



Nunavut Regional Office
Operations Directorate
Water Resources Division
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February 13, 2009

Via Email

Phyllis Beaulieu
Manager of Licensing
Nunavut Water Board
P.O. Box 119
Gjoa Haven, NU X0E 1J0

**Subject Water License #1AR-NAN0208, CanZinco Ltd., Nanisivik Mine,
Qikiqtani Region, Renewal and Amendment Application,
Technical Intervention Memorandum**

Dear Phyllis,

Please be advised that on behalf of Indian and Northern Affairs Canada (INAC), I have reviewed the above referenced Type A Water ~~License~~ ~~Licence~~ Renewal and Amendment Application submitted by CanZinco Ltd. to the Nunavut Water Board (NWB or Board) for approval.

A Technical Intervention Memorandum (attached) is provided to the Board for consideration in preparation for the February 23, 2009 Public Hearing that will be held in the Hamlet of Arctic Bay.

Should you have any questions regarding this submission, feel free to contact ~~me~~ ~~be~~ at 867-975-4555 or David.Abernethy@inac-ainc.gc.ca.

Regards,
David W. Abernethy

Cc. Kevin Buck, Water Resources Division Manager
Michael Nadler, Director of Operations - Acting

Technical Intervention Memorandum

Date: Feb. 13/09

To: Phyllis Beaulieu, Nunavut Water Board

From: David Abernethy, Indian and Northern Affairs Canada, Water Resources Division, Iqaluit, NU

Re: **Water License #1AR-NAN0208, CanZinco Ltd., Nanisivik Mine, Water License Renewal and Amendment Application, Review of Additional Information in Advance of Feb. 23/09 Public Hearing required by the Nunavut Water Board on Feb. 3/09.**

A. Description

The Nunavut Water Board (NWB or Board) distributed a Pre-hearing Conference (PHC) Decision and Public Hearing Notice on Dec. 15/08. The Board requested interested parties to submit written intervention statements by Feb. 13/09. During the PHC CanZinco Ltd. agreed to provide additional information to the Board by Jan. 30/09. The NWB received this information on this date and made it available to others for review on Feb. 3/09.

As requested, CanZinco Ltd. submitted the following information on Jan. 30/09

- Nanisivik Mine Reclamation Completion Report (BGC Engineering Inc., Jan. 30/09);
- Nanisivik Remaining Reclamation Financials 2009 (CanZinco Ltd., Jan. 30/09);
- Nanisivik Water Quality Monitoring Report 2008 (Jacques Whitford, Jan. 30/09);
- Nanisivik Proposed Geotechnical Monitoring 2009 (BGC Engineering Inc., Jan. 30/09);
- Nanisivik Proposed Water Quality Monitoring 2009 (Jacques Whitford, Jan. 30/09);
- Nanisivik Dock – Contaminated Soil Remediation 2007 (Gartner Lee Ltd., Apr. 9/08);

- Nanisivik Mine – Contaminated Soil Remediation 2007 (Gartner Lee Ltd., Nov. 30/08);
- Nanisivik Mine – Contaminated Soil Remediation 2008 (SRK Consulting, Jan. 20/09);
- Human Health Ecological Risk Assessment - Review 2009 (Jacques Whitford, Jan. 28/09); and,
- Nanisivik Geotechnical Inspection Report 2008 (BGC Engineering Inc., Jan. 30/09).

B. Comments / Recommendations

INAC has reviewed the above referenced additional information as well as the NWB approved (July 6/04) *2004 Nanisivik Mine Reclamation Plan and Closure Plan*. The following comments / recommendations are provided for the Board's consideration,

1. Term of License

- On Feb. 21/08 CanZinco Ltd. submitted a Type A Water License Renewal and Amendment Application to the Board for approval. The application proposed a five (5) year term with changes to license terms and conditions that reflect the mine's current reclamation status. INAC concurs that a five (5) year license term is appropriate;
- As referenced in the PHC Decision, CanZinco Ltd. has advised the Board that 2009 represents the first year of the **Post Closure Monitoring Period** ~~post-closure-monitoring-period~~. The proposed water quality monitoring and geotechnical monitoring programs submitted by CanZinco Ltd. also advise of Post Closure Monitoring commencing in 2009; and,
- Post **Closure / Closure Monitoring** ~~closure-monitoring~~ should therefore be required for the full five (5) year term of the license and the results reviewed prior to any further renewal (i.e., 2009-2013).

2. Annual Reporting

- For proper assessment of **Post Closure / Closure Monitoring** ~~post-closure/
closure-monitoring~~, the following information should be included in Annual Report submissions:
 - The results of all water quality monitoring activities. This should include a discussion that analyzes observed trends and any proposed or recommended mitigation measures, if necessary. The information should be presented in a format similar to the Jacques Whitford 2008 *Annual Water Quality Monitoring Report*;
 - The results of all geotechnical monitoring. This should include a discussion that analyzes observed trends and any proposed or recommended mitigation measures if necessary. All visual inspection observations and any undertakings of reclamation maintenance should also be provided in the Annual Report. The information should be presented in a format similar to the BGC Engineering Inc. 2008 *Annual Geotechnical Inspection Report*. For instance, separate information in regard to each reclaimed area of the site should be referenced;
 - Any other activities pertinent to normal reclamation reporting, such as total yearly costs, etc.; and,
 - A proposed work plan should be submitted in the Annual Report for each subsequent year during the term of the license. The work plan should reference approximately when site inspection and sampling activity will occur.

3. Type and Amount of Security

- INAC has reviewed the CanZinco Ltd. submission for remaining financial security provided in their Jan. 30/09 response to the Board. The amount provided was \$1,517,250.00. No contingency was noted in the assessment; and,
- INAC recommends a 25% contingency plus the additional costs of sample monitoring suggested in the Monitoring Section of this document for the five (5) year period of the license. This amounts to approximately \$2,000,000.

4. Geotechnical

- INAC concurs with CanZinco Ltd.'s proposal to conduct an annual geotechnical inspection as stated in the *Nanisivik Remaining Reclamation Financials 2009* document. All areas that have been reclaimed should be inspected. Results, as previously mentioned should be included with an Annual Report and be presented in the same format as the *2008 Annual Geotechnical Inspection Report* provided by BGC Engineering Inc.; and,
- See Monitoring Section.

5. Water Management and Water Quality

- As previously mentioned, all water management and water quality monitoring results should be included in an Annual Report; and,
- See Monitoring Section.

6. Waste Management

- Any further waste generated at the site should be disposed of in accordance with the approved (NWB July 6/04) *Nanisivik Mine 2004 Reclamation Plan and Closure Plan*. Any plans to dispose of waste at the site that is not in accordance with this ~~Plan~~ ~~plan~~ must be approved by the NWB prior to any disposal.

7. Tailings Storage Facilities

- See Geotechnical and Monitoring Sections.

8. Contingency Planning

- A ~~Contingency Plan~~ ~~contingency plan~~ should be provided to the NWB for approval prior to the ~~amendment and~~ renewal of this license that identifies triggers and proposed contingency actions for further reclamation / mitigation measures (e.g., water quality exceeding criteria, observations of subsidence, erosion, etc.). See Monitoring Section for further details.

9. Mitigation, Treatment, and Management of Contaminated Soils

- Appears to be complete.

10. Monitoring

Water Quality Monitoring

- INAC is of the opinion that a water quality monitoring program be carried out for the duration of this license renewal (i.e., 5 years, 2009-2013 inclusive);
- The bi-weekly monitoring frequency proposed by Jacques Whitford for Years 1 and 2 is acceptable. However, prior to allowing for monthly sampling in **Years years** 3 to 5 (2011, 2012, and 2013) CanZinco Ltd. should submit a comprehensive trend and comparative analysis (to previously collected data, including background monitoring data) for all sample parameters and locations and provide a rationale acceptable to the NWB for any reduced sampling frequency, changes or eliminations of locations, or changes in parameters;
- The NWB should impose the discharge compliance criteria presently stated in the license for the recognized final discharge point, i.e., Monitoring Station (MS) #159-4. Further to this, INAC recommends that the following **additional** parameters be tested for at MS #'s 159-4 (Outflow from West Twin Disposal Area), 159-6 (Outlet of Twin Lakes Creek into Strathcona Sound), NML-23 (Outflow from East Twin Lake), 159-17 (Chris Creek Outlet into Strathcona Sound), and 159-15 (Chris Creek upstream of Area 14).

The parameters recommended include,

Metals Aluminum, Arsenic, Cadmium, Copper, Iron, Lead, Nickel, Mercury, Molybdenum, and Zinc.

Other Ammonia, Nitrate, Alkalinity, Sulphate, Conductivity, Dissolved Oxygen, pH, Total Suspended Solids, Radium 226, and Oil and Grease (visible)

The reason for these sampling requirements is to compare future monitoring results to historical values, define background water quality at the site, determine the effectiveness of the reclamation activity, and to determine any potential impacts from former mining activity;

- Water quality monitoring should commence in June and continue through to Sept. 30 or freeze-up, whichever is sooner;
- It was noted during the document review that levels of Total Petroleum Hydrocarbons (TPH) were detected in samples at MS #159-4. This occurred on June 23, July 3, July 4, and July 12/08 (Refer to Appendix C of the Jacques Whitford 2008 Annual Water Quality Monitoring Report). Therefore, it would be appropriate for the Board to require TPH analysis in addition to those previously listed on samples taken at this location;
- It was noted during a review of the documentation submitted by CanZinco Ltd. on Jan. 30/09 that MS #159-9 (Twin Lakes Creek Stream Crossing) was removed as a sampling location. This Monitoring Station was included in the May 30/08 Jacques Whitford proposed Water Quality Monitoring Schedule (Type A Water License Amendment and Renewal Application). INAC recommends that this location be included in the Water Quality Monitoring Program. It is applicable for assessing reclamation activity in the West Pit mining area;
- The parameters provided by Jacques Whitford namely, pH, Conductivity, Temperature, Hardness, Cadmium, Lead, Zinc, Sulphate, and Total Suspended Solids are appropriate for proposed MS #'s 159-9, 159-10, 159-14, and NML-29 (Twin Lakes Creek Stream Crossing, Twin Lakes Creek upstream of west townsite tributary, Chris Creek downstream of K-Baseline, and Downstream of Landfill respectively) ~~are appropriate for sample locations~~; and,
- The Jacques Whitford 2008 Annual Water Quality Monitoring Report refers to background conditions (1975) in the Chris Creek, West Twin Creek, and East Adit Area as being sporadically elevated for Cadmium, Lead, Zinc, and Iron. CanZinco Ltd. should establish trigger levels for all parameters without compliance criteria whereby an investigation or contingency measure would be required at the site. These ~~the~~ trigger levels ~~level~~ would be site specific and would be related to historical background levels. INAC recognizes that the Canadian Council of Ministers of the Environment (CCME) *Guidelines for the Protection of Aquatic Life* may be lower than historic and background data collected from this site. Nonetheless, INAC feels that it is important for CanZinco Ltd. to provide a defined mechanism (i.e., trigger values ~~value~~) whereby a determination can be made as to whether any exceedance of these guidelines are normal background conditions or due to former mining activity at the site.

CanZinco Ltd. should therefore identify what contingency measures or mitigation would occur when such trigger levels are exceeded.

Geotechnical Monitoring

- INAC generally concurs with the proposed Geotechnical Monitoring Schedule. However, a contingency plan should be established and submitted to the NWB that clearly outlines when the maintenance of dams, spillways, cover structures, etc. would be required;
- The *2008 Annual Geotechnical Inspection Report* provided by BGC Engineering Inc. appears satisfactory. Annual inspections and reporting (i.e., Annual Report) should be required by the NWB. This format would be acceptable for future reports; and,
- INAC concurs with the proposed water quality monitoring program at two (2) monitoring wells in the West Twin Disposal Area Test Cell as proposed by BGC Engineering Inc.

11. Closure and Reclamation

- CanZinco Ltd. states that the Nanisivik Mine is entering the Post Closure / Closure Monitoring Period. However, the main Fuel Tank Farm is still on site. The NWB should require CanZinco Ltd. to provide a specific date during the term of this license renewal as to when this facility will be reclaimed and the associated contaminated soil remediated. CanZinco Ltd. has stated that there are currently ongoing discussions with the Department of National Defence (DND) regarding the potential transfer of this facility to DND. However, no firm dates have been provided and this facility currently is a reclamation liability.

12. Other Issues

- Although CanZinco Ltd. states that the mill and concentrate storage facility have been removed from the site, the location where it was taken was not provided. INAC is requesting that CanZinco Ltd. provide this information.