

March 25, 2021

Nunavut Water Board
Mohammad Ali Shaikh, Technical Advisor
P. O. Box 119
Gjoa Haven, NU X0B 1J0

Dear Mr. Shaikh,

Re: Water Licence 1AR-NAN2030: Response to NWB Technical Review of 2019 Annual Report

The NWB completed a technical review of the contents of the 2019 Annual Report filed by Canzinco Mines Ltd. The review incorporated comments from Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) and Environment and Climate Change Canada (ECCC). The results of the review were documented in a letter dated 18 August 2020 and addressed to Canzinco.

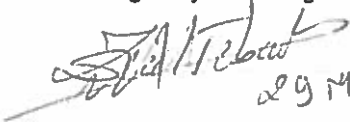
The technical review concluded that the 2019 Annual Report addressed the requirements of the Licence. Nevertheless, Canzinco was advised to respond to the review comments provided by CIRNAC and ECCC.

Tables 1 and 2 summarize the questions from the interveners and detail Canzinco's responses.

We trust that our responses meet your expectations but would be pleased to respond to any additional questions or comments that you may have.

Sincerely,

Zied Tebaibi
Site Manager Nyrstar Langlois

A handwritten signature in black ink, appearing to read "Zied Tebaibi".

29 March 2021

Table 1 1AR-NAN2030: Response to CIRNAC Technical Review Comments on 2019 Annual Report

Topic	CIRNAC Comment/Question	CIRNAC Recommendation	Canzinc Response
Exceedance of Water Quality "Action Level" at Station NML-29	It is not clear how conductivity measurements will be applied to determine the cause(s) or source(s) of the observed exceedances of total zinc and sulphate concentrations at Station NML-29 on two consecutive occasions.	CIRNAC recommends that the proponent clarify how this method works and presents their result in its next annual report for review.	Field parameters, including conductivity as well as pH, total dissolved solids, and temperature, were collected at nine locations upstream of Station NML-29 as part of annual water quality monitoring conducted in 2020. Collection of field parameters assisted with identifying areas of elevated conductivities (i.e., relative to those at NML-29) and, if present, further investigation was completed to assess if the source is related to the Landfill or a natural source (e.g., localized seepage associated with active layer thaw). Water quality samples would be collected if the source was suggested to be related to the Landfill, to support further delineation of the impacts to the drainage. BGC's 2020 Annual Water Quality Monitoring Report contains discussion of results of the field investigation undertaken during the August 2020 site inspection.
Seepages and Formation of Head Pond or Surface Water Pooling on Tailings Cover	The 2019 Geotechnical Inspection Report (Appendix D) identified issues that warrant further monitoring; the seepages at the West Twin Outlet Wall and at the toe of the left bank of the East Twin Creek Diversion Dyke, as well as the formation of head pond at the entrance to the spillway at the south end of the surface cell tailings cover. These issues are not included in the 2020 Update to Post Closure Geotechnical Monitoring Contingency Plan (Appendix H).	CIRNAC recommends that the seepage and head pond issues be monitored and reported by the proponent in future annual reports.	As noted within the 2020 Annual Geotechnical Report, there are no significant concerns with the seepage noted in each of these areas as they do not impact the effectiveness of the reclamation measures. Nonetheless, seepage at the West Twin Outlet Wall, the left bank of the East Twin Creek Diversion Channel, and the head pond at the Surface Cell Spillway inlet will continue to be monitored and reported in future annual inspection reports.
Acid Rock Drainage Staining at Oceanview East Raise	The 2019 Geotechnical Inspection Report (Appendix D) noted the acid rock drainage (ARD) staining of the ground surface at Oceanview East Raise. The source of the ARD is unknown.	CIRNAC recommends that the extent of the ARD staining be monitored and reported by the proponent in future annual reports.	The ARD staining is likely associated with spring melt waters impacted by natural near-surface sulphide mineralization in the area. Very little change to this staining has occurred over the last several years and it may not be reflective of recent activity. Any changes to the extent of the ARD staining will continue to be monitored in future annual inspection reports.

Table 2 1AR-NAN2030: Response to ECCC Technical Review Comments on 2019 Annual Report

Topic	ECCC Comment/Question	ECCC Recommendation	Canzinc Response
Zinc Action Levels – Station 159-6	<p>The Action Level for zinc at Station 159-6 was previously set at 4.6 mg/L, and is proposed to increase to 8.9 mg/L for 2020 onwards. This station is at the outflow of Twin Lakes Creek into Strathcona Sound. High zinc concentrations previously measured in the creek are related to inputs from water flow over mineralized zones, and this is reflected in the high zinc Action Level values. However, very low zinc concentrations measured at this station over the past 5 years suggest that the proposed Action Level value of 8.9 mg/L is too high. Re-calculation of the 2020 zinc 99th percentile using a more recent dataset may be more representative of closure conditions and provide a more relevant yardstick.</p> <p>Given the consistently low concentrations measured, the Action Level may be too high for the current closure configuration, and would not provide a meaningful trigger level.</p>	<p>ECCC recommends that the Proponent revisit the Action Level for zinc at Station 159-6 (including 159-6 Temp), in order to reflect recent observed values for zinc concentrations.</p>	<p>As noted in the comment from ECCC, the water quality at monitoring station 159-6 reflects natural mineralization of the underlying geology at Nanisivik, rather than reflecting primarily historical operations of the former mine or present-day loadings of metals from the decommissioned facilities. In particular, and as recognized in the comment, there is a sulfidic mineralized zone located in the gorge created by Twin Lakes Creek (between the former town site, and the former mill site). Two factors, namely: surface weathering of the natural mineralized outcrop and associated geological materials leading to acidic runoff and associated high metals concentrations; and erosion of the valley wall leading to periodic slumping of large amounts of weathered rock directly into the stream, cause occasional spikes in metal concentrations in the creek, which are noted in monitoring at Station 159-6. These events result from natural processes that have been occurring for millennia, and will surely continue into the future, and are not caused by or associated with the historical mining activity at Nanisivik.</p> <p>With this in mind, the use of the full water quality dataset (i.e., 1996 to 2019) to calculate the Action Level is appropriate, as it provides a suitably long baseline from which to evaluate occasional large natural variations in water quality. The period of relative stability that is reflected in water samples collected at Station 159-6 since 2015 is just that, and will inevitably come to an end as natural processes of weathering and erosion continue in the gorge. As noted in the comment from ECCC, Station 159-4 (arguably the most important monitoring location as it is the final discharge point for the decommissioned West Twin Lake tailings disposal area) remains under direct regulation by the Nunavut Water Board, with a maximum authorized concentration for zinc of 0.25 mg/L.</p> <p>It is also important to note (see Page 3 of the Contingency Plan, Stantec, 2020) that although the use of the 99th percentile value as a “single trigger” to evaluate the water quality monitoring data in 2020 and through the period of the present Water Licence results in higher numeric values than the previous 95th percentile values, the previous values required a “double trigger” of two consecutive values greater than the Action Level to initiate an investigation. In this context, the statistical probability of triggering an investigation using the 99th percentile value as a single trigger is four times greater than in the past. Therefore, although the individual 99th percentile values are higher, in application these values are more likely to lead to on-site investigation and oversight than the previous values. We believe that this is a suitably conservative and precautionary approach, given that the site has now progressed to a single monitoring event per year.</p>

Topic	ECCC Comment/Question	ECCC Recommendation	Canzinc Response
Oceanview Open Pit Waste Rock Cover	Under the heading Inspection Conditions, the proponent observed that there was some seepage at the toe of the cover and observed some acid rock drainage staining on the east edge of the cover. The proponent made similar observations during previous inspections.	ECCC recommends that the proponent propose mitigation measures that would reduce or stop the seepage. ECCC also recommends that the proponent determine the sources of the observed acid rock drainage staining on the east edge of the cover, and then propose suitable mitigation measures.	<p>Seepage at the toe of the cover is expected, and normal. Meteoric water and melt water from active layer thaw on the cover system will flow along the base of the active layer and will exit the cover system down-gradient at the northern toe. Data from the frost gauge and thermistor in the Oceanview cover system indicate that the cover is performing as intended, with active layer thaw confined to the cover system. The performance of the Oceanview cover system will continue to be monitored during future site inspections.</p> <p>The ARD staining is likely associated with spring melt waters impacted by natural near-surface sulphide mineralization in the area. Very little change to this staining has occurred over the last several years and it may not be reflective of recent activity. Any changes to the extent of the ARD staining will continue to be monitored and reported in future annual inspection reports.</p>
Upper Pond Dump Tailings Cover	Photo 62 Appendix I, Upper Dump Pond, appears to indicate a breach in the road to the mill site. It is not clear whether the photo was mislabeled.	ECCC recommends that the proponent clarify if the photo refers to the correct site. If the photo does refer to the correct site, then ECCC recommends that the proponent provides a remediation plan for the breach on the road.	The photo and caption refer to the correct site. The breach in the road was intentional to re-establish natural drainage paths. No further action is required.
Oceanview East Raise	In the Inspection Conditions section, the proponent provided a photo from the inspection (Photo 72), and stated that "It was noted that periodic flows of groundwater seepage from upslope of the raise has caused acid rock drainage (ARD) staining of the ground surface around the raise. The source of the ARD is not known but is likely related to near surface exposure of sulphidic soils and/or bedrock."	ECCC recommends that the proponent determine the source of the ARD seepage, and then propose appropriate mitigation.	The ARD impacted water is likely associated with spring melt waters and other surface water flows impacted by natural near-surface sulphide mineralization in the area. This water has collected in a disturbed area downslope of the raise.