September 15, 2023

Nunavut Water Board
Richard Dwyer, Manager of Licensing
P. O. Box 119
Gjoa Haven, NU X0B 1J0

Dear Mr. Dwyer,

Re: Water Licence 1AR-NAN2030: Response to ECCC Comments on 2022 Annual Report

This communication is provided in response to review comments on the 2022 annual report for the former Nanisivik mine identified by Environment and Climate Change Canada (ECCC) in a letter dated 30 June 2023.

Canzinco's responses are detailed in the attached table. The table was developed by Canzinco's water quality and geotechnical consultant, BGC Engineering.

With regards to comment 1. concerning seepage and ARD staining at the Oceanview Pit and the Oceanview East Rise, reference is also made to Canzinco's responses to ECCC review comments on the 2019 annual report.

We trust that our responses meet your expectations but would be pleased to provide additional information or clarifications as needed.

Sincerely,

Zied Tebaibi
Site Manager Nyrstar Langlois

Item No.	Subject	Reference	ECCC Comment	ECCC Recommendation	BGC Response
1	Quality Assurance/Quality Control (QA/QC) Samples	- Section 6.3.9. Oceanview Open Pit Waste Rock Cover, Canzinco Mines Ltd., Nanisivik Mine, Nunavut, 2022 Annual Geotechnical Inspection - Section 6.4.10. Oceanview East Rise, Canzinco Mines Ltd., Nanisivik Mine, Nunavut, 2022 Annual Geotechnical Inspection - Appendix II: Inspection Photos, Canzinco Mines Ltd., Nanisivik Mine, Nunavut, 2022 Annual Geotechnical Inspection	Under the Inspection Conditions for the Oceanview Pit in Section 6.3.9. it is stated that “some seepage was observed at the toe of the cover (Photo 60), believed to be flowthrough seepage along the frozen material within the cover.” Photo 60 from Appendix II shows staining along the toe cover of the Oceanview Pit, and states that “no seepage was observed during the inspection.” Under the Inspection Conditions for the Oceanview East Rise in Section 6.4.10. it is stated that “during the annual inspection, and as noted in previous inspections, 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.” Photo 73 from Appendix II shows ARD staining along the Oceanview East Raise. For both the Oceanview Pit and the Oceanview East Rise, the source of the ARD staining is stated to be not known. ECCC is of the opinion that efforts should be made to determine the source of the ARD staining so that appropriate mitigations can be determined.	ECCC recommends that the Proponent conduct continued monitoring with an effort to identify the source of the seepage causing the ARD staining in both the Oceanview Pit and Oceanview East Rise, in order to determine adequate mitigation measures.	The seepage observed at the toe of the Oceanview pit cover system was very minimal in 2022 and is not visible in the photo. The caption for Photo 60 should have been amended to note the minor amount of seepage observed during the inspection. As noted in the report there is no concern with this seepage observed at the toe of the cover system and it is expected given the design of the cover. The ARD staining noted on the surface of the Oceanview pit cover system and around the Oceanview raise has been observed for many years. Surface flows have never been observed during the inspections of these areas making determining the source of the ARD staining difficult. The Oceanview area is known for natural deposits of near surface sulphide materials, as evidenced by the shallow nature of the Oceanview open pit. Hence the supposition is that the ARD staining is likely related to periodic surface flows influenced by natural sulphide materials upslope of the observed staining. Future inspections will continue to review these areas for indications of the source of the ARD staining.
2	Terminology	Section 4.0 Climate Review, Canzinco Mines Ltd., Nanisivik Mine, Nunavut, 2022 Annual Geotechnical Inspection	Section 4.0 of the Annual Geotechnical Inspection report defines the acronym MAAT as “Mean Annual Air Temperature.” It is then correctly used to describe the annual average of -15.2 °C. However, later on in the section, the acronym MAAT is then repeatedly used to describe temperature anomalies in specific months and seasons. It is unclear if these MAAT references to specific months and seasons is a reference to the mean air temperature for that month/season, or if comparison is being made to the MAAT for the year.	ECCC requests clarification on the incorrect use of MAAT to describe temperature anomalies for specified months/seasons in Section 4.0 of the Annual Geotechnical Inspection report.	Descriptions related to temperatures of individual months were mislabeled as Mean Annual Air Temperature (MAAT). Specific monthly values should rather be referred to as mean monthly air temperature.
3	Probable Maximum Precipitation Values	- Section 4.0 Climate Review, Canzinco Mines Ltd., Nanisivik Mine, Nunavut, 2022 Annual Geotechnical Inspection - Canadian Climate Normals 1981-2010 Station Data for Nanisivik, available at https://climate.weather.gc.ca/climate_normals/results_1981_2010_e.html?searchType=stnName&txtStationName=nanisivik&searchMethod=contains&txtCentralLatMin=0&txtCentralLatSec=0&txtCentralLongMin=0&txtCentralLongSec=0&stnID=1769&dispBack=1 under the Normals Data tab.	Section 4.0 of the Annual Geotechnical Inspection report states that “climate data was collected at the Nanisivik Airport by Environment Canada from 1976 to 2010.” Additionally, this section states that the “twenty-four-hour Probable Maximum Precipitation (PMP) value was estimated to range from 140 to 210 mm.” According to the Canadian Climate Normals 1981-2010 Station Data, the extreme daily precipitation for this period was 68.4 mm, consisting entirely of snow. The extreme daily rainfall for this period was 36.0 mm. It is unclear how the PMP values of 140 to 210 mm, depicted in the Annual Geotechnical Inspection report, were determined based on the data presented in the Canadian Climate Normals 1981-2010 Station Data. It is also unclear what differences there may be when considering extreme snow or rainfall events.	ECCC requests clarification on how the PMP values were derived, and whether the determination is influenced by the phase of the precipitation.	The hydrologic design parameters for the Nanisivik Mine site were developed as part of the closure plan development and submitted to the NWB as part of the approved closure plan in 2004. The parameters were developed using the information available at the time. Their inclusion in the annual geotechnical inspection report are intended to provide a frame of reference for the climate and site observations. Based on a review of the original project documentation, the 24-hour rainfall PMP was estimated to be 140 mm. Additional detail can be found in the original closure plan documentation submitted to the NWB in 2004.