T13A

TC13A

NANISIVIK MINE
DRILL REPORT / LOG

24/05/97

LOCATION: Borehole on 376 Platform Chainage 1+50

0.0 - 2.2 m	Frozen shale, fairly well bonded.
2.2 - 2.7 m	Frozen well bonded tailings.
2.7 - 4.4 m	Frozen well bonded shale.
4.4 - 7.3 m	Frozen well bonded tailings.
7.3 - 9.5 m	Dolomite bedrock.
COMMENTS:	Good core recovery and full fluid return while drilling.

Thermocouple points as follows:

T-1 = 9.4 m ✓	Elev. = 366.6
T-2 = 7.4 m	Elev. = 368.6
T-3 = 5.4 m	Elev. = 370.6
T-4 = 3.4 m	Elev. = 372.6
T-5 = 1.4 m	Elev. = 374.6

Frank Tordon, P.Eng.

T14.

TC14A

NANISIVIK MINE
DRILL REPORT / LOG

LOCATION: Elevation 376 m(platform) at chainage 2+25, T/C 14 Extension.

LOG:

0.0 – 2.4 m	Shale, core recovery poor.
2.4 – 3.5 m	Frozen well bonded tailings.
3.5 – 4.1 m	Mix of tailings and shale, frozen and well bonded.
4.1 – 5.8 m	Frozen well bonded tailings.
5.8 – 6.4 m	Frozen well bonded Twin Lakes sand and gravel, with irregular ice dispersions.
6.4 – 9.5 m	Frozen well bonded tailings.
9.5 – 9.8 m	Frozen well bonded lake sediment of clayey silt. A few 0.5 – 1.0 cm ice lenses in upper half. GROUND ICE COMMENTS.
9.8 – 11.2 m	Frozen well bonded reddish glacial till.
11.2 – 13.0 m	Dolomite(dolostone).
13.0m	End of hole.

Good water return while drilling.
Glacial till consists of silt, sand, gravel and cobble sizes.

THERMOCOUPLE POINTS

	DEPTH (m)	ELEVATION (m)
T - 1	12.7	363.3
T - 2	10.7	365.3
T - 3	8.7	367.3
T – 4	6.7	369.3
T – 5	4.7	371.3
T – 6	2.7	373.3

TISA

NANISIVIK MINE
DRILL REPORT / LOG

LOCATION: Elevation 377 m(platform) at chainage 3+00,
(At old causeway to West Twin reservoir)

LOG:

0.0 – 5.8 m	Shale, No core (cuttings only.)
5.8 – 6.7 m	Red ss boulders, Large pieces as core.
6.7 – 8.8 m	Boulders of sandstone, ss.
8.8 – 10.4m	No Core recovered, tlgs in cuttings reporting to surface.
10.4 – 11.9m	Red clay with ss boulders and minor pebbles.
11.9 – 12.8m	Boulders and cobbles of sandstone.
12.8 - 13.4m	Boulders of red/white sandstone
13.4 - 14.9m	Dolomite
14.9m	BoH

THERMOCOUPLE POINTS	DEPTH (m)	ELEVATION (m)
T - 1	14.9	362.1
T - 2	12.9	364.1
T - 3	10.8	366.2
T – 4	8.8	368.2
T – 5	6.4	370.6
T – 6	4.4	372.6

Thermocouple length - 17.5 m.(Spacings on T/C string are not equal!)

DRILLED IN MAY, 1997

T16A.

NANISIVIK MINE
DRILL REPORT / LOG

LOCATION: Elevation 376 m(platform) at chainage 3+75, T/C 16 Replacement.

LOG:

0.0 – 4.3 m	CUTTINGS Shale, no core.
4.3 – 4.7 m	Till, road Bed. Bit plugging, no core pieces.
4.7 – 5.4 m	Till, road bed with wood debris.
5.4 – 7.2 m	Till, intermixed with tlgs, no core.
7.2 – 8.3 m	No returns, Tlgs run core. Communication with hole drilled appr. 1.5 m away to a depth of 15 meters (poor tlg core recovery – too much water on bit?)
8.3 – 9.0 m	Frozen Tailings.
9.0 – 10.2 m	Unfrozen tlgs.
10.2 – 14.1 m	Frozen Tlgs.
14.1 - 14.9 m	No core, red glacial till silt.
14.9 – 15.5 m	Gravel, with glacial till, lake bed.
15.5 – 16.4 m	Frozen lake bed.
16.4 – 18.0 m	Dolomite.
18.0 m	Bottom of hole.

(10)

S 3.07

T 17A.
Drilled in May, 1997. By Frank Tordon.

NANISIVIK MINE
DRILL REPORT / LOG

LOCATION: Elevation 376 m(platform) at chainage 4+50, Between T/C #'s 17 & 18

LOG:

0.0 – 5.0 m	Shale fill, poor recovery and not well bonded.
5.0 – 7.8 m	Tailings, Frozen and well bonded.
7.8 – 10.7 m	Mixture of lake sediment; silt, sand and shale fill. (May have been part of original causeway.)Frozen and well bonded.
10.7 – 12.8 m	Reddish coloured glacial till consisting of mainly gravel and cobbles with little matrix. Unable to visually identify if this stratum is frozen.
12.8 – 16.0 m	Dolomite, bedrock.
16.0 m	Bottom of Hole.

THERMOCOUPLE POINTS	DEPTH (m)	ELEVATION (m)
T - 1	16.0 ✓	360.0
T - 2	14.0	362.0
T - 3	11.9	364.1
T – 4	9.9	366.1
T – 5	7.5	368.5
T – 6	5.5	370.5

Thermocouple length - 17.5 m. (Spacings on T/C string are not equal!)

T19

NANISIVIK MINE
DRILL REPORT / LOG

Location: Borehole on ice about 15 m downstream of dam toe @ chainage 4+50 on elevation of 371.2m.

LOG:

0.0-0.8 m	Ice
0.8-5.5 m	Tailings frozen and well bonded. Thin hairline to 1-2 mm ice lenses every 5 to 10 cm, except for section from 1.8-1.9 m where several lenses are present.
5.5-5.8 m	Frozen well bonded lake sediment of red coloured silt and sand with trace clay sizes.
5.8-7.4 m	Red glacial till of silt, sand and gravel fragments. 5 mm ice lense at 7.35 m, frozen and well bonded.
7.4-8.2 m	Unfrozen red sand, trace of silt.
8.2-9.2 m	Dolostone.
9.2 m	End of Hole.

Thermocouple Located as follows:

Thermister	Depth	Elevation
T1	8.0 m	363.2 m
T2	6.0 m	365.2 m
T3	4.0 m	367.2 m
T4	2.0 m	369.2 m
T5	0.0 m	371.2 m

Frank Tordon, P.Eng.

T20

NANISIVIK MINE

DRILL REPORT / LOG

26/05/97 ✓

LOCATION:	Borehole on ice about 15m downstream of the toe of the dam at chainage 1 + 50. Estimated ice elevation 371.2 m.
0.0 - 1.1 m	Ice
1.1 - 3.3 m	Tailings - frozen and well bonded to 3m. Numerous hairline to 1 cm thick horizontal ice lenses. (Tailings <u>not</u> frozen from a depth of 3.0 to 3.3m)
3.3 - 5.3m	Dolomite bedrock.
5.3m	End of borehole.
COMMENTS:	Good core recovery and full fluid return while drilling.

Thermocouple points as follows: ✓

T-1 = 5.3m	Approx. Elevation 365.9m
T-2 = 3.3m	Approx. Elevation 367.9m
T-3 = 1.3m	Approx. Elevation 369.9m

Frank Tordon, P.Eng.

DRILL HOLE # TC - 28

Date Drilled: June, 1998
Contractor & Rig: Nanisivik Mine Drill
Drill Method: Fresh Water Solution
Hammer Type: N/A

Location: WTDA Dike
Elevation: 384 m (approximately)
Co-ord: N/A
Logged by: Nanisivik Mine

Project No. N/A
Reviewed by: N/A
Notes: Borehole information supplied by NML

Depth (m)	SOIL DESCRIPTION		Core Run	Recovery	Moisture Content % Wp |-------X------| Wl 10 20 30 40	Installation / Backfill	Depth (m)
0	Ground Surface	384.0					0
	SHALE (FILL)	0.0				T/C node at 0.1 m	
	Frozen						
1						Backfilled with slough	1
		382.0					
2	***TAILINGS***	2.0					2
	Frozen						
3						T/C node at 3.1 m	3
4							4
5							5
6							6
7							7
8						T/C node at 8.1 m	8
9							9
10							10

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CLIENT: Nanisivik Mine, a Division of CanZinco
PROJECT: N/A
Final Depth: 18.1 m

DRILL HOLE # TC - 28

Date Drilled: June, 1998
Contractor & Rig: Nanisivik Mine Drill
Drill Method: Fresh Water Solution
Hammer Type: N/A

Location: WTDA Dike
Elevation: 384 m (approximately)
Co-ord: N/A
Logged by: Nanisivik Mine

Project No. N/A
Reviewed by: N/A
Notes: Borehole information supplied by NML

Depth (m)	SOIL DESCRIPTION	Core Run	Recovery	Moisture Content % Wp |-------X------| Wl 10 20 30 40	Installation / Backfill	Depth (m)
11	TAILINGS Frozen					11
12						12
13					T/C node at 13.1 m	13
14						14
15						15
16						16
17						17
18	365.9 18.1 End of Borehole				T/C node at 18.1 m	18
19						19
20						20

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CLIENT: Nanisivik Mine, a Division of CanZinco
PROJECT: N/A
Final Depth: 18.1 m

DRILL HOLE # TC - 29

Date Drilled: June, 1998
Contractor & Rig: Nanisivik Mine Drill
Drill Method: Fresh Water Solution
Hammer Type: N/A

Location: WTDA Dike
Elevation: 385 m (approximately)
Co-ord: N/A
Logged by: Nanisivik Mine

Project No. N/A
Reviewed by: N/A
Notes: Borehole information supplied by NML

Depth (m)	SOIL DESCRIPTION		Core Run	Recovery	Moisture Content % Wp |-------X------| Wl 10 20 30 40	Installation / Backfill	Depth (m)
0	Ground Surface	385.0					0
	SHALE (FILL)	0.0					
	Frozen						
1						Backfilled with slough	1
		383.0					
2	***TAILINGS***	2.0				T/C node at 2.2 m	2
	Frozen						
3							3
4							4
5							5
6							6
7						T/C node at 7.2 m	7
8							8
9							9
10							10

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CLIENT: Nanisivik Mine, a Division of CanZinco
PROJECT: N/A
Final Depth: 17.2 m

DRILL HOLE # TC - 29

Date Drilled: June, 1998
Contractor & Rig: Nanisivik Mine Drill
Drill Method: Fresh Water Solution
Hammer Type: N/A

Location: WTDA Dike
Elevation: 385 m (approximately)
Co-ord: N/A
Logged by: Nanisivik Mine

Project No. N/A
Reviewed by: N/A
Notes: Borehole information supplied by NML

Depth (m)	SOIL DESCRIPTION	Core Run	Recovery	Moisture Content % Wp |-------X------| Wl 10 20 30 40	Installation / Backfill	Depth (m)
11	Tailings Frozen					11
12					T/C node at 12.2 m	12
13						13
14						14
15						15
16						16
17	368.1 ***BEDROCK*** 16.9 367.8 End of Borehole 17.2				T/C node at 17.2 m	17
18						18
19						19
20						20

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CLIENT: Nanisivik Mine, a Division of CanZinco
PROJECT: N/A
Final Depth: 17.2 m

Table 1
Borehole Stratigraphy

Borehole #	BH99-1	BH99-11 (TC30)
Location	Western end of EW test cell causeway	Test cell causeway, 30 m SW
(m)	NA	NA
0.0	SAND - silty, tr. clay, v. dk grey (Tailings)	SAND - silty, tr. clay, wet non plastic, v. dark grey (Tailings)
3.0	frozen	frozen - Nf to Nbn
5.0	becomes SILT - some and clay	frozen, Nbn
5.5	becomes CLAY and SILT wet, high plastic	
8.0	SAND - silty, tr. clay, dark grey, frozen	
12.0	EOH No instrumentation installed.	
13.2		SILT - clayey, tr. sand., dark grey with isolated reddish-green silt frozen (Tailings)
16.4		EOH Thermocouple string installed.

Table 3
Borehole Stratigraphy

TC31 TC32 TC33

Borehole #	BH99-8	BH99-9	BH99-10	BH99-7
Location	376 lift, 4m North of T13	378 lift, 5m North of T13	382 lift, 5m North of T13	386 lift, 5 m North of T13
(m)	375.6	378	381.8	385.5
	SHALE - cobbles, some sand, dry to damp, grey, frozen at depth (Fill)	SHALE - cobbles, gravel, some sand, dry, dk. grey (Fill)	SHALE - cobbles, gravel, some sand, dry at dk grey (Fill)	SHALE - cobbles, gravel, some sand, dry, dk grey, thawed at surface (Fill)
3.8				
4.0			SAND - silty, tr. clay, to wet, v.dk. grey	
4.2	SAND - silty, tr.clay, wet, v. dark grey, may have frozen (Tailings)	SAND - silty, tr. clay, wet, v. dk grey (Tailings)		SAND - silty, v. dk grey, (Tailings)
5.7				possibly not frozen 5.6-
			frozen at 7m	
8.3				
	BEDROCK - Dolostone, medium strong, slightly weathered with oxide stainings, calcite infills	clear ICE at 10.1-10.2m		
10.2		SILT - clayey (Lakebed)		
10.4		BEDROCK - Dolostone, med. strong, slightly weathered	SILT - some sand and frozen, v.dk. grey	
11.7				
	EOH Standpipe piezometer installed.	EOH at 12.0m Thermocouple string installed.		partially frozen Nf
12.7			SILT - clayey, tr. sand, frozen Nbn to Vr=10%, v. grey (Lakebed)	
13.0			BEDROCK - Dolostone, strong, slightly weathered, frozen, vugs 5-20 cm	
15.95			CLAY - silty, high plastic, damp, v. dk grey	
16.8			EOH Thermocouple string installed.	
19.0				MC=9.82% at 18.5m SILT - some clay (Lakebed) EOH - Standpipe piezometer installed.

THERMOCOUPLE ONLY

Borehole Stratigraphy

TC34

Borehole #	BH99-12	BH99-5	BH99-6
Location	376 lift, 5m South of T18	380 lift, 5m North of T18	386 lift, 5 m North of T18
Elevation (m)	375.6	380	385.6
	SHALE - cobbles, some sand, dry at dark grey (Fill)	SHALE - cobbles, gravel, some sand, dry, v. dk. grey, (Fill)	SHALE - cobbles, gravel, some sand, dry to damp (Fill)
3.7			
4.0		SAND - silty, dark grey, metallic luster, frozen Nbn, (Tailings)	SAND - silty, v. dk. grey, frozen Nbn (Tailings)
	SAND - silty, tr. clay, v. grey, frozen Nbn, Vs=2% (Tailings)		
	becomes finer with depth		
6.5			
	SAND and GRAVEL - silt, reddish grey, frozen (Till)	95% ice at 7.1-7.2m	
8.4		MC=15.94%	
8.7			
	BEDROCK - Shale, highly fractures, some oxidized joints	boulder at 9.7-9.9m	
10.0	EOH at 9.2m Standpipe piezometer installed.		
		BEDROCK - Shale, v.dark grey, highly fractured, ice lenses (max 10mm) Vx=30%	becomes SILT, some Vs/Vr=50% 3-10mm thick
			clear ICE at 11.5-11.8m
			clear ICE at 11.9-12.0m Vr/Vs=60% becomes SILT and CLAY MC=13.83% becomes SAND-silty, tr
13.2			
		EOH Standpipe piezometer installed.	
14.0			
			SILT - tr. clay, tr. gravel low to non plastic, dry, reddish grey (Lakebed)
14.3			
			EOH - Thermistor and standpipe installed.

DRILL HOLE # TC - 35

Date Drilled: Nov. 16, 2000
Contractor & Rig: Mine's Diamond Drill
Drill Method: BQ Chilled Brine Coring
Hammer Type: N/A

Location: Surface Cell
Elevation: 387.5 m
Co-ord: 13400N, 17410E (Mine Grid)
Logged by: Mine Employee

Project No. N/A
Reviewed by: N/A
Notes: Drilled by mine staff, T/C Installed

Depth (m)	SOIL DESCRIPTION		Core Run	Recovery	Moisture Content % Wp |-------X------| Wl 10 20 30 40	Installation / Backfill	Depth (m)
0	Ground Surface	387.5					0
	SHALE	0.0	1			T/C node @ 0.0 m	
1						Backfilled with slough	1
		386.0					
	TAILINGS	1.5					
2	Frozen						2
3			2				3
4						T/C node @ 4.0	4
5							5
6			3				6
7							7
8			4			T/C node @ 8.0 m	8
9							9
			5				
10							10

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CLIENT: Nanisivik Mine, a Division of CanZinco Ltd.
PROJECT: Geotechnical Investigation
Final Depth: 16.0 m

DRILL HOLE # TC - 35

Date Drilled: Nov. 16, 2000
Contractor & Rig: Mine's Diamond Drill
Drill Method: BQ Chilled Brine Coring
Hammer Type: N/A

Location: Surface Cell
Elevation: 387.5 m
Co-ord: 13400N, 17410E (Mine Grid)
Logged by: Mine Employee

Project No. N/A
Reviewed by: N/A
Notes: Drilled by mine staff, T/C Installed

Depth (m)	SOIL DESCRIPTION	Core Run	Recovery	Moisture Content % Wp |-------X------| Wl 10 20 30 40	Installation / Backfill	Depth (m)
11	@ 11.0 m - slightly muddy	6			T/C node @ 11.0 m	11
12		7				12
13		8				13
14					T/C node @ 14.0 m	14
15		9				15
16	@ 16.0 m - Drill stopped advancing due to frost shattered bedrock. 371.5 End of Borehole 16.0				T/C node @ 16.0 m	16
17						17
18						18
19						19
20						20

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CLIENT: Nanisivik Mine, a Division of CanZinco Ltd.
PROJECT: Geotechnical Investigation
Final Depth: 16.0 m

DRILL HOLE # TC - 36

Date Drilled: May 25, 2001
Contractor & Rig: Mine's Diamond Drill
Drill Method: BQ Chilled Brine Coring
Hammer Type: N/A

Location: Test Cell Dike - Lower Bench
Elevation: 373.5 m
Co-ord: 13428N, 17899E (Mine Grid)
Logged by: Mine Employee

Project No. N/A
Reviewed by: N/A
Notes: Drilled by mine staff, T/C Installed

Depth (m)	SOIL DESCRIPTION		Core Run	Recovery	Moisture Content % Wp |-------X------| Wl 10 20 30 40	Installation / Backfill	Depth (m)
0	Ground Surface	373.5					0
	SHALE	0.0				T/C node @ 0.0 m	
1						Backfilled with slough	1
		372.2					
	TAILINGS	1.3					
	Frozen						
2						T/C node @ 2.0 m	2
3							3
4						T/C node @ 4.0 m	4
5							5
6						T/C node @ 6.0 m	6
7							7
8						T/C node @ 8.0 m	8
9							9
10						T/C node @ 10.0 m	10

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CLIENT: Nanisivik Mine, a Division of CanZinco Ltd.
PROJECT: Geotechnical Investigation
Final Depth: 16.5 m

DRILL HOLE # TC - 36

Date Drilled: May 25, 2001
Contractor & Rig: Mine's Diamond Drill
Drill Method: BQ Chilled Brine Coring
Hammer Type: N/A

Location: Test Cell Dike - Lower Bench
Elevation: 373.5 m
Co-ord: 13428N, 17899E (Mine Grid)
Logged by: Mine Employee

Project No. N/A
Reviewed by: N/A
Notes: Drilled by mine staff, T/C Installed

Depth (m)	SOIL DESCRIPTION	Core Run	Recovery	Moisture Content % Wp |-------X------| Wl 10 20 30 40	Installation / Backfill	Depth (m)
11						11
12						12
13						13
14						14
15						15
16	@ 16.5 m - Hole terminated due to caving.					16
	357.0					
	End of Borehole 16.5					
17						17
18						18
19						19
20						20

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CLIENT: Nanisivik Mine, a Division of CanZinco Ltd.
PROJECT: Geotechnical Investigation
Final Depth: 16.5 m

BORE HOLE # BH-10 (TC-37)

Date Drilled: May, 2002/ July, 2002
Contractor & Rig: Nanisivik Mine
Drill Method: Diamond Drill/ BQ Coring
Hammer Type: N/A

Location: Surface Cell
Elevation: 387.46 m
Co-ord: 13668.3N/ 17256.8E (Mine Grid)
Logged by: Neil B. (NML)/ J. Cassie (BGC)

Project No. 0255-006-03
Reviewed by: J. Cassie
Notes: Thermocouple Installed (TC-37)

Depth (m)	SOIL DESCRIPTION	Sample Number	Sample Type	Recovery	USC	SPT 'N'	Moisture Content % Wp |-------X------| Wl 10 20 30 40	Pocket Penetrometer ● kPa ● 100 200 300 400 / SPT (N) ■ Blows/ft ■ 10 20 30 40	Installation / Backfill	Depth (m)
0	Ground Surface 387.5									0
	TAILINGS 0.0 SILT and SAND, grey, fine grained sand.								Backfilled with slough. T/C Node @ -1.0 m	
1										1
2									T/C Node @ -2.0 m	2
3	384.5 3.0 @ 3.0 to 6.0 m No Recovery									3
4										4
5									T/C Node @ -5.0 m	5
6	381.5 6.0									6
7										7
8										8
9										9
10	377.6 9.9								T/C Node @ -10.0 m	10

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CLIENT: Nanisivik Mine, a Division of CanZinco Ltd.
PROJECT: Spillway Alignment Investigation
Final Depth: 30.5 m

BORE HOLE # BH-10 (TC-37)

Date Drilled: May, 2002/ July, 2002
Contractor & Rig: Nanisivik Mine
Drill Method: Diamond Drill/ BQ Coring
Hammer Type: N/A

Location: Surface Cell
Elevation: 387.46 m
Co-ord: 13668.3N/ 17256.8E (Mine Grid)
Logged by: Neil B. (NML)/ J. Cassie (BGC)

Project No. 0255-006-03
Reviewed by: J. Cassie
Notes: Thermocouple Installed (TC-37)

Depth (m)	SOIL DESCRIPTION	Sample Number	Sample Type	Recovery	USC	SPT 'N'	Moisture Content % Wp |-------X------| Wl 10 20 30 40	Pocket Penetrometer kPa 100 200 300 400 / SPT (N) Blows/ft 10 20 30 40	Installation / Backfill	Depth (m)
11	***TAILNGS*** SILT and SAND, grey, fine grained sand.									11
12										12
13										13
14										14
15									T/C Node @ -15.0 m	15
16										16
	370.8 / 16.7									
17	@ 16.7 to 18.3 m Reduced Recovery									17
18										18
	369.2 / 18.3									
19										19
	367.6 / 19.9								T/C Node @ -20.0 m	
20										20