SLEMA
April 2011
Environmental Update

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April 30, 2011

Outline

1. Mine Update
2. Inspection Update
3. Regulator Update
4. Stakeholders' Update
5. Reviews

Acronyms

- AEMP – Aquatic Effects Monitoring Program
- ARD – Acid Rock Drainage
- DFO – Fisheries and Oceans Canada
- EC – Environment Canada
- ENR – Department of Environment and Natural Resources, GNWT
- GNWT – Government of the Northwest Territories
- INAC – India and Northern Affairs Canada
- MVLWB – Mackenzie Valley Land and Water Board
- PK – Processed Kimberlite
- SLEMA – Snap Lake Environmental Monitoring Agency
- SNP – Surveillance Network Program
- TDS – Total Dissolved Solids
- WEMP – Wildlife Effects Monitoring Program
- WTP – Water Treatment Plant
- WMP – Water Management Pond

1.1 Mine Update – March 2011

- Production rate: 68% of its capacity (66,364 tonnes of kimberlite processed)
- 3,099 m^3 of water withdrawn from Snap Lake
- 625,093 m^3 of treated water discharged into Snap Lake
- 58,289 tonnes of coarse reject and 49,933 m^3 of slimes deposited in the North Pile
- 11 spills (6 reportable)
- Water sampled in 5 monitoring stations
  - The monthly average for all parameters met compliance
- Deposition of PK grits initiated in the East Cell
- Regular scheduled commercial traffic to/from Snap Lake on the winter road ceased on March 31, 2011
  - Gravel removed from the portage sections to minimize impact of deteriorating portages
- Surface Drill Core Program initiated to provide more detail on the geometry of the ore-body (kimberlite dyke)

1.2 Drilling Spill on Lake in March

- Spill #2011-084 on March 28, 2011
- “Due to a fault in the containment of the closed re-circulation system, drill water (255L) escaped containment to the ice and it is possible that a portion of the water leaked down the drill hole to the lake”
- Levels of TSS, Aluminum, Chromium, Copper, Lead, and Zinc were over Water Licence discharge limit

Environmental Analyst Comments

- Two minor spills occurred at the same lake drill site before and/or after the major spill
  - 20L on March 26
  - 20L on March 28
- De Beers should have taken immediate actions after the first spill on March 26 to prevent the major spill on March 28
  - More care should be taken in the future for any operations over the lake

1.3 Ammonium Nitrate (AN) Pad Remediation and Reclamation

- Letter addressed to the INAC Inspector on April 13, 2011
  - Provided the process and timeline for the remediation and reclamation of the historic AN pad
    - In five phases, completed on October 31, 2011
  - Crush removed from the AN pad will be recycled for use on the road (underground) and in construction materials (e.g. cement)

Environmental Analyst Comments

- Justifications should be provided along with the reclamation plan for the AN Pad
  - Moving the crush from the AN Pad to the underground is “pollution transfer”, even though the contaminated crush is contained in the underground, the leachate will be diluted in the mine water and further collected and pumped to Water Treatment Plant for treatment. Chance of underground water pollution still exists
  - Alternative options should also be provided for comparison

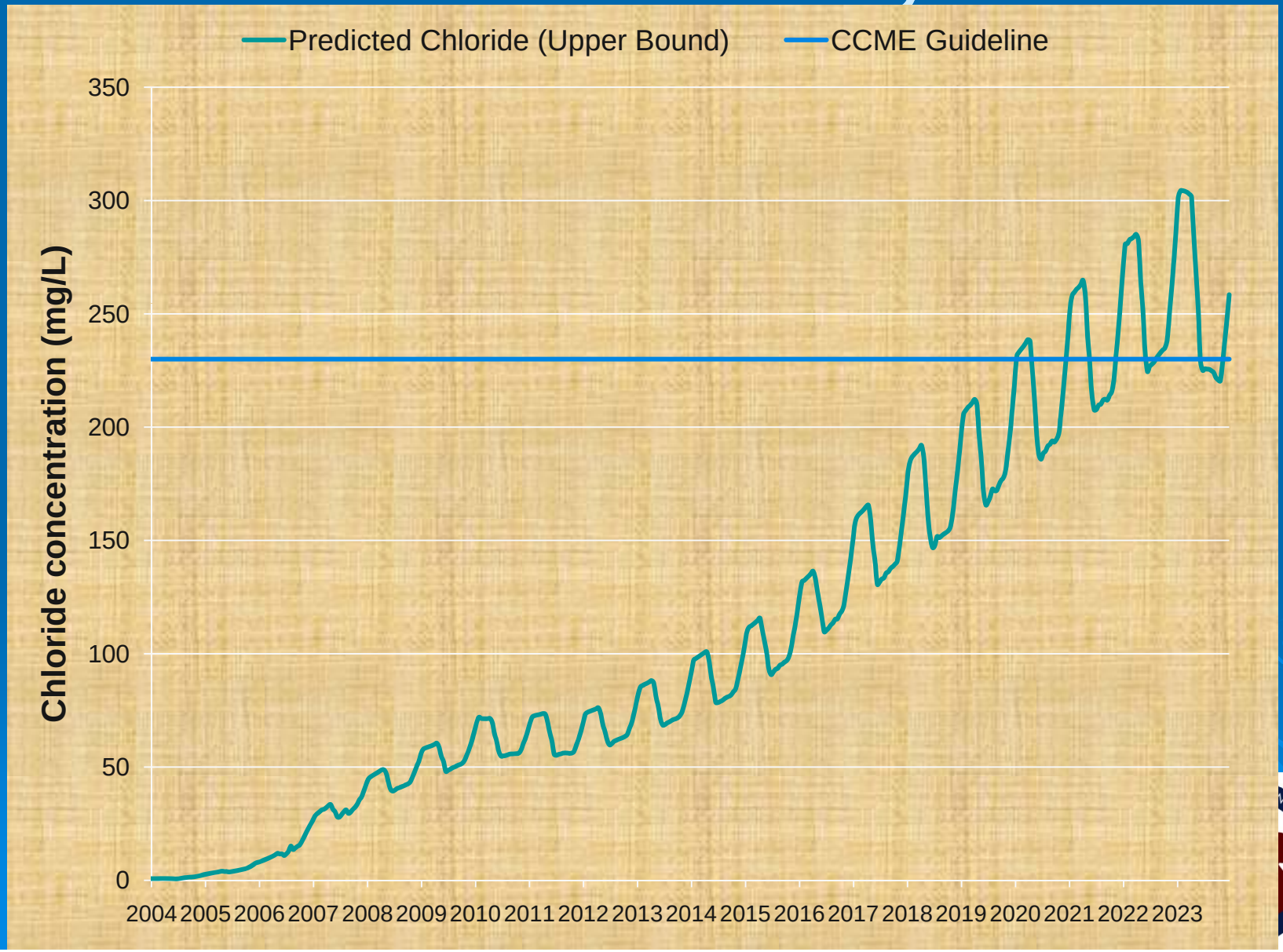
1.4 De Beers Response to INAC Concerns of the geotechnical Stability of the North Pile

- Letter addressed to MVLWB on April 12, 2011
- Golder Associated Ltd's professional engineers sighed and stamped letter provided
  - "No signs of instability have been observed to date"

1.5 Water Quality Workshop

- 3 models developed or updated
  - 3-D Underground Water Model
  - 3-D Lake Water Model
  - Site Model (linkage)
- Total Dissolved Solids (TDS), Chloride guideline criteria will be exceeded in the Upper Bound scenario
- Modeling work is ongoing
  - Dissolved Oxygen (DO) and nutrients modeling
  - Low Bound scenario modeling

Chloride Prediction by Golder



Water Quality Workshop

- De Beers may not apply for changes from the current Water Licence limits such as Effluent Quality Criteria (EQC, end-of-pipe discharge limit) and Water Quality Objective (WQO, ambient water quality standard). However, if prediction indicates some unfavorable stuff, site-specific studies will be done for site-specific guidelines (EQC and WQO)

Environmental Analyst Comments

- Calibration of the models looks great
- One water quality criterion used in the presentation was not correct (230 mg/L is guideline value for Chloride from US EPA rather than CCME)
- Chloride levels in Snap Lake may exceed the BC guideline value (150 mg/L) even in the “Lower Bound” scenario

1.6 January 2011 Water Quality Program

- Notice of program cancellation on April 27, 2011
  - Due to extreme weather conditions
  - Golder Associate Limited's cold weather policy – -35°C or equivalent wind-chill is a safe limit for work on winter water quality programs at Snap Lake Mine
- The quarterly program originally planned for January was completed in February

2. Inspection Update

- INAC Inspector – Tracy Covey
- Water Licence Inspection
  - March18, 2011
- Land Use Permit Inspection
  - March 18, 2011

2.1 Water Licence Inspection

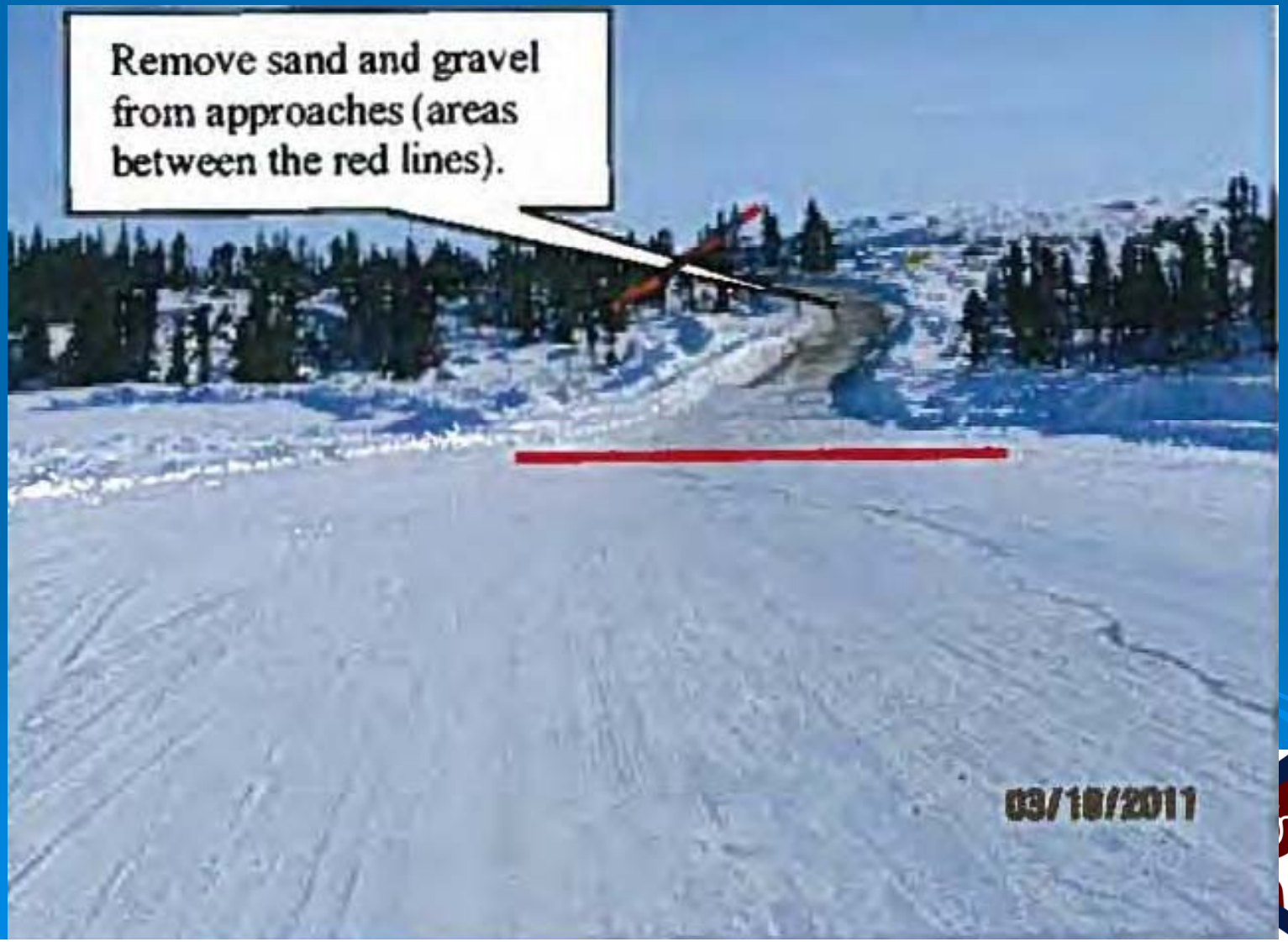
- Dated March18, 2011
- Inspected fuel storage, winter road, the North Pile, water management, waste management, and Closure and Reclamation Plan
- Environmental risks were identified
  - The monthly SNP report for February was not submitted within the allotted 30 days
  - Other risks identified in previous inspections remains
    - Reclamation research
    - Diffuser line
    - Elevated ammonia situation at the historic AN storage pad

Yellow spill kits (drum on ground, bag on wall) & secondary fuel containment underground fuel transfer station

All but a few of the drums/cubes at the WMA have been successfully transferred from the Mine site

Slurry (PK) deposition into the southern half of the Starter Cell

Northern approach to Portage 1 of the Winter Road



No actual land-farming has been noted during Inspections (to date)

- The inspector requests information on the following:
  - Why has the facility not been put to use, to date, to remediate soils contaminated with "light" hydrocarbons?
  - When does DeBeers propose to make use of the current land farm facility (i.e., to actively utilize the farm for remediating contaminated soils)?
  - Which specific fractions make up "light hydrocarbons"?

Holes in the line from the WTP to the diffuser end are intermittently releasing air/water trapped in the line

Bulk nitrate material arrived throughout February & March and was successfully transferred into the storage building

2.2 2010 Mine Reclamation Status Report

- Commented on March 23, 2011
  - “this document fails to report on the status of many aspects of reclamation which are required by the Water Licence (under art I (8) (a-h); Part I (10))”
  - Reporting Compliance Commitment Table attached

2.3 Seismic Investigations

- De Beers submitted an proposal for Seismic (vibrometric) Investigations at Snap Lake Mine on March 29, 2011
- The Inspector had no concerns with the plan as forwarded on April 13, 2011

2.4 Spill Reporting

- Two spills of drill fluids (20L) on Snap Lake were reported in March 2011 SNP Monthly Report
- The Inspector pointed out on April 29, 2011 that the two spill should have been reported to the NWT Spill Line
  - "All releases/potential releases of any size that are near or into an open water body must be reported immediately (Appendix B, Schedule 1, NWT Spills Agreement)"

3. Regulator Update

- MVLWB
  - Report review – due on May 27, 2011
    - 2010 Water Licence Annual Report
    - AEMP 2010
  - De Beers 2010 Mine Reclamation Status Report
    - Plan denial on April 14, 2011
    - The report did not fully meet compliance with Water Licence MV2001L2-0002
    - The Reviewer Comment Summary Table attached
    - Update requested by May 24, 2011

4. Stakeholders' Update

- INAC Water Resources Division commented De Beers 2010 Mine Reclamation Status Report on March 24, 2011
  - Many developer commitments as well as legislated requirements "have yet to be implemented. INAC stresses the importance of implementing such measures in the near future as DeBeers proceeds through the mine life at Snap Lake"
  - The Report "does not meet all of the conditions set out in the water license (MV2001L2-0002)". "INAC strongly urges the Board to direct DeBeers to address these issues"

4.1 INAC Concerns on the North Pile Development

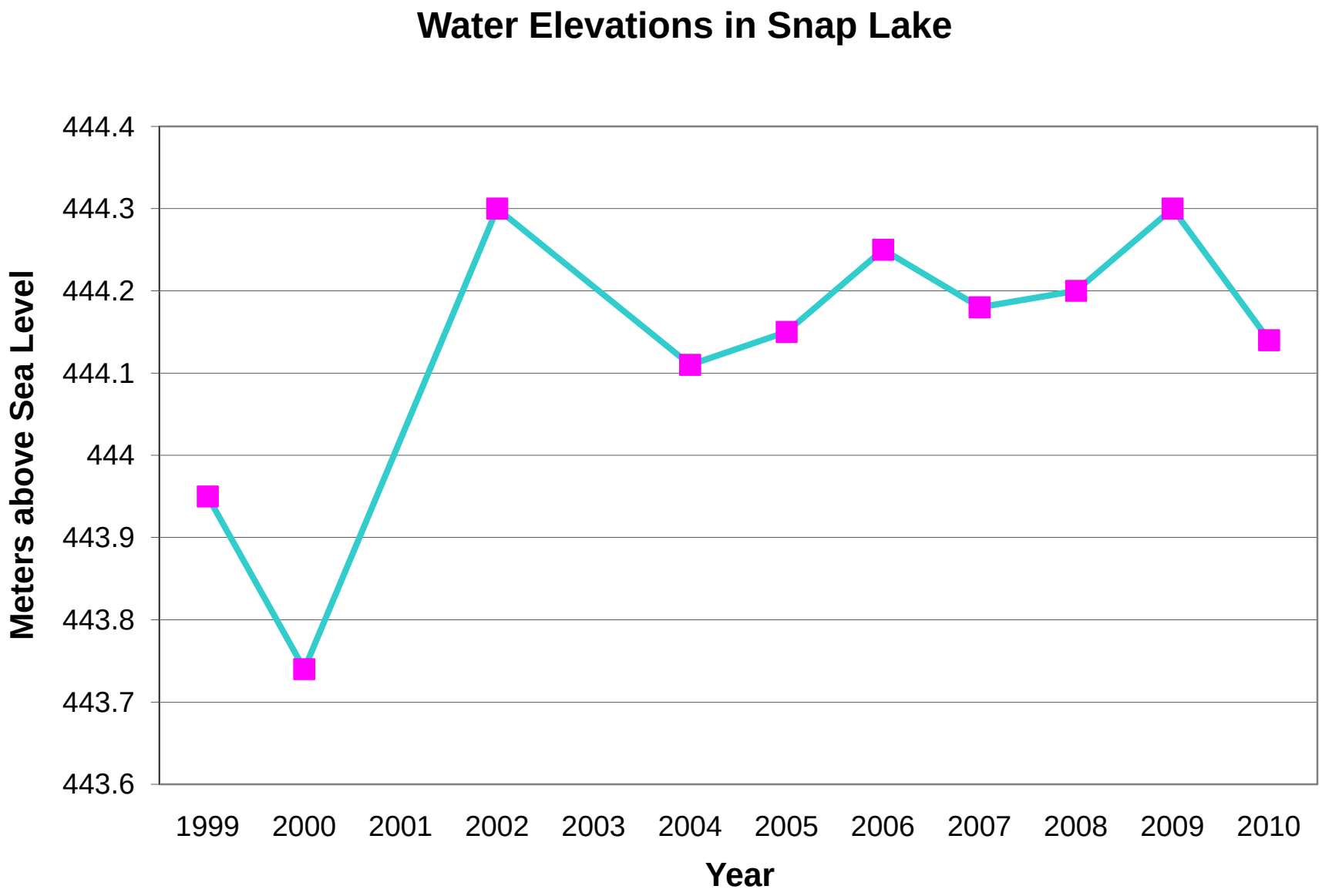
- INAC's main concern is that the development of the North Pile has not been done according to the original specifications. Namely the direct deposit of processed kimberlite (PK) "slurry" into the North Pile tailings impoundment as opposed to PK "paste".
- Operation of the North Pile in this manner creates geotechnical, geothermal, an closure water quality problems

5. Reviews

- 2010 Water Licence Annual Report
- 2010 Aquatic Effects Monitoring Program Report
  - Submitted on March 31, 2011
- Interim Mine Closure and Reclamation Plan
  - Submitted on April 8, 2011
- Adaptive Management Plan
  - Updated on April 29, 2011

5.1 2010 Water Licence Annual Report

- Technical Summary
  - Water elevations through the 2010 ice-free condition season are lower than 2009, and within the range observed in historic data
  - Ore feed to the processing plant increased from approximately 1,000 tonnes per day in 2009 to over 2,500 tonnes per day in the last quarter of 2010
  - Further test work was completed on the paste backfill system and pumping tests are scheduled for 2011


Water Elevations in Snap Lake
Meters above Sea Level
444.4
444.3
444.2
444.1
444
443.9
443.8
443.7
443.6
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
Year

Technical Summary

- The Starter Cell development continued in 2010 with the completion of the 2009 Board-approved 4 m raise
- The water control structures of the East Cell, comprised of three permanent sumps and the connecting ditches, were completed in 2010. No embankment construction was initiated
- The WTP effluent being discharged into Snap Lake via the Permanent Diffuser has been compliant with the Water Licence discharge criteria with a few exceptions

Environmental Analyst Comments

- Data quality of precipitation measurement has been improved
- The concern of impacts from underground blasting on fish raised by SLEMA may be dropped
  - Calculation of setback distances shows that the Mine is well within the two guideline criteria published by DFO
- Hydrogeological Modeling Project made significant progress in 2010
  - The 3-Dimension Flow and Transport Model successfully applied to the Water Quality Modeling

Environmental Analyst Comments

- The amount of PK deposition reported in Section 12 may be wrong
  - De Beers will resubmit section 12 of the WLAR by May 6
- Overall the Annual Report is of good quality, and presents reasonable details on water related activities