BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

CANZINCO MINES LTD

NANISIVIK MINE, NUNAVUT

2022 WATER QUALITY MONITORING

PROJECT NO.: 0255034 DATE: March 15, 2023

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY
Suite 500 - 980 Howe Street
Vancouver, BC Canada V6Z 0C8
Telephone (604) 684-5900
Fax (604) 684-5909

March 15, 2023
Project No.: 0255034

Zied Tebaibi, P.Geo.
Langlois Mines
c/o CanZinco Mines Ltd.
C.P. 6000, Route 1000, Km. 42
Lebel-sur-Quévillon, Québec J0Y 1X0

Dear Zied,

Re: Nanisivik Mine, Nunavut – 2022 Water Quality Monitoring

Please find attached our above-captioned report documenting the 2022 Water Quality Monitoring undertaken at Nanisivik Mine, Nunavut. If there are any questions or comments regarding this report, please contact the undersigned at your convenience.

Yours sincerely,

BGC ENGINEERING INC.
per:

Scott Garrison, M.Eng., P.Eng.
Geological Engineer

EXECUTIVE SUMMARY

This report provides a summary of the 2022 water quality monitoring results for the Nanisivik Mine (the Mine) located on the Borden Peninsula of northern Baffin Island in Nunavut, Canada. The 2022 water quality monitoring program was conducted as required under the Mine's Water Licence 1AR-NAN2030, and included a single sampling event completed from August 18 to 20, 2022, in parallel with the geotechnical monitoring program. The objective of the water quality monitoring program was to assess the effectiveness and adequacy of mine reclamation as demonstrated by monitoring of key water quality parameters at six identified monitoring stations (i.e., Stations 159-4, 159-6, 159-14, NML-23, NML-29, and NML-30), with comparison to specific criteria.

Results for the Final Discharge Point of the West Twin Disposal Area (WTDA), monitored at Station 159-4, were compared to the authorized criteria stated in the Water Licence. Results from the five remaining monitoring stations outlined in the Water Licence were compared to non-regulatory, station-specific 99th percentile Action Levels, as referenced in the *Contingency Plan for Water Quality Exceedances* (Stantec, March 27a, 2020). The results indicated compliance with all maximum authorized concentrations at Station 159-4, and one zinc Action Level exceedance at Station 159-14.

Review of data collected at Station 159-14, as well as field observations and data collected in 2022, did not identify the origin of the elevated zinc value; hence, a site investigation has been recommended for 2023 to assess the potential source(s) and pathways that may have contributed to the observed chemistry at Station 159-14. The summary of this review of the zinc Action Level exceedance at Station 159-14 and associated recommendation were documented in a separate memorandum in accordance with the Contingency Plan for the Mine, and filed with the Nunavut Water Board in 2022.

Overall, water quality monitoring of the decommissioned Nanisivik Mine in 2022 indicated that the mine decommissioning is meeting its objectives.

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LIMITATIONS

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1.0 INTRODUCTION

The Nanisivik Mine (the Mine) was an underground lead and zinc mine located on the northern tip of Baffin Island, Nunavut, that operated from 1976 to 2002, following which reclamation activities began. BGC Engineering Inc. (BGC) has provided geotechnical engineering, mine waste and mine closure support to the Mine since 2000, including the development and implementation of the reclamation plan for tailings deposits, waste rock piles, portals, and open pits (BGC, February 6, 2004). Additionally, BGC has overseen the implementation of the post-closure geotechnical and geothermal performance monitoring plan since completion of the bulk of the reclamation measures in 2004 and 2005.

In May 2022, BGC was retained by CanZinco Mines Ltd. (CanZinco) to carry out the water quality monitoring program in parallel with geotechnical and geothermal monitoring at the Mine, of which the latter is reported under separate cover (BGC, February 7, 2023). The water quality monitoring program is required under Water Licence 1AR-NAN2030 (Nunavut Water Board (NWB), January 9, 2020) to assess the overall performance of reclamation and closure activities at the Mine.

The approved 2022 water quality monitoring scope of services included three tasks:

1. A single water quality sampling event and associated analysis.
2. Data review and interpretation.
3. Reporting.

This technical report completes Task 03 by summarizing the details of previously completed Tasks 01 and 02 and represents the third year of reporting under Water Licence 1AR-NAN2030.

1.1. Regulatory Framework

Since 1976, the Mine has operated under six different Water Licences issued by the Northwest Territories Water Board and the NWB:

1. Northwest Territories Water Licence N5L3-0159 – Northwest Territories Water Board (July 1976); renewed in 1978, 1983, 1988, and 1991.
2. Nunavut Water Licence NWB1NAN9702 – NWB (July 1997; the original term of five years was extended until closure in September 2002.
3. Nunavut Water Licence NWB1NAN0208 – NWB (October 2002 to May 2008).
4. Nunavut Water Licence NWB1AR-NAN0914 – NWB (April 2009 to December 2014).
5. Nunavut Water Licence 1AR-NAN1419 – NWB (December 2014 to December 2019).
6. Nunavut Water Licence 1AR-NAN2030 – NWB (January 9, 2020, through January 8, 2030) – current approved Water Licence.

The current, approved Water Licence 1AR-NAN2030 authorizes and establishes the conditions for continued post-closure monitoring that may be needed "*to ensure the continued integrity and functionality of completed reclamation works*" [Part A, 1a(iii)]. The water quality monitoring conditions of Water Licence 1AR-NAN2030 represent a reduction in sampling locations, frequency and parameters required for analysis relative to the previous licences (as listed above). These changes are consistent with the progression of the decommissioning and post-closure

monitoring period at the Mine. As indicated in the Schedule H (Table 1 and Table 3) of the Water Licence 1AR-NAN2030, water quality monitoring in 2022 encompasses a single annual monitoring event, which is to be completed in parallel with the Mine's geotechnical monitoring program. The monitoring schedule for the approved period of the Water Licence 1AR-NAN2030 (i.e., 2020 to 2029 inclusive) includes annual (one-time yearly) monitoring in years 2020, 2021, 2022, 2024, 2026, and 2029 (Schedule H, Table 1). Water quality monitoring is not required in years 2023, 2025 and 2027 to 2028

The Water Licence 1AR-NAN2030 (Part D, Item 2) documents maximum authorized concentrations of select water quality parameters associated with discharge from the decommissioned West Twin Disposal Area (WTDA), as monitored at Station 159-4 (Table 1-1; Drawing 01).

Table 1-1. Effluent quality requirements for the WTDA monitored at Station 159-4.

Parameter	Maximum Authorized Concentration (mg/L)
Total Arsenic (mg/L)	0.25
Total Cadmium (mg/L)	0.005
Total Copper (mg/L)	0.10
Total Lead (mg/L)	0.10
Total Nickel (mg/L)	0.50
Total Zinc (mg/L)	0.25
Total Suspended Solids (TSS) (mg/L)	15.0
pH (pH units)	6.0 – 9.5
Hydrocarbons (Oil and grease)	15.0[1]

Notes:

1. As per Part D, Item 3 of the Water Licence 1AR-NAN2030, guideline to be applied if visible sheen is observed.

Data for the remaining five water quality monitoring stations documented in the Water Licence 1AR-NAN2030 (i.e., NML-23, NML-29, NML-30, 159-6, 159-14) are to be compared to station-specific Action Levels for select parameters (i.e., cadmium, lead, zinc, sulphate, total suspended solids (TSS), pH, and hydrocarbons), which are described in the Mine's *Contingency Plan for Water Quality Exceedances.* The Contingency Plan was updated by Stantec Consulting Ltd. (Stantec, March 27a, 2020) as required by the Water Licence 1AR-NAN2030 (Part H, Item 10), whereby Action Levels (for select metals, sulphate and TSS) were provided for each station based on 99th percentile concentrations, calculated from station-specific monitoring data collected over the period 1996 to 2019 (Table 1-2). Previous versions of Action Levels (Stantec, March 24, 2015) were based on 95th percentile values from the 1996 to 2014 dataset. The 2020 Action Level revisions reflect the decrease in monitoring frequency (to annually) as part of the Water Licence 1AR-NAN2030 (Stantec, March 27a, 2020).

Action Levels for pH continue to reflect the permissive range listed for Station 159-4 in the Water Licence 1AR-NAN2030 (i.e., pH 6.0 to pH 9.5; Table 1-2). In accordance with the Water Licence 1AR-NAN2030 (Part H, Item 3), hydrocarbons (i.e., oil and grease) are also included with the station-specific Action Levels; that is, any observed hydrocarbon sheen necessitates the collection of additional water samples for hydrocarbon analysis and results are assessed against a 15.0 mg/L concentration (Table 1-2). Details of the monitoring requirements are discussed in Section 3.0.

Table 1-2. Station-specific Action Levels (as presented in Stantec, March 27a, 2020).

Parameter	Units	Station				
		Twin Lakes Creek Watershed		Chris Creek Watershed	Landfill Watershed	
		159-6	NML-23	159-14	NML-29[1]	NML-30
Total Cadmium	mg/L	0.0297	0.0135	0.0010	0.0017	0.0017
Total Lead	mg/L	0.0893	0.0553	0.0115[2]	0.0062	0.0062
Total Zinc	mg/L	8.9	0.23	0.68	0.09	0.09
Total Sulphate	mg/L	614	118	960	340	340
Total Suspended Solids (TSS)	mg/L	140	20	158	113	113
pH[3]	pH units	6.0 – 9.5				
Hydrocarbons (Oil and grease)[4]	mg/L	15.0				

Notes:

1. NML-29 flow is intermittent. Action Levels in case of flow are the same as at NML-30.
2. As reported in the 2020 Annual Report for Water Licence 1AR-NAN2030 (Nyrstar, March 25, 2021). The value shown in the Contingency Plan was incorrect.
3. pH values are not calculated from historic ranges, but instead reflect the acceptable range listed for Station 159-4 noted in the Water Licence 1AR-NAN2030 (Table 1-1) (Stantec, March 27a, 2020).
4. Part H, Item 3 of the Water Licence 1AR-NAN2030 establishes the maximum concentration of oil and grease in water at any station where a hydrocarbon sheen may have been visually observed.

2.0 BACKGROUND

2.1. Site Description

The Mine is located 750 kilometres (km) north of the Arctic Circle at an approximate latitude of 73 north and is approximately 33 km (by road) from the hamlet of Arctic Bay, in northern Baffin Island (Drawing 01).

Prior to decommissioning, the Mine facilities consisted of an underground mine and a 2,200 tonne per day concentrator that used conventional crushing, rod and ball mill grinding, differential lead and zinc flotation, and concentrate drying. Between 1976 and 2002, the underground facility extracted and shipped zinc and lead concentrates. Ore concentrates were shipped from a concentrate storage shed located adjacent to Strathcona Sound, where a deep-water wharf allowed ocean-going vessels to moor. Concentrates were transferred to ships using a ship-loader. Process tailings were transported to and deposited at the WTDA, where resulting effluent was discharged into Twin Lakes Creek. The Mine was in operation from its opening 1976 until closure in September 2002 (Stantec, March 10, 2020).

Reclamation activities began at the Mine in 2002. On July 30, 2006, Environment Canada approved the Nanisivik Mine as having achieved “recognized closed mine” status under the *Metal Mining Effluent Regulations* and therefore, mine effluent and environmental effects monitoring requirements under those regulations were no longer required. On October 1, 2008, reclamation of the site was completed, and a post-closure monitoring period began (Stantec, March 10, 2020).

2.2. Previous Water Quality Monitoring Programs

Water quality monitoring in post-closure, up to 2019, was previously carried out by Stantec. From 2020 onwards, BGC has conducted the Mine’s post-closure water quality monitoring in parallel with its geotechnical and geothermal monitoring program and in accordance with Water License 1AR-NAN2030. A summary of the results from last year’s 2021 monitoring is as follows, with a complete description provided in BGC (March 18, 2022):

- Monitoring in 2021 occurred during a single event in August 2021, which included the collection of samples at the six stations identified in the Water License 1AR-NAN2030 (i.e., 159-4, 159-6, 159-14, NML-23, NML-29, and NML-30).
- The 2021 monitoring results at Station 159-4 were less than the station’s maximum authorized concentrations (Table 1-1), and there were no exceedances of the station-specific Action Levels (Table 1-2) at Stations 159-6, 159-14, NML-23 and NML-30.
- A 2021 site investigation carried out near Station NML-29 and Station NML-30 in the Landfill watershed assessed the potential source(s) of the 2020 Action Level sulphate exceedance at NML-29, as recommended in BGC (March 24, 2021) and in accordance with the Mine’s Contingency Plan (Stantec, March 27a, 2020). The following is a summary of observations made as part of the site investigation:
    - Four samples were collected for water quality analysis from four investigation points along the Station NML-29 drainage channel. Two samples were also

collected along the Station NML-30 drainage channel as it is located in the same Landfill watershed as Station NML-29.

- Results from the 2021 NML-29 investigation, along with the conceptualization that the roadway bisecting the NML-29 and NML-30 drainage is interpreted to act as a sub-watershed divide (i.e., hydraulic barrier), suggested that the source of the Station NML-29 sulphate exceedances was unlikely to be originating from the Landfill (i.e., located within the NML-30 sub-watershed). Rather, observed areas of active layer thaw and runoff/seepage from the south and/or north side of the Station NML-29 channel were likely contributing to the chemistry measured along that drainage.
- Results from the investigation near NML-30 indicated that seepage from the Landfill may be contributing to elevated (but below the NML-30 Action Level) sulphate concentrations in drainages near the toe of the Landfill; however, concentrations were observed to decrease downstream such that there appeared to be attenuation of the elevated sulphate concentrations along the flow path to Station NML-30.

A summary of the monitoring results from the Stantec-led programs from 2009 to 2019 can be found in Stantec's 2020 report (March 10, 2020) and references therein, along with a high-level summary provided by BGC (March 24, 2021).

3.0 2022 SAMPLING PROGRAM

3.1. Field Program

Water samples were collected at the Mine from the Twin Lakes Creek, Chris Creek, and Landfill watersheds from August 18 to August 20, 2022, by two BGC staff, Scott Garrison, P.Eng., and Christy Rouault, P.Eng. The 2022 water quality monitoring program was carried out in conjunction with annual geotechnical monitoring, as required by the Water Licence 1AR-NAN2030. Six stations were sampled as part of the 2022 water quality monitoring program, which are identified in the Water License 1AR-NAN2030 (i.e., Stations 159-4, 159-6, 159-14, NML-23, NML-29, and NML-30) (Drawing 01).

During the 2022 site inspection, data collected from thermistors and frost gauges indicated active layer thaw depths comparable to 2020 and 2021. The site observations were supported by air temperature monitoring at Arctic Bay (Arctic Bay Airport YAB) and the Mine, where in general, temperatures in summer 2022 were average; however, the prior fall (September through November 2021) was warmer than average and the winter to spring (December 2021 to May 2022) were cooler than average (BGC, February 7, 2023).

No precipitation measurements are taken on site, and the meteoric weather station at the Arctic Bay Airport (YAB) does not reliably collect precipitation data. However, based on observations made by field staff, surface water conditions on site were generally drier than recent years. The observed surface water conditions were supported anecdotally by locals in Arctic Bay who commented on the 2021/2022 winter as having little snow and the 2022 spring/summer as having less rain than recent years (S. Garrison [BGC], personal communication, September 2, 2022).

3.2. Water Quality Analysis

Field parameters were recorded at the time of sampling at the six stations identified by the Water Licence. Field parameter measurements were taken by BGC field personnel with an Aqua TROLL 600 (In Situ, July 13, 2022), which included measurements of the following parameters: specific conductance (SC; i.e., conductivity temperature-corrected to 25^{o}C), temperature, and pH. The pH sensor was calibrated prior to sampling each day, using three pH calibration buffer solutions (pH 4.01, pH 7.01 and pH 10.01) and daily calibration results of -55.99 to -57.41 mV/pH were within an acceptable pH calibration slope range (Bier, 2018). The conductivity sensor was calibrated prior to the field program using a 1,413 µS/cm calibration solution; calibration measurements for the conductivity meter were within ±3.6% of the calibration solution. The presence or absence of a hydrocarbon sheen was also visually noted and recorded at the time of sampling.

Water quality monitoring at the Mine involved the following prescribed parameter suites (Table 3-1), as described in in the Water Licence 1AR-NAN2030 (Schedule H, Table 2):

- NAN-1: Trace (total) metal analysis (cadmium, lead, and zinc), major cations (calcium, magnesium, sodium, potassium, and hardness), major anions (chloride, sulphate, bicarbonate, carbonate, nitrate + nitrite (as N), and alkalinity), ammonia (N-NH_3), TSS,

field parameters (specific conductivity, temperature, pH, and visual observation for hydrocarbon sheen).

- Trace (total) metal analysis of arsenic, copper, and nickel were also analyzed by the analytical laboratory in addition to the NAN-1 suite. The Water Licence 1AR-NAN2030 (Schedule H, Table 2) does not include total arsenic, copper, or nickel; however, these parameters have regulated conditions and comparison criteria for the Mine (Part D, Item 2).

- NAN-2: petroleum hydrocarbon analysis of F2 to F4 hydrocarbons.[1]

Samples did not require filtration for trace (total) metal analysis. Therefore, sampled waters were dispensed into laboratory-provided sample bottles, kept cool during transport from the field to Eurofins Environment Testing Inc. (Eurofins; Ottawa, Ontario). Metals bottles were acidified with nitric acid upon receipt at the laboratory, which is understood to be typical practice at Eurofins (R. Koshy [Eurofins], email communication, July 26, 2022).

The Water Licence 1AR-NAN2030 does not require pH nor conductivity to be measured by the laboratory as part of the NAN-1 parameter suite; however, the inclusion of these parameters as part of laboratory measurements was based on recommendations from Stantec (March 10, 2020), to allow for an assessment of the robustness of field sampling methods. Further details of the data quality assessment are provided in Section 4.1.

Table 3-1. Analytical schedule 2022 water quality monitoring.

Station	Station Description	Parameter Suite[1,2]
Twin Lakes Creek Watershed		
159-4	Outflow from WTDA; final discharge point	NAN-1
159-6	Outlet of Twin Lakes Creek into Strathcona Sound	NAN-1, NAN-2
NML-23	Outflow from East Twin Lake	NAN-1
Chris Creek Watershed		
159-14	Chris Creek downstream of K-Baseline[3]	NAN-1
Landfill Watershed		
NML-29	Downstream of Landfill – East Drainage System	NAN-1, NAN-2
NML-30	Downstream of Landfill – West Drainage	NAN-1, NAN-2

Notes: For the six stations regulated by the Water Licence 1AR-NAN2030 (i.e., Stations 159-4, 159-6, 159-14, NML-23, NML-29, and NML-30), the above is in accordance with details provided therein in Schedule H, Table 3.

1. Field parameters also recorded at each station (i.e., specific conductivity, temperature, pH, visual observations for hydrocarbon sheen).
2. Trace (total) metals as part of the NAN-1 analytical suite were also analyzed for arsenic, copper, and nickel.
3. K-baseline is understood by BGC to refer to historical mine workings, as shown in Drawing 01.

[1] The parameters analyzed to assess for "oil and grease", as described in Section 1.1, are not explicitly described in the Water Licence 1AR-NAN2030, but are interpreted to be those parameters analyzed as part of the NAN-2 suite. The detection limit of F2 hydrocarbons was 0.020 mg/L, whereas the detection limit of the F3 and F4 hydrocarbons was 0.050 mg/L (for both).

Elevated field pH measurements relative to values recorded by the analytical laboratory were highlighted by BGC in 2021 but have also been reported previously at the Mine (BGC, March 24, 2021). In 2021, BGC reported that all samples had higher field pH than laboratory pH values, with six samples ranging between 0.5 pH units and 1.0 pH units difference, as well as two samples (Stations 159-14 and NML-23) with a difference greater than 1.0 pH units. Since the field procedures conducted to measure pH agreed with standard practice and daily sensor calibration results met the manufacturer's requirements (i.e., pH slope was within -66 to -50 mV/pH and pH 7 offset was ± 30 mV), BGC proposed that a naturally occurring process may be contributing to the observed differences between field to laboratory values. Dissociation of organic matter (e.g., humic acids) within the sample over time could potentially contribute to a decrease in pH during transport to the laboratory (BGC, March 18, 2022).

In response to review comments from Environment and Climate Change Canada (ECCC, June 13, 2022) on details provided in BGC (March 18, 2022), additional analyses were recommended to be carried out as part of 2022 water quality monitoring at the Mine to investigate the hypothesis that an organic mechanism may contribute to the observed drift in pH from field to laboratory measurements. Following the review of field versus laboratory pH, samples collected at Station 159-6 and Station NML-23 were submitted for dissolved organic carbon (DOC) and total organic carbon (TOC)[2] as the largest pH discrepancies were noted at these stations (to be described in Section 4.1.1).

3.3. Quality Assurance and Quality Control

Four additional samples were collected for the purposes of QA/QC, which included two field duplicate samples collected at Station 159-6 and Station 159-14, as well as one travel blank and one field blank. Duplicate samples were collected in sequence (i.e., the complete parent sample was collected, followed by the duplicate), were sampled in the same manner as the parent sample, followed the same handling practices and storage environment, and submitted for the same analytical suite. The field blank and travel blank were analyzed for the NAN-1 and NAN-2 parameter suites. The *2020 Quality Assurance/Quality Control Plan for Surface Water Monitoring Samples* (Stantec, March 27b, 2020) outlined the number of field duplicates, field blanks, and travel blanks, and the analyses required for the QA/QC samples, which were included as part of the 2022 sampling program.

The 10 samples (i.e., 6 station samples and 4 QA/QC samples) were shipped in coolers with cold packs and a chain-of-custody to Eurofins in Ottawa, Ontario, Canada for analysis. Samples were received by Eurofins on August 25, 2022, with a shipment receipt temperature of 4°C.

[2] Aliquots were taken from the from the NAN-1 suite sample container at Station 159-6 and Station NML-23 to perform the DOC and TOC analyses.

4.0 RESULTS

Laboratory certificates of analysis (COAs) for the 10 samples collected are provided in Appendix B, with time-series figures of select parameters from the six monitoring stations identified in the Water Licence 1AR-NAN2030 shown in Appendix C.

4.1. QA/QC Results

Upon receipt of the laboratory results, the quality of the data was checked using the following QA/QC methods and data quality objectives (DQOs):

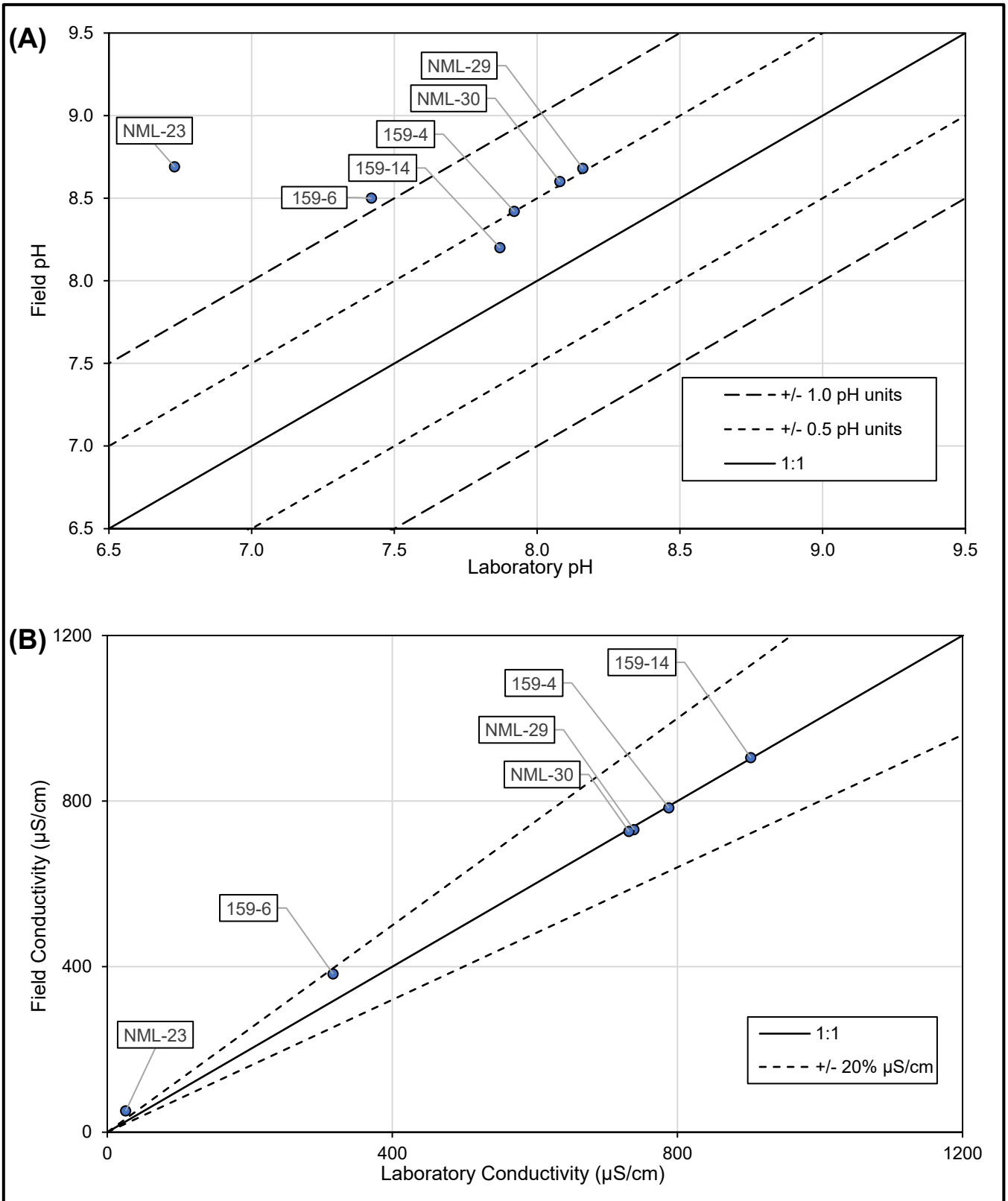
- Field pH versus laboratory pH: DQO of less than ± 0.5 pH unit difference between field and laboratory measurements.
- Field conductivity vs laboratory conductivity: DQO of less than 20% relative percent difference (RPD).[3]
- Cation/anion percent different: DQO of within ± 10% percent difference.
- Field duplicate sample comparison: DQO less than 40% RPD for those parameters with values greater than five times (5x) the detection limit for both the parent and duplicate sample. Values that are less than 5x the parameter-specific detection limit are considered below its practical quantification limit whereby measurements may not be reproducible and RPD values may not be valid. Quantifying acceptable precision is considered a matter of judgement by the qualified professional (Canadian Council of Ministers of the Environment [CCME], 2016a).
- Field and travel blank measurements: DQO of measured parameters to contain concentrations below 5x the parameter-specific detection limit.
- Review the laboratory (internal) QC results to assess if all tests met laboratory-specific guidelines.

These DQOs are based on BGC standard of practice, as well as guidance provided from the British Columbia Ministry of the Environment (2013), CCME (2016a; 2016b) and typical QA/QC practices from analytical laboratories. The goal of a DQO is to provide a threshold whereby data is scrutinized for robustness should the DQO not be met. This QA/QC assessment is conducted to review the accuracy of field and laboratory methods used as part of the 2022 water quality monitoring program and to provide an appraisal of the representativeness of samples results to site conditions.

4.1.1. pH

The results of the comparison of field versus laboratory pH values are shown in Figure 4-1A. One sample (Station 159-14) meets the pH DQO of ± 0.5 units, three samples were along the threshold of ± 0.5 units, and two samples (Stations 159-6 and NML-23) had a field to laboratory pH

[3] Relative Percent Difference (RPD) % = |Original Sample – Duplicate Sample|/Average (Original Sample, Duplicate Sample) * 100.



NOTES:

1. This Figure should be read in conjunction with BGC's report titled, "Nanisivik Mine, Nunavut, 2022 Water Quality Monitoring," and dated March 2023.
2. Data are comparisons between laboratory analyzed data and in-situ field measurements conducted as part of the August 2022 water quality monitoring event.
3. Conductivity reflects specific conductance.(i.e., the electrical conductance of 1 cm^3 of solution at 25°C).

PREPARED BY: CLP	FIGURE TITLE: COMPARISON OF LABORATORY VERSUS FIELD pH (A) AND CONDUCTIVITY (B).		
CHECKED BY: SB	CLIENT: CANZINCO MINES LTD.		
APPROVED BY: CLP	SCALE: NTS	PROJECT NO: 0255034	FIGURE NO: 4-1

0 5 10 mm in ANSI A sized paper

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discrepancy greater than 1.0 pH units. Similar to previous years (BGC, March 24, 2021; BGC, March 18, 2022; Stantec, March 13, 2019), field measured pH values were higher than laboratory measured pH values; the stations with the highest measured pH discrepancies differs from last year (i.e., 2021: Station 159-14 and NML-23; 2022: 159-6 and NML-23). Simulation of theoretical field pH values in PHREEQC (Parkhurst and Appelo, 2013), which assumed equilibration with estimated atmospheric conditions, was conducted to assess if sensor drift contributed to the large pH discrepancy between field and laboratory measured values. Model results generally showed theoretical field pH values between field-measured and laboratory-measured values with all meeting the ±0.5 pH unit DQO.

The daily pH sensor calibration results met the manufacturer's requirements for pH slope (-58 to -56 mV/pH); however, field staff and pH sensor data records indicated pH measurements stabilized slowly, with some stabilization times exceeding 30 minutes. Although the Aqua TROLL 600 was operated within the manufacturer's specified operating temperature range of -5°C to 50°C (In Situ, July 13, 2022), recent BGC experience has suggested that more frequent calibrations (i.e., multiple times per day) may improve measurements (i.e., quicker stabilization and less drift) when operating near the lower limits of its operating temperature range.

As recommended in the prior year's report, samples were analyzed for organic parameters (i.e., DOC and TOC) to assess the hypothesis that dissociation of organic matter (e.g., humic acids) contributes to the persistently observed lower laboratory pH values relative to field pH values. Samples from Station NML-23 and Station 159-6 were submitted for DOC and TOC analysis, with results from both stations noted to be low and to be close to the analytical detection limit (i.e., 0.5 mg/L), namely:

- Station NML-23: DOC = 1.0 mg/L; TOC = 0.6 mg/L
- Station 159-6: DOC = 1.1 mg/L; TOC = 0.6 mg/L

These results did not support organic matter dissociation as a possible mechanism contributing to lower laboratory pH values.

Although there were some concerns with field pH measurements, all values that were measured or simulated were within the acceptable pH range for the site as outlined in the Water Licence 1AR-NAN2030 (see Table 1-1 and Table 1-2). BGC recommends a more frequent calibration procedure to mitigate the sensor's temperature sensitivities to cooler conditions and improve confidence in field pH measurements, which should be assessed as part of the next monitoring program at the Mine.

4.1.2. Conductivity

The field versus laboratory measured SC values are shown in Figure 4-1B. Samples met the DQO of RPD less than or equal to 20% at five (of six) stations. The one exception was Station NML-23 with an RPD of 65% (i.e., field SC = 51 µS/cm; laboratory SC = 26 µS/cm). Calibration of the SC sensor with a much higher calibration solution (i.e., 1,413 µS/cm; Section 3.2) may have accounted for this larger discrepancy and suggests a lower conductivity calibration solution should

be used for future monitoring at the Mine. Overall, the field measured SC was considered representative of site conditions at the time of sampling.

4.1.3. Duplicate, Field Blank, and Travel Blank Samples

Comparison of the field duplicate samples collected at Station 159-6 and Station 159-14 are provided in Table 4-1. Estimated RPD values were generally less than or equal to 40% for parameters with values greater than 5x their respective detection limit, thereby meeting the DQO for duplicates. The one exception was noted for sulphate at Station 159-6, which had a slightly higher RPD of 41.5%. The sulphate concentrations in these duplicate samples were reanalyzed and the results were confirmed by the laboratory (R. Koshy [Eurofins], email communication, October 18, 2022). In general, the results indicate field sampling methods were robust and did not introduce contamination; therefore, samples are considered representative of site conditions at the time of sampling.

The field blank and travel blank results were all below the parameter-specific detection limit for all measured parameters, thereby meeting the DQO.

4.1.4. Cation-Anion Percent Balance

The cation-anion percent balance is an assessment of electrical neutrality and the completeness of a sample's chemical results and is calculated based on the soluble major cation and anion constituents present in solution. The cation-anion percent balance was conducted using the hydrogeochemical speciation software PHREEQC (Parkhurst and Appelo, 2013) as it was not provided by the laboratory. The samples were within the DQO of ±10%, except for Station 159-6, which had a -20% cation-anion percent balance. Although this elevated charge balance was noted at Station 159-6, satisfactory field duplicate results collected at this station support the representativeness of this sample at the time of sampling. Additionally, it is recognized that the analytes measured as part of the NAN-1 suite were limited and did not include a complete metal suite and the summed cation balance may be underestimated.

Table 4-1. Field duplicate QA/QC assessment.

Parameter	Units	Detection Limit	Station 159-6			Station 159-14		
			Parent sample	Duplicate Sample	RPD (%)	Parent Sample	Duplicate Sample	RPD (%)
Conductivity	uS/cm	5	317	302	4.8	903	910	0.8
Alkalinity as $CaCO_3$	mg/L	5	61	58	5.0	111	114	2.7
HCO_3 as $CaCO_3$	mg/L	1	61	58	5.0	111	114	2.7
Hardness as $CaCO_3$	mg/L	1	203	203	0.0	535	462	14.6
TSS	mg/L	2	<2	<2	-	<2	3	-
NO_2 + NO_3 (as N)	mg/L	0.1	0.2	0.25	-	<0.10	<0.10	-
N-NH_3	mg/L	0.02	<0.020	<0.020	-	<0.020	<0.020	-
Total Sulphate	mg/L	1	221	145	**41.5**	425	426	0.2
Calcium	mg/L	1	40	40	0.0	89	76	15.8
Potassium	mg/L	1	1	<1	-	<1	<1	-
Magnesium	mg/L	1	25	25	0.0	76	66	14.1
Sodium	mg/L	1	1	1	-	2	1	-
Total Arsenic	mg/L	0.001	<0.001	<0.001	-	<0.001	<0.001	-
Total Cadmium	mg/L	0.0001	0.0006	0.0006	0.0	0.0004	0.0003	-
Chloride	mg/L	1	3	3	-	5	5	0.0
Total Copper	mg/L	0.001	<0.001	<0.001	-	<0.001	<0.001	-
Total Nickel	mg/L	0.005	<0.005	<0.005	-	<0.005	<0.005	-
Total Lead	mg/L	0.001	<0.001	<0.001	-	<0.001	<0.001	-
Total Zinc	mg/L	0.01	0.27	0.26	3.8	1.04	1.08	3.8

Notes:

RPD indicates relative percent difference. Refer to Section 4.1 for equation.

'-' indicates that RPD was not calculated as one, or both, of the duplicate and parent sample contain values less than 5 times the detection limit.

Bolded text reflects exceedance of the field duplicate DQO (i.e., RPD > 40%).

4.1.5. Review of Laboratory (Internal) QC Results

Eurofins carried out a blank QC sample, which provided results within their QC limits; therefore, no issues with laboratory analytical methods were identified.

4.1.6. Review of Sample Holding Times

The analyses of nitrite and nitrate (i.e., NO_2+NO_3) were performed past there accepted hold time (of 7 days) for 8 samples (of 10, including QA/QC samples); however, most samples present values within 5x the detection limit for this parameter (i.e., DL = 0.10 mg/L). Overall, the time delay of 1 day is not anticipated to meaningfully influence results for NO_2+NO_3.

4.1.7. QA/QC Summary

Overall, the QA/QC procedures implemented by BGC as part of the 2022 water quality monitoring program generally meet the various DQOs to support the accuracy of field and laboratory methods used as part of this monitoring program. Improvements to the calibration procedures conducted in the field are anticipated to increase confidence in the field measured pH values.

4.2. Twin Lakes Creek Watershed

4.2.1. Station 159-4 (Final Discharge Point)

Water quality data collected at Station 159-4 were compared to the maximum authorized water quality limits for discharge from the WTDA, as provided in Part D, Items 2 and 3 of the Water Licence (Section 1.1; Table 1-1). The water quality data for the parameters specified in the Water Licence 1AR-NAN2030 at Station 159-4 are presented in Table 4-2, with time-series figures of the station's historical dataset provided in Appendix C (Figure C-1).

Measured concentrations of the regulated parameters (i.e., arsenic, cadmium, copper, lead, nickel, zinc, and TSS) were below the maximum authorized concentrations and pH was within the authorized range of pH 6.0 to pH 9.5. No hydrocarbon sheen was observed during the 2022 sampling program at Station 159-4; however, sampled water was submitted for the NAN-2 parameter suite despite it not being a requirement of the Water Licence 1AR-NAN-2030. All reported hydrocarbon fractions included in the NAN-2 parameter suite were below the laboratory detection limit.

Sulphate is not included in the parameter list for Station 159-4 but is typically reviewed to assess the presence of acid rock drainage (ARD) conditions. Sulphate concentration at Station 159-4 was 361 mg/L and within the historical post-closure range observed at this station (i.e., 107 mg/L to 1,090 mg/L (2009 to present day); Appendix C). Additionally, concentrations of sulphate, as well as other metals (e.g., Cd, Pb, Zn), presented a visually interpreted decreasing trend with time from operations to post-closure periods, suggestive of improving conditions.

Table 4-2. Comparison of August 18, 2022, Station 159-4 chemistry to maximum authorized concentrations, as provided in the Water Licence 1AR-NAN2030.

Parameter	Units	Station 159-4	
		Maximum Authorized Concentration[1]	Result
Total Arsenic	mg/L	0.25	<0.001
Total Cadmium	mg/L	0.005	0.0001
Total Copper	mg/L	0.1	<0.001
Total Lead	mg/L	0.1	<0.001
Total Nickel	mg/L	0.5	<0.005
Total Zinc	mg/L	0.25	0.05
Total Suspended Solids (TSS)	mg/L	15	<2
pH[2]	pH units	6.0 – 9.5	8.42
Hydrocarbons (Oil and grease)[3]	mg/L	15.0	b.d.[4]

Notes:

Bolded text reflects exceedance of maximum authorized concentration criterion.

'b.d.' indicates that the result was below the laboratory detection limit.

1. From Part D, Items 2 and 3 of the Water Licence 1AR-NAN2030.
2. Field pH measurements were interpreted to be impacted by a degraded pH electrode and field values may not accurately reflect field conditions (Section 4.1.1).
3. Refer to Section 3.2 for description of parameters analyzed as part of the hydrocarbon (oil and grease) analysis.
4. Results are below analytical detection limits for petroleum hydrocarbon F2, F3, and F4, which are 0.020 mg/L, 0.050 mg/L, and 0.050 mg/L, respectively, and below the 15.0 mg/L Action Level.

4.2.2. Other Stations

In addition to Station 159-4, two other stations present in the Twin Lakes Creek watershed were sampled in 2022 (i.e., 159-6 and NML-23). Station 159-6 is located along Twin Lakes Creek, prior to discharging into Strathcona Sound. Station NML-23 is located in the upper reach of the Twin Lakes Creek watershed near the outlet of East Twin Lake, which is also upstream of the confluence of Twin Lakes Creek and the outflow from WTDA (Drawing 01). Both of these stations are identified in the Water Licence 1AR-NAN2030 for post-closure monitoring. Water quality data for these two stations are presented in Table 4-3 along with the comparison station-specific Action Levels (where applicable), with time-series figures of these stations historical data provided in Appendix C (Figure C-2 and Figure C-3, respectively).

Results shown in Table 4-3 indicate there were no exceedances of the station-specific Action Levels identified at either Station 159-6 or Station NML-23 as part of the 2022 monitoring program. No visible hydrocarbon sheen was observed at these monitoring stations in the Twin Lakes Creek watershed. Hydrocarbon analyses (i.e., NAN-2 parameter suite) reported concentrations that were below the laboratory detection limit at Station 159-6.

Table 4-3. Select data from the Twin Lakes Creek watershed, Station 159-6 and Station NML-23, collected August 18, 2022.

Parameter	Units	Station 159-6		Station NML-23	
		Action Level[1]	Result	Action Level[1]	Result
Total Cadmium	mg/L	0.0297	0.0006	0.0135	<0.0001
Total Lead	mg/L	0.0893	<0.001	0.0553	<0.001
Total Zinc	mg/L	8.9	0.27	0.23	<0.01
Total Sulphate	mg/L	614	221	118	13
Total Suspended Solids (TSS)	mg/L	140	<2	20	<2
pH[2]	pH units	6.0 – 9.5	8.50	6.0 – 9.5	8.69
Hydrocarbons (Oil and grease)[3]	mg/L	15.0	b.d.[4]	15.0	n/a

Notes:

Bolded text reflects exceedance of station-specific Action Levels.
'b.d.' indicates that the result was below the laboratory detection limit.
'n/a' indicates that the parameter was not analyzed.

1. Action Levels were updated as part of the approval of Water Licence 1AR-NAN2030, which were provided in Stantec (March 27a, 2020); refer to Section 1.1.
2. Field pH measurements were interpreted to be impacted by a degraded pH electrode and field values may not accurately reflect field conditions (Section 4.1.1).
3. Refer to Section 3.2 for description of parameters analyzed as part of the hydrocarbon (oil and grease) analysis.
4. Results are below analytical detection limits for petroleum hydrocarbon F2, F3, and F4, which are 0.020 mg/L, 0.050 mg/L, and 0.050 mg/L, respectively, and below the 15.0 mg/L Action Level.

4.3. Chris Creek Watershed

Station 159-14 is located in Chris Creek approximately 1.6 km upstream of its discharge to Strathcona Sound and downstream of the historic mine workings (i.e., K-baseline, East Trench, and East Open Pit; Drawing 01). Water quality data for Station 159-14 are presented in Table 4-4 along with the comparison to station-specific Action Levels, with time-series figures of this station's historical dataset provided in Appendix C (Figure C-4).

Results from the water quality monitoring program identified a zinc Action Level exceedance at Station 159-14 in 2022 (Table 4-4). A duplicate sample collected at Station 159-14 showed comparable chemistry to the parent sample and confirmed that consistent field sampling procedures were applied, and the sample is considered representative of site conditions (Table 4-1). The zinc value measured at Station 159-14 was the highest zinc concentration reported to date (i.e., 1.04 mg/L; Appendix C).

Table 4-4. Select data from Chris Creek watershed, Station 159-14, collected August 18, 2022.

Parameter	Units	Station 159-14	
		Action Level[1]	Result
Total Cadmium	mg/L	0.001	0.0004
Total Lead	mg/L	0.0115	<0.001
Total Zinc	mg/L	0.68	**1.04**
Total Sulphate	mg/L	960	425
TSS	mg/L	158	<2
pH[2]	pH units	6.0 – 9.5	8.20
Hydrocarbons (Oil and grease)[3]	mg/L	15.0	n/a

Notes:

Bolded text reflects exceedance of station-specific Action Levels.

'n/a' indicates that the parameter was not analyzed.

1. Action Levels were updated as part of the approval of Water Licence 1AR-NAN2030, which were provided in Stantec (March 27a, 2020); refer to Section 1.1.
2. Field pH measurements were interpreted to be impacted by a degraded pH electrode and field values may not accurately reflect field conditions (Section 4.1.1).
3. Refer to Section 3.2 for description of parameters analyzed as part of the hydrocarbon (oil and grease) analysis.

Upon review of these values and identification of the zinc Action Level exceedance, a reanalysis of the zinc value from Station 159-14 and the field duplicate collected at this station (i.e., Field Duplicate 2) was requested (S. Blackmore [BGC], email communication, September 16, 2022). The reanalyzed values provided by Eurofins (R. Koshy, email communication, September 21, 2022) were comparable to the original values (i.e., ±4%), confirming the original measured zinc values, namely:

- Station 159-14: original = 1.04 mg/L; reanalysis = 1.05 mg/L
- Field Duplicate 2 (i.e., taken at Station 159-14): original = 1.08 mg/L; reanalysis = 1.04 mg/L.

BGC drafted a memorandum to CanZinco summarizing the zinc Action Level exceedance (BGC, October 4, 2022), which was issued to the NWB in accordance with the *Contingency Plan for Surface Water Quality Exceedances* (Stantec, March 27a, 2020) for the Mine. The following is a summary of the BGC (October 4, 2022) memorandum:

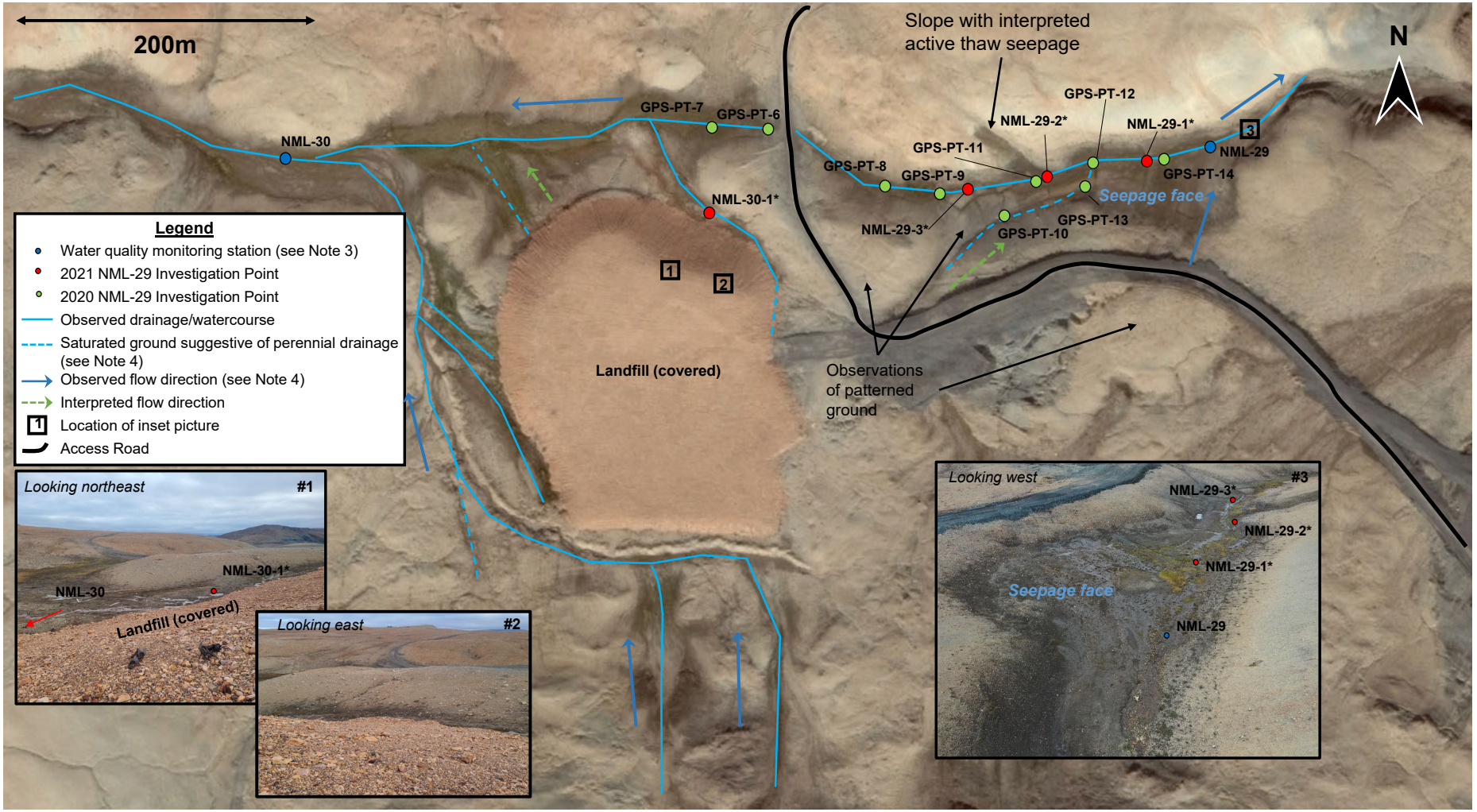
- Zinc has commonly been reported above the previously applied Action Level (of 0.13 mg/L) at Station 159-14 during the post-closure monitoring period (i.e., 2011 [Stantec, March 9, 2012], 2012 [Stantec, March 25, 2013], 2013 [Stantec, February 28, 2014], 2016 [Stantec, February 9, 2017], 2019 [Stantec, March 10, 2020]).
    - Note that post-construction monitoring activities at the Mine, during the period these previous zinc Action Levels were noted, were operated under prior Water Licences (i.e., NWB1AR-NAN0914 and 1AR-NAN1419; see Section 1.1) and included a lower zinc Action Level of 0.13 mg/L relative to the currently applied Action Level of 0.68 mg/L.

- Prior reporting did not explicitly note the origin of these elevated zinc values and have generally commented that these concentrations have been within the range of natural background levels recorded in Chris Creek prior to mine development, or warmer/wetter conditions may have promoted deeper than usual melting of surface permafrost.
- Field observations in 2022 of the cover systems associated with the East Trench, Area 14 and K-baseline mine workings did not present signs of deformation nor erosion. Seepage from the toes of these cover systems was not observed. Field reconnaissance of the headwater region to the Chris Creek watershed displayed visual evidence of oxidation and surface staining, which have been noted previously and interpreted to be associated with zones of natural mineralization based on sulphide-bearing bedrock outcroppings in the area.
- Data from thermistors and frost gauges collected in 2022 indicated active layer thaw depths comparable to recent years. As well, it was noted that surface water conditions on site were generally drier than recent years.

Overall, field observations and data did not provide a clear assessment as to the zinc source contributing to the Action Level exceedance at Station 159-14. Therefore, BGC recommended a site investigation to be undertaken at the Mine in 2023, to assess the potential source(s) and pathways contributing to Station 159-14 flow and chemistry and, therein the elevated zinc value. Data from this investigation should also be used to perform a statistical assessment on the historical data, to assess for potential trends and/or correlation with other parameters (BGC, October 4, 2022).

4.4. Landfill Watershed

The former Landfill is located west of the Mine and has been reclaimed with a thermal cover system. The conceptualization of the Landfill watershed evolved in 2021, which was described in BGC (March 18, 2022). That is, seepage and runoff (i.e., thawing porewaters from the active layer and/or snowmelt/precipitation) from the Landfill area are interpreted to migrate radially and northward and eventually report to Station NML-30. Runoff from areas upslope of the Landfill is generally directed northward and diverted around the Landfill by a water diversion berm (located to the south of the Landfill), and eventually reports to Station NML-30. Stations NML-29 and NML-30 are located along the east- and west -flowing drainages, respectively, located to the north of the Landfill and drainages are divided by a roadway (Drawing 01). The roadway bisecting the NML-29 and NML-30 drainage is interpreted to act as a sub-watershed divide (i.e., hydraulic barrier), which suggests that the water chemistries observed at the Stations NML-29 and NML-30 are not directly related (BGC, March 18, 2022). Flow has only occasionally been observed at Station NML-29, but flow is regularly observed at Station NML-30. In 2022, water was observed to be flowing at both Station NML-29 and Station NML-30 (Appendix A). A schematic outlining this conceptualization is shown in Figure 4-2, which is reproduced from BGC (March 18, 2022). Other details shown in this figure (e.g., investigation points, seepage observations) are documented in the March 2022 report.



NOTES

1. THIS FIGURE MUST BE READ IN CONJUNCTION WITH BGC'S REPORT TITLED "NANISIVIK MINE 2022 WATER QUALITY MONITORING", AND DATED MARCH 2023, WHICH IS A REPRODUCTION OF FIGURE 4-2 PROVIDED IN BGC (MARCH 18, 2022).
2. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.
3. WATER QUALITY MONITORING STATIONS IDENTIFIED IN WATER LICENCE 1AR-NAN2030. DETAILS OF NML-29 INVESTIGATION POINTS PROVIDED IN BGC (MARCH 18, 2022)
4. BASED ON SITE OBSERVATIONS) MADE BY FIELD STAFF AS PART OF THE AUGUST 2021 MONITORING EVENT (I.E., NOT SURVEYED FEATURES).
5. IMAGE PROVIDED BY GOOGLE EARTH ©2022
6. UNLESS BGC AGREES OTHERWISE IN WRITING, THIS DRAWING SHALL NOT BE MODIFIED OR USED FOR ANY PURPOSE OTHER THAN THE PURPOSE FOR WHICH BGC GENERATED IT. BGC SHALL HAVE NO LIABILITY FOR ANY DAMAGES OR LOSS ARISING IN ANY WAY FROM ANY USE OR MODIFICATION OF THIS DOCUMENT NOT AUTHORIZED BY BGC. ANY USE OF OR RELIANCE UPON THIS DOCUMENT OR ITS CONTENT BY THIRD PARTIES SHALL BE AT SUCH THIRD PARTIES' SOLE RISK.

PREPARED BY: CJ	FIGURE TITLE: LANDFILL WATERSHED CONCEPTUALIZATION		
CHECKED BY: BMA	CLIENT: CanZinco Mines Ltd.		
APPROVED BY: CLP	SCALE: NTS	PROJECT NO: 0255034	FIGURE NO: 4-2

0 5 10 mm in ANSI B sized paper

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Water quality data for Stations NML-29 and NML-30 are presented in Table 4-5 along with comparison to station-specific Action Levels, with the complete data provided in Appendix B. Time-series figures of these datasets are provided in Appendix C.

Table 4-5. Select data from Landfill watershed stations, Station NML-29 and Station NML-30, collected August 18, 2022.

Parameter	Units	Station NML-29		Station NML-30	
		Action Level[1]	Result	Action Level[1]	Result
Total Cadmium	mg/L	0.0017	<0.0001	0.0017	<0.0001
Total Lead	mg/L	0.0062	<0.001	0.0062	<0.001
Total Zinc	mg/L	0.09	<0.01	0.09	<0.01
Total Sulphate	mg/L	340	260	340	269
TSS	mg/L	113	<2	113	<2
pH[2]	pH units	6.0 – 9.5	8.68	6.0 – 9.5	8.60
Hydrocarbons (Oil and grease)[3]	mg/L	15	b.d.[4,5]	15	0.050[4,6]

Notes:

Bolded text reflects exceedance of station-specific Action Levels.

'b.d.' indicates that the result was below the laboratory detection limit.

1. Action Levels were updated as part of the approval of Water Licence 1AR-NAN2030, which were provided in Stantec (March 27a, 2020); refer to Section 1.1.
2. Field pH measurements were interpreted to be impacted by a degraded pH electrode and field values may not accurately reflect field conditions (Section 4.1.1).
3. Refer to Section 3.2 for description of parameters analyzed as part of the hydrocarbon (oil and grease) analysis.
4. No visible hydrocarbon sheen observed, but samples were submitted for hydrocarbon analysis (NAN-2 parameter suite; Section 3.2) in accordance with the Water Licence 1AR-NAN2030.
5. Results are below analytical detection limits for petroleum hydrocarbon F2, F3, and F4, which are 0.020 mg/L, 0.050 mg/L and 0.050 mg/L, respectively, and below the 15.0 mg/L Action Level.
6. Results are below analytical detection limits for petroleum hydrocarbon F2 and F3 (i.e., <0.020 mg/L and <0.050 mg/L). Results from the petroleum hydrocarbon F4 analysis are shown in the table. These results are below the 15.0 mg/L Action Level.

No Action Level exceedances were reported at Stations NML-29 and NML-30 in 2022 (Table 4-5). No visible hydrocarbon sheen was observed at these monitoring stations in the Landfill watershed. Hydrocarbon analyses (i.e., NAN-2 parameter suite) generally reported concentrations that were below the laboratory detection limit, except for one (of three) fraction (i.e., F4) measured as part of the NAN-2 petroleum hydrocarbon suite at Station NML-30. This measurement was reported at the laboratory detection limit of 0.050 mg/L, and well below the Action Level value.

5.0 SUMMARY AND RECOMMENDATIONS

5.1. Summary

Water quality monitoring in accordance with the Water Licence 1AR-NAN2030 for the decommissioned Nanisivik Mine was conducted in a single, annual event conducted between August 20 and 22, 2022. The six monitoring stations outlined in the Water Licence 1AR-NAN2030 (i.e., Stations 159-4, 159-6, 159-14, NML-23, NML-29, and NML-30) were sampled, along with two field duplicates, one field blank and one travel blank for QA/QC purposes.

Sample collection and analysis methods provided results that are considered representative of the site conditions at the time of sampling. However, laboratory pH measurements continued to report lower values than those measured in the field, similar to observations in previous years. Recent BGC experience and simulation of theoretical field pH values suggests more frequent calibrations (i.e., multiple times per day) may improve measurements (i.e., quicker stabilization and less drift) when operating in temperatures near the lower end of the instrument's operating temperature range. While it was hypothesized in last year's monitoring report that dissociation of organic acids may contribute to the lower pH values noted in the laboratory, analysis of TOC and DOC in two samples showed low concentrations of organic material and did not support of this hypothesized mechanism. Instead, modifications to field practices of pH sensor calibration are anticipated to improve confidence in the field measured pH values.

A comparison of the 2022 results showed no exceedances of maximum authorized concentrations at Station 159-4 (i.e., the final discharge point of the WTDA) nor exceedances of site-specific Action Levels at Station 159-6, Station NML-23, Station NML-29, and Station NML-30.

An Action Level exceedance of zinc at Station 159-14 was identified in 2022, and the result was validated by a field duplicate sample with comparable chemistry, as well as comparable results in both the parent and duplicate samples after reanalysis by the analytical laboratory. Results at Station 159-14 reflected the highest zinc value measured to date at this station during the post-closure period. The field observations in 2022 did not provide a clear assessment as to the zinc source, as surface flow, cover system, and climate conditions were similar to previous years (BGC, October 4, 2022).

A review of the historical dataset at Station 159-14 and previous annual reporting indicated zinc has commonly been reported above the applied Action Levels at Station 159-14. These previous monitoring events have generally commented that concentrations have been within the range of natural background levels recorded in Chris Creek prior to mine development or may be associated with warmer/wetter conditions and seasonal thawing of near surface permafrost. BGC understands that a document outlining these observations and recommendations for follow up actions/steps (BGC, October 4, 2022) was provided to the NWB, in accordance with the Mine's Contingency Plan for Surface Water Quality Exceedances (Stantec, March 27a, 2020).

5.2. Recommendations for 2023

The following outlines recommendations for 2023 water quality monitoring at the Mine, based on the results presented in this report.

- A site investigation is recommended to be undertaken at the Mine in 2023, to assess the potential source(s) and pathways that may have contributed to the elevated zinc value at Station 159-14 in 2022. Data from this investigation should also be used to perform a statistical assessment on historical data, to assess for potential trends and/or correlation with other parameters. Data from this site investigation should be used to refine the conceptual understanding of the flow system in the Chris Creek watershed and perform a statistical assessment on the historical data to assess for potential trends and/or correlation with other parameters.
- The source of the pH discrepancy between laboratory and field measurements remains unresolved; however, electrode malfunction/degradation and potentially the pH sensor sensitivity to cold conditions may have contributed to the pH discrepancies noted. For the sampling program in 2023, intra-day calibrations should be conducted to confirm the sensor is accurately measuring field pH conditions and to mitigate potential sensor drift in response to temperature effects. As well, a second pH sensor (confirmed to be suitable for the expected field conditions) should be brought to site to allow for additional assessment of sensor drift in response to temperature effects, if noted.

6.0 CLOSURE

We trust the above satisfies your requirements at this time. Should you have any questions or comments, please do not hesitate to contact us.

Yours sincerely,

BGC ENGINEERING INC.
per:

REGISTERED PROFESSIONAL GEOSCIENTIST
2023-MAR-15
C.J.K. PURDY
LICENSEE
NT/NU

Colin Lussier-Purdy, M.Sc., P.Geo.
Geochemist

Sharon Blackmore, Ph.D., P.Geo. (AB)
Senior Hydrogeochemist

Reviewed by:

B. Marc Adams, M.Sc., P.Eng. (NS,AB)
Principal Geoenvironmental Engineer

SG/BMA/gc/th

PERMIT TO PRACTICE
BGC ENGINEERING INC.
Signature _____ P.Eng.
Date 15-Mar-23
PERMIT NUMBER: P 285
NT/NU Association of Professional Engineers and Geoscientists

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Stantec Consulting Ltd. (2020, March 27b). *2020 Quality Assurance/Quality Control Plan for Surface Water Monitoring Samples, Former Nanisivik Mine, Nanisivik, Nunavut, Canada.* Prepared for CanZinco Mines Ltd.

APPENDIX A
WATER QUALITY MONITORING STATION PHOTOGRAPHS

Station:	**159-14**
Latitude:	73.047278 N
Longitude:	-84.418062 W
Date Sampled:	August 20, 2022
Field Temperature (°C):	5.91
Field Conductivity (µS/cm)[1]:	905
Field pH:	8.20
Field Total Dissolved Solids (ppt):	0.59
Flow Condition[2]:	Flowing
Visible Hydrocarbons?	No

View looking south

Notes:

1. Conductivity measurements reflect specific conductance (i.e., conductivity temperature-corrected to 25°C).
2. Flow conditions were qualitatively documented as “stagnant” for standing or pooled water, or “flowing” if water movement was observed.

Station:	159-4
Latitude:	73.025644 N
Longitude:	-84.477130 W
Date Sampled:	August 18, 2022
Field Temperature (°C):	8.42
Field Conductivity (µS/cm)[1]:	783
Field pH:	8.42
Field Total Dissolved Solids (ppt):	0.51
Flow Condition[2]:	Flowing
Visible Hydrocarbons?	No

View looking south

Notes:

1. Conductivity measurements reflect specific conductance (i.e., conductivity temperature-corrected to 25°C).
2. Flow conditions were qualitatively documented as “stagnant” for standing or pooled water, or “flowing” if water movement was observed.

Station:	**159-6**
Latitude:	73.069603 N
Longitude:	-84.557824 W
Date Sampled:	August 18, 2022
Field Temperature (°C):	5.42
Field Conductivity (µS/cm)[1]:	382
Field pH:	8.50
Field Total Dissolved Solids (ppt):	0.25
Flow Condition[2]:	Flowing
Visible Hydrocarbons?	No

View looking south

Notes:

1. Conductivity measurements reflect specific conductance (i.e., conductivity temperature-corrected to 25°C).
2. Flow conditions were qualitatively documented as “stagnant” for standing or pooled water, or “flowing” if water movement was observed.

Station:	NML-23
Latitude:	73.022970 N
Longitude:	-84.472946 W
Date Sampled:	August 18, 2022
Field Temperature (°C):	7.64
Field Conductivity (µS/cm)[1]:	51
Field pH:	8.69
Field Total Dissolved Solids (ppt):	0.03
Flow Condition[2]:	Flowing
Visible Hydrocarbons?	No

View looking South

Notes:

1. Conductivity measurements reflect specific conductance (i.e., conductivity temperature-corrected to 25°C).
2. Flow conditions were qualitatively documented as “stagnant” for standing or pooled water, or “flowing” if water movement was observed.

Station:	NML-29
Latitude:	73.038523 N
Longitude:	-84.555158 W
Date Sampled:	August 18, 2022
Field Temperature (°C):	7.54
Field Conductivity (µS/cm)[1]:	731
Field pH:	8.68
Field Total Dissolved Solids (ppt):	0.48
Flow Condition[2]:	Flowing
Visible Hydrocarbons?	No

View looking southwest

Notes:

1. Conductivity measurements reflect specific conductance (i.e., conductivity temperature-corrected to 25°C).
2. Flow conditions were qualitatively documented as “stagnant” for standing or pooled water, or “flowing” if water movement was observed.

Station:	NML-30
Latitude:	73.038580 N
Longitude:	-84.574106 W
Date Sampled:	August 18, 2022
Field Temperature (°C):	7.91
Field Conductivity (µS/cm)[1]:	726
Field pH:	8.60
Field Total Dissolved Solids (ppt):	0.47
Flow Condition[2]:	Flowing
Visible Hydrocarbons?	No

View looking east

Notes:

1. Conductivity measurements reflect specific conductance (i.e., conductivity temperature-corrected to 25°C).
2. Flow conditions were qualitatively documented as “stagnant” for standing or pooled water, or “flowing” if water movement was observed.

APPENDIX B
LABORATORY CERTIFICATES OF ANALYSIS (COAs)

Certificate of Analysis

Client: Canzinco (c/o BGC Engineering)
Suite 500 - 1000 Centre St NE
Calgary, AB
V6B 4N8
Attention: Mr. Scott Garrison
PO#: ENV/2012/0
Invoice to: Canzinco Mines Ltd.

Report Number: 1984822
Date Submitted: 2022-08-26
Date Reported: 2022-09-02
Project: Nanisivik 2022
COC #: 218514

Dear Scott Garrison:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Report Comments:

APPROVAL: _____
Rebecca Koshy, Project Manager

All analysis is completed at Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) unless otherwise indicated.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is accredited by CALA, Canadian Association for Laboratory Accreditation to ISO/IEC 17025 for tests which appear on the scope of accreditation. The scope is available at: https://directory.cala.ca/.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is licensed by the Ontario Ministry of the Environment, Conservation, and Parks (MECP) for specific tests in drinking water (license #2318). A copy of the license is available upon request.

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Please note: Field data, where presented on the report, has been provided by the client and is presented for informational purposes only. Guideline values listed on this report are provided for ease of use (informational purposes) only. Eurofins recommends consulting the official provincial or federal guideline as required. Unless otherwise stated, measurement uncertainty is not taken into account when determining guideline or regulatory exceedances.

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Certificate of Analysis

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Suite 500 - 1000 Centre St NE
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Attention: Mr. Scott Garrison
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Report Number: 1984822
Date Submitted: 2022-08-26
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Project: Nanisivik 2022
COC #: 218514

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1647302 Water 2022-08-18 159-4	1647303 Water 2022-08-18 159-6	1647304 Water 2022-08-18 NML-23	1647305 Water 2022-08-18 Spillway Inlet
Anions	Cl	1	mg/L			4	3	1	3
	SO4	1	mg/L			361	221	13	940
General Chemistry	Alkalinity as CaCO3	5	mg/L			83	61	12	123
	CO3 as CaCO3	1	mg/L			N/A-PH	N/A-PH	N/A-PH	N/A-PH
	Conductivity	5	uS/cm			788	317	26	1600
	HCO3 as CaCO3	1	mg/L			83	61	12	123
	pH	1.00				7.92	7.42	6.73	7.90
	Total Suspended Solids	2	mg/L			<2	<2	<2	<2
Hardness	Hardness as CaCO3	1	mg/L			451	203	25	1050
Hydrocarbons	F2 (C10-C16)	20	ug/L			<20	<20		
	F3 (C16-C34)	50	ug/L			<50	<50		
	F4 (C34-C50)	50	ug/L			<50	<50		
Metals	As	0.001	mg/L			<0.001	<0.001	<0.001	<0.001
	Ca	1	mg/L			98	40	5	204
	Cd	0.0001	mg/L			0.0001	0.0006	<0.0001	<0.0001
	Cu	0.001	mg/L			<0.001	<0.001	<0.001	<0.001
	K	1	mg/L			5	1	<1	12
	Mg	1	mg/L			50	25	3	132
	Na	1	mg/L			2	1	<1	3
	Ni	0.005	mg/L			<0.005	<0.005	<0.005	<0.005
	Pb	0.001	mg/L			<0.001	<0.001	<0.001	<0.001
	Zn	0.01	mg/L			0.05	0.27	<0.01	0.01
Nutrients	N-NH3	0.020	mg/L			<0.020	<0.020	<0.020	<0.020
Others	NO2 + NO3 as N	0.10	mg/L			<0.10	0.20	<0.10	0.16

Guideline = *** = Guideline Exceedence**

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Certificate of Analysis

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Client: Canzinco (c/o BGC Engineering)
Suite 500 - 1000 Centre St NE
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V6B 4N8
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Report Number: 1984822
Date Submitted: 2022-08-26
Date Reported: 2022-09-02
Project: Nanisivik 2022
COC #: 218514

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1647306 Water 2022-08-20 159-14	1647307 Water 2022-08-18 NML-29	1647308 Water 2022-08-18 NML-30	1647309 Water 2022-08-18 Field Duplicate 1
Anions	Cl	1	mg/L			5	4	3	3
	SO4	1	mg/L			425	260	269	145
General Chemistry	Alkalinity as CaCO3	5	mg/L			111	192	155	58
	CO3 as CaCO3	1	mg/L			N/A-PH	N/A-PH	N/A-PH	N/A-PH
	Conductivity	5	uS/cm			903	739	732	302
	HCO3 as CaCO3	1	mg/L			111	192	155	58
	pH	1.00				7.87	8.16	8.08	7.28
	Total Suspended Solids	2	mg/L			<2	<2	<2	<2
Hardness	Hardness as CaCO3	1	mg/L			535	438	427	203
Hydrocarbons	F2 (C10-C16)	20	ug/L				<20	<20	<20
	F3 (C16-C34)	50	ug/L				<50	50	<50
	F4 (C34-C50)	50	ug/L				<50	<50	<50
Metals	As	0.001	mg/L			<0.001	<0.001	<0.001	<0.001
	Ca	1	mg/L			89	88	90	40
	Cd	0.0001	mg/L			0.0004	<0.0001	<0.0001	0.0006
	Cu	0.001	mg/L			<0.001	<0.001	<0.001	<0.001
	K	1	mg/L			<1	2	2	1
	Mg	1	mg/L			76	53	49	25
	Na	1	mg/L			2	2	2	1
	Ni	0.005	mg/L			<0.005	<0.005	<0.005	<0.005
	Pb	0.001	mg/L			<0.001	<0.001	<0.001	<0.001
	Zn	0.01	mg/L			1.04	<0.01	<0.01	0.26
Nutrients	N-NH3	0.020	mg/L			<0.020	<0.020	<0.020	<0.020
Others	NO2 + NO3 as N	0.10	mg/L			<0.10	0.16	0.79	0.25

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Certificate of Analysis

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Client: Canzinco (c/o BGC Engineering)
Suite 500 - 1000 Centre St NE
Calgary, AB
V6B 4N8
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Invoice to: Canzinco Mines Ltd.

Report Number: 1984822
Date Submitted: 2022-08-26
Date Reported: 2022-09-02
Project: Nanisivik 2022
COC #: 218514

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1647310 Water 2022-08-20 Field Duplicate 2	1647311 Water 2022-08-18 Field Blank 1	1647312 Water 2022-08-18 Travel Blank
Anions	Cl	1	mg/L			5	<1	<1
	SO4	1	mg/L			426	<1	<1
General Chemistry	Alkalinity as CaCO3	5	mg/L			114	<5	<5
	CO3 as CaCO3	1	mg/L			N/A-PH	N/A-PH	N/A-PH
	Conductivity	5	uS/cm			910	<5	<5
	HCO3 as CaCO3	1	mg/L			114	<1	<1
	pH	1.00				7.96	5.67	5.41
	Total Suspended Solids	2	mg/L			3	<2	<2
Hardness	Hardness as CaCO3	1	mg/L			462	<1	<1
Hydrocarbons	F2 (C10-C16)	20	ug/L				<20	<20
	F3 (C16-C34)	50	ug/L				<50	<50
	F4 (C34-C50)	50	ug/L				<50	<50
Metals	As	0.001	mg/L			<0.001	<0.001	<0.001
	Ca	1	mg/L			76	<1	<1
	Cd	0.0001	mg/L			0.0003	<0.0001	<0.0001
	Cu	0.001	mg/L			<0.001	<0.001	<0.001
	K	1	mg/L			<1	<1	<1
	Mg	1	mg/L			66	<1	<1
	Na	1	mg/L			1	<1	<1
	Ni	0.005	mg/L			<0.005	<0.005	<0.005
	Pb	0.001	mg/L			<0.001	<0.001	<0.001
	Zn	0.01	mg/L			1.08	<0.01	<0.01
Nutrients	N-NH3	0.020	mg/L			<0.020	<0.020	<0.020
Others	NO2 + NO3 as N	0.10	mg/L			<0.10	<0.10	<0.10

Guideline = *** = Guideline Exceedence**

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Suite 500 - 1000 Centre St NE
Calgary, AB
V6B 4N8
Attention: Mr. Scott Garrison
PO#: ENV/2012/0
Invoice to: Canzinco Mines Ltd.

Report Number: 1984822
Date Submitted: 2022-08-26
Date Reported: 2022-09-02
Project: Nanisivik 2022
COC #: 218514

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 428358 **Analysis/Extraction Date** 2022-08-26 **Analyst** ML **Method** C SM4500-NO3-F			
NO2 + NO3 as N	<0.10 mg/L	98	80-120
Run No 428394 **Analysis/Extraction Date** 2022-08-28 **Analyst** ML **Method** EPA 350.1			
N-NH3	<0.020 mg/L	89	80-120
Run No 428400 **Analysis/Extraction Date** 2022-08-29 **Analyst** SP **Method** CCME O.Reg 153/04			
Petroleum Hydrocarbons F2	<20 ug/L	84	60-140
Petroleum Hydrocarbons F3	<50 ug/L	84	60-140
Petroleum Hydrocarbons F4	<50 ug/L	84	60-140
Run No 428478 **Analysis/Extraction Date** 2022-08-30 **Analyst** AaN **Method** SM 4110			
Chloride	<1 mg/L	100	90-110
SO4	<1 mg/L	95	90-110
Run No 428568 **Analysis/Extraction Date** 2022-08-31 **Analyst** CK **Method** C SM2540			
Total Suspended Solids	<2 mg/L	96	90-110

Guideline = *** = Guideline Exceedence**

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V6B 4N8
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COC #: 218514

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 428571 **Analysis/Extraction Date** 2022-08-31 **Analyst** AaN **Method** SM 4110			
SO4	<5 mg/L	100	90-110
Run No 428651 **Analysis/Extraction Date** 2022-08-31 **Analyst** SD **Method** EPA 200.8			
Arsenic	<0.001 mg/L	100	80-120
Cadmium	<0.0001 mg/L	110	80-120
Copper	<0.001 mg/L	110	80-120
Nickel	<0.005 mg/L	106	80-120
Lead	<0.001 mg/L	114	80-120
Zinc	<0.01 mg/L	112	80-120
Run No 428688 **Analysis/Extraction Date** 2022-08-31 **Analyst** AsA **Method** SM2320,2510,4500H/F			
Alkalinity (CaCO3)	<5 mg/L	104	90-110
Conductivity	<5 uS/cm	101	90-110
pH		100	90-110
Run No 428689 **Analysis/Extraction Date** 2022-09-01 **Analyst** CK **Method** C SM2540			
Total Suspended Solids	<2 mg/L	100	90-110

Guideline = *** = Guideline Exceedence**

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Suite 500 - 1000 Centre St NE
Calgary, AB
V6B 4N8
Attention: Mr. Scott Garrison
PO#: ENV/2012/0
Invoice to: Canzinco Mines Ltd.

Report Number: 1984822
Date Submitted: 2022-08-26
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Project: Nanisivik 2022
COC #: 218514

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 428691 **Analysis/Extraction Date** 2022-09-01 **Analyst** AaN **Method** SM 4110			
SO4	<5 mg/L	105	90-110
Run No 428726 **Analysis/Extraction Date** 2022-09-01 **Analyst** Z S **Method** M SM3120B-3500C			
Calcium	<1 mg/L	101	90-110
Potassium	<1 mg/L	105	87-113
Magnesium	<1 mg/L	99	76-124
Sodium	<1 mg/L	103	82-118
Run No 428752 **Analysis/Extraction Date** 2022-09-01 **Analyst** AET **Method** SM 2320B			
CO3 as CaCO3			
Hardness as CaCO3			
HCO3 as CaCO3			
Run No 428795 **Analysis/Extraction Date** 2022-09-02 **Analyst** SP **Method** CCME O.Reg 153/04			
Petroleum Hydrocarbons F2	<20 ug/L	116	60-140
Petroleum Hydrocarbons F3	<50 ug/L	116	60-140
Petroleum Hydrocarbons F4	<50 ug/L	116	60-140

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COC #: 218514

Sample Comment Summary

Sample ID: 1647302 159-4 NO2+NO3 was analyzed past hold time
Sample ID: 1647303 159-6 NO2+NO3 was analyzed past hold time
Sample ID: 1647304 NML-23 NO2+NO3 was analyzed past hold time
Sample ID: 1647305 Spillway Inlet NO2+NO3 was analyzed past hold time
Sample ID: 1647307 NML-29 NO2+NO3 was analyzed past hold time
Sample ID: 1647308 NML-30 NO2+NO3 was analyzed past hold time
Sample ID: 1647309 Field Duplicate 1 NO2+NO3 was analyzed past hold time
Sample ID: 1647311 Field Blank 1 NO2+NO3 was analyzed past hold time
Sample ID: 1647312 Travel Blank NO2+NO3 was analyzed past hold time

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Suite 500 - 1000 Centre St NE
Calgary, AB
V6B 4N8
Attention: Mr. Scott Garrison
PO#: ENV/2012/0
Invoice to: Canzinco Mines Ltd.

Report Number: 1986249
Date Submitted: 2022-09-16
Date Reported: 2022-09-23
Project: Nanisivik 2022
COC #: 899450

Dear Scott Garrison:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Report Comments:

APPROVAL: _____
Addrine Thomas, Inorganics Supervisor

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Certificate of Analysis

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Client: Canzinco (c/o BGC Engineering)
Suite 500 - 1000 Centre St NE
Calgary, AB
V6B 4N8
Attention: Mr. Scott Garrison
PO#: ENV/2012/0
Invoice to: Canzinco Mines Ltd.

Report Number: 1986249
Date Submitted: 2022-09-16
Date Reported: 2022-09-23
Project: Nanisivik 2022
COC #: 899450

Group	Analyte	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sampling Date / Sample I.D.		
					1651691 / Water / / 2022-08-18 / 159-6	1651692 / Water / / 2022-08-18 / NML-23	1651693 / Water / / 2022-08-18 / Field Duplicate 1
General Chemistry	DOC	0.5	mg/L		1.1	1.0	1.0
	TOC	0.5	mg/L		0.6	0.6	0.6

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Report Number: 1986249
Date Submitted: 2022-09-16
Date Reported: 2022-09-23
Project: Nanisivik 2022
COC #: 899450

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 429988 **Analysis/Extraction Date** 2022-09-19 **Analyst** ACG **Method** C SM5310C			
DOC	<0.5 mg/L	95	84-116
Run No 430094 **Analysis/Extraction Date** 2022-09-21 **Analyst** ACG **Method** C SM5310C			
DOC	<0.5 mg/L	94	84-116
TOC	<0.5 mg/L	94	84-116

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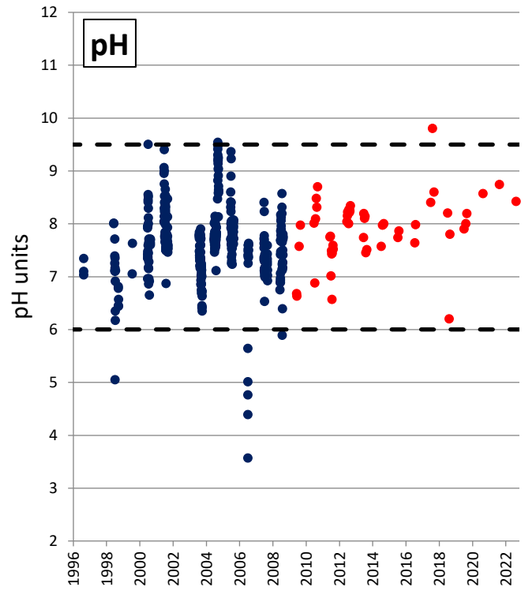
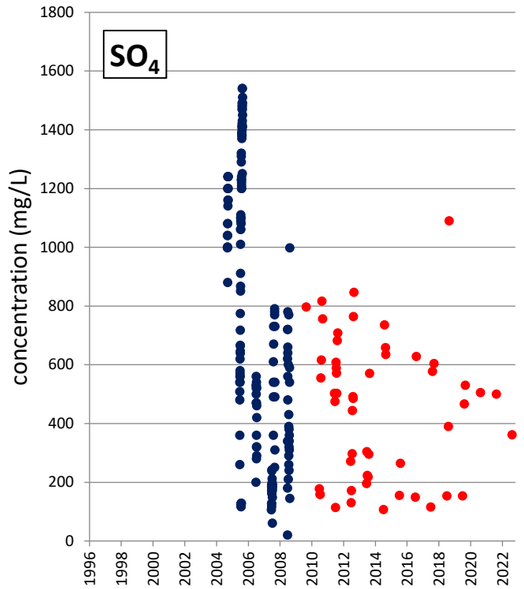
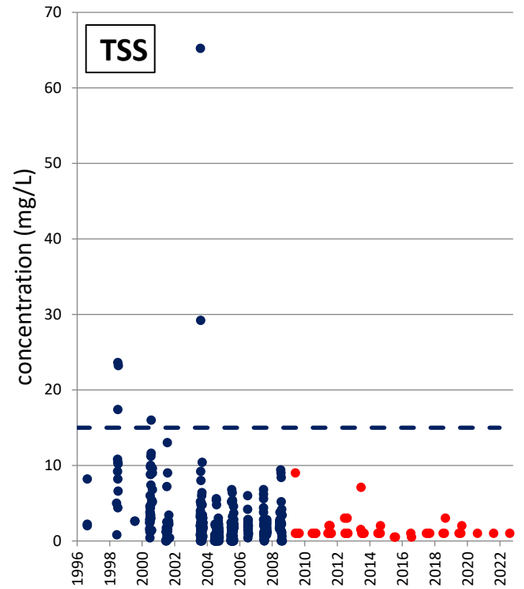
Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

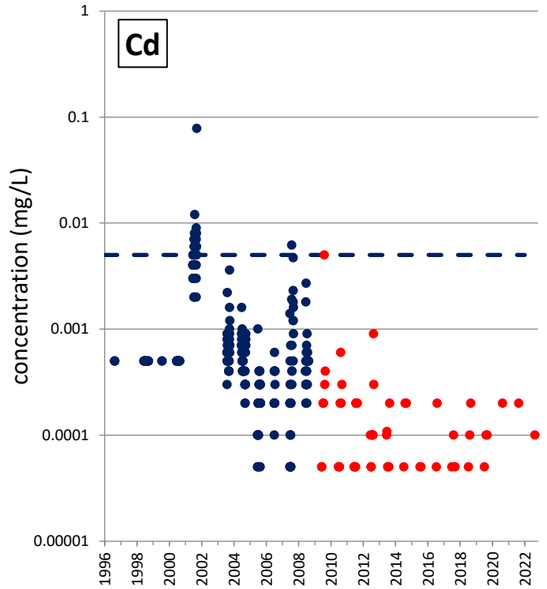
MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

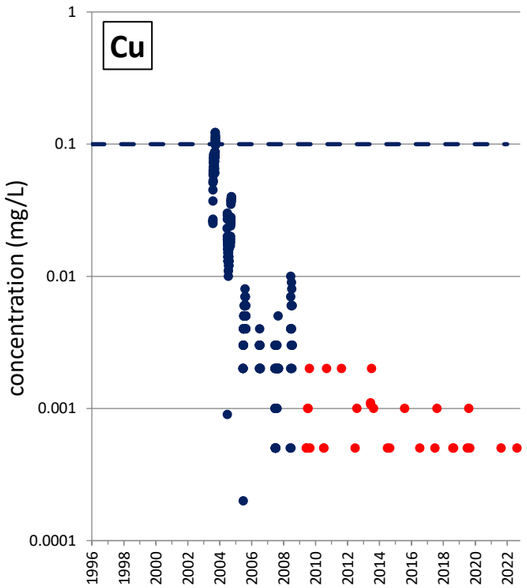
APPENDIX C
CHEMICAL TIME-SERIES FIGURES

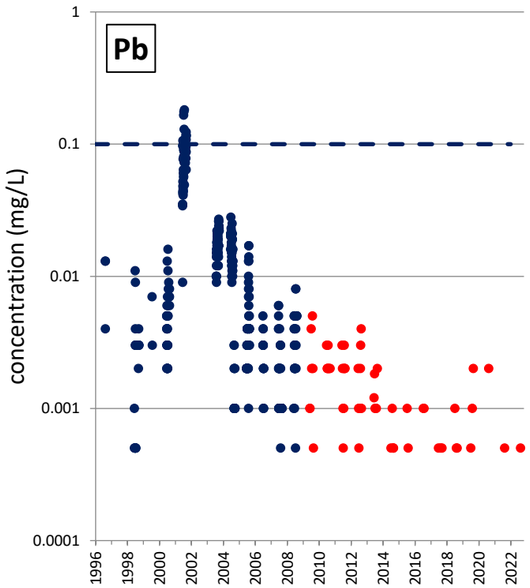


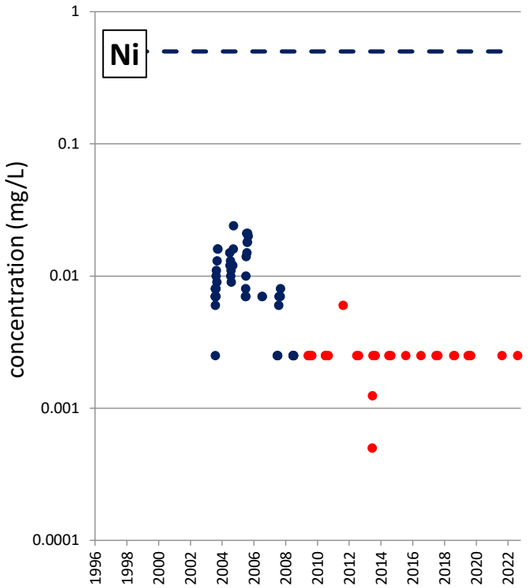


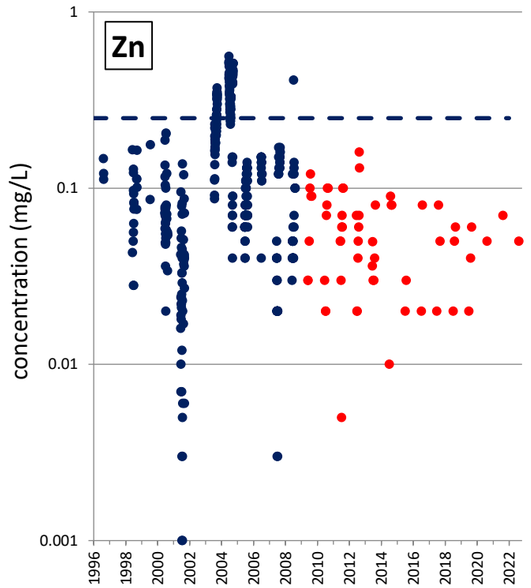












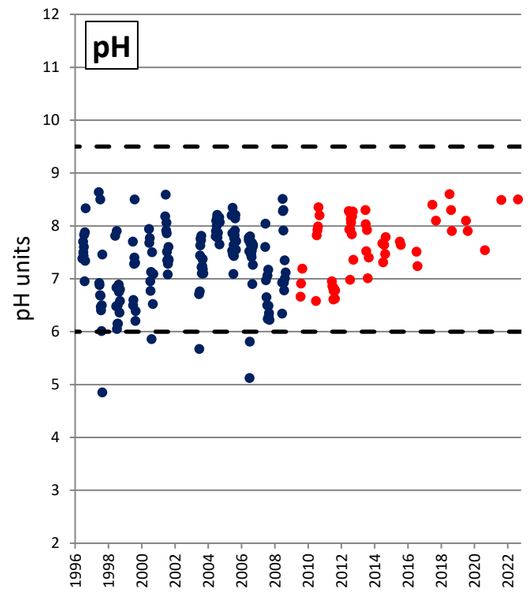
NOTES

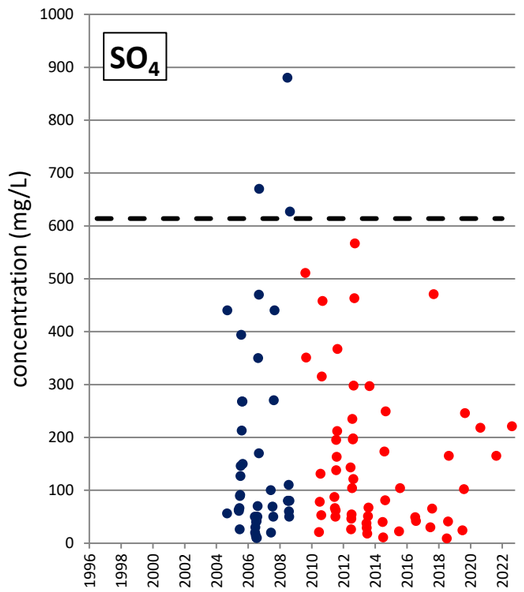
1. THIS FIGURE SHOULD BE READ IN CONJUNCTION WITH BGC'S REPORT TITLED "NANISIVIK MINE, NUNAVUT, 2022 WATER QUALITY MONITORING", AND DATED MARCH 2023.
2. BLUE DOTS REPRESENT SAMPLES COLLECTED PRIOR TO CLOSURE, ON OCTOBER 1, 2008 (STANTEC, MARCH 10, 2020); RED DOTS REPRESENT SAMPLES COLLECTED IN POST-CLOSURE.
3. DASHED LINES INDICATE THE MAXIMUM AUTHORIZED CONCENTRATIONS (MAC) OF SPECIFIC WATER QUALITY PARAMETERS, AS DEFINED IN THE WATER LICENCE 1AR-NAN2030 FOR STATION 159-4. FOR TEMPORAL PLOTS WHERE NO DASHED LINES ARE PRESENT, NO MAC ARE DEFINED.
4. DATA FOR TOTAL AS NOT PRESENTED; HOWEVER, VALUES REMAIN <0.003 MG/L (I.E., BELOW THE LAB DETECTION LIMIT) AND HAVE NOT EXCEEDED THE MAC OF 0.25 MG/L OVER ITS PERIOD OF RECORD (I.E., 2003 - 2021).
5. ALL RESULTS REPORTED BELOW THE DETECTION LIMIT (DL) ARE PRESENTED AS HALF THE ASSOCIATED DL.

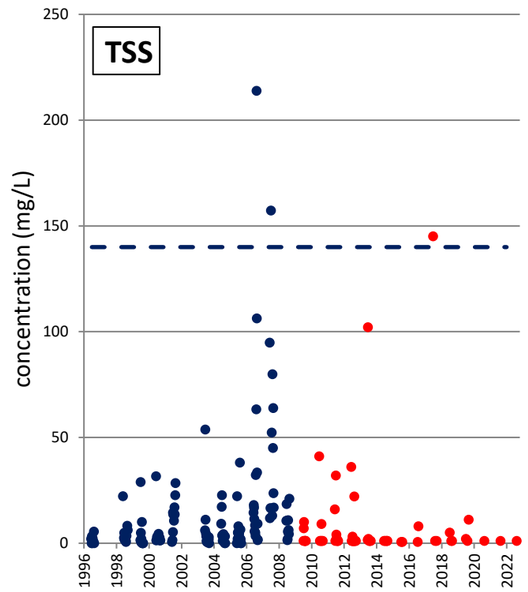
PREPARED BY:	FIGURE TITLE		
CLP	TEMPORAL TRENDS AT STATION 159-4		
CHECKED BY:	CLIENT:		
SB	CANZINCO MINES LTD.		
APPROVED BY:	SCALE:	PROJECT NO:	FIGURE NO:
CLP	NTS	0255034	C-1

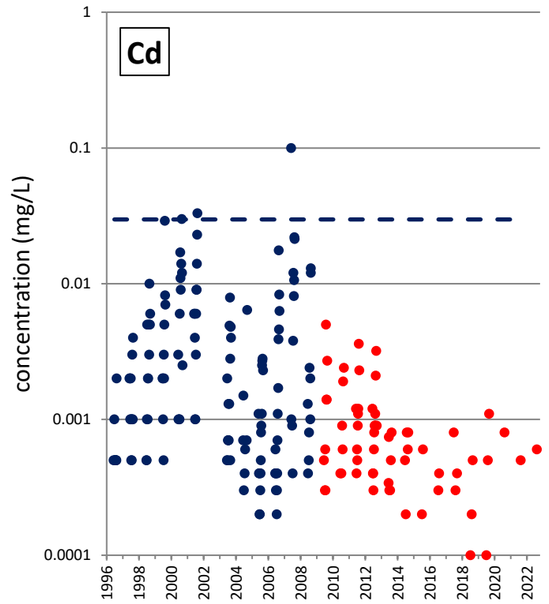
0 5 10 mm in ANSI B sized paper

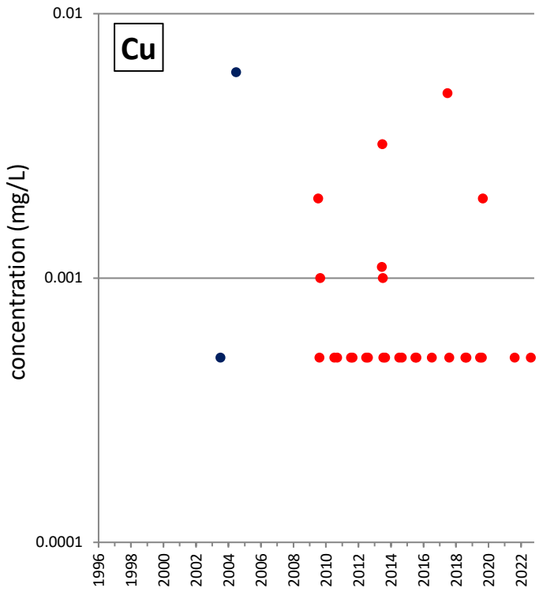
BGC ENGINEERING INC.

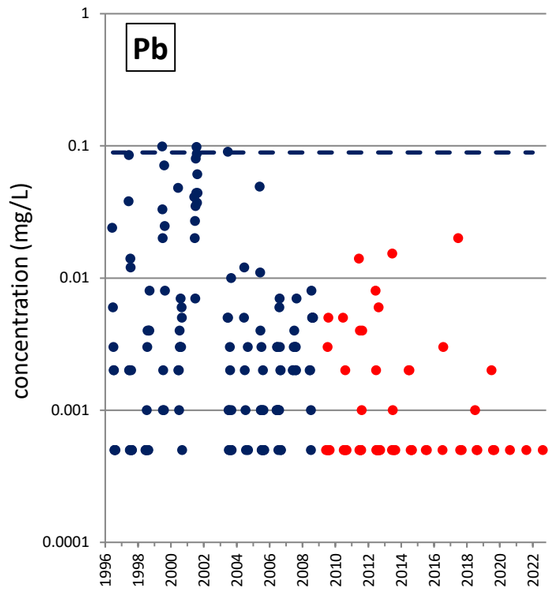


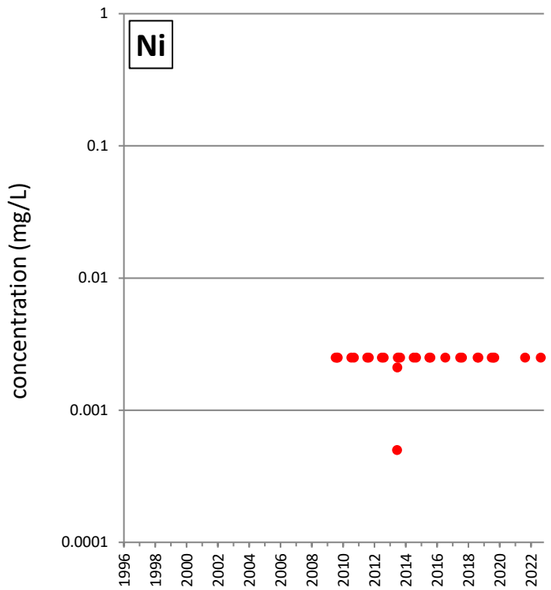


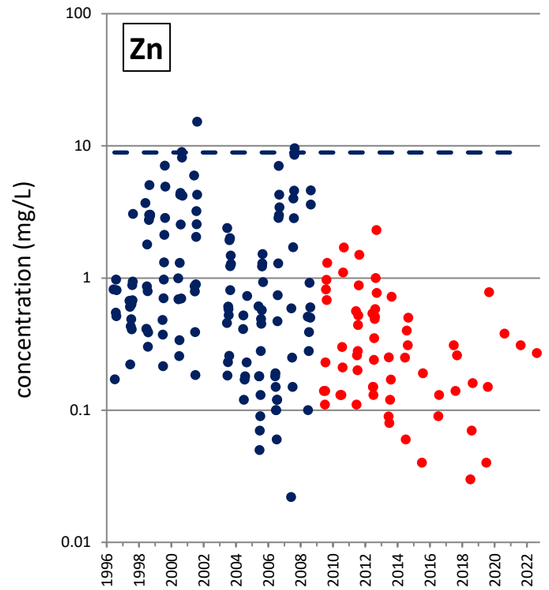












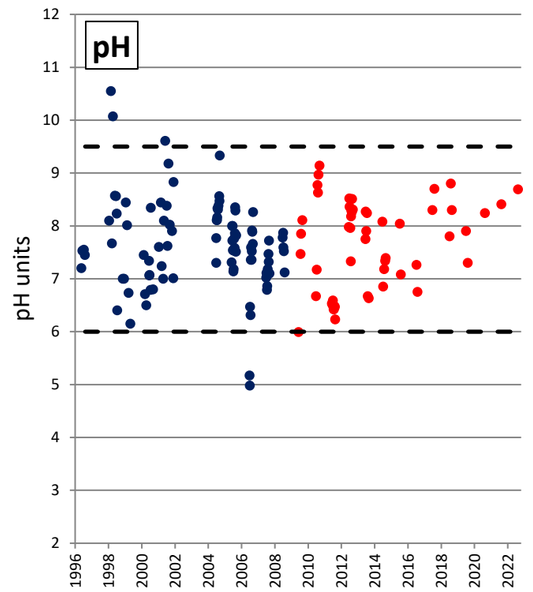
NOTES

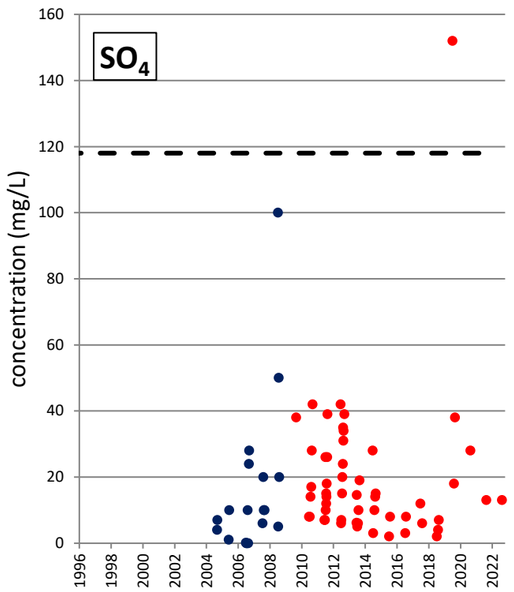
1. THIS FIGURE SHOULD BE READ IN CONJUNCTION WITH BGC'S REPORT TITLED "NANISIVIK MINE, NUNAVUT, 2022 WATER QUALITY MONITORING", AND DATED MARCH 2023.
2. BLUE DOTS REPRESENT SAMPLES COLLECTED PRIOR TO CLOSURE, ON OCTOBER 1, 2008 (STANTEC, MARCH 10, 2020); RED DOTS REPRESENT SAMPLES COLLECTED IN POST-CLOSURE.
3. DASHED LINES INDICATE THE SITE-SPECIFIC ACTION LEVELS FOR STATION 159-6, AS PROVIDED IN THE MINE'S *CONTINGENCY PLAN FOR WATER QUALITY EXCEEDANCES* (STANTEC, MARCH 27A, 2020). HOWEVER, PH GUIDANCE REFLECTS THE MAC RANGE DENOTED IN THE WATER LICENCE 1AR-NAN2030. FOR TEMPORAL PLOTS WHERE NO DASHED LINES ARE PRESENT, NO ACTION LEVELS ARE DEFINED.
4. ALL RESULTS REPORTED BELOW THE DETECTION LIMIT (DL) ARE PRESENTED AS HALF THE ASSOCIATED DL.

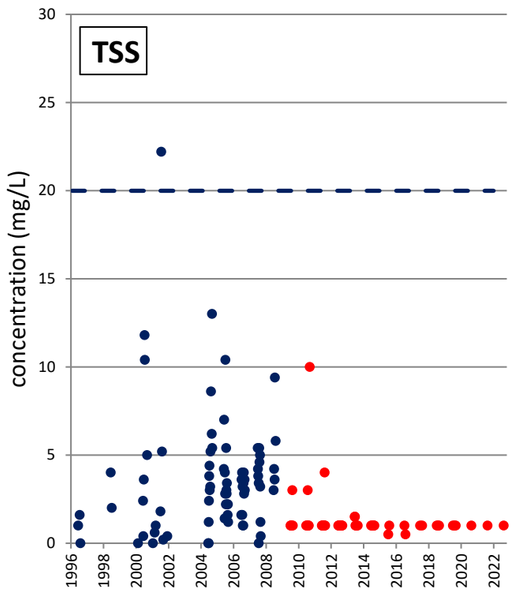
PREPARED BY: CLP	FIGURE TITLE: TEMPORAL TRENDS AT STATION 159-6		
CHECKED BY: SB	CLIENT: CANZINCO MINES LTD.		
APPROVED BY: CLP	SCALE: NTS	PROJECT NO: 0255034	FIGURE NO: C-2

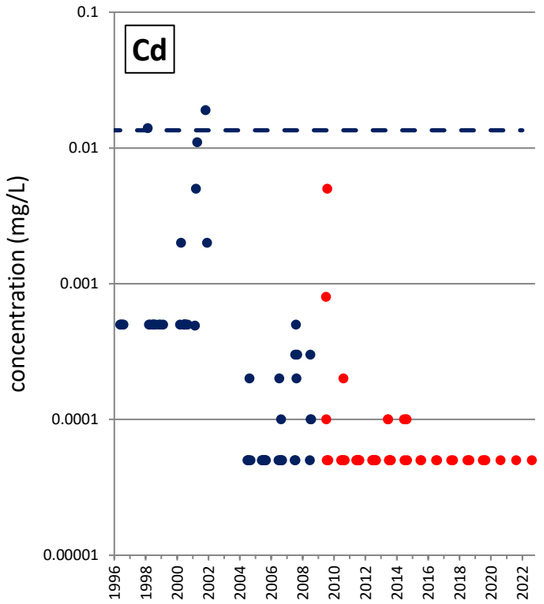
0 5 10 mm in ANSI B sized paper

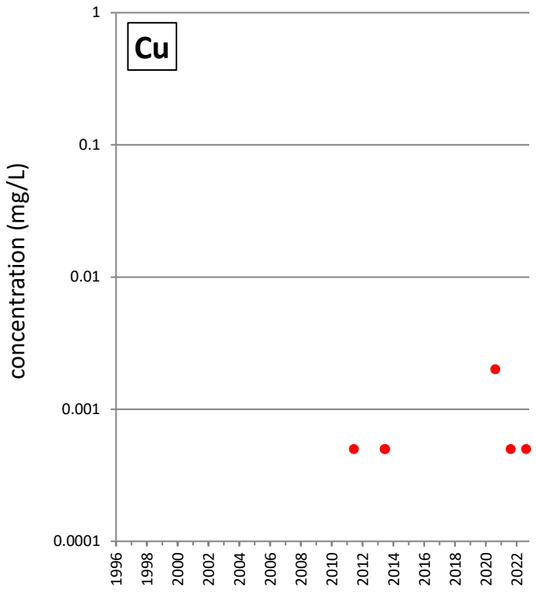
BGC ENGINEERING INC.

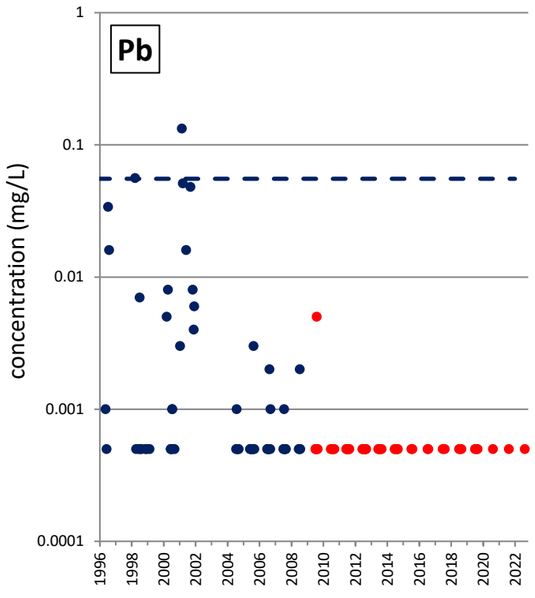


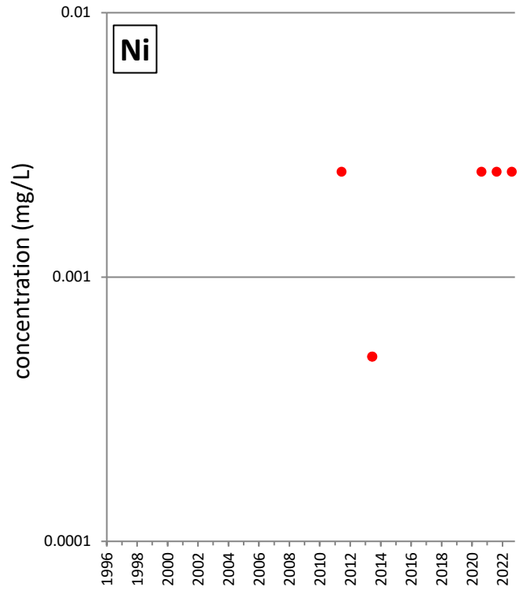


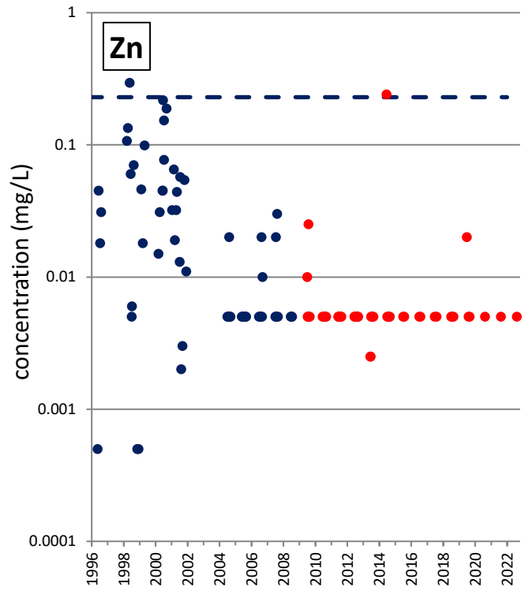












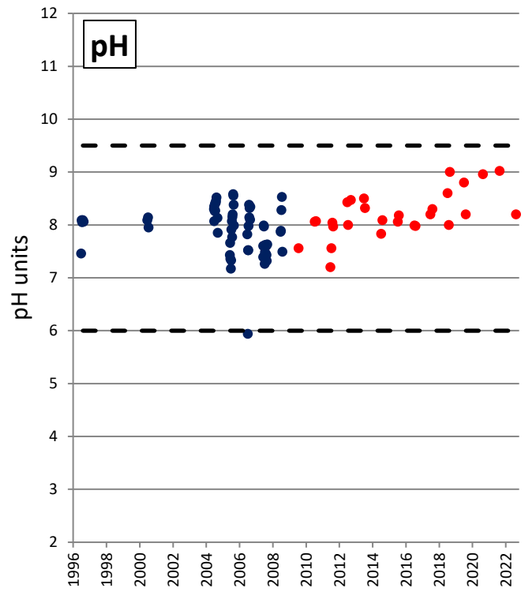
NOTES

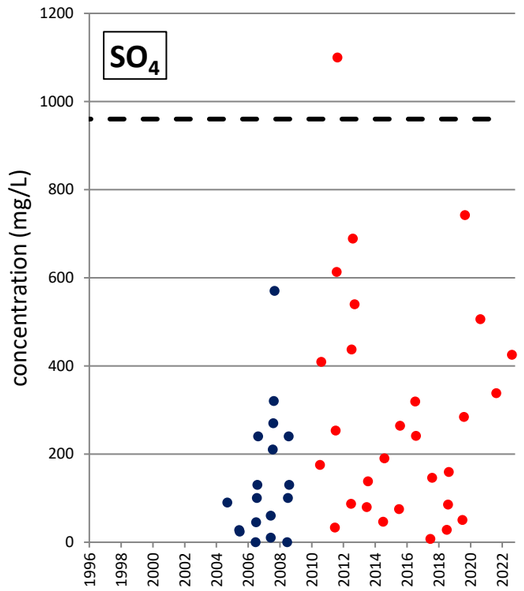
1. THIS FIGURE SHOULD BE READ IN CONJUNCTION WITH BGC'S REPORT TITLED "NANISIVIK MINE, NUNAVUT, 2022 WATER QUALITY MONITORING", AND DATED MARCH 2023.
2. BLUE DOTS REPRESENT SAMPLES COLLECTED PRIOR TO CLOSURE, ON OCTOBER 1, 2008 (STANTEC, MARCH 10, 2020); RED DOTS REPRESENT SAMPLES COLLECTED IN POST-CLOSURE.
3. DASHED LINES INDICATE THE SITE-SPECIFIC ACTION LEVELS FOR STATION NML-23, AS PROVIDED IN THE MINE'S *CONTINGENCY PLAN FOR WATER QUALITY EXCEEDANCES* (STANTEC, MARCH 27A, 2020). HOWEVER, pH GUIDANCE REFLECTS THE MAC RANGE DENOTED IN THE WATER LICENCE 1AR-NAN2030. FOR TEMPORAL PLOTS WHERE NO DASHED LINES ARE PRESENT, NO ACTION LEVELS ARE DEFINED.
4. ALL RESULTS REPORTED BELOW THE DETECTION LIMIT (DL) ARE PRESENTED AS HALF THE ASSOCIATED DL.

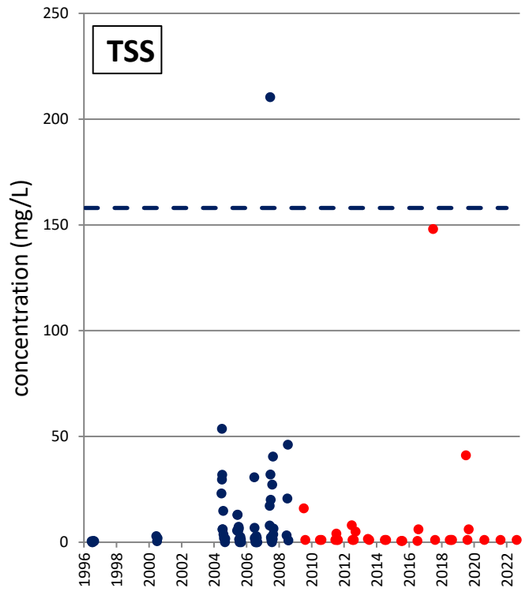
PREPARED BY:	FIGURE TITLE		
CLP	TEMPORAL TRENDS AT STATION NML-23		
CHECKED BY:	CLIENT:		
SB	CANZINCO MINES LTD.		
APPROVED BY:	SCALE:	PROJECT NO:	FIGURE NO:
CLP	NTS	0255034	C-3

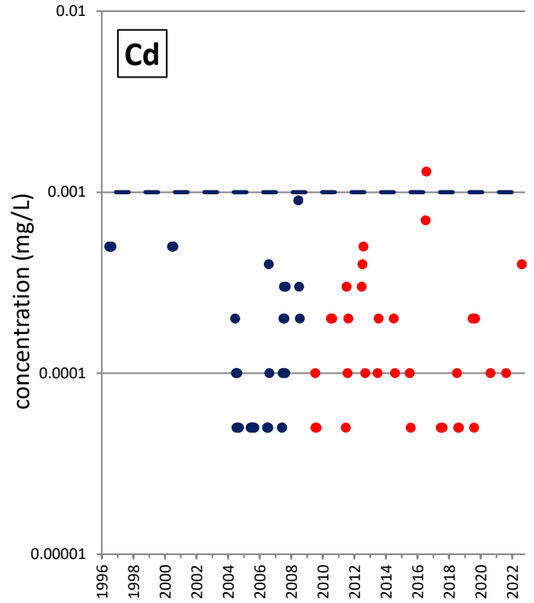
0 5 10 mm in ANSI B sized paper

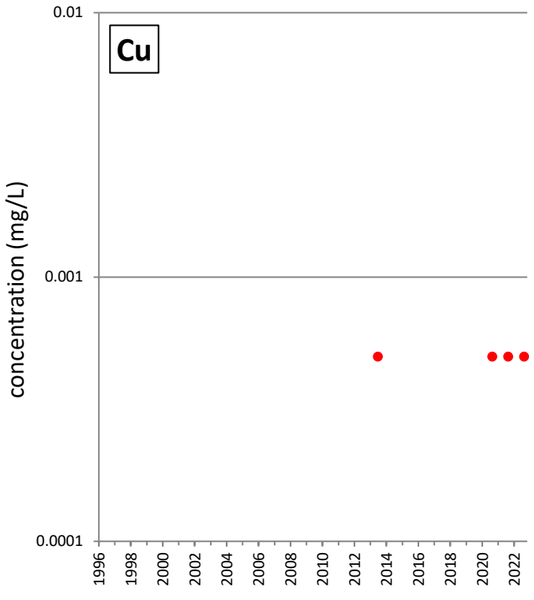
BGC ENGINEERING INC.

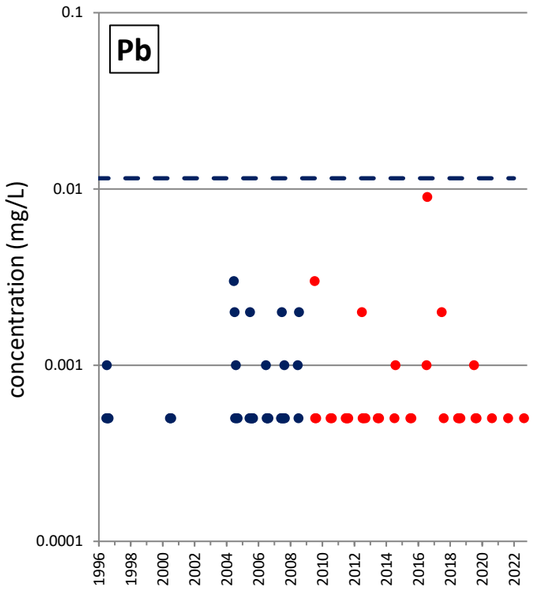


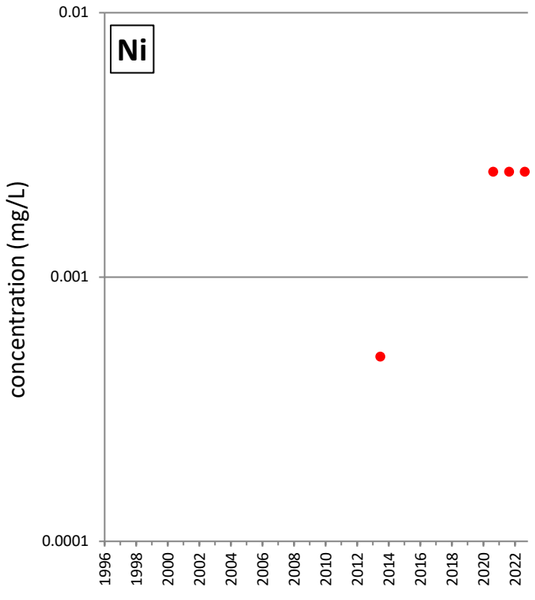


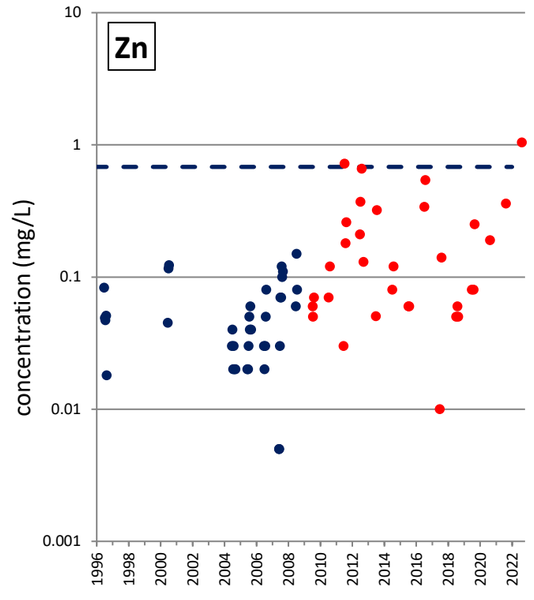










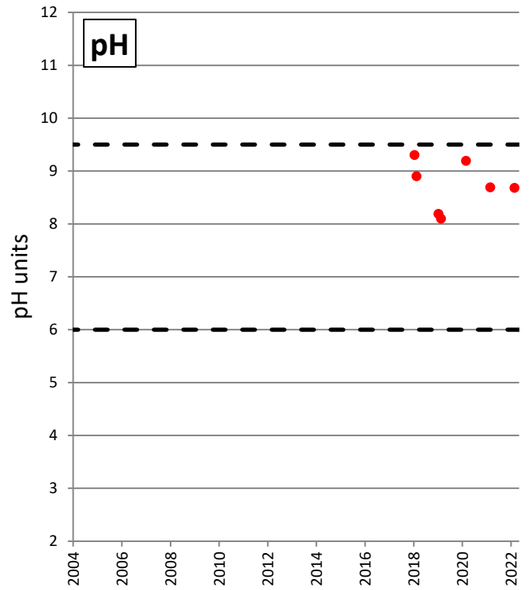


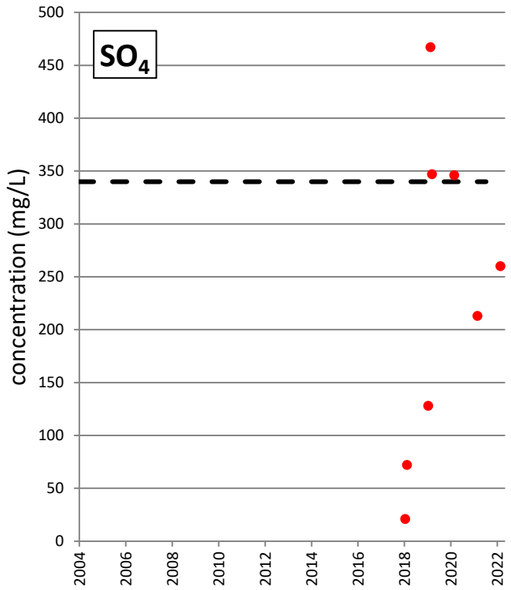
NOTES
1. THIS FIGURE SHOULD BE READ IN CONJUNCTION WITH BGC'S REPORT TITLED "NANISIVIK MINE, NUNAVUT, 2022 WATER QUALITY MONITORING", AND DATED MARCH 2023.
2. BLUE DOTS REPRESENT SAMPLES COLLECTED PRIOR TO CLOSURE, ON OCTOBER 1, 2008 (STANTEC, MARCH 10, 2020); RED DOTS REPRESENT SAMPLES COLLECTED IN POST-CLOSURE.
3. DASHED LINES INDICATE THE SITE-SPECIFIC ACTION LEVELS FOR STATION 159-14, AS PROVIDED IN THE MINE'S *CONTINGENCY PLAN FOR WATER QUALITY EXCEEDANCES* (STANTEC, MARCH 27A, 2020). HOWEVER, pH GUIDANCE REFLECTS THE MAC RANGE DENOTED IN THE WATER LICENCE 1AR-NAN2030. FOR TEMPORAL PLOTS WHERE NO DASHED LINES ARE PRESENT, NO ACTION LEVELS ARE DEFINED.
4. ALL RESULTS REPORTED BELOW THE DETECTION LIMIT (DL) ARE PRESENTED AS HALF THE ASSOCIATED DL.

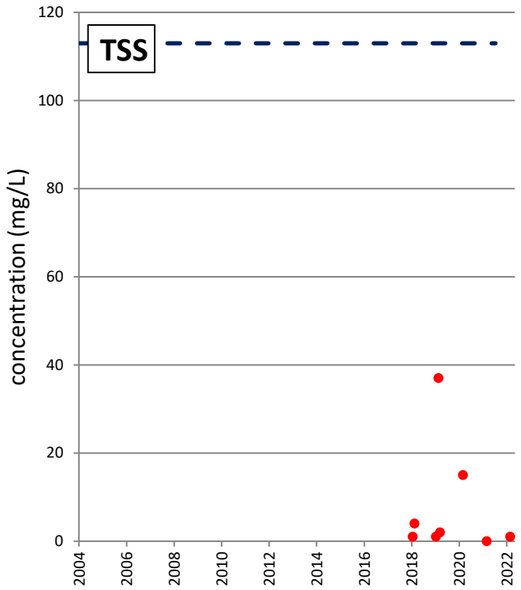
PREPARED BY:	FIGURE TITLE		
CLP	TEMPORAL TRENDS AT STATION 159-14		
CHECKED BY:	CLIENT:		
SB	CANZINCO MINES LTD.		
APPROVED BY:	SCALE:	PROJECT NO:	FIGURE NO:
CLP	NTS	0255034	C-4

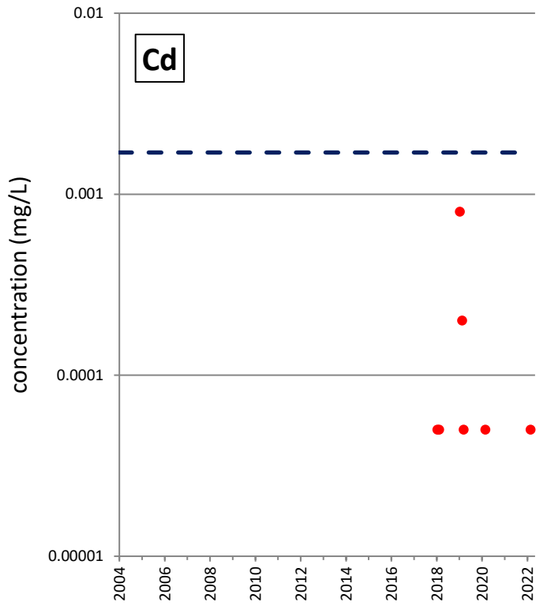
0 5 10 mm in ANSI B sized paper

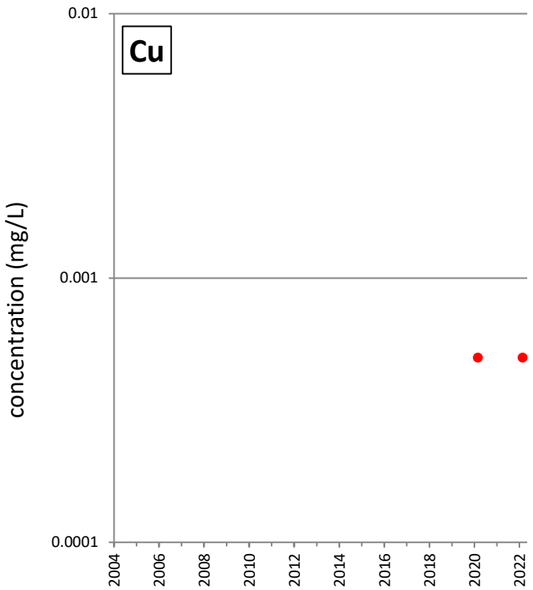
BGC ENGINEERING INC.

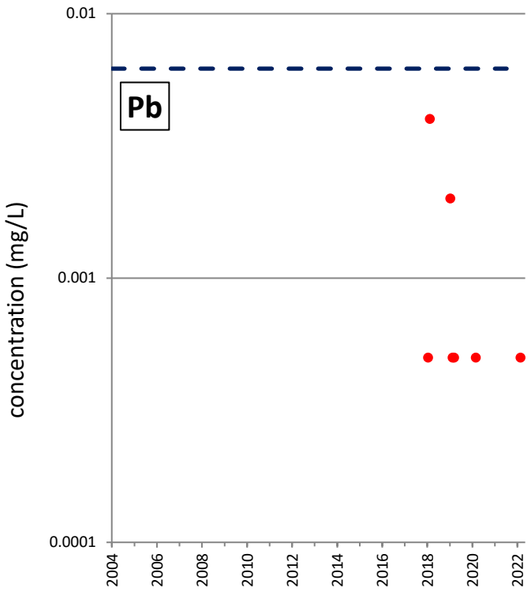


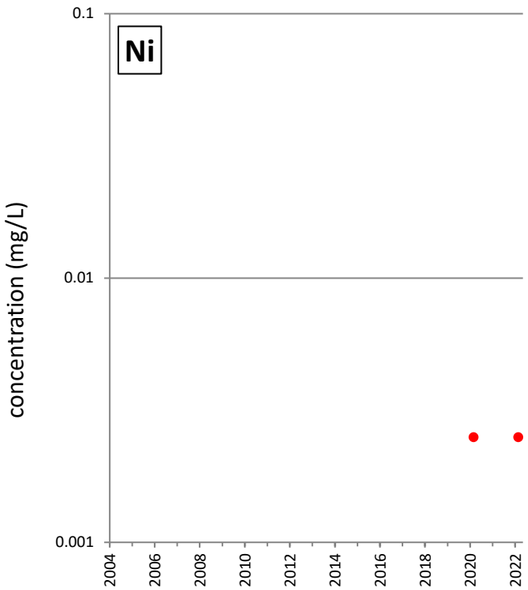


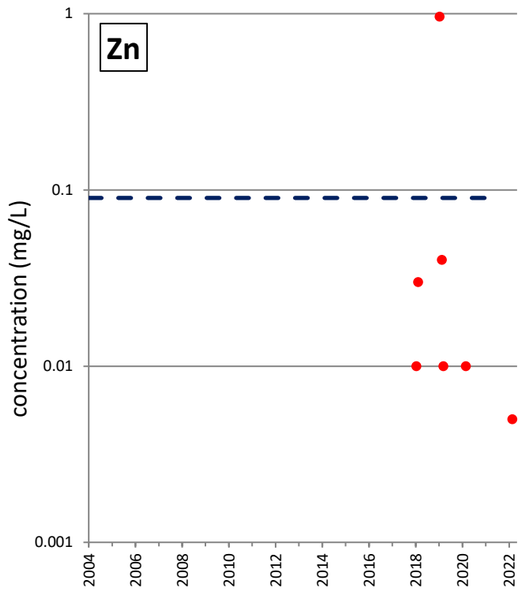












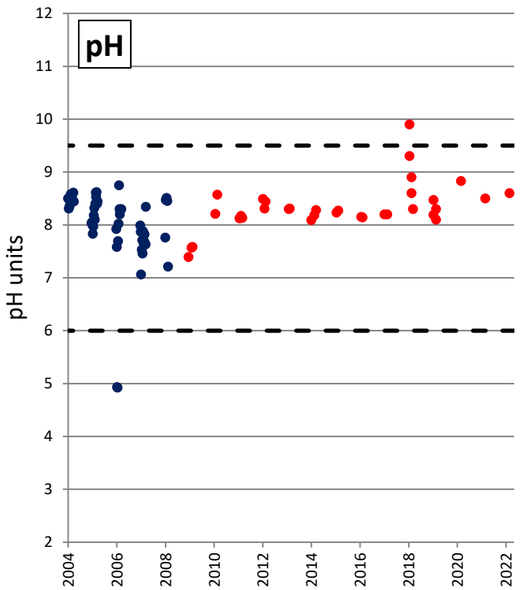
NOTES

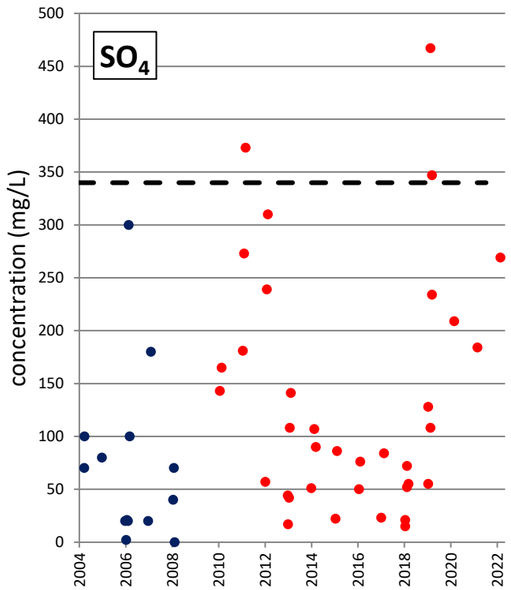
1. THIS FIGURE SHOULD BE READ IN CONJUNCTION WITH BGC'S REPORT TITLED "NANISIVIK MINE, NUNAVUT, 2022 WATER QUALITY MONITORING", AND DATED FEBRUARY 2023.
2. BLUE DOTS REPRESENT SAMPLES COLLECTED PRIOR TO CLOSURE, ON OCTOBER 1, 2008 (STANTEC, MARCH 10, 2020); RED DOTS REPRESENT SAMPLES COLLECTED IN POST-CLOSURE.
3. DASHED LINES INDICATE THE SITE-SPECIFIC ACTION LEVELS FOR STATION NML-29, AS PROVIDED IN THE MINE'S *CONTINGENCY PLAN FOR WATER QUALITY EXCEEDANCES* (STANTEC, MARCH 27A, 2020). HOWEVER, PH GUIDANCE REFLECTS THE MAC RANGE DENOTED IN THE WATER LICENCE 1AR-NAN2030. FOR TEMPORAL PLOTS WHERE NO DASHED LINES ARE PRESENT, NO ACTION LEVELS ARE DEFINED.
4. ALL RESULTS REPORTED BELOW THE DETECTION LIMIT (DL) ARE PRESENTED AS HALF THE ASSOCIATED DL.
5. SAMPLES ARE INCONSISTENTLY COLLECTED AT NML-29 DUE TO INSUFFICIENT WATER FOR SAMPLING.

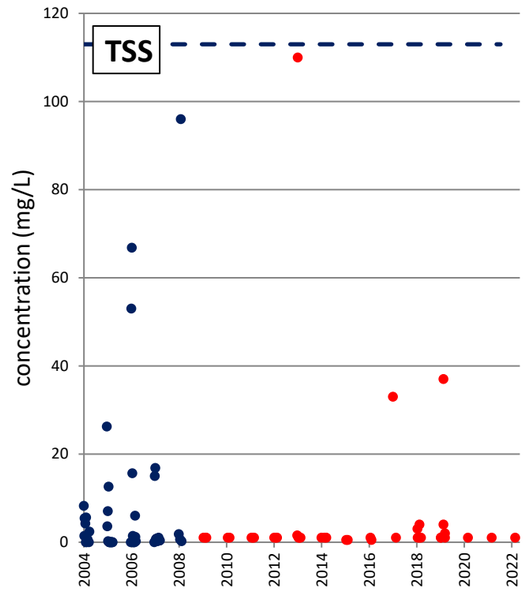
PREPARED BY:	FIGURE TITLE		
CLP	TEMPORAL TRENDS AT STATION NML-29		
CHECKED BY:	CLIENT:		
SB	CANZINCO MINES LTD.		
APPROVED BY:	SCALE:	PROJECT NO:	FIGURE NO:
CLP	NTS	0255034	C-5

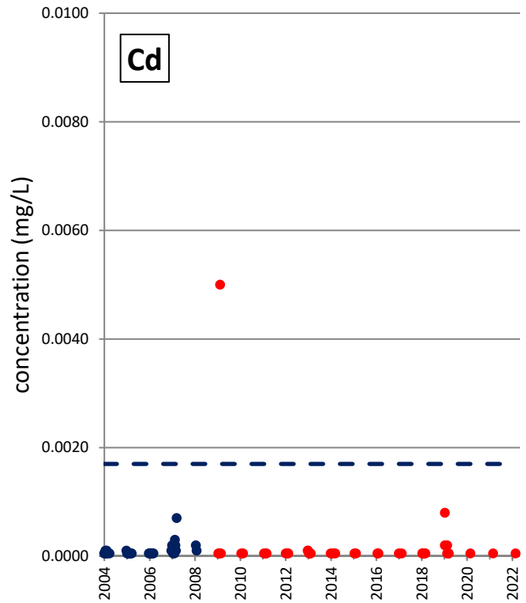
0 5 10 mm in ANSI B sized paper

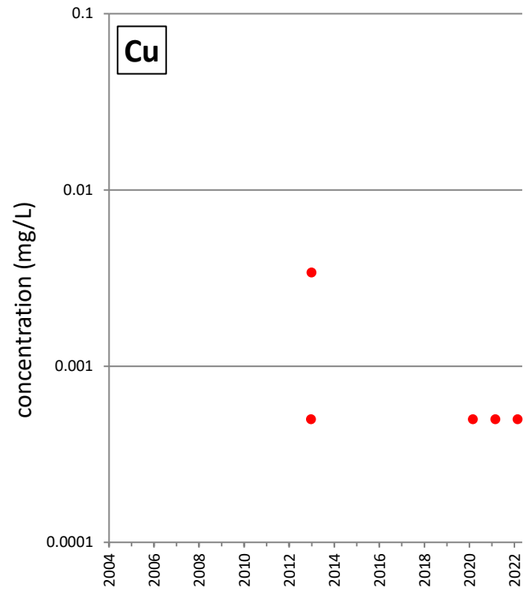
BGC ENGINEERING INC.

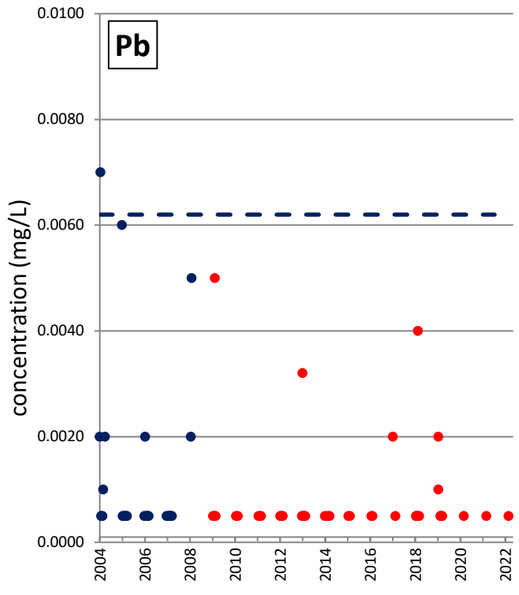


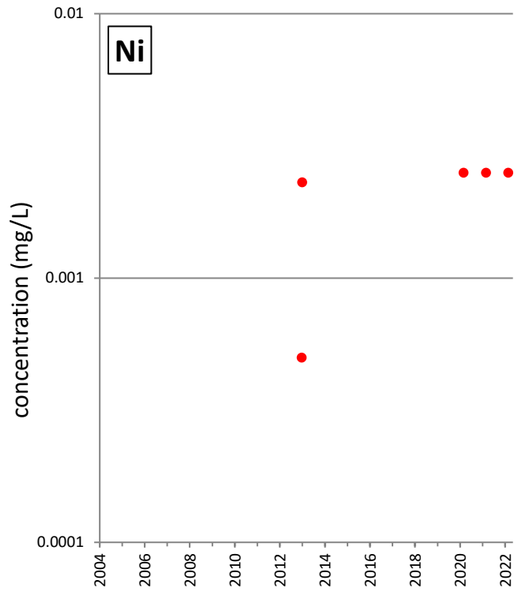


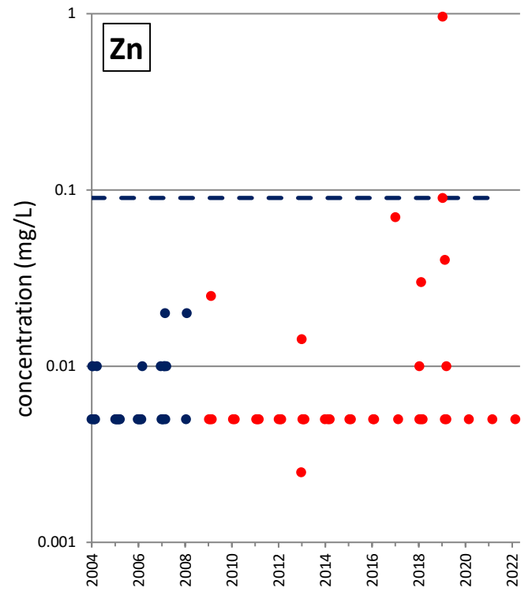












NOTES

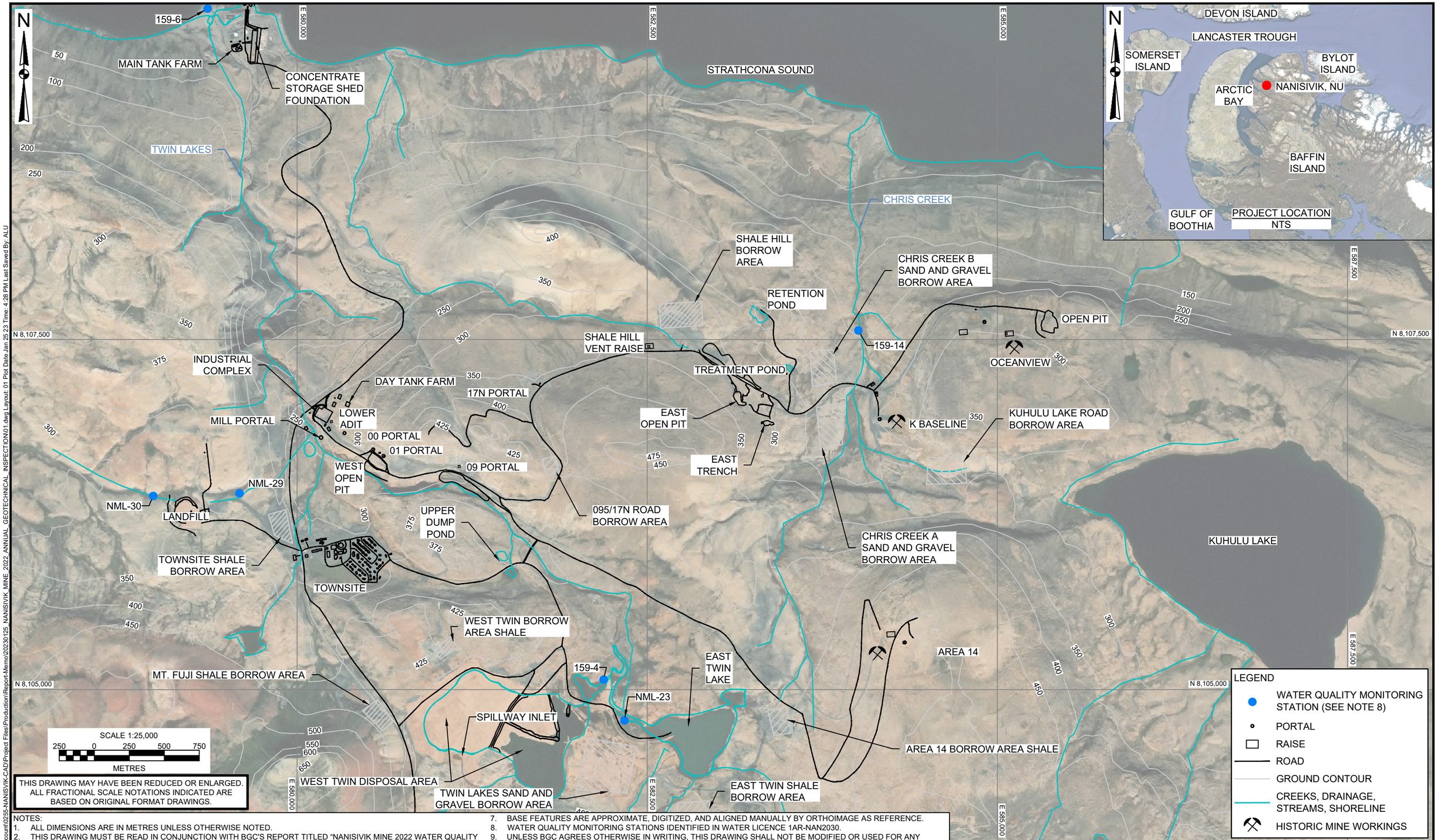
1. THIS FIGURE SHOULD BE READ IN CONJUNCTION WITH BGC'S REPORT TITLED "NANISIVIK MINE, NUNAVUT, 2022 WATER QUALITY MONITORING", AND DATED MARCH 2023.
2. BLUE DOTS REPRESENT SAMPLES COLLECTED PRIOR TO CLOSURE, ON OCTOBER 1, 2008 (STANTEC, MARCH 10, 2020); RED DOTS REPRESENT SAMPLES COLLECTED IN POST-CLOSURE.
3. DASHED LINES INDICATE THE SITE-SPECIFIC ACTION LEVELS FOR STATION NML-30, AS PROVIDED IN THE MINE'S *CONTINGENCY PLAN FOR WATER QUALITY EXCEEDANCES* (STANTEC, MARCH 27A, 2020). HOWEVER, pH GUIDANCE REFLECTS THE MAC RANGE DENOTED IN THE WATER LICENCE 1AR-NAN2030. FOR TEMPORAL PLOTS WHERE NO DASHED LINES ARE PRESENT, NO ACTION LEVELS ARE DEFINED.
4. ALL RESULTS REPORTED BELOW THE DETECTION LIMIT (DL) ARE PRESENTED AS HALF THE ASSOCIATED DL.

PREPARED BY: CLP	FIGURE TITLE: TEMPORAL TRENDS AT STATION NML-30		
CHECKED BY: SB	CLIENT: CANZINCO MINES LTD.		
APPROVED BY: CLP	SCALE: NTS	PROJECT NO: 0255034	FIGURE NO: C-6

0 5 10 mm in ANSI B sized paper

BGC ENGINEERING INC.

DRAWINGS



NOTES:
1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.
2. THIS DRAWING MUST BE READ IN CONJUNCTION WITH BGC'S REPORT TITLED "NANISIVIK MINE 2022 WATER QUALITY MONITORING", AND DATED FEBRUARY 2023.
3. BASE TOPOGRAPHIC DATA BASED ON STANTEC DRAWING NAMED "WATER SAMPLING LOCATIONS - MINE AREA - WATER QUALITY MONITORING: A-2, PROVIDED BY NYRSTAR CANADA (HOLDINGS) LTD., DATED FEBRUARY 21, 2020. CONTOUR INTERVAL IS 50.0 m.
4. COORDINATE SYSTEM IS NAD83 UTM ZONE 16N. VERTICAL DATUM IS UNKNOWN.
5. ORTHOIMAGE FROM ESRI WORLD IMAGERY SERVER RETRIEVED FROM GLOBAL MAPPER VER. 21.1 ON FEBRUARY 11, 2021. DATUM IS GOOGLE MAPS (SPHERE RADIUS 6378137).
6. OVERVIEW MAP IMAGERY FROM GOOGLE EARTH PRO V7.3.3.7786. (DECEMBER 30, 2016). NANISVIK, NUNAVUT, IMAGE LANDSAT/COPERNICUS. CAPTURED ON FEBRUARY 19, 2021.
7. BASE FEATURES ARE APPROXIMATE, DIGITIZED, AND ALIGNED MANUALLY BY ORTHOIMAGE AS REFERENCE.
8. WATER QUALITY MONITORING STATIONS IDENTIFIED IN WATER LICENCE 1AR-NAN2030.
9. UNLESS BGC AGREES OTHERWISE IN WRITING, THIS DRAWING SHALL NOT BE MODIFIED OR USED FOR ANY PURPOSE OTHER THAN THE PURPOSE FOR WHICH BGC GENERATED IT. BGC SHALL HAVE NO LIABILITY FOR ANY DAMAGES OR LOSS ARISING IN ANY WAY FROM ANY USE OR MODIFICATION OF THIS DOCUMENT NOT AUTHORIZED BY BGC. ANY USE OF OR RELIANCE UPON THIS DOCUMENT OR ITS CONTENT BY THIRD PARTIES SHALL BE AT SUCH THIRD PARTIES' SOLE RISK.

SCALE:	1:25,000
DATE:	MAR 2023
DRAWN:	AL
REVIEW:	BMA
APPROVED:	CLP

CLIENT: **CANZINCO MINES LTD.**

BGC

PROJECT: **NANISIVIK MINE 2022 WATER QUALITY MONITORING**

TITLE: **SITE LOCATION PLAN**

PROJECT No.: **0255034**

DWG No.: **01**

C:_BIM\ACCDocs\BGC BIM Account\0255-NANISVIK-CAD\Project Files\Production\Report-Memo\20230125_NANISVIK_MINE_2022_ANNUAL_GEOTECHNICAL_INSPECTION\01.dwg Layout: 01 Plot Date: Jan 25 23 Time: 4:28 PM Last Saved By: ALU