September 20, 2022

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 2021 Annual Report

Environment and Climate Change Canada (ECCC) reviewed the information provided in the 2021 annual report under Water Licence 1AR-NAN2030. The results of the review were documented in a letter from the ECCC dated 13 June 2022 and addressed to the Nunavut Water Board (NWB).

Canzinco was advised by the NWB to respond to the review comments provided by ECCC. Table 1 summarizes the comments from ECCC and details Canzinco's responses.

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

Table 1 1AR-NAN2030: Response to ECCC Review Comments on 2021 Annual Report.

Topic	ECCC Comment/Question	ECCC Recommendation	Canzinco Response
Total Dissolved Solids (TDS)	Table 4-6 reports TDS concentrations below 1 mg/L for all stations shown. This is not possible given the measured sulphate concentrations at the stations. This parameter may have been mistakenly labeled when it should be Total Suspended Solids (TSS), or alternatively, results been mis-reported.	ECCC recommends the Proponent provide clarification of the parameter labeled TDS in Table 4-6.	The concentrations for TDS were not converted to mg/L from parts per thousand. A revised Table 4-6, showing the corrected TDS values in mg/L is appended to this document.
pH Readings	Field pH readings have been noted as being higher than laboratory readings over time, and following validation of field practices for pH measurement, BCG Engineering Inc. postulated that: "This trend (of higher field pH values) may be associated with the presence of organic matter (e.g., humic acids) within the watercourses, that dissociates over time and contributes to lower measured pHs following transport to the laboratory. The source of the organic matter may be the surrounding hummocky landscape (typical of arctic regions), which can contain substantial amounts of organic matter (Schnitzer and Vendette, 1975) and be transported to watercourses following spring snow melt." In follow-up, BGC recommends: "To better assess the potential for organic matter to contribute to higher field pH values, relative to laboratory values, BGC recommends samples from a subset of the 2022 monitoring stations be analyzed for total organic carbon and/or humic acids." Given the paucity of soils and organic matter at the mine site, this theory needs further investigation to see if organic matter could account for differences in pH. It would be helpful to have the chemical equations/stoichiometry noted for the suggested dissociation reaction to see if this could account for the drop in pH between field and lab readings. Alternative explanations should be explored if it is found that organic matter concentrations are minimal.	ECCC concurs with the recommendation to further investigate causes of apparent pH downward drift in samples from field to lab measurements.	Additional analyses are being undertaken on samples presenting larger differences between field to laboratory pH measurements. As well, further investigation of pH is being conducted as part of the 2022 field work program. These findings will be presented in the 2022 Annual Report.

Table 4-6. Select data from 2021 NML-29 site investigation monitoring points.

Parameter	Units	Action Level - Station NML-29, NML-30[1]	NML-30	NML-30-1*	NML-29-3*	NML-29-2*	NML-29-1*	NML-29
			West	◄———	———	———	———►	East
pH (field)	-	6.0-9.5	8.50	8.44	8.63	8.78	8.68	8.69
Conductivity (field)	µS/cm	-	623	846	546	623	638	645
Temperature	°C	-	7.18	4.64	5.51	4.74	5.82	5.66
TDS	mg/L	-	400	550	350	400	420	420
Total Sulphate	mg/L	340	184	305	156	182	205	213
Total Cadmium	mg/L	0.0017	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Total Lead	mg/L	0.0062	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Total Zinc	mg/L	0.09	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
TSS	mg/L	113	<2	<2	<2	5	<2	<2

Notes. Cell shading indicates the interpreted divide between the NML-29 and NML-30 watersheds, based on a watershed divide at the roadway (see Figure 4-2). Shaded locations are west of the interpreted divide; unshaded locations are east of the interpreted divide. All data collected on August 21, 2021.

1. Action levels were updated as part of the approval of Water Licence 1AR-NAN2030, which are provided in Stantec (March 27a, 2020); refer to Section 1.1 for details. Action Levels only apply to NML-29 and NML-30, and are used as a screening tool for data collected at the 2021 site investigation points.