data, depending on the scale of exploration, sample density and the area represented by the sample. Samples from lakes and streams represent large drainage or catchment basins measuring a few tenths to several square miles; whereas, samples of seepage, pit or snow-melt runoff usually represent areas of less than a few hundred square feet. Samples from the latter three water types are more closely related to metal and pH values in soils than lake or stream waters and consequently provide a link between soil, lake and stream water data.

Various water types were sampled over the summers of 1974 and 1975 (Table 2) with a twofold purpose: 1) to assess the relative importance of chemical weathering and hydromorphic dispersion under permafrost conditions and 2) to determine the usefulness of hydrogeochemical methods at regional and detailed levels of exploration.

Initially lake, stream, surface-seepage and pit waters were sampled in July, 1974; however, the usefulness of the latter two media was limited by availability. Consequently, water sampling in 1975 was initiated earlier in the summer (June) to take advantage of abundant surface water - provided by melting snow and thawing soil (Plate 11) - and to monitor temporal variations and examine the 'flushing effect' of snow-melt runoff as postulated by Jonasson and Allan (1973) and various Soviet scientists. Although the use of snow as a sample medium has been employed with success (Jonasson and

Allan, 1973), trace element concentrations are generally low and sampling depth critical; therefore, the usefulness of snow-melt runoff, collected within 15 to 100 feet of melting snowbanks, was in doubt.

Because sampling of lake and stream waters is generally considered to be a reconnaissance rather than a detailed form of exploration geochemistry, data from the Anne-Cleaver Lakes area are included to augment the data from the Camp Lake area. Regional data from Cameron and Ballantyne (1975) have been added to facilitate a more complete understanding of the regional lake water geochemistry and to expand examination of variation with respect to time and analytical technique in the analysis of lake waters. A similar approach has been taken with lake sediments as detailed in Section V.

B. Regional Data:

1. Streams

Evaluation of trace element levels in streams is difficult because streams are relatively few and characteristically display intermittant flows due to low topographic relief and low amounts of precipitation (<12 inches/year). In general, stream flow is substantial in early to mid June but thereafter, most of the snow has melted and flow rates are drastically reduced until fall rains slightly increase flow. Except for a segment of the main drainage system at Camp Lake, beginning at B-C stream and ending nearly two miles down drainage, data on streams are minimal.

Seasonal variation of dissolved metals in waters flowing into and out of Camp Lake were monitored at B-C and Camp-Upper Sunken Lake streams. The inflowing stream shows a consistent increase in Zn values from early June to the end of July while the exit stream (Camp-Upper Sunken Lake stream) displays concentrations which rise to a maximum in mid-late June and subsequently decrease and level off (?) (Table 15). Farther down drainage the stream crosses the "mineral horizon" just below Upper Sunken Lake and Zn values increase slightly to 90 ppb then decrease to 85 ppb one-half mile farther down stream (Table 15). Limited data for Ca (range 1500 to 3700 ppb) tend to show a negative correlation with Zn while Mg (range 800 to 1100 ppb) tend to show a positive correlation with Zn. Fe is rarely detectable (d.l. ≈5 ppb) but Mn is usually 12 to 25 ppb.

2. Lakes

Regional lake water data have largely been taken from Cameron and Ballantyne (1975). Where overlap of sampling occurred between this author and Cameron, a comparison of data has been provided (Tables 7 and 16). Because the results obtained by Cameron and this author are remarkably similar (considering the different collection, preparation and analytical techniques), a direct comparison of data is

Table 15. Dissolved Zn (ppb) in exit and entrance streams of Camp Lake, 1975.

Date Sampled	Camp Lake Exit	Camp Lake Entrance	Upper Sunken Lake Exit
June 7[1]	91	-	85 (90)[2] (85)[3]
June 13	130	6	
July 4	65	10	
July 27	55	29	
July 30	58	55	

1: 10 ppb and 15 ppb Cu detected at Camp Lake exit and Sunken Lake exit respectively, all other samples were below the d.l. of ≈10 ppb for Cu.

2: Value in ( ) obtained 1000 feet down stream from Upper Sunken Lake.

3: Value in ( ) obtained 4200 feet down stream from Upper Sunken Lake.

Table 16. Comparison of metal, conductivity and pH values in water samples collected from the same sites on July 9, and 30, 1974 (modified from Cameron and Ballantyne, 1975).

Location	Zn[1]	Cu[1]	pH	Cond.[1]
Camp Lake	71(66)[2]	9(9)	7.0(6.8)	31(31)
Lower Sunken L.	30(28)	2(2)	7.0(6.8)	25(25)
Boot Lake	13(9)	1(1)	7.3(7.1)	-
Thigh Lake	10(7)	3(2)	7.4(7.5)	-
Upper Banana L.	7(1)	1(1)	7.3(7.2)	-
Banana Lake	<1(3)	2(3)	7.2(7.0)	27(27)

1: Zn and Cu values in ppb; conductivity in μohms/cm^2.

2: Data in ( ) are from samples collected on July 30, 1974.

Note: Mn and Fe were rarely detected (d.l. = 8 ppb and 5 ppb respectively).

Table 17. Geochemistry of Camp, Banana, Anne and Turtle Lake Waters.

Lake	Depth (ft.)	Date Sampled	ppb Ca	Mg	Mn	Zn	pH	Cond.[1]
Camp	1	7/8/74	1472	801	8	74	7.0	27
Camp	15	7/8/74	1472	923	12	69	7.0	28
Camp	35	7/8/74	1472	777	12	72	6.9	27
Camp	1	7/15/74	1472	801	d.l.	74	7.0	28
Camp	25	7/15/74	1515	801	d.l.	74	7.0	28
Camp	50	7/15/74	1472	801	d.l.	71	7.0	28
Camp	1	7/5/75	3105	868	d.l.	65	6.8	28
Camp	10	7/5/75	3105	834	d.l.	68	6.8	30
Camp	20	7/5/75	2277	851	d.l.	74	6.7	28
Camp	1	7/5/75	3105	842	d.l.	71	6.8	29
Camp	10	7/5/75	2173	918	d.l.	71	6.8	27
Camp	25	7/5/75	3105	809	17	71	6.8	30
Camp	45	7/5/75	2691	776	50	65	6.8	29
Banana	1	7/28/74	1626	715	12	d.l.	7.0	26
Banana	30	7/28/74	2042	715	d.l.	d.l.	7.0	26
Anne	1	7/29/74	6752	1635	d.l.	37	7.0	76
Anne	15	7/29/74	6752	1609	d.l.	37	7.0	77
Turtle	1	8/4/74	7280	1297	12	10	7.0	65
Turtle	43	8/4/74	7197	1272	8	13	7.0	66
Turtle	1	8/4/74	7155	1297	12	10	7.0	65
Turtle	54	8/4/74	7322	1297	12	11	7.0	65

1: μohms/cm^2.

d.l. = concentration below the detection limit. d.l. = 8 ppb for Mn and 7 ppb for Zn.

Table 18. Variation with respect to time in the composition of surface lake waters in the vicinity of the Yava (Agricola Lake) prospect, 40 miles south of Bathurst Norsemines.

	Yava Lake Samples				East Tooshort Lake samples				Shorereef Lake samples		
Sample Number	740009	742472	750203	752750	740025	742486	750210	752767	742491	750175	752783
Date sampled	1/7/74	23/7/74	30/6/75	18/7/75	2/7/74	23/7/74	30/6/75	18/7/75	23/7/74	30/6/75	18/7/75
SiO_2 (ppm)	7.10	n.d.	2.68	3.61	2.97	n.d.	1.12	1.29	n.d.	0.35	0.25
Al (ppm)	1.75	n.d.	n.d.	n.d.	0.20	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Fe (ppb)	74.00	162.00	70.00	56.00	36.00	29.00	5.00	<3.00	15.00	<3.00	<3.00
Mn (ppb)	76.00	71.00	69.00	91.00	36.00	27.00	30.00	34.00	4.00	<3.00	<3.00
Ni (ppb)	20.00	26.00	24.00	29.00	8.00	11.00	13.00	14.00	5.00	7.00	4.00
Cu (ppb)	39.00	59.00	64.00	90.00	7.00	11.00	9.00	13.00	2.00	2.00	1.00
Pb (ppb)	15.00	18.00	10.00	11.00	1.00	1.00	2.50	2.50	1.00	<1.00	<1.00
Zn (ppb)	179.00	186.00	125.00	195.00	32.00	34.00	25.00	30.00	2.00	2.00	<1.00
Ca (ppm)	2.50	3.17	2.32	3.40	1.80	1.84	0.86	1.96	0.97	0.80	1.07
Mg (ppm)	1.42	1.30	1.33	1.53	0.94	0.92	0.45	0.89	0.49	0.40	0.47
Na (ppm)	1.00	1.08	0.76	1.10	0.60	0.66	0.38	0.75	0.48	0.38	0.63
K (ppm)	0.58	0.52	0.40	0.71	0.48	0.41	0.30	0.50	0.22	0.26	0.22
SO_4 (ppm)	40.60	41.10	26.50	37.50	14.00	12.20	10.10	11.00	3.00	3.40	3.50
Cl (ppm)	0.30	2.40	2.10	3.30	0.22	0.10	<0.10	0.10	0.10	<0.10	<0.10
Acidity as $CaCO_3$ (ppm)	26.5	n.d.	22.80	26.00	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Alkalinity as HCO_3 (ppm)	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	0.50	1.90	1.30	2.30	1.80
Specific conductance (μohms)	112.00	141.00	104.00	127.00	31.00	41.00	30.00	34.00	19.50	14.40	14.80
pH	3.50	3.80	3.90	3.9	4.5	4.70	4.90	5.00	6.10	6.60	6.70

n.d. = not determined.

Note: correlation of low pH and high levels of Cu, Pb and Zn.

Table 19. Water composition of Camp, Banana and Lower Sunken Lakes sampled during July, 1974.

	Banana	Camp	Lower Sunken
SiO_2 ppm[1]	--	1.73	-
Fe ppb[2]	<5	<5	<5
Mn ppb[2]	<8	<8	<8
Ca ppm[1]	2.81	2.51	2.63
Mg ppm	0.77	0.80	0.81
Na ppm[1]	0.49	0.40	0.52
K ppm[1]	0.47	0.47	0.47
SO_4 ppm[1]	2.80	5.00	6.70
Cl ppm[1]	0.20	0.60	0.60
pH[2]	7.20	7.00	7.00
Cond.[2] (μohms/cm^2)	27(16)[3]	30(18)[3]	30(18)[3]

1: Data from Cameron and Ballantyne (1975), samples collected July, 1974.

2: Data collected by this author July, 1974.

3: Data in ( ) equals dissolved solids content in ppm using the relation of specific conductance x 0.60 = dissolved solid concentration in ppm (from Livingston, 1973).

possible. Geochemical data for Camp, Banana and Lower Sunken Lakes are given in Tables 16, 17 and 19 and Figure 101. Limited data for the lakes in and adjacent to the Anne-Cleaver Lakes study area are presented in Table 17 and Figure 101.

Based on data from the 1974 and 1975 field seasons and Cameron's 1974 data (Cameron and Ballantyne, 1975) lake waters in the Bathurst Norsemines region can be considered homogeneous (within individual lakes), of near neutral pH and exhibit little seasonal variation (Tables 16 to 18). Lake waters are extraordinarily clear, with visibility in excess of 25 feet, and extremely pure (total dissolved solids <20 ppm) relative to most North American fresh waters (Livingston, 1973).

Examination of Figure 101 (also Fig. 17, note trace of "mineral horizon") reveals that at both study areas anomalous concentrations of Zn (≥ 10 ppb) and Cu (≥ 2 ppb) are generally restricted to lakes that lie down ice and/or down drainage from mineralization. The highest Cu and Zn values are found in those lakes that lie closest to but are directly down ice/down drainage from mineralization. Zn and Cu values progressively decrease down ice/down drainage from mineralization with Cu values appearing to decrease more rapidly relative to Zn (Table 31; Fig. 101). Lakes that lie up ice, or more importantly up drainage, (e.g. Banana Lake) contain exceedingly low Cu and Zn values (Fig. 101). Pb and Ag were not detected in any lake waters while Mn and Fe were rarely detected.

C. Local Data: Surface-seepage, Pit and Snow-melt Runoff

1. Surface-seepage and pit waters

Surface-seepage and pit water data have been combined because of their similarities and scarcity over the soil grid (Fig. 97). Although broad areas of interest have been outlined, sample density is insufficient for detailed interpretation. Nevertheless, Cu appears to form a slightly more restricted pattern relative to Zn. The highest Cu and Zn values are confined to the area north of Camp Lake and east of B-C stream in the vicinity of the gossan zone, low soil and water pH's and anomalous concentrations of Cu, Pb and Zn in soils. Relative to Cu and Zn levels in soils, surface-seepage and pit waters generally have much higher contrast.

Although the data are limited, comparison of Cu and Zn values in surface-seepage with complimentary pit waters (Table 20) shows that Zn values are consistently higher for surface-seepage waters while Cu levels in these waters are approximately equal to those in pit waters. Based on all the pit and seepage data, Mn and Fe values are generally higher in pit waters.

2. Snow-melt runoff

The sampling of snow-melt runoff resulted in more complete coverage of the study area and, except for Fe, metal values and conductivity measurements are considerably lower

Table 20. Comparison of Cu, Zn, Fe, Mn, SO_4, pH and conductivity values in water from surface-seepages and soil pits.

Site	Zn (ppb)		Cu (ppb)		Fe (ppb)		Mn (ppb)		Surface-pit Ave.[1]		
	Surface	Pit	Surface	Pit	Surface	Pit	Surface	Pit	SO_4	pH	Cond.
39	3600	3000	2400	1800	15	4	2459	2971	160	4.0	485
192	660	610	550	700	<5	52	79	117	35	4.4	70
66	358	218	18	15	<5	<5	49	111	47	5.0	130
277	252	68	<12	20	<5	<5	96	33	<35	5.3	40

1: Because values for these three parameters are similar for both water types they have been combined and averaged. SO_4 is in ppm and conductivity is in microhms/cm^2.

Table 21. Comparison of the geochemistry of snow-melt run-off with seepage-pit waters at Camp Lake.

	Water Type	Range of Values	N[1]	Mean Conc.[2]
Cu (ppb)	Snow-melt	<10-2500	27	207
	Seepage-pit	<10-2400	21	265
Zn (ppb)	Snow-melt	<7-70307	63	296[4]
	Seepage-pit	<7-3600	32	460
pH	Snow-melt	<4.0-6.7	66	5.5
	Seepage-pit	<4.0-7.0	32	5.5
Conductivity (μohms/cm^2)	Snow-melt	6-2750	66	44[3]
	Seepage-pit	18-490	32	104
SO_4 (ppm)	Snow-melt	<35-275	10	87
	Seepage-pit	<35-230	15	73
Mn (ppb)	Snow-melt	<8-2288	53	43[4]
	Seepage-pit	<8-2971	30	68[4]
Fe (ppb)	Snow-melt	<5-43107	56	108[4]
	Seepage-pit	<5-82	12	21

1: N = number of samples above detection limit; the total number equals 66 and 32 for snow-melt and seepage-pit waters respectively.

2: Except for pH, where values less than 4.0 were taken as 3.0, values below the detection limits (d.l.) were not used in calculation of arithmetic means.

3: Two extremely high values of 2750 and 1710 microhms/cm^2 were excluded in calculation of the mean.

4: The following extremely high metal values (ppb) were omitted from calculation of arithmetic means: Zn, snow-melt 70307, 32520; Mn, seepage-pit 2971, 2459; Mn, snow-melt, 2204, 2288; Fe, snow-melt, 1839, 1349, 32107.

Table 22. Comparison of Zn, Cu, conductivity and pH values in snow-melt runoff with surface-seepage and pit waters collected at the same sample site.

Site Number	Pit/surface-seepage[1]				Snow-melt runoff[1]			
	Zn	Cu	Cond.	pH	Zn	Cu	Cond.	pH
9	124	d.l.[2]	85	5.8	35	d.l.	20	6.0
44	23	d.l.	34	6.0	10	d.l.	11	5.3
55	114	d.l.	135	5.5	65	d.l.	45	5.5
66	358	18	140	5.0	16	d.l.	15	5.0
66	(218)	(15)	(110)	(5.0)	16	d.l.	15	5.0
72	314	91	57	5.7	162	d.l.	32	6.0
76	13	d.l.	31	6.0	14	20	15	5.8
112	(1188)	(1818)	(315)	(<4.0)	586	399	144	4.0
115	33	130	15	6.0	31	90	10	5.5
125	(525)	(1667)	(127)	(<4.0)	34	130	14	5.5
126	465	191	45	5.5	25	50	14	5.8
128	140	76	24	5.8	98	60	14	5.8

1: Zn and Cu values in ppb, conductivity in microhms/cm^2 values in ( ) are pit waters, all other values are from surface-seepage waters.

2: d.l. denotes concentration below the detection limit of ≈10 ppb.

relative to surface-seepage/pit results (Tables 21 and 22). In contrast, pH and sulphate levels remain relatively unchanged on the average (Table 21), although for sulphate the percentage of samples above the detection limit of 35 ppm is only 15 percent compared to 45 percent for surface-seepage/pit waters. Nevertheless, Cu and Zn concentrations are relatively high with excellent geochemical contrast and well developed patterns (Figs. 98 to 100).

Like the surface-seepage and pit waters, the highest Cu and Zn values occur in the vicinity of mineralized footwall outcrops near B-C stream where the most intense part of the gossan, low (<4.0) soil and water pH's and negative to low Cu and Zn soil anomalies can be found (Figs. 31, 32 and 43 to 47). Relative to Cu, Zn is more widely dispersed, has higher geochemical contrast and forms two narrow east-west belts of high (>40 ppb) values. High Cu values display a clear association with altered, weakly Cu mineralized footwall volcanics with the very high Cu values (>100 ppb) encompassing the most northerly Cu mineralized outcrops.

High Cu and Zn levels in snow-melt runoff coincide with high Cu and Zn values in soils and outline, with extremely high values, those areas where Cu and Zn levels in soil can be characterized as negative anomalies due to low soil pH's (<4.0).

Relative to the poorly developed, low contrast Cu and Zn patterns in the soil, Cu and Zn patterns in snow-melt runoff are very well developed with contrast values of 40 to 100 compared to values of 4 to 14 for the soils.

V SEDIMENTS

A. Introduction

Two distinct types of sediment are found in lakes of the Bathurst Norsemines Area: those of the immediate near shore ($\leq$10 feet of water) and those found in deeper water. In general, near-shore sediments consist of sand and silt with subordinate amounts of pebbles and clay while lake-center sediments are more homogeneous, consisting almost entirely of silt-and clay-size particles with 12 to 28 percent organic matter (cf. Cameron, 1977c).

Near-shore sediments were not sampled in this study because close examination of these sediments reveals that they closely resemble till and are affected by many of the frost processes operating in till. In addition, these sediments may be significantly affected by mechanical processes which can result in highly variable and limited geochemical dispersion trains.

Examples of patterned ground features such as circles and stripes in near-shore sediments can be seen upon close inspection of Plates 16 and 17. Circles are restricted to very near-shore sediments while stripes form in slightly deeper water where slopes are higher. Shilts and Dean (1975) have adequately discussed the formation of many of these sub-aqueous features.

Lake-center sediments were chosen because they are: 1) less affected by frost processes and mechanical dispersion, 2) are more homogeneous and 3) provide a large anomalous dispersion train. In addition, lake-center sampling had not been previously reported for lakes within the zone of continuous permafrost.

A mud snapper was used to collect 57 surficial lake sediment samples from Camp, Banana, Upper Sunken, Lower Sunken, Anne and Turtle Lakes. Collection of surficial sediments were made to: 1) establish the distribution of Ag, Cd, Cu, Fe, Mn, Pb and Zn concentrations across the deeper portions of lakes, 2) assess factors controlling metal distribution and 3) examine geochemical dispersion in lake sediments relative to lake waters and soils with regards to the applicability of lake-center sediments to mineral exploration. Detailed studies on metal distributions within sediments as a function of texture, depth within the sediment and Eh (studies which are not possible on surficial sediment) were provided by 18 core samples from Camp and Banana Lakes.

Regional data, unfortunately, could not be obtained; therefore, regional data from Cameron and Durham (1974) and Allan et al. (1973) have been included for comparison purposes because most of the data collected by this author from the aforementioned lakes suggests that virtually all these lakes are highly anomalous in Cu, Pb and Zn.

Because streams are few with intermittant and ill-defined flow, only a few sediment samples were collected (Table 2); therefore, these data are only briefly discussed.

B. Surficial Lake Sediments

Although regional background data were not obtained, Cameron and Durham (1974) have reported regional data for near-shore sediments from the region (106° to 110° west longitude and $60^{\circ}30'$ to 66° north latitude), part of which is summarized in Tables 23 and 24.

Comparison of regional near-shore, local near-shore and lake-center sediment geochemistry (Table 25) shows that metal levels in sediment can locally be extremely high in both near-shore and lake-center samples but that lake-center sediments generally contain higher values with better contrast (Table 25 and cf. Hoffman, 1976 pp. 197 and 328). Near-shore sediment may be influenced significantly by mechanical dispersion processes and, consequently, may not present as wide a target as lake-center or break-in-slope sampling (Hoffman, 1976). Comparison of these two sample types in terms of their chemical and textural components is generally not valid as near-shore sediments are typically impoverished in trace metals relative to more finely divided, organic rich (>18% carbon) lake-center sediments. Furthermore, Cameron's

Table 23. Major and minor element composition of near-shore lake sediments from a 1250 square mile region centered on Camp Lake[1].

	Semi-regional[2]			Camp Lake[3]
	$\overline{X}$	S	G	$\overline{X}$
SiO_2%	73.5	7.5	73.2	69.1
Al_2O_3%	11.0	2.0	10.8	12.1
Fe_2O_3%	2.67	1.36	2.37	3.0
MgO%	1.25	0.55	1.15	1.70
CaO%	0.99	0.36	0.91	1.10
Na_2O%	2.22	0.67	2.14	2.00
K_2O%	1.87	0.55	1.81	1.70
TiO_2%	0.37	0.11	0.35	0.50
MnO%	0.042	0.016	0.039	0.03
Ba%	0.035	0.013	0.033	0.04
Zn ppm	71.3	71.5	50.5	1419.0
Cu ppm	34.1	32.5	24.7	624.0
Pb ppm	29.3	95.1	11.9	140.0
Ni ppm	24.0	27.4	16.8	32.0
Co ppm	9.2	11.6	6.3	11.0
Ag ppm	0.60	1.16	0.30	0.90
Hg ppb	19.7	11.7	17.4	48.0

1: Data from Allan et al. (1973a), minus-250 mesh fraction; $\overline{X}$, arithmetic mean; S, standard deviation; G, geometric mean.

2: Statistics computed from 28 near-shore lake sediments.

3: Average of three near-shore samples taken from 3 to 8 feet of water.

Table 24. Cu, Pb, Zn, Fe, Mn and organic carbon content of near-shore lake sediments from the Bathurst Norsemines region.[1]

	Cu	Pb	Zn	Fe%	Mn	Organic Carbon%
Arith. mean	24	13	-	2.3	104	4.0
Geom. mean	20	13	32	2.2	89	2.0
Std. dev.	20	3.0	26	0.78	66	4.3

1: Data from GSC maps 10 to 13 - 1972, Sheet 3; statistics based on 1349 near-shore lake sediments collected in 3 to 8 feet of water; one sample per lake from an area of 12,500 mi^2.

Table 25. Comparison of the geochemistry of regional near-shore lake sediments with lake-center sediments from the Bathurst Norsemines property.

		Arith. Mean Concentrations[1]					
Lake	N[2]	Cu	Pb	Zn	Fe%	Mn	LOI%
Camp	5(20)	148(795)	N.A.(133)	255(1064)	N.A.(2.4)	N.A.(1043)	<1(20)
Banana	2(9)	16(659)	15(24)	90(1008)	1.6(2.2)	64(86)	N.A.(19)
Lower Sunken	1(1)	12(59)	N.A.(3)	27(175)	N.A.(1.2)	N.A.(114)	N.A.(7)
Joe	1	11	11	16	1.8	64	<1(N.A.)
Bat	1	64	N.A.	89	N.A.	N.A.	N.A.
Boot	1	25	N.A.	36	N.A.	N.A.	N.A.
Thigh	1	29	N.A.	86	N.A.	N.A.	N.A.
Anne	1(16)	656(1543)	N.A.(88)	875(3071)	N.A.(2.2)	N.A.(279)	N.A.(16)
Turtle	2(9)	80(468)	19(16)	125(1572)	2.5(2.3)	163(1076)	3(10)

1: Near-shore sediment data from Cameron and Durham (1974) GSC Paper 74-27. Data in ( ) are for lake-center sediments from this study. Geochemical data in ppm unless otherwise noted. Cameron and Durham's data are from the minus 250-mesh fraction; this study minus 80-mesh fraction. N.A. = not available.

2: Number of samples.

Table 26. Metal content of lake sediments sampled with a mud snapper at Bathurst Norsemines.

Lake	N	Metal Content ppm									
		Cu		Pb		Zn		Fe%		Mn	
		Mean[1]	Range	Mean[1]	Range	Mean[1]	Range	Mean[1]	Range	Mean[1]	Range
Camp	19	795	154-2260	133	9-302	1064	226-6264	2.4[2]	1.3-13.1	1043	126-4300
Up. Sunken	2	260	241-282	33	31-34	429	419-438	1.7	1.7-1.7	237	231-242
Lo. Sunken	1	59		3		175		1.2		114	
Banana	9	659	29-1995	24	5-60	1008	74-2321	2.2	0.8-3.9	181	89-295
Anne	16	1543	380-3439	88	25-147	3071	1415-5232	2.2	1.7-2.8	279[2]	154-1800
Turtle	9	468	291-757	16	9-28	1572	597-2984	2.3[2]	1.5-12.4	1076[2]	150-26188

1: Arithmetic mean.

2: The following values were excluded in calculation of $\overline{X}$: Fe: Camp Lake, 13.1% and 12.3% Turtle Lake, 12.4%. Mn (ppm): Anne Lake, 1800, 1260; Turtle Lake, 12269, 26188.

Table 27. Cu, Pb and Zn ratios in sediments[1] and soils[1].

Medium	Ratios Cu:Pb	Zn:Pb	Zn:Cu
Camp Lake Area			
Camp Lake Soils (0-14")	2.3	2.8	1.22
Camp Lake seds.	6.0	8.0	1.34
Upper Sunken L. seds.	8.1	13.0	1.65
Banana L. seds.	27.0	42.0	1.52
Lower Sunken L. seds.	20.0	58.3	2.97
Anne Lake Area			
Anne Lake soils (0-10")	1.8	2.3	2.16
Anne Lake seds.	17.5	34.9	1.99
Turtle Lake seds.	29.0	98.3	3.36
Sediment:Soil Ratios[2]			
	Cu:Cu	Pb:Pb	Zn:Zn
Camp Lake	15.0	5.8	16.4
Anne Lake	18.8	1.2	17.4

1: Total attack (nitric-perchloric), -80 mesh fraction.

2: Based on geometric means for sediment and soil (Layer 1) data (Tables 9, 26 and B1).