduce fuel consumption. - New waste incinerator (with pollution prevention device). - "Waste" heat from powerhouse generators used to heat facilties connected to powerhouse (camps, maintenance shops, etc.). - Underground air quality monitoring conducted. - Improving efficiencies of plant operations to reduce power draw. - 2 TSP monitors installed at the mine site.	- DDMI reports GHG emissions annually to appropriate regulators and internally to Rio Tinto. - The wind turbines reduced GHG emissions by 10,726 tonnes in 2013.

Aspect	Compliance	Adaptive Management Response	Mitigative Measures	Effectiveness of Measures
Hazardous Materials	- No significant spills or non-compliance issues. - Disposal practices that minimize possible environmental impacts	- All reported spills are investigated and taproots are conducted on external spills. - Electronic system for MSDS tracking for chemicals on site. - New products being brought to site are reviewed by Health, Safety and Environment personnel. - Equipment identified as having issues relating to frequency/volume of spills can be taken out of service for repairs/overhaul, as required. - Vehicle inspection and storage procedures improved in an effort to reduce spills. - Addition of underground spill response procedures to the Operational Phase Contigency Plan (OPCP).	- Orientation and specific training for employees and contractors is provided for storing and handling hazardous materials. - Regular waste inspections are conducted by Environment Staff at the Waste Transfer Area and Landfill. - A site-wide compliance inspection is also completed weekly. - Hazardous materials are backhauled each year on the winter road; materials are either recycled or disposed of in a safe manner. Prior to backhaul, hazardous materials are stored and inventoried at the Waste Transfer Area (contained, lined area). - A Lube Storage Building was built beside the truck shop to fully contain maintenance products. - Containment facilities exist for underground product storage & above-ground tankfarms - Pipelines that feed the powerhouse from the south tank farm are encased in cement. - All employees and contractors take WHMIS training. - NIWTP expansion provided improved containment for sulphuric acid and other water treatment chemicals stored on-site. - Alternative biodegradable products are encouraged, as are bulk orders. - Spill containment & clean up kits are located throughout the mine site (above & under ground). - The on-site Emergency Response Team has spill response equipment & capabilities, and practices such drills annually. - Installation of a waste oil burner at a plant on site to reduce on-site storage, shipment and off-site disposal risks with backhauling product.	- Spills are reported, recorded and quickly and effectively cleaned up. Follow up actions resulting from external spills are documented and reported to the Inspector. - No significant hazardous materials compliance issues were identified in 2013. - Spill volumes and frequency from problem equipment remained low during 2013.