NANISIVIK MINE
A division of CanZinco Ltd.
P.O. Box 225
Nanisivik, NU
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March 25, 2004

Mr. Phillipe diPizzo
Executive Director – Nunavut Water Board
P.O. Box 119
Gjoa Haven, NU
X0B 1J0

Re: Water Licence NWB1NAN0208

In accordance with Part H Item 31 please accept this submission as Nanisivik Mine's 2003 Effluent Monitoring Report

If further information is required please do not hesitate to contact me.

Regards,

Murray Markle
Site Manager

Phone: 867-436-7376
email: mmarkle@nu.breakwater.ca

c.c. B. Heath
R. Carreau
File

During the period of July 8th to October 4th, effluent was released from the identified final deposition point 159-4. Monitoring of the effluent was conducted as per the guidelines set forth in the **MMER**. As per Schedule 6 pertaining to Section 22 of the MMER, the following information is submitted:

Name of Mine	Nanisivik
Mine Operator	CanZinco Ltd.
Address:	PO Box 225, Nanisivik, NU X0A 0X0
Telephone:	867-436-7502
E-Mail:	mmarkle@nu.breakwater.ca
Location of Final Discharge Point:	Water flows from the West Twin Reservoir to a polishing pond prior to being discharged to twin lakes creek. A Steel plate barrier that contains seven 6-inch valves holds the water back. Sampling station159-4 is located at this decant structure. The coordinates and elevation for this final discharge point are as follows:

Station	Latitude	Longitude	Elevation (m)
159-4	73° 01' 29.4" N	84° 28' 32.8" W	368.196

Effluent characterization and water quality monitoring was also conducted on samples taken from the receiving environment exposure area surrounding the point of entry of effluent from final discharge point 159-4. This sampling location is known as 159-4A. It is located approximately 50 metres down stream from the decant structure (159-4). The coordinates and elevation for sampling station 159-4A are as follows:

Station	Latitude	Longitude	Elevation (m)
159-4A	73° 01' 32.3" N	84° 28' 33.5" W	366.914

The reference area with respect to station 159-4A is located approximately 50 metres up stream from the decant structure (159-4). This sampling station is known as 159-4B and is actually located in the stream that flows out of East Twin Lake. Effluent characterization and water quality monitoring was conducted on samples taken from this station as well. The coordinates and elevation for sampling station 159-4B are as follows:

Station	Latitude	Longitude	Elevation (m)
159-4B	73° 01' 33.2" N	84° 28' 20.9" W	366.742

Table 1 and 2 of schedule 6 is shown below.

TABLE 1

MONTHLY MEAN CONCENTRATIONS, pH RANGE AND VOLUME OF EFFLUENT (1)(2)

Month	As (mg/L)	Cu (mg/L)	CN (mg/L)	Pb (mg/L)	Ni (mg/L)	Zn (mg/L)	TSS (mg/L)	Ra (Bq/L)	pH range	Effluent Volume (m3)
Jan.	ND	ND	NMR	ND	ND	ND	ND	ND	ND	ND
Feb.	ND	ND	NMR	ND	ND	ND	ND	ND	ND	ND
Mar.	ND	ND	NMR	ND	ND	ND	ND	ND	ND	ND
Apr.	ND	ND	NMR	ND	ND	ND	ND	ND	ND	ND
May	ND	ND	NMR	ND	ND	ND	ND	ND	ND	ND
June	ND	ND	NMR	ND	ND	ND	ND	ND	ND	ND
July	0.001	0.025	NMR	0.008	<0.005	0.054	3.300	0.047	6.3 -8.0	154812
Aug.	0.002	0.063	NMR	0.016	0.008	0.182	5.100	0.100	7.2-7.9	154656
Sept.	0.002	0.085	NMR	0.019	0.013	0.258	2.500	0.090	6.4-7.7	63660
Oct.	0.003	0.105	NMR	0.023	0.016	0.323	1.750	0.102	6.4-6.6	2678
Nov.	ND	ND	NMR	ND	ND	ND	ND	ND	ND	ND
Dec.	ND	ND	NMR	ND	ND	ND	ND	ND	ND	ND

(1) Any measurement not taken because there was no deposit from the final discharge point shall be identified by the letters "ND" - (No Deposit)

(2) Any measurement not taken because no measurement was required in accordance with the conditions set out in section 13 of the Regulations shall be identified by the letters "NMR" - (No Measurement Required).

TABLE 2

RESULTS OF ACUTE LETHALITY TESTS AND *DAPHNIA MAGNA* MONITORING TESTS

Date Sample Collected	Effluent Acutely Lethal to Rainbow Trout (yes or no)	Effluent Acutely Lethal to *Daphnia magna* (yes or no)
09/08/2003	No	Yes
13/09/2003	No	Yes

The Excel spreadsheets provided by Environment Canada and containing all the MMER information provided here have been submitted electronically.

There was a data entry error for the August TSS mass loading in the 3rd quarter effluent monitoring report. This error has been corrected and the summary for the year is tabled below.

TABLE 3
2003 MASS LOADING SUMMARY

Month	TSS (kg)	Cd (kg)	Pb (kg)	As (kg)	Cu (kg)	Ni (kg)	R 226 (Mbq)	Zn (kg)	NH_3 (kg)	Total Water (m3)
July	466.85	0.05	1.23	0.17	3.68	0.59	6.62	9.82	172.44	154812
August	932.94	0.10	2.46	0.24	9.37	1.39	15.46	26.78	394.82	154656
September	179.37	0.05	1.26	0.15	5.54	1.09	6.48	16.90	200.66	63660
October	4.29	0.02	0.06	0.01	0.28	0.04	0.10	0.87	10.08	2678
Total	1583.45	0.22	5.01	0.57	18.87	3.11	28.66	54.37	778.00	375806

Effluent Characterization and Water Quality Monitoring

During the period of July 8th to October 4th, effluent was released from the identified final deposition point 159-4. Monitoring of the effluent was conducted as per section 7 of the **MMER** in accordance with schedule 5. As per Section 8 of schedule 5 relating to the **EEM** (environmental effects monitoring studies), the following information is submitted:

The dates on which each sample was collected for effluent characterization, sub lethal toxicity testing and water quality monitoring are shown in the table below:

Sample Type	Dates		
Effluent Characterization	July 12	August 9	September 10
Sub Lethal Toxicity		August 9	September 13
Water Quality Monitoring	July 12	August 9	September 10

Water flows from the West Twin Reservoir to a polishing pond prior to being discharged to twin lakes creek. A Steel plate barrier that contains seven 6-inch valves holds the water back. The water is released through the valves and flows along a cement spillway prior to being deposited into the Twin Lakes Creek. The sample is collected at the end of the spillway just before it enters the creek. This sampling station is known as 159-4. The coordinates and elevation for this final discharge point are as follows:

Station	Latitude	Longitude	Elevation (m)
159-4	73° 01' 29.4" N	84o 28' 32.8" W	368.196

Effluent characterization and water quality monitoring was also conducted on samples taken from the receiving environment exposure area surrounding the point of entry from final discharge point 159-4. This sampling location is known as 159-4A. It is located approximately 50 metres down stream from the decant structure (159-4). The coordinates and elevation for sampling station 159-4A are as follows:

Station	Latitude	Longitude	Elevation (m)
159-4A	73° 01' 32.3" N	84° 28' 33.5" W	366.914

The reference area with respect to station 159-4A is located approximately 50 metres up stream from the decant structure (159-4). This sampling station is known as 159-4B and is actually located in the stream that flows out of East Twin Lake. Effluent characterization and water quality monitoring was conducted on samples taken from this station as well. The coordinates and elevation for sampling station 159-4B are as follows:

Station	Latitude	Longitude	Elevation (m)
159-4B	73° 01' 33.2" N	84° 28' 20.9" W	366.742

The 159-4 discharge point was selected as the location where sub lethal toxicity testing would be conducted for two reasons, the first and foremost being that this was the only location where effluent was released during 2003. The second reason is that the twin lakes creek is an actual waterway for the entire season whereas water-flow through the valley at the East Adit discharge point is sporadic at best.

The results of effluent characterization, sub lethal toxicity testing and water quality monitoring have been entered on a set of Excel spreadsheets provided by Environment Canada with the file name "**EEM MMER Report".** A formatted version of these spreadsheets are appended to this report as appendix A and the original spreadsheets accompany the electronic submission.

Methodologies used to conduct effluent characterization and water quality monitoring were as follows:

Parameter	Method	Reference
Metals (Al, As, Cd, Cu, Fe, Mo, Ni, Pb, Zn)	ICP-MS	EPA 200.8
Metals (Ca, Mg)	ICP-AES	SM 3120B
Hardness	Calculation	SM 2340B
Hg	Cold Vapour AA	SM 3112
N-NH3	Auto-Colour	SM 4500-NH3-G
N-NO3	Ion Chromatogram	SM 4110
Alkalinity	Auto-Titration	SM 2320B
DRO	GC/FID	EPA 3510/MOE 3421

Note:
SM: Standard Method for the Examination of Water and Wastewater, 20th edition, 1998
EPA: Environmental Protection Agency (USA)
MOE: Ministry of the Environment (ONT)

The method detection limits for each parameter are tabled below

Parameter	MDL	Units	Parameter	MDL	Units
Hardness as CaCO3	1	mg/l	Arsenic	.001	mg/l
Alkalinity	5	mg/l	Copper	.001	mg/l
Aluminum	.01	mg/l	Lead	.001	mg/l
Cadmium	.0001	mg/l	Nickel	.005	mg/l
Iron	.01	mg/l	Zinc	.01	mg/l
Mercury	.0001	mg/l	Radium 226	.01	bq/l
Molybdenum	.005	mg/l	TSS	.0001	mg/l
Ammonia	.02	mg/l	Temperature	0.1	mg/l
Nitrate	.10	mg/l	Dissolved Oxygen	.01	mg/l
PH	.01				

Quality assurance was achieved by following a standard operating procedure for sampling. Closed sample containers were taken to the field for collection. The containers were opened just prior to sampling and rinsed twice with the effluent prior to collection. The lids were also rinsed twice for each sample. The sample number and date are written on both the sample bottle and its lid. The PH is measured using a calibrated portable PH metre. A duplicate sample is collected on each sampling date. One sample is filtered on site to determine suspended solids and the other is preserved with nitric acid and shipped to an offsite lab for analysis. Personnel involved in the sampling were trained in the procedure.

Appendix A
EEM MMER Report

Appendix A-1
Effluent Characterization

Date (YYYY-MM-DD)	Final Dishcharge Point (Name)	Latitude	Longitude	Grab or Composite? (G or C)	Hardness	Alkalinity	Aluminum	Cadmium	Iron	Mercury	Molybdenum	Ammonia	Nitrate	Comments
					mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	
2003-07-12	159-4	73° 01' 29.4" N	84° 28' 32.8" W	G	363	22	0.02	0.0002	0.22	< 0.0001	0.011	0.69	1.16	
2003-08-09	159-4	73° 01' 29.4" N	84° 28' 32.8" W	G	1210	*	0.03	0.0006	0.1	< 0.0001	0.045	2.13	0.03	* Akalinity Analyses not available due to addition of preservative
2003-08-09	159-4A	73° 01' 32.3" N	84° 28' 33.5" W	C	317	*	0.3	0.0003	0.32	< 0.0001	0.009	0.51	0.3	* Akalinity Analyses not available due to addition of preservative
2003-08-09	159-4B	73° 01' 33.2" N	84° 28' 20.9" W	G	55	*	0.16	0.0002	0.11	< 0.0001	< 0.005	< 0.02	0.16	* Akalinity Analyses not available due to addition of preservative
2003-09-10	159-4	73° 01' 29.4" N	84° 28' 32.8" W	G	1580	46	0.12	0.0007	0.4	< 0.0001	0.045	2.83	6.55	
2003-09-10	159-4A	73° 01' 32.3" N	84° 28' 33.5" W	C	727	32	0.38	0.0003	0.52	< 0.0001	0.016	1.16	2.45	
2003-09-10	159-4B	73° 01' 33.2" N	84° 28' 20.9" W	G	38	30	0.11	0.0001	0.12	< 0.0001	< 0.005	< 0.02	0.11	

Appendix A-2
Water Quality Monitoring

Date (YYYY-MM-DD)	Exposure/Reference Area (Name)	Exposure or Reference? (E or R)	Latitude	Longitude	Hardness	Alkalinity	Aluminum	Cadmium	Iron	Mercury	Molybdenum	Ammonia	Nitrate	pH	Arsenic
					mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L		mg/L
12-Jul	159-4	E	73° 01' 29.4" N	84° 28' 32.8" W	363	22	0.020	0.0002	0.22	< 0.0001	0.011	0.69	1.16	6.60	
09-Aug	159-4	E	73° 01' 29.4" N	84° 28' 32.8" W	1210		0.030	0.0006	0.10	< 0.0001	0.045	2.13	0.03	7.58	0.001
09-Aug	159-4A	E	73° 01' 32.3" N	84° 28' 33.5" W	317		0.300	0.0003	0.32	< 0.0001	0.009	0.51	0.30	7.60	< 0.001
09-Aug	159-4B	R	73° 01' 33.2" N	84° 28' 20.9" W	55		0.160	0.0002	0.11	< 0.0001	< 0.005	< 0.02	0.16	7.95	< 0.001
10-Sep	159-4	E	73° 01' 29.4" N	84° 28' 32.8" W	1580	46	0.120	0.0007	0.40	< 0.0001	0.045	2.83	6.55	7.24	0.002
10-Sep	159-4A	E	73° 01' 32.3" N	84° 28' 33.5" W	727	32	0.380	0.0003	0.52	< 0.0001	0.016	1.16	2.45	7.30	0.001
10-Sep	159-4B	R	73° 01' 33.2" N	84° 28' 20.9" W	38	30	0.110	0.0001	0.12	< 0.0001	< 0.005	< 0.02	0.11	6.90	< 0.001

Date (YYYY-MM-DD)	Exposure/Reference Area (Name)	Exposure or Reference? (E or R)	Latitude	Longitude	Copper	Cyanide	Lead	Nickel	Zinc	Radium 226 (Bq/L)	TSS	Temperature	Dissolved Oxygen	Comments
					mg/L	mg/L	mg/L	mg/L	mg/L	Bq/L	mg/L	°C	mg/L	
12-Jul	159-4	E	73° 01' 29.4" N	84° 28' 32.8" W			0.004		0.007		2.0	14.1		
09-Aug	159-4	E	73° 01' 29.4" N	84° 28' 32.8" W	0.053		0.014	0.008	0.219	0.04	2.4	6.3		
09-Aug	159-4A	E	73° 01' 32.3" N	84° 28' 33.5" W	0.015		0.005	0.002	0.072	< 0.01	30.0	5.9	9.05	
09-Aug	159-4B	R	73° 01' 33.2" N	84° 28' 20.9" W	0.001		0.001	< 0.001	0.011	< 0.01	15.2	4.8	9.32	
10-Sep	159-4	E	73° 01' 29.4" N	84° 28' 32.8" W	0.069		0.021	0.009	0.210	0.09	6.4	3.6		
10-Sep	159-4A	E	73° 01' 32.3" N	84° 28' 33.5" W	0.019		0.007	< 0.005	0.080	0.04	20.2	4.1	9.81	
10-Sep	159-4B	R	73° 01' 33.2" N	84° 28' 20.9" W	< 0.001		0.003	< 0.005	0.010	< 0.01	8.8	4.1	9.06	

Appendix A-3
Sublethal Toxicity Testing

Date (YYYY-MM-DD)	Final Dischcharge Point (Name)	Latitude	Longitude	Grab or Composite? (G or C)	Species Tested (Latin name)	Test Type (Growth, Reproduction, Survival)	LC50	LC50 Lower	LC50 Upper	EC25 or IC25	EC25 or IC25 Lower	EC25 or IC25 Upper	Comments
09-Aug-04	159-4	73-01-29 N	84-28-33 W	G	Pimephales promelas	Growth				> 100			4 day holding time. Power Failure on Aug 14th adding 5 hours of darkness
09-Aug-04	159-4	73-01-29 N	84-28-33 W	G	Pimephales promelas	Survival	> 100						4 day holding time. Power Failure on Aug 14th adding 5 hours of darkness
09-Aug-04	159-4	73-01-29 N	84-28-33 W	G	Ceriodaphnia dubia	Survival	57.6	40.5	94.6				4 day holding time. Power Failure on Aug 14th adding 5 hours of darkness
09-Aug-04	159-4	73-01-29 N	84-28-33 W	G	Ceriodaphnia dubia	Reproduction				9.3	7.4	11.5	4 day holding time. Power Failure on Aug 14th adding 5 hours of darkness
09-Aug-04	159-4	73-01-29 N	84-28-33 W	G	Lemna Minor	Growth (Weight)				> 97			4 day holding time. Power Failure on Aug 14th adding 5 hours of darkness
09-Aug-04	159-4	73-01-29 N	84-28-33 W	G	Lemna Minor	Growth (Frond Production)				> 97			4 day holding time. Power Failure on Aug 14th adding 5 hours of darkness
09-Aug-04	159-4	73-01-29 N	84-28-33 W	G	Selenstrum Capricornutum	Growth				10.4	9.4	10.8	4 day holding time. Power Failure on Aug 14th adding 5 hours of darkness. No inhibitory gradient detected in control grp using MK trend test. Negative cell yield indicates no growth. Prior to statistical analyses, neg #' for cell yield were replaced with zeros
13-Sep-03	159-4	73-01-29 N	84-28-33 W	G	Pimephales promelas	Growth				> 100			Test conducted using three subsamples from a single sampling.
13-Sep-03	159-4	73-01-29 N	84-28-33 W	G	Pimephales promelas	Survival	> 100						Test conducted using three subsamples from a single sampling.
13-Sep-03	159-4	73-01-29 N	84-28-33 W	G	Ceriodaphnia dubia	Survival	30.8	20.2	50.3				Test conducted using three subsamples from a single sampling.
13-Sep-03	159-4	73-01-29 N	84-28-33 W	G	Ceriodaphnia dubia	Reproduction				8.7	6.7	10.5	Test conducted using three subsamples from a single sampling.
13-Sep-03	159-4	73-01-29 N	84-28-33 W	G	Lemna Minor	Growth (Weight)				> 97			Test sample enriched with 10 ml/l nutrient stock solutions A, B and C as described in EPS 1/RM/37. Test dilutions were prepared and then allowed to acclimate for one hour before plants were added. Control plants showed the required minimum growth of >8 times.
13-Sep-03	159-4	73-01-29 N	84-28-33 W	G	Lemna Minor	Growth (Frond Production)				37	20.4	54.3	Test sample enriched with 10 ml/l nutrient stock solutions A, B and C as described in EPS 1/RM/37. Test dilutions were prepared and then allowed to acclimate for one hour before plants were added. Control plants showed the required minimum growth of >8 times.
13-Sep-03	159-4	73-01-29 N	84-28-33 W	G	Selenstrum Capricornutum	Growth				8.6	7.8	9	No inhibitory gradient detected in control grp using MK trend test. Negative cell yield indicates no growth. Prior to statistical analyses, neg #' for cell yield were replaced with zeros