



February 2019 Environmental Update for SLEMA Board

Feb 28, 2019

Outline

1. Mine Update
2. Reports
3. Regulators' Update
4. Aboriginal Update
5. Stakeholders' Update
6. Agency's Activities



Acronyms

- AEMP – Aquatic Effects Monitoring Program
- ARD – Acid Rock Drainage
- DFO – Fisheries and Oceans Canada
- ECCC – Environment and Climate Change Canada
- ECM – Extended Care and Maintenance
- ENR – Department of Environment and Natural Resources, GNWT
- EQC – Effluent Quality Criterion
- GNWT – Government of the Northwest Territories
- INAC – Indigenous and Northern Affairs Canada (formerly Aboriginal Affairs and Northern Development Canada [AANDC])
- MVEIRB – Mackenzie Valley Environmental Impact Review Board
- MVLWB – Mackenzie Valley Land and Water Board
- PK – Processed Kimberlite
- SLEMA – Snap Lake Environmental Monitoring Agency
- SNP – Surveillance Network Program
- SSWQO – Site-Specific Water Quality Objective
- TDS – Total Dissolved Solids
- WEMP – Wildlife Effects Monitoring Program
- WTP – Water Treatment Plant
- WMP – Water Management Pond



1. Mine Update

- The Snap Lake Mine remains in suspended operations (Extended Care and Maintenance) and Zero Occupancy period;
- The “Zero occupancy” period started in October 2018 and is scheduled to extend until March 2019;



Slide 4

pdp1

to check ECM starting date

philippe di pizzo, 2018-11-28

1. Mine Update

- No water use or wastewater discharge at site was reported;
- No treated water was discharged into Snap Lake;
- No water sampling reported;



1. Mine Update

- No spill reported
- Monitoring performed as per approved Surveillance Network Program (SNP) for Care and Maintenance



Slide 6

pdp1

to check ECM starting date

philippe di pizzo, 2018-11-28

2. Reports

- 2.1 De Beers January 2018's SNP Report
- Monitoring activities during December 2018 and January 2019 were reported in the SNP Report submitted by De Beers on January 31, 2019;



2. Reports

➤ 2.1 De Beers Jan 2019's SNP Report

During that period, monitoring at Snap Lake Mine included the following:

- Fuel tank inspections;
- Monthly North Pile, ditch and perimeter sump monitoring;



2. Reports

➤ 2.1 De Beers Jan 2019's SNP Report

- North Pole Thermistor and Piezometer monitoring;
- Dams and Water Management Pond monitoring;
- Main camp building Inspection;
- Meteorological data downloads;



2. Reports

➤ 2.1 De Beers Jan 2019's SNP Report

The following remote monitoring has been conducted in January:

- The perimeter sumps, WMP and 12M L tank farm were monitored continuously through remote monitoring cameras. The weekly photos are included in the SNP report;
- Remote monitoring of the East Cell instrumentation and site specific weather data is ongoing;



2. Reports

➤ 2.1 De Beers January 2019 SNP Report

- A contingency plan to allow de-icing to lower the sump or WMP water levels based on inspection is in place;
- Snow clearance was not required in January;



2. Reports

➤ 2.1 De Beers January 2019 SNP Report

- During January, De Beers staff mobilized to site on the following dates:
- January 4, and
- January 25, 2019;
- Photos of the remotely inspected structures for each of these campaigns are included in the report.



➤ 2.1 De Beers January 2019 SNP Report

➤ Remote monitoring and Water Licence (WL) compliance :

- De Beers has reportedly submitted to the Inspector weekly records of the remote images of the Water Management Pond, sumps, and the 12 million liter tank farm;









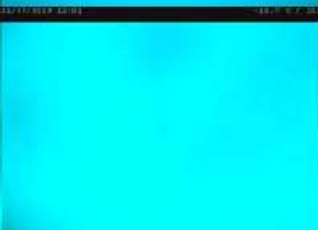













➤ 2.1 De Beers January 2019 SNP Report

➤ Remote monitoring and WL compliance:

- The January submission of the Remote Monitoring Report was attached as an appendix of the SNP Report;
- A log of camera icing and ice mitigation is included in the appendix of the report;



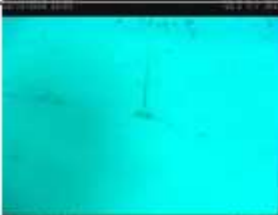














2.1 De Beers January 2019 SNP Report

Water Control Structure	Photos				
	Week 14 Dec 30, 2018 - Jan 5, 2019	Week 15 Jan 6-12, 2019	Week 16 Jan 13-19, 2019	Week 17 Jan 20-26, 2019	Week 18 Jan 27-Feb 2, 2019
Perimeter Sump 1					
Perimeter Sump 2					
Perimeter Sump 3					
Perimeter Sump 4					

Remote Monitoring Photos at Snap Lake Site, January 2019



2.1 De Beers January 2019 SNP Report

Water Control Structure	Photos				
	Week 14 Dec 30, 2018 - Jan 5, 2019	Week 15 Jan 6-12, 2019	Week 16 Jan 13-19, 2019	Week 17 Jan 20-26, 2019	Week 18 Jan 27-Feb 2, 2019
Perimeter Sump 5					
Water Management Pond					
Fuel Tank					

Remote Monitoring Photos at Snap Lake Site, January 2019



2.1 De Beers January 2019 SNP Report



Photos at Snap Lake Site during De Beers visit, January 4 2019



2.1 De Beers January 2019 SNP Report



Photos taken at Snap Lake Site during the Beers site's visit,
January 25, 2019



2. Reports

➤ 2.1 January 2019's SNP Report

- No Regulatory inspections were conducted during December 2019.



3. Regulator's Update

- No activities reported



4. Aboriginal Update

- No activities reported



5.1 Stakeholders' Update:

- Workshop on Guideline for Contaminated Soil Treatment Facilities:
- In order to develop a Guideline for Hydrocarbon Contaminated Soil Treatment Facilities in the NWT, the GNWT - ENR, the IWB, and the MVLWB formed a Working Group;
- A workshop is going to be held on March 12, open to all interested parties, to work towards finalizing the Guideline;



5. 2 Stakeholders' Update:

- Comments on De Beers 2017 Envir. Agreement Annual (EAA) Report:
- On November 19, 2018 ENR invited parties of the EA to provide comments on De Beers' 2017 EAA Report;
- On or before Jan 3, 2019, SLEMA and DFO provided comments;
- On Feb 15, ENR submitted the comments to De Beers;



5. 2 Stakeholders' Update

➤ Comments on De Beers 2017 EAA Report:

- SLEMA's comments:

For SLEMA's comments, please, see the January 2019 Environmental Update;

- DFO's comments:

It has reviewed the Report and has no comments or concerns at this time;



5. 2 Stakeholders' Update:

➤ Comments on De Beers 2017 EAA Report:

- GNWT directed De Beers to provide a revised Annual Report or an addendum that:
 - “More comprehensively compares the results predicted in the environmental assessment to the actual performance of the Project for all environmental components” (as required under Article 10.1(b) of the Agreement);



5. 2 Stakeholders' Update

➤ Comments on De Beers 2017 EAA Report:

- Provides “ a comprehensive summary of all supporting information, data and results related to the environmental monitoring programs” as required under Article 10.1ci) of the Agreement;



5. 2 Stakeholders' Update

➤ Comments on De Beers 2017 EAA Report:

- Lists and summarizes all environmental plans and programs as required under Article 10.1 c vi; and,
- “Provides a more comprehensive summary of public concerns and responses to public concerns”, as per Article 10.1 c(x).



5. 2 Stakeholders' Update:

- Comments on De Beers 2017 EAA Report:
- Finally, ENR – GNWT requested that the revised Annual Report or the addendum addressing the noted issues be submitted by De Beers within sixty days of receiving the letter (dated February 15) in accordance with Clause 10.1 (h) of the Agreement.



5. 3 Stakeholders' Update:

- Snap Lake Mine Water Licence Renewal Workshop
- On February 15, 2019 De Beers informed that it will host a one day workshop in YK on March 7, 2019;
- The Workshop's purpose is to discuss the Type A Water Licence renewal application for the Snap Lake Mine;



5. 3 Stakeholders' Update:

- Snap Lake Mine Water Licence Renewal Workshop
 - “The objective of this workshop is to present and discuss the proposed treatment wetland, updates to water model predictions, effluent quality criteria, and the aquatic effects monitoring plan”;
 - “Input received will be reviewed and incorporated where possible into the Water Licence renewal application”.



5.4 Stakeholders' Update:

- De Beers Air Quality and Emissions Management and Monitoring Plan (AQEMMP)
- On February 1, 2019 De Beers submitted to ENR – GNWT the draft of the AQEMMP for review as per the Agreement;
- On February 15, 2019 ENR – GNWT held a meeting in order to discuss the AQEMMP;
- SLEMA's Executive Director (by phone) and Environmental Analyst attended the one hour meeting;



5.4 Stakeholders' Update:

- After the meeting a table that summarizes comments was submitted to De Beers for its consideration, some points are:
- It would be helpful to have an understanding of: the site activities that will occur during closure and post-closure; and the associated time duration of closure and post-closure periods. Activities that relate to air quality emissions are of interest;



5.4 Stakeholders' Update:

- Demonstrating past monitoring activities and if/how De Beers reliably demonstrated conformance with model predictions and/or air quality standards would set the stage for proposed monitoring during closure;
- The AQEMMP currently states that monitoring will cease for post-closure, but that will not allow baseline conditions to be demonstrated. If the north pile, or other un-revegetated areas around site remain a source for wind-blown dust, then ongoing monitoring should be maintained until conformance is demonstrated.



5.4 Stakeholders' update

- After mine decommissioning and reclamation is completed, the affirmation that the air quality would not be affected for any component of the mine will require to be confirmed by monitoring;
- The following requires further discussion and additional supporting information about all station location changes and how these locations are going to capture the necessary data based on emission sources and activities related to the context;



5.4 Stakeholders' update

The statement that PM2.5 addresses the AQEMMP requirements of section 6.3 (item e) (ii and iii) and section 7.2 (a) of the Agreement requires further elaboration:

- How the proposed monitoring approach can be used to substantiate that all NWT ambient air quality parameters are being met?
- Depending on the answer, it may be required that the data program is expanded to include appropriate instrumentation to capture data related to this program and the FCRP final criteria.



5.4 Stakeholders' update

New location for the SHARP monitor requires further discussion on:

- How was this scientifically selected for particulate data capture?
- Where is this station situated in relation to average wind direction and site activities that contribute to the sources?
- Is the communications building going to adequately capture particulate data to be of use for determining chemical air stability for closure criteria?



5.4 Stakeholders' update

Location of the dust fall monitoring stations requires further discussion on:

- How were the Dust fall stations chosen?
- How do they relate to sources of dust, and average expected wind directions known for the site?
- Is there a scientific justification for this? It is noted that dust fall stations are not placed on opposite sides the North Pile for example, or near the airport - two potential dust sources.



5.4 Stakeholders' update

SO₂ and NO₂ passive monitoring and the proposal to stop it during ECM, Closure and Post-Closure requires further discussion:

- The decision needs to be supported with data;
- ENR recommends continuation of monitoring



5.4 Stakeholders' update

Air dispersion modeling :

- The model discusses, uses data and provides conclusions based on the two the SHARP Monitors, which were previously located near the airstrip and emulsion plant .Since October 2017, one of the SHARP Monitors, located near the emulsion plant, was relocated to near the communications building
- Are the results provided by this relocated SHARP monitor comparable to the results that the SHARP Monitors located near to the emulsion plant and the airstrip would provide? and the model results still applicable to this new location?



5.4 Stakeholders' update

North Pile dust emission and air modeling:

- The closure plan for the North Pile is to apply a rock cover to the surface; therefore, PK will not be exposed to wind erosion during the post-reclamation period;
- Is the model assumption that the rock cover over PK would have 100% of efficiency in protecting PK for wind erosion? Why? This assumption requires further discussion.



6. Agency's activities

- On February 15, 2019 ENR – GNWT held a meeting in order to discuss the updated AQEMMP;
- SLEMA's Executive Director (by phone) and Environmental Analyst attended the one hour meeting;
- Following the meeting SLEMA submitted written comments on the AQEMMP



7. Case Study: Polaris Mine Closure Monitoring



7. Case Study: Polaris Mine Closure - Monitoring

- Underground zinc – lead mining operations began in early '80 and ceased in September 2002;
- After that the mine underwent a two year decommissioning and reclamation phase that ended in 2004;
- During operations, tailings from the mine were deposited in the nearby Garrow Lake, recognized under MMER as a tailing impoundment area;

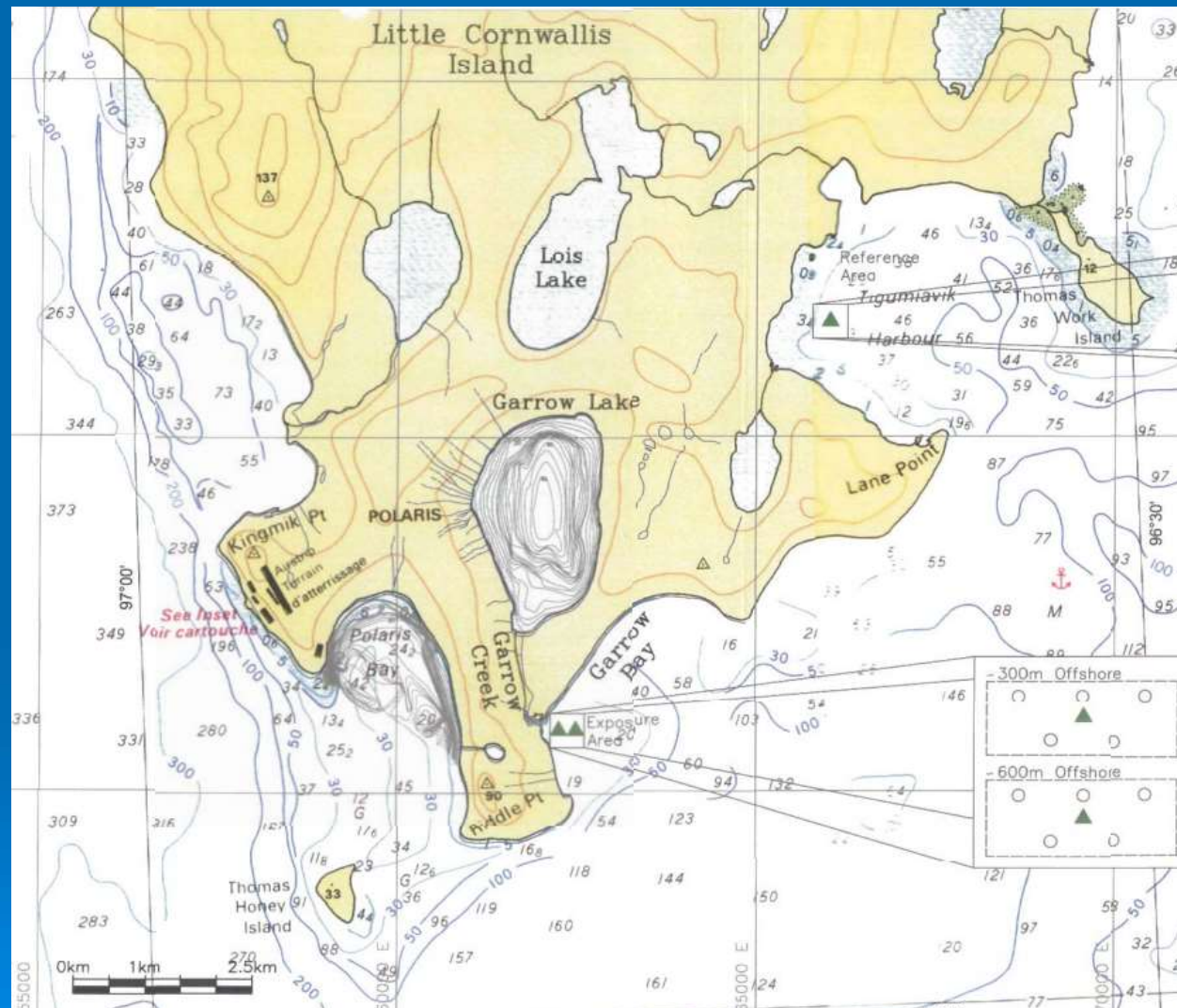


7. Case Study: Polaris Mine Closure - Monitoring

- Garrow Lake naturally discharges to a creek (Garrow Creek), and
- Then, the Creek discharges downstream into the marine foreshore of Garrow Bay;
- Discharges occur between end of July and mid September;



7. Case Study: Polaris Mine Closure - Monitoring



7. Case Study: Polaris Mine Closure - Monitoring

- There are two main components to the monitoring required under the licences issued for the Polaris Mine Project:
 - a geotechnical component, and
 - a water quality component.



7. Case Study: Polaris Mine Closure - Monitoring

- According to the *Guidelines for the Closure and Reclamation of Advanced Mineral Exploration and Mine Sites in the NWT* post closure monitoring should be carried out
- “After monitoring has demonstrated that closure objectives and criteria have been met”



7. Case Study: Polaris Mine Closure - Monitoring

- In determining the post closure monitoring the following guidelines were considered by the Nunavut Water Board (NWB):
 - 1) The “*Guidelines for the Closure and Reclamation of Advanced Mineral Exploration and Mine Sites in the NWT*” (the Guidelines); and
 - 2) The AANDC “*Abandoned Military Site Remediation Protocol*” (the Protocol).

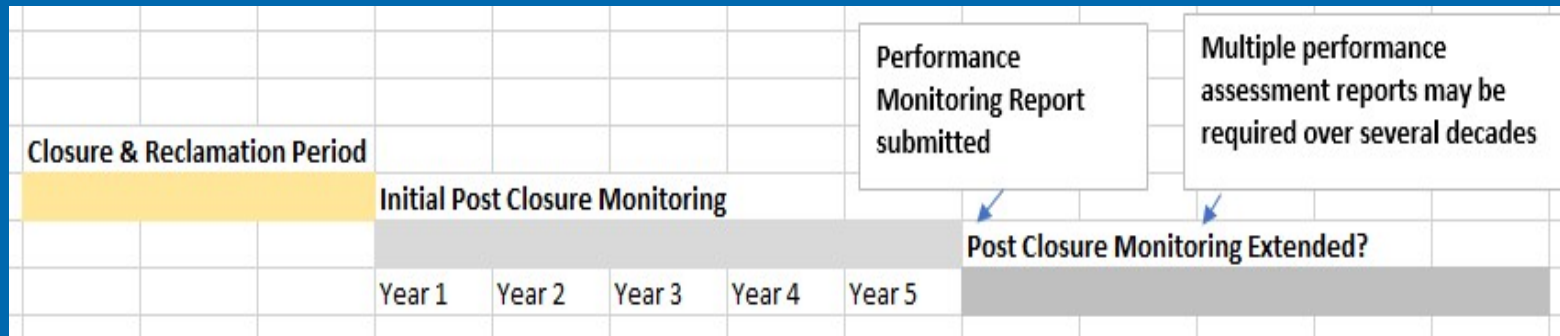


7. Case Study: Polaris Mine Closure - Monitoring

- According to the *Guidelines*, after the permanent closure of a mine and when reclamation activities are finalized, an initial post-closure monitoring period of five (5) years is recommended;



7. Case Study: Polaris Mine Closure



Post Closure Monitoring as per the Guidelines for the Closure and Reclamation of Advanced Mineral Exploration and Mine Sites in the NWT



7. Case Study: Polaris Mine Closure - Monitoring

- Following this initial five-years post-closure monitoring period, the post-closure monitoring period may be extended at the discretion of regulators;



7. Case Study: Polaris Mine Closure - Monitoring

- An extension of the monitoring period may be required, when some individual components may remain at site in perpetuity, such as mine tailings, underground structures, etc., which must be further monitored to ensure stability and full reclamation.



7. Case Study: Polaris Mine Closure - Monitoring

- The AANDC “*Abandoned Military Site Remediation Protocol*” was developed Under the Northern Contaminated Sites Program, where AANDC manages a number of contaminated properties (landfills, landfarms, etc.) abandoned by previous occupants of the land;



7. Case Study: Polaris Mine Closure - Monitoring

- After implementation of remedial actions for a given site, the Protocol identifies three monitoring phases:
- Phase I: Monitoring over a period of five years to confirm equilibrium conditions and stability are achieved;
- Phase II: Monitoring to verify the achievement of equilibrium conditions.

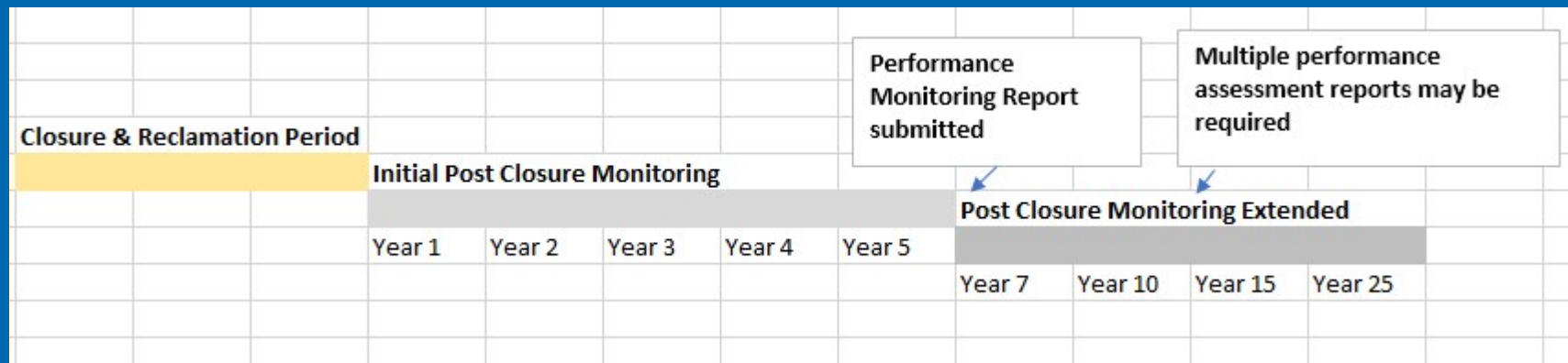


7. Case Study: Polaris Mine Closure – Monitoring

- During Phase II, monitoring frequency will be reduced and be carried out the following years: Year 7, Year 10, Year 15, and Year 25.
- Year 25 would mark the end of Phase II monitoring.
- At the end of Phase II, the Protocol proposes a re-evaluation be carried out.



7. Case Study: Polaris Mine Closure - Monitoring



Post Closure Monitoring as per the AANDC Abandoned Military Site Remediation Protocol



7. Case Study: Polaris Mine Closure - Monitoring

- MONITORING AT POLARIS
- Between 2003 and 2004, during active remediation, Teck was required to perform an extensive monitoring as per the NWB Water Licence;
- In 2005, active remediation at site ceased and Teck requested reductions in monitoring frequency, number of monitoring stations and frequency of reporting;



7. Case Study: Polaris Mine Closure Monitoring

➤ MONITORING AT POLARIS

- The reduction in monitoring frequencies and number of monitoring stations requested by Teck was granted by the NWB;
- As well as the submission of one annual report about site conditions and monitoring results (instead of quarterly reports);



7. Case Study: Polaris Mine Closure - Monitoring

- MONITORING AT POLARIS
- In 2015, during the renewal of the water licence, the NWB agreed with Teck and stakeholders to take the AANDC Protocol as useful guide for the post closure monitoring;



7. Case Study: Polaris Mine Closure - Monitoring

- MONITORING AT POLARIS
- Thus the Board recognized:
 - 2005, the first year of long-term monitoring at Polaris, as the beginning of the Phase I monitoring (as per the Protocol);
 - 2011 as marking the beginning of the Phase II monitoring period described in the Protocol (Year 7);



7. Case Study: Polaris Mine Closure

- MONITORING AT POLARIS
- According to that, monitoring should be performed in 2014, 2019 and 2029:

Closure & Reclamation Period	Initial Post closure Monitoring					Post Closure Monitoring Extended			
	2005	2006	2007	2008	2009				
						2011	2014	2019	2029
	Year 1	Year 2	Year 3	Year 4	Year 5				
						Year 7	Year 10	Year 15	Year 25

Figure: Post-closure monitoring at Polaris as per the NWB WL 1AR-POL1531

