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CHEMICAL ANALYSES OF FLIN FLON AREA LAKE WATERS AND PRECIPITATION: 1973 TO 1977

by

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ABSTRACT

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The following water chemistry parameters were determined from lakes in the vicinity of a base metal smelter located at Flin Flon, Manitoba: pH, conductivity, chloride, sulfate, sodium potassium, magnesium, calcium, zinc, copper, cadmium, manganese and iron, from 1973 to 1977. Chemical analysis of precipitation and lake surface snow are also reported.

Key words: water chemistry; chemical fallout, smelter; lakes; base metals; precipitation chemistry.

RESUME

McFarlane, G.A., W.G. Franzin, and A. Lutz. 1979. Chemical analyses of Flin Flon area lake waters and precipitation: 1973 to 1977. Can. Fish. Mar. Serv. MS Rep. 1486: v + 42 p.

Les paramètres suivants de la chimie de l'eau de lacs situés dans le voisinage d'une fonderie de métaux communs, installée à Flin Flon, au Manitoba, ont été étudiés de 1973 à 1977: le pH, la conductivité, les chlorures, les sulfates, les sels de sodium et de potassium, le magnésium, le calcium, le zinc, le cuivre, le cadmium, le manganèse et le fer. L'analyse chimique a aussi porté sur les précipitations et la neige de la surface des lacs.

Mots-clés: chimie de l'eau; retombées de produits chimiques; fonderie; lacs; métaux communs; chimie de précipitations.

THIS MANUSCRIPT REPORT IS DEDICATED TO THE MEMORY OF ROBERT T. BARNES, Jr.

INTRODUCTION

Water quality of selected lakes in the Flin Flon, Manitoba area was monitored from July 1973 to August 1977. The Flin Flon area was selected for study because lakes in the area receive high levels of metal deposition (Franzin et al. 1979), originating from a base-metal smelter located in the city of Flin Flon. The smelter has been in production since 1930, and a new super stack (250m) has been in operation since November 1974. All data compiled are included in this report, field and laboratory methods are outlined, and a tabulation of precipitation data at selected sites for the period August 1976 to August 1977 and snow data for the years 1976 and 1977 are included.

In this manuscript no discussion of data has been included as all detailed analysis appears in other publications (McFarlane and Franzin 1978; Franzin and McFarlane 1979; Franzin et al. 1979). The purpose of this report is to make available to the many agencies that have requested it a comprehensive compilation of raw data on water quality in the Flin Flon area.

METHODS

FIELD

A clean PVC Van Dorn water sampler was used to collect water from specified depths in all lakes sampled.

All samples for pH were collected in clean non acid-washed 500 mL linear polyethylene (LPE) bottles. Determinations of pH in the field were made at room temperature ($20^{o}C$) within 4 hrs of completion of sampling, using a Radiometer Model 53 Specific Ion Meter with glass electrodes, calibrated using pH 4.00 and 7.000 buffers. Water for all other determinations was collected in 500 mL acid-washed LEP bottles. One sample for heavy metal determinations was retained unfiltered and one sample was filtered through acid-washed and distilled water rinsed 0.45 µ, membrane filters, using all glass Millipore ^{R} apparatus. Both samples then were acidified with high purity HNO_3 to 5 mL/L, and refrigerated prior to transport to analytical laboratories. A third sample, also refrigerated immediately after collection was used for all other chemical analyses.

Annual loadings of heavy metals in bulk precipitation were estimated from amounts collected in samplers every two months from August 1976 through July 1977. The samplers consisted of 92 cm lengths of 20 cm diameter aluminum stove pipe maintained in an upright position at ground level. Tight-fitting polyethylene bags (approximately 30 cm by 60 cm) were placed in the open top of the stove pipes providing a collection surface area of approximately 0.032 cm^2. Thirteen of these samplers were operated during the collection period including three on each of Hamell and Thompson lakes, three in each of SW and SE directions from the smelter stack and one approximately 70 km west. Collection sites were chosen to provide comparative loading rates on two individual lakes and two transects in prevalent and non-prevalent wind directions as well as a distant site to estimate background loading rates. For short periods 50 oz. (1.4L) polyethylene containers were maintained adjacent to three of the stove pipe samplers and at the same height to provide an indication of catchment efficiency. Each sampler site was chosen to provide an open space with an angle of at least 45^{o} from the nearest tall vegetations but it was not possible to locate samplers in a similar topographic situation in every case. No sampler was closer than 100 m to any roadway, railway or habitation. In our collections we made no attempt to characterize either minerology of the fallout materials or the sizes of particles. However the literature reveals that our collectors while comparing favorably with any sedimentation collector probably did not collect particles smaller than 5 µm in diameter in still air (Corn 1976) and with any wind at all were inefficient at catching particles < 15 µm in average diameter (Hendrickson 1968).

Snow samples were collected in early February of 1976 and 1977 from the surfaces of Flin Flon area lakes to estimate heavy metal loading rates directly to lakes. Two types of samples were taken in 1976; square columns of snow from surface to ice level were removed with a clean steel shovel and placed in polyethylene bags or alternatively, a plexiglass tube and flat plate were used to remove several 42 cm^2 cores of snow which were placed in 3.8L polyethylene jars - Shovel samples collected an area of about 0.047 m^2 while the usual eight cores taken over an area of about 100 m^2 sampled about 0.034 m^2. In 1977 only the core sampler was used bu 6-10 cores were taken over the length of each of usually two approximately 1 Km long transects on each lake. Transects were, as nearly as possible, located to sample a windward and leeward shore relative to the direction of the smelter stack. All sampling locations were at least 100 m from the nearest roadway, railway or habitation.

SAMPLE HANDLING AND PRESERVATION

Samples removed from precipitation collectors were agitated vigorously, volume determined in a graduated cylinder, transferred to clean acid-washed (LPE) bottles acidifed with reagent grade or ultrapure HNO_3 to 5 mL/L then transported to the laboratory for storage and analysis.

Lake surface snow samples collected in polyethylene bags or bottles were kept frozen until they were transported to the laboratory. Bagged samples were thawed in large polyethylene beakers, volume determined with a large graduated cylinder then portioned into 500 mL acid washed linear polyethylene bottles. Jar samples were thawed *in situ*, volumes determined as above and in 1976 portioned into 500 mL bottles as above. In 1977, one 500 mL bottle of sample was removed from the jars for major ion analysis while that remaining in the jars was acidified *in situ* with HNO_3 to 5 mL/L. Among all the collector samples and snow samples, when volume permitted, a non-acidified sample was reserved for major ion analysis. All analyses, with the exception of 1973 and 1974, were performed in laboratories at the Freshwater Institute. The 1973, 1974 water samples were analysed at the University of Toronto, Departments of Geology and Chemistry.

LABORATORY

Sulfate, chloride, conductivity, calcium, magnesium, sodium and potassium were determined from non-acidified samples according to the procedures of Stainton et al. (1974). Heavy metal analyses for the 1973 and 1974 samples was described by Van Loon and Beamish (1977).

Metal analyses for 1975, 1976 and 1977 were determined according to the following methods:

ARSENIC

Two mL of concentrated sulfuric acid was added with mixing to 20 mL (or smaller aliquot) of sample followed by 1 mL of 10% potassium iodide. The sample was made to a 25 mL volume and aliquots placed in sample cups. Analysis was performed by modification of the semi-automated borohydride reduction method of Vijan and Wood (1974). The modification consisted of a heated quartz cell constructed with a quartz window and a inlet tube at the same end. Standard equivalent from 10 to 40 µg arsenic per litre were similarly treated. The detection limit by this method was 1 µg As/L.

MERCURY

Mercury was determined by flameless atomic absorption spectrophotometry on a 100 mL sample by the method of Kopp et al. (1972), using a Coleman MAS-50 mercury analyzer. The detection limit by this method was 0.05 µg Hg/L.

CADMIUM, COPPER, IRON, MANGANESE, LEAD AND ZINC

Cadmium, copper, iron, manganese, lead and zinc were determined in the samples either by atomic absorption using an air-acetylene flame or a carbon-rod atomization depending on concentration. A Varian AA-5 atomic absorption spectrophotometer equipped with a BC-6 simultaneous background corrector was used. Table below indicates the metals and their practical detection limits by the two methods.

Element	Cd	Cu	Fe	Mn	Pb	Zn
Wavelength nm	228.8	324.7	248.3	279.5	217.0	213.9
Detection limit flame (µg/L)	3	10	30	5	30	8
Detection limit C.R.A. (µg/L)	0.1	1	2	0.5	2	0.1

Detection limit is defined as the concentration of an element in solution which will give a signal equal to twice the standard deviation of a series of measurements near the blank level.

RESULTS AND DISCUSSION

The results of water chemistry are presented in Table 1; precipitation analyses in Table 2; and snow analyses in Table 3. Laboratory conductivity determinations were done according to Stainton et al. 1974; field conductivity determinations utilized a Beckman Model RB-3 Conductivity Meter with a temperature compensator. All conductivities are reported as µS/cm at 25°C.

Although no discussion is included a few general trends are noteworthy:

1. Concentrations of Zn, Cu, and Cd in Flin Flon area lakes are considerably higher than in unmineralized Canadian Shield lakes (Beamish et al. 1976).

2. Concentrations of other metals such as Mn and Fe appear to be related to factors other than atmospheric fallout, e.g. dust.

3. Concentrations of Zn and Cd in smaller lakes increased annually within the zone of influence of the smelter complex.

4. The highest lake water metal concentrations, particularly Zn, Cu, and Cd were recorded in early spring, immediately under the ice after the snowmelt had passed through (Franzin and McFarlane 1979).

5. Seasonal fluctuations of metal concentrations varied considerably in all lakes sampled on a bimonthly basis e.g. Cu appears to be related directly to biological activity in the lakes; Cd is measurable only at certain times of the year, particularly spring, in many lakes.

6. Linear regressions of chemical concentrations in lakes with distance from the smelter showed Zn to be the only metal which was significantly correlated,

$$\log [Zn] = 3.6741 - 1.9290 \log km$$

$$r = .74, p<.01$$

but deposition of many constituents on lake surface correlated well with distance from the smelter (Franzin et al. 1979). Van Loon and Beamish (1977) found that Zn, Cu, and SO_4 were all significantly correlated with distance from the smelter, however, they included lakes in their regressions which were outside the mineralized area.

Occasionally, concentrations of metals were higher in filtered samples than in unfiltered duplicates. The higher filtered vales have resulted from non systematic sampling error introduced by the filtering and acidification procedures. These data were eliminated from statistical analysis.

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Table 1. Chemical analyses of water of selected lakes in the Flin Flon area, 1973.

Lake: Cliff Lake

Date	Depth (m)	pH	Cond.	Cl mg/l	SO_4 mg/l	Na mg/l	K mg/l	Mg mg/l	Ca mg/l
July	OM,St.1	7.55	1180	2.6	17.8	2.06	1.41	3.88	16.2
July	OM,St.2	7.59	1190	2.0	16.0	1.79	1.37	3.71	14.4
Sept.	OM,St.1	7.59	111	2.0	15.0	1.74	1.30	3.67	14.5

Date	Depth	Zn µg/l		Cu µg/l		Cd µg/l		Mn µg/l		Fe µg/l	
		unf	f+a	unf	f+a	unf	f+a	unf	f+a	unf	f+a
July	St.1,OM	88	95	1.4	3.5	0.3	0.6	6	2.3	8.1	7.2
July	St.2,OM	86	90	8.3	3.7	0.6	0.4	12	1.4	24	3.1
Sept.	St.1,OM	60	51	11	8	0.2	0.2			8	7
Oct.	St.1,OM	-	68	-	10	-	0.2			-	4
	3M	-	70	-	9	-	0.2				3
	5M	-	74	-	10	-	0.2			-	4
	10M	-	74	-	10	-	0.2			-	1
	15M	-	80	-	10	-	0.2			-	3
	St.2,1M	-	76	-	10	-	0.2			-	1
	St.3,OM	-	75	-	9	-	0.2			-	2
	St.4,1M	-	78	-	10	-	0.2			-	<1
	St.5,1M	-	75	-	10	-	0.2			-	3

Lake: Douglas

Date	Depth (m)	pH	Cond.	Cl mg/l	SO_4 mg/l	Na mg/l	K mg/l	Mg mg/l	Ca mg/l
Sept.	OM	8.10	162	4.8	20.2	1.97	1.59	3.82	23.7

Date	Depth	Zn µg/l		Cu µg/l		Cd µg/l		Mn µg/l		Fe µg/l	
		unf	f+a	unf	f+a	unf	f+a	unf	f+a	unf	f+a
Sept.	OM	32	24	7	3	.3	<.1	-	-	28	3

Lake: Embury

Date	Depth (m)	pH	Cond.	Cl mg/l	SO_4 mg/l	Na mg/l	K mg/l	Mg mg/l	Ca mg/l
July	St.1,3M	7.65	1180	0.6	18.6	1.68	1.48	3.76	14.1
July	St.2,3M	7.61	1070	0.6	15.6	1.59	1.37	3.61	13.7
Sept.	St.1,3M	7.70	107	0.8	15.2	1.52	1.32	3.03	14.1

Date	Depth	Zn µg/l		Cu µg/l		Cd µg/l		Mn µg/l		Fe µg/l	
		unf	f+a	unf	f+a	unf	f+a	unf	f+a	unf	f+a
July	St.1,3M	47	1	9.1	1	0.8	0.2	6.0	0.4	43	8.1
July	St.2,3M	46	46	10.2	3.9	1.6	0.4	6.3	1.1	33	15
Sept.	St.1,3M	40	29	10	13	0.3	0.2	-	-	10	3

Table 1. 1973 Continued

Lake: Hamell

Date	Depth (m)	pH	Cond.	Cl mg/ℓ	SO_4 mg/ℓ	Na mg/ℓ	K mg/ℓ	Mg mg/ℓ	Ca mg/ℓ
July	3M	7.99	990	2.4	13.6	1.24	1.32	2.82	14.1
Sept.	3M	7.60	100	3.2	12.6	1.65	1.36	2.99	17.1

Date	Depth	Zn unf µg/ℓ	Zn f+a µg/ℓ	Cu unf µg/ℓ	Cu f+a µg/ℓ	Cd unf µg/ℓ	Cd f+a µg/ℓ	Mn unf µg/ℓ	Mn f+a µg/ℓ	Fe unf µg/ℓ	Fe f+a µg/ℓ
July	3M	192	139	32	2.8	0.8	<0.2	37	4.4	438	10
Sept.	3M	160	160	10	7	0.5	1.4			26	15
Oct.	St.1,1M	-	160	-	10	-	.8			-	4
	3M	-	150	-	9	-	.8			-	5
	St.2,1M	-	150	-	9	-	.8			-	2
	St.3,1M	-	140	-	9	-	.8			-	3
	St.4,1M	-	130	-	9	-	.8			-	1
	St.5,1M	-	140	-	3	-	.8			-	7

Lake: Johnson

Date	Depth (m)	pH	Cond.	Cl mg/ℓ	SO_4 mg/ℓ	Na mg/ℓ	K mg/ℓ	Mg mg/ℓ	Ca mg/ℓ
July	3M 3M	7.80	680	1.0	9.0	1.87	1.14	2.34	8.73
Sept.	3M 3M	7.91	77	1.2	9.6	1.96	1.13	2.39	7.96

Date	Depth	Zn unf µg/ℓ	Zn f+a µg/ℓ	Cu unf µg/ℓ	Cu f+a µg/ℓ	Cd unf µg/ℓ	Cd f+a µg/ℓ	Mn unf µg/ℓ	Mn f+a µg/ℓ	Fe unf µg/ℓ	Fe f+a µg/ℓ
July	3M	65	11	6.8	1.2	3.4	1.2	129	4.2	130	28
Sept.	3M	2	8	2	2	<0.1	<0.1	-	-	55	15

Lake: 6

Date	Depth (m)	pH	Cond.	Cl mg/ℓ	SO_4 mg/ℓ	Na mg/ℓ	K mg/ℓ	Mg mg/ℓ	Ca mg/ℓ
Sept.	3M	7.89	106	0.4	14.6	1.01	0.87	3.59	14.9

Date	Depth	Zn unf µg/ℓ	Zn f+a µg/ℓ	Cu unf µg/ℓ	Cu f+a µg/ℓ	Cd unf µg/ℓ	Cd f+a µg/ℓ	Mn unf µg/ℓ	Mn f+a µg/ℓ	Fe unf µg/ℓ	Fe f+a µg/ℓ
Sept.	3M	150	125	10	10	0.3	0.3			12	7

Lake: Little Spruce

Date	Depth (m)	pH	Cond.	Cl mg/ℓ	SO_4 mg/ℓ	Na mg/ℓ	K mg/ℓ	Mg mg/ℓ	Ca mg/ℓ
Sept.	3M	8.3	262	0.8	32.5	6.45	1.49	11.3	30.2

Date	Depth	Zn unf µg/ℓ	Zn f+a µg/ℓ	Cu unf µg/ℓ	Cu f+a µg/ℓ	Cd unf µg/ℓ	Cd f+a µg/ℓ	Mn unf µg/ℓ	Mn f+a µg/ℓ	Fe unf µg/ℓ	Fe f+a µg/ℓ
Sept.	3M	2	1	1	1	<0.1	<0.1			8	5

Table 1. 1973 Continued

Lake: Haligne

Date	Depth (m)	pH	Cond.	Cl mg/ℓ	SO_4 mg/ℓ	Na mg/ℓ	K mg/ℓ	Mg mg/ℓ	Ca mg/ℓ
July	3M	8.30	1070	2.0	5.2	3.03	1.44	4.45	13.7
Sept.	3M	8.19	152	2.0	4.8	2.92	1.36	4.41	12.1

Date	Depth	Zn µg/ℓ		Cu µg/ℓ		Cd µg/ℓ		Mn µg/ℓ		Fe µg/ℓ	
		unf	f+a	unf	f+a	unf	f+a	unf	f+a	unf	f+a
July	3M	1	2	11	<1	1.5	<0.2	23	0.4	72	34
Sept.	3M	13	30	2	2	<0.1	<0.1	-	-	35	8

Lake: Neso

Date	Depth (m)	pH	Cond.	Cl mg/ℓ	SO_4 mg/ℓ	Na mg/ℓ	K mg/ℓ	Mg mg/ℓ	Ca mg/ℓ
July	3M	7.61	593	0.8	6.2	1.32	.66	2.26	8.46
Sept.	3M	7.74	64	0.8	5.6	1.41	.70	2.43	7.66

Date	Depth	Zn µg/ℓ		Cu µg/ℓ		Cd µg/ℓ		Mn µg/ℓ		Fe µg/ℓ	
		unf	f+a	unf	f+a	unf	f+a	unf	f+a	unf	f+a
July	3M	1	2	4	2.5	1.7	.3	23	2.8	86	44
Sept.	3M	1	1	2	2	<0.1	<0.1	-	-	42	25

Lake: Nasootao

Date	Depth (m)	pH	Cond.	Cl mg/ℓ	SO_4 mg/ℓ	Na mg/ℓ	K mg/ℓ	Mg mg/ℓ	Ca mg/ℓ
July	3M	7.51	737	1.0	12.4	1.65	1.17	2.03	9.85

Date	Depth	Zn µg/ℓ		Cu µg/ℓ		Cd µg/ℓ		Mn µg/ℓ		Fe µg/ℓ	
		unf	f+a	unf	f+a	unf	f+a	unf	f+a	unf	f+a
July	3M	22	21	3.3	2.5	0.5	0.5	28	3.2	46	16

Lake: Otter

Date	Depth (m)	pH	Cond.	Cl mg/ℓ	SO_4 mg/ℓ	Na mg/ℓ	K mg/ℓ	Mg mg/ℓ	Ca mg/ℓ
July	3M	7.70	788	2.6	7.2	2.02	.73	3.66	10.1
Sept.	3M	7.77	82	2.8	10.2	2.02	.74	3.69	9.91

Date	Depth	Zn µg/ℓ		Cu µg/ℓ		Cd µg/ℓ		Mn µg/ℓ		Fe µg/ℓ	
		unf	f+a	unf	f+a	unf	f+a	unf	f+a	unf	f+a
July	3M	3	7	<1	<1	7	<.2	23	1.4	783	431
Sept.	3M	1	3	2	2	3	<.2	-	-	130	70

Table 1, 1973 Continued

Lake: Phantom

Date	Depth	pH	Cond.	Cl mg/ℓ	SO_4 mg/ℓ	Na mg/ℓ	K mg/ℓ	Mg mg/ℓ	Ca mg/ℓ
July	St.1,3M	8.90	1420	1.6	18.2	2.44	1.74	5.30	17.8
	St.2,3M	8.99	1430	1.6	18.2	2.44	1.75	5.33	18.3
	St.3,3M	8.62	1480	1.4	18.8	2.46	1.74	5.36	18.7
Sept.	St.1,3M	7.91	148	1.8	18.2	2.37	1.65	5.13	17.6

Date	Depth	Zn unf µg/ℓ	Zn f+a µg/ℓ	Cu unf µg/ℓ	Cu f+a µg/ℓ	Cd unf µg/ℓ	Cd f+a µg/ℓ	Mn unf µg/ℓ	Mn f+a µg/ℓ	Fe unf µg/ℓ	Fe f+a µg/ℓ
July	St.1,3M	135	86	8.1	2.1	0.6	0.2	23	3.5	36	5.0
July	St.2,3M	40	36	8.4	2.3	0.8	0.3	20	2.5	21	4.4
July	St.3,3M	70	56	3.9	2.1	0.4	0.2	18	5.1	21	3.9
Sept.	St.1,3M	50	50	6.0	6.0	0.3	0.1	-	-	15	8.0

Lake: Ross

Date	Depth	pH	Cond.	Cl mg/ℓ	SO_4 mg/ℓ	Na mg/ℓ	K mg/ℓ	Mg mg/ℓ	Ca mg/ℓ
July	3M	3.95	13500	122	428	53.2	6.46	15.0	178
Sept.	3M	4.00	2172	353	683	101	8.37	26.9	244

Date	Depth	Zn unf µg/ℓ	Zn f+a µg/ℓ	Cu unf µg/ℓ	Cu f+a µg/ℓ	Cd unf µg/ℓ	Cd f+a µg/ℓ	Mn unf µg/ℓ	Mn f+a µg/ℓ	Fe unf µg/ℓ	Fe f+a µg/ℓ
July	3M	4500	4400	235	200	18.8	18.8	362	338	2400	2200
Sept.	3M	13000	10000	400	400	60	50			1900	1500
Oct.	St.1,1M	-	9600	-	780	-	105				
	3M	-	9700	-	780	-	100				
	St.2,1M	-	9700	-	770	-	100				
	St.3,1M	-	9800	-	780	-	100				
	St.4,1M	-	9500	-	770	-	100				
	St.5,1M	-	9600	-	790	-	110				

Lake: Scotty

Date	Depth (m)	pH	Cond.	Cl mg/ℓ	SO_4 mg/ℓ	Na mg/ℓ	K mg/ℓ	Mg mg/ℓ	Ca mg/ℓ
July	3M	8.80	2030	4.8	10.2	3.06	1.40	9.20	25.7
Sept.	3M	7.95	202	4.6	10.8	3.03	4.47	9.63	25.1

Date	Depth	Zn unf µg/ℓ	Zn f+a µg/ℓ	Cu unf µg/ℓ	Cu f+a µg/ℓ	Cd unf µg/ℓ	Cd f+a µg/ℓ	Mn unf µg/ℓ	Mn f+a µg/ℓ	Fe unf µg/ℓ	Fe f+a µg/ℓ
July	3M	1	1	6.7	1.2	1.6	<.2	21	0.7	27	6.7
Sept.	3M	1	2	2	2	<0.1	<.2	-	-	5	1

Table 1. 1973 Continued.

Lake: Twin

Date	Depth (m)	pH	Cond.	Cl mg/ℓ	SO_4 mg/ℓ	Na mg/ℓ	K mg/ℓ	Mg mg/ℓ	Ca mg/ℓ
July	3M	7.91	803	0.8	6.0	1.29	.75	3.23	11.6

Date	Depth	Zn unf µg/ℓ	Zn f+a µg/ℓ	Cu unf µg/ℓ	Cu f+a µg/ℓ	Cd unf µg/ℓ	Cd f+a µg/ℓ	Mn unf µg/ℓ	Mn f+a µg/ℓ	Fe unf µg/ℓ	Fe f+a µg/ℓ
July	3M	21	1	6	<.1	1.2	0.3	18	.4	677	56

Lake: We

Date	Depth (m)	pH	Cond.	Cl mg/ℓ	SO_4 mg/ℓ	Na mg/ℓ	K mg/ℓ	Mg mg/ℓ	Ca mg/ℓ
Sept.	1M	7.62	111	1.4	11.8	1.88	0.92	5.02	13.2

Date	Depth	Zn unf µg/ℓ	Zn f+a µg/ℓ	Cu unf µg/ℓ	Cu f+a µg/ℓ	Cd unf µg/ℓ	Cd f+a µg/ℓ	Mn unf µg/ℓ	Mn f+a µg/ℓ	Fe unf µg/ℓ	Fe f+a µg/ℓ
Sept.	1M	1	2	4	4	0.1	<0.1			33	33

Lake: Whitehead

Date	Depth (m)	pH	Cond.	Cl mg/ℓ	SO_4 mg/ℓ	Na mg/ℓ	K mg/ℓ	Mg mg/ℓ	Ca mg/ℓ
Sept.	1M	8.04	57	0.6	7.2	1.22	0.87	2.30	15.9

Date	Depth	Zn unf µg/ℓ	Zn f+a µg/ℓ	Cu unf µg/ℓ	Cu f+a µg/ℓ	Cd unf µg/ℓ	Cd f+a µg/ℓ	Mn unf µg/ℓ	Mn f+a µg/ℓ	Fe unf µg/ℓ	Fe f+a µg/ℓ
Sept.	1M	470	105	31	9	1.9	0.4			325	80

Lake: Winteringham

Date	Depth (m)	pH	Cond.	Cl mg/ℓ	SO_4 mg/ℓ	Na mg/ℓ	K mg/ℓ	Mg mg/ℓ	Ca mg/ℓ
July	3M	7.80	437	0.8	5.2	1.71	0.81	2.0	5.76

Date	Depth	Zn unf µg/ℓ	Zn f+a µg/ℓ	Cu unf µg/ℓ	Cu f+a µg/ℓ	Cd unf µg/ℓ	Cd f+a µg/ℓ	Mn unf µg/ℓ	Mn f+a µg/ℓ	Fe unf µg/ℓ	Fe f+a µg/ℓ
July	3M	1	1	2.3	<1	1.3	0.2	25	1.4	405	31

Lake: Wonderland

Date	Depth (m)	pH	Cond.	Cl mg/ℓ	SO_4 mg/ℓ	Na mg/ℓ	K mg/ℓ	Mg mg/ℓ	Ca mg/ℓ
Sept.	3M	7.52	104	1.6	13.2	1.70	0.86	4.50	13.3

Date	Depth	Zn unf µg/ℓ	Zn f+a µg/ℓ	Cu unf µg/ℓ	Cu f+a µg/ℓ	Cd unf µg/ℓ	Cd f+a µg/ℓ	Mn unf µg/ℓ	Mn f+a µg/ℓ	Fe unf µg/ℓ	Fe f+a µg/ℓ
Sept.	3M	6	3	4	4	<0.1	<0.1			20	16

Table 1 cont" Chemical analyses of water of selected lakes in the Flin Flon Area, 1974

Lake: 1974-June 1

Lake	Depth	Zn unf µg/L	Zn f+a µg/L	Cu unf µg/L	Cu f+a µg/L	Cd unf µg/L	Cd f+a µg/L	Mn unf µg/L	Mn f+a µg/L	Fe unf µg/L	Fe f+a µg/L
Beaverdam	3M		440		23		1.0				54
Bluenose	3M		5		3		<0.2				9
Cliff	St.1-3M		110		9		0.3				16
	St.2-3M		120		11		0.3				36
Douglas	3M		75		10		<0.2				15
Embury	3M		47		12		<0.2				15
Hamell	St.1-3M		260		15		0.7				32
	St.2-3M		260		16		0.6				106
	St.3-3M		270		15		0.6				55
Johnson	3M		10		2		<0.2				59
Kisseynew	3M		<1		1		<0.2				90
Lake 6	1M		30		8		<0.2				52
Little Spruce	3M		14		5		<0.2				20
Maligne	3M		1		3		<0.2				25
Mosher	3M		17		4		<0.2				43
Neosap	3M		10		2		<0.2				70
Neso	3M		1		2		<0.2				79
Nesootao	3M		38		14		<0.2				41
Otter	3M		6		4		<0.2				117
Phantom	3M		50		7		<0.2				136
Ross	3M		2800		200		20				125
Scotty	3M		18		4		<0.2				10
Schist	St.1-3M		1300		200		20				125
	St.2-3M		160		13		5				21
Twin	3M		9		3		<0.2				20
Wonderland	3M		30		8		<0.2				52
Whitehead	1M		210		12		0.5				152
We	3M		31		8		<0.2				60

Table 1 cont" Chemical analyses of water of selected lakes in the Flin Flon Area, 1975.

Lake: Beaverdam Creek

Date	Depth (m)	pH	Cond.	Cl mg/ℓ	SO_4 mg/ℓ	Na mg/ℓ	K mg/ℓ	Mg mg/ℓ	Ca mg/ℓ
May 30	0	6.96	100	0.8	27.0	1.23	0.47	2.74	11.3

Date	Depth	Zn unf µg/ℓ	Zn f+a µg/ℓ	Cu unf µg/ℓ	Cu f+a µg/ℓ	Cd unf µg/ℓ	Cd f+a µg/ℓ	Mn unf µg/ℓ	Mn f+a µg/ℓ	Fe unf µg/ℓ	Fe f+a µg/ℓ	As unf µg/ℓ
May 30	0	1170		102		1.5		30				4.3

Lake: Birch

Date	Depth (m)	pH	Cond.	Cl mg/ℓ	SO_4 mg/ℓ	Na mg/ℓ	K mg/ℓ	Mg mg/ℓ	Ca mg/ℓ
June 27	3M		395	88.5	328	16.8	1.95	625	40.0

Lake: Bluenose

Date	Depth (m)	pH	Cond.	Cl mg/ℓ	SO_4 mg/ℓ	Na mg/ℓ	K mg/ℓ	Mg mg/ℓ	Ca mg/ℓ
June 27	3M		91	1.2	18.6	1.52	1.38	2.57	12.0

Date	Depth	Zn unf µg/ℓ	Zn f+a µg/ℓ	Cu unf µg/ℓ	Cu f+a µg/ℓ	Cd unf µg/ℓ	Cd f+a µg/ℓ	Mn unf µg/ℓ	Mn f+a µg/ℓ	Fe unf µg/ℓ	Fe f+a µg/ℓ
June 27	3M	75	43	<1	<1	<0.1	<0.1			20	

Lake: Byklum

Date	Depth (m)	pH	Cond.	Cl mg/ℓ	SO_4 mg/ℓ	Na mg/ℓ	K mg/ℓ	Mg mg/ℓ	Ca mg/ℓ
June 27	3M		161	1.4	9.0	1.44	0.79	7.70	16.7

Lake: Cleaver

Date	Depth (m)	pH	Cond.	Cl mg/ℓ	SO_4 mg/ℓ	Na mg/ℓ	K mg/ℓ	Mg mg/ℓ	Ca mg/ℓ
Aug. 11	0	7.32	91	2.6	8.0			8.47	14.0

Date	Depth	Zn unf µg/ℓ	Zn f+a µg/ℓ	Cu unf µg/ℓ	Cu f+a µg/ℓ	Cd unf µg/ℓ	Cd f+a µg/ℓ	Mn unf µg/ℓ	Mn f+a µg/ℓ	Fe unf µg/ℓ	Fe f+a µg/ℓ
Aug. 11	0	3		2.5		<0.2					

Table 1. 1975 Continued

Lake: Cliff

Date	Depth (m)	pH	Cond.	Cl mg/ℓ	SO_4 mg/ℓ	Na mg/ℓ	K mg/ℓ	Mg mg/ℓ	Ca mg/ℓ
June	3M		114	2.2	16.6	1.68	1.51	3.17	13.3

Date	Depth	Zn unf µg/ℓ	Zn f+a µg/ℓ	Cu unf µg/ℓ	Cu f+a µg/ℓ	Cd unf µg/ℓ	Cd f+a µg/ℓ	Mn unf µg/ℓ	Mn f+a µg/ℓ	Fe unf µg/ℓ	Fe f+a µg/ℓ
June	3M	133	122	7	7	<0.1	<0.1			20	

Lake: Douglas

Date	Depth (m)	pH	Cond.	Cl mg/ℓ	SO_4 mg/ℓ	Na mg/ℓ	K mg/ℓ	Mg mg/ℓ	Ca mg/ℓ
June 27	3M		166	6.4	30.0	1.84	1.83	6.84	24.0

Date	Depth	Zn unf µg/ℓ	Zn f+a µg/ℓ	Cu unf µg/ℓ	Cu f+a µg/ℓ	Cd unf µg/ℓ	Cd f+a µg/ℓ	Mn unf µg/ℓ	Mn f+a µg/ℓ	Fe unf µg/ℓ	Fe f+a µg/ℓ
June 27	3M	143	144	2	2	<0.1	<0.1			20	

Lake: Flin Flon Creek

Date	Depth (m)	pH	Cond.	Cl mg/ℓ	SO_4 mg/ℓ	Na mg/ℓ	K mg/ℓ	Mg mg/ℓ	Ca mg/ℓ
May 30	0	6.47	740	77.0	226	22.8	0.55	11.6	85.3
Dec. 12	At F.F. Lake	6.59	810	133	243	34.1	3.93	8.57	110
	At Palen Ave.	6.70	870	247	230	37.3	4.10	8.71	114
	3rd Ave.	5.56	2000	403	542	103	9.41	13.7	279

Date	Depth	Zn unf µg/ℓ	Zn f+a µg/ℓ	Cu unf µg/ℓ	Cu f+a µg/ℓ	Cd unf µg/ℓ	Cd f+a µg/ℓ	Mn unf µg/ℓ	Mn f+a µg/ℓ	Fe unf µg/ℓ	Fe f+a µg/ℓ	As unf µg/ℓ
May 30	0	7220		505		122		550				4.5
Sept. 24	At F.F. Lake	3110	2980	1040	982	<0.3	<0.3					
	Palen Ave.	3650	3520	635	599	<0.3	<0.3					
Dec. 12	At F.F. Lake	1830	1710	230	94	12.6	12.4					
	Palen Ave.	1880	1740	520	340	11.3	10.9					
	3rd Ave.	2630	2450	920	830	29.6	29.3					

Lake: Hamell

Table 1. 1975 Continued

Date	Depth (m)	pH	Cond.	Cl mg/ℓ	SO_4 mg/ℓ	Na mg/ℓ	K mg/ℓ	Mg mg/ℓ	Ca mg/ℓ
May 30	0	7.42	100	3.0	14.2	1.25	1.66	2.57	16.7
	3M	7.59	100	3.0	14.0	1.26	1.66	2.48	12.7
June 27	2M		104	3.8	14.4	1.32	1.55	–	16.0
Sept. 24	0	7.73	120	2.6	13.2	–	–	–	–
Dec. 12	0	7.57	120	2.8	18.8	1.60	1.62	3.24	15.6
	3M	7.50	115	3.4	16.8	1.44	1.47	3.03	14.8

Date	Depth	Zn unf µg/ℓ	Zn f+a µg/ℓ	Cu unf µg/ℓ	Cu f+a µg/ℓ	Cd unf µg/ℓ	Cd f+a µg/ℓ	Mn unf µg/ℓ	Mn f+a µg/ℓ	Fe unf µg/ℓ	Fe f+a µg/ℓ
May 30	0	250		10		0.2		20			
	3M	260		10		<0.2		10			
June 27	2M	321	202	7	4	<0.1	<0.1			90	
Sept. 24	0	190		12		<0.3					
	3M	160	140	6.6	6.6	<0.3	<0.3				
Dec. 12	0	270	230	9.4	9.9	<0.3	<0.3				
	3M	250	230	10	9.4	<0.3	<0.3				

Lake: Hook

Date	Depth (m)	pH	Cond.	Cl mg/ℓ	SO_4 mg/ℓ	Na mg/ℓ	K mg/ℓ	Mg mg/ℓ	Ca mg/ℓ
June 27	3M		229	2.4	19.6	2.04	1.38	5.73	34.0

Date	Depth	Zn unf µg/ℓ	Zn f+a µg/ℓ	Cu unf µg/ℓ	Cu f+a µg/ℓ	Cd unf µg/ℓ	Cd f+a µg/ℓ	Mn unf µg/ℓ	Mn f+a µg/ℓ	Fe unf µg/ℓ	Fe f+a µg/ℓ
June 27	3M	60	49	2	2	<0.1	<0.1			30	

Lake: Manistikwan, Big Island Creek

Date	Depth (m)	pH	Cond.	Cl mg/ℓ	SO_4 mg/ℓ	Na mg/ℓ	K mg/ℓ	Mg mg/ℓ	Ca mg/ℓ
May 28	0		150	1.8	17.8	2.12	1.53	4.45	18.0

Date	Depth	Zn unf µg/ℓ	Zn f+a µg/ℓ	Cu unf µg/ℓ	Cu f+a µg/ℓ	Cd unf µg/ℓ	Cd f+a µg/ℓ	Mn unf µg/ℓ	Mn f+a µg/ℓ	Fe unf µg/ℓ	Fe f+a µg/ℓ	As unf µg/ℓ
May 28	0	140		13		0.6		10		50		3.7
June 27	0	122	122	7	8	<0.1	<0.1					
	0	133	111	10	9	<0.1	<0.1					
Sept. 24	0	150	150	12	12	<0.3	<0.3					

Lake: Manistikwan

Date	Depth (m)	pH	Cond.	Cl mg/ℓ	SO_4 mg/ℓ	Na mg/ℓ	K mg/ℓ	Mg mg/ℓ	Ca mg/ℓ
May 28	0		150	2.0	17.4	2.20	1.51	4.53	19.3

Date	Depth	Zn unf µg/ℓ	Zn f+a µg/ℓ	Cu unf µg/ℓ	Cu f+a µg/ℓ	Cd unf µg/ℓ	Cd f+a µg/ℓ	Mn unf µg/ℓ	Mn f+a µg/ℓ	Fe unf µg/ℓ	Fe f+a µg/ℓ	As unf µg/ℓ
May 28	0	160		13		0.7		10		50		3.7

Table 1. 1975 Continued

Lake: Phantom

Date	Depth (m)	pH	Cond.	Cl mg/ℓ	SO_4 mg/ℓ	Na mg/ℓ	K mg/ℓ	Mg mg/ℓ	Ca mg/ℓ
June 27	3M		156	1.8	20.6	2.50	1.91	4.36	18.7

Date	Depth	Zn unf µg/ℓ	Zn f+a µg/ℓ	Cu unf µg/ℓ	Cu f+a µg/ℓ	Cd unf µg/ℓ	Cd f+a µg/ℓ	Mn unf µg/ℓ	Mn f+a µg/ℓ	Fe unf µg/ℓ	Fe f+a µg/ℓ
June 27	3M	142	95	7	4	<0.1	<0.1			30	

Lake: Pothook

Date	Depth (m)	pH	Cond.	Cl mg/ℓ	SO_4 mg/ℓ	Na mg/ℓ	K mg/ℓ	Mg mg/ℓ	Ca mg/ℓ
Aug. 11	0	7.42	66	1.0	8.2			7.87	8.70

Date	Depth	Zn unf µg/ℓ	Zn f+a µg/ℓ	Cu unf µg/ℓ	Cu f+a µg/ℓ	Cd unf µg/ℓ	Cd f+a µg/ℓ	Mn unf µg/ℓ	Mn f+a µg/ℓ	Fe unf µg/ℓ	Fe f+a µg/ℓ
Aug. 11	0	2		1.4		<0.2					

Lake: Precipice

Date	Depth (m)	pH	Cond.	Cl mg/ℓ	SO_4 mg/ℓ	Na mg/ℓ	K mg/ℓ	Mg mg/ℓ	Ca mg/ℓ
June 27	3M		91	2.0	13.8	1.51	1.40	2.31	11.3

Lake: Ross

Date	Depth (m)	pH	Cond.	Cl mg/ℓ	SO_4 mg/ℓ	Na mg/ℓ	K mg/ℓ	Mg mg/ℓ	Ca mg/ℓ
May 30	3M	6.50	880	126	241	31.9	4.69	10.3	110

Date	Depth	Zn unf µg/ℓ	Zn f+a µg/ℓ	Cu unf µg/ℓ	Cu f+a µg/ℓ	Cd unf µg/ℓ	Cd f+a µg/ℓ	Mn unf µg/ℓ	Mn f+a µg/ℓ	Fe unf µg/ℓ	Fe f+a µg/ℓ	As unf µg/ℓ
May 30	3M	6430		272		102		420				5.6

Lake: Ruby

Date	Depth (m)	pH	Cond.	Cl mg/ℓ	SO_4 mg/ℓ	Na mg/ℓ	K mg/ℓ	Mg mg/ℓ	Ca mg/ℓ
June 27	3M		140	1.0	9.6	1.34	1.85	4.02	18.0

Date	Depth	Zn unf µg/ℓ	Zn f+a µg/ℓ	Cu unf µg/ℓ	Cu f+a µg/ℓ	Cd unf µg/ℓ	Cd f+a µg/ℓ	Mn unf µg/ℓ	Mn f+a µg/ℓ	Fe unf µg/ℓ	Fe f+a µg/ℓ
June 27	3M	48	35	<1	<1	<0.1	<0.1			10	

Table 1. 1975 Continued

Lake: Schist, Inlet Arm

Date	Depth (m)	pH	Cond.	Cl mg/ℓ	SO_4 mg/ℓ	Na mg/ℓ	K mg/ℓ	Mg mg/ℓ	Ca mg/ℓ
May 28	St.2-0		530	77.5	93.0	21.0	5.46	7.61	64.0
	3M	8.09	540	78.0	93.5	21.1	2.93	7.70	64.0
	10M		560	82.3	97.5	22.4	3.12	7.44	68.0
	21M	7.05	590	90.0	107	24.9	1.34	8.21	75.3
	St.3-3M	8.03	550	85.0	96.5	21.6	5.16	7.87	62.7
June 27	St.1-3M		343	37.5	52.5	11.2	2.21	1.88	44.0
	St.2-3M	8.60	416	49.5	65.5	14.8	2.44	6.42	50.0
	St.3-3M		484	62.0	80.0	18.2	2.70	325	58.0
Dec. 12	St.2-0	7.57	845	87.0	99	22.3	2.78	9.30	69.4
	3M	7.57	545	82.5	98	23.6	2.55	8.94	66.4
	26M	7.49	515	81.0	96	21.8	2.60	9.16	67.0
	St.3-3M	7.44	585	96.0	97	23.9	2.51	9.75	71.8

Date	Depth	Zn unf µg/ℓ	Zn f+a µg/ℓ	Cu unf µg/ℓ	Cu f+a µg/ℓ	Cd unf µg/ℓ	Cd f+a µg/ℓ	Mn unf µg/ℓ	Mn f+a µg/ℓ	Fe unf µg/ℓ	Fe f+a µg/ℓ	As unf µg/ℓ
May 28	St.2-0	140		<1		<0.2		10				2.6
	3M	140		3		<0.2		22				2.7
	10M	140		4		<0.2		10				5.9
	21M	140		<1		<0.2		30				2.6
	St.3-3M	140		9		<0.2		20				2.6
Sept. 24	St.2-3M	140	130	6.0	6.0	<0.3	<0.3					
Dec. 12	St.2-0	87	84	6.7	7.2	0.5	0.4					
	3M	73	71	4.2	4.6	<0.3	<0.3					
	26M	82	68	4.2	5.2	<0.3	<0.3					
	St.3-3M	120	92	4.2	5.7	<0.3	<0.3					

Lake: Schist: N.E. Arm

Date	Depth (m)	pH	Cond.	Cl mg/ℓ	SO_4 mg/ℓ	Na mg/ℓ	K mg/ℓ	Mg mg/ℓ	Ca mg/ℓ
June 27	NE1-3M		572	89.0	96.0	23.3	3.08	7.87	74.0
	NE2-3M	8.62	556	82.5	93.0	22.2	2.97	7.61	67.3
	NE3-3M		582	84.0	96.5	23.5	3.02	7.79	70.3
Dec. 12	NE2-0	7.59	665	112	124	26.8	3.20	11.2	83.6
	3M	7.58	630	105	117	26.1	2.95	10.4	79.8
	30M	7.49	625	101	115	22.6	2.90	10.6	78.7
	NE3-3M	7.37	495	84.5	94	22.3	2.72	9.75	72.9

Date	Depth	Zn unf µg/ℓ	Zn f+a µg/ℓ	Cu unf µg/ℓ	Cu f+a µg/ℓ	Cd unf µg/ℓ	Cd f+a µg/ℓ	Mn unf µg/ℓ	Mn f+a µg/ℓ	Fe unf µg/ℓ	Fe f+a µg/ℓ
June 27	NE1-3M	303	255	1	2	<0.1	<0.1			40	
	NE2-3M	167	144	2	2	<0.1	<0.1			20	
	NE3-3M	230	190	3	4	<0.1	<0.1			40	
Dec. 12	NE2-0	110	95	5.6	6.1	<0.3	<0.3				
	3M	98	82	4.9	4.8	<0.3	<0.3				
	30M	95	90	4.4	5.4	<0.3	<0.3				
	NE3-3M	87	76	4.8	8.2	<0.3	<0.3				

Table 1. 1975 Continued

Lake: Schist, Northwest Arm

Date	Depth (m)	pH	Cond.	Cl mg/ℓ	SO_4 mg/ℓ	Na mg/ℓ	K mg/ℓ	Mg mg/ℓ	Ca mg/ℓ
May 30	NW1-3M	7.42	970	166	213	43.8	4.69	9.84	123
	NW3-3M	7.55	940	181	182	42.9	4.40	9.84	118
	NW2-0	8.27	960	177	188	43.5	4.55	9.67	118
	5M	8.20	960	179	185	43.3	4.50	9.75	117
	12M	6.59	1600	322	299	81.1	6.29	13.1	179
June 27	NW1-3M		858	141	178	37.5	4.33	9.50	111
	NW2-3M	9.14	879	148	174	38.9	4.31	9.58	106
	NW3-3M		837	139	157	36.2	3.99	9.24	103
Dec. 12	NW1-3M	7.5	920	161	196	41.0	3.96	12.2	121
	NW3-3M	7.54	910	162	194	40.8	3.89	12.1	123
	NW2-0	7.58	955	166	200	42.4	4.07	12.6	125
	3M	7.55	945	165	199	41.9	3.99	12.7	126
	15M	7.18	1100	174	233	47.1	4.43	125	139
	NW4-3M	7.52	905	152	183	40.0	3.93	12.3	122
	NW5-0	7.65	710	113	131	29.2	3.37	11.1	85.7
	3M	7.50	880	148	181	39.0	3.78	11.2	115
	18M	7.25	960	186	238	45.4	4.20	12.2	133

Date	Depth	Zn unf µg/ℓ	Zn f+a µg/ℓ	Cu unf µg/ℓ	Cu f+a µg/ℓ	Cd unf µg/ℓ	Cd f+a µg/ℓ	Mn unf µg/ℓ	Mn f+a µg/ℓ	Fe unf µg/ℓ	Fe f+a µg/ℓ	As unf µg/ℓ
May 30	NW3-1M	2610		113		14.5		220				2.7
	NW3-3M	1430		44		10.2		210				2.1
	NW2-0	1780		70		12.4		190				
	5M	1740		67		16.6		190				
	12M	2090		132		508		340				
June 27	NW1-3M	2060	258	46	15	5.9	6.5	40				
	NW2-3M	1170	211	22	14	4.3	3.5	40				
	NW3-3M	786	189	11	14	2.3	2.3	40				
Sept. 24	NW1-3M	670	610	18	12	1.2	0.7					
	NW2-3M	370	260	8.2	5.5	<0.3	<0.3					
	NW3-3M	400	370	5.0	4.7	<0.3	<0.3					
Dec. 12	NW1-3M	260	240	5.8	8.1	<.3	<.3					
	NW3-3M	270	240	6.0	7.2	<.3	<.3					
	NW2-0	280	260	5.8	5.8	<.3	<.3					
	3M	280	280	5.8	5.6	<.3	<.3					
	15M	700	700	24.3	16.2	5.1	4.8					
	NW4-3M	240	240	5.2	6.9	<.3	<.3					
	NW5-0	140	120	6.4	6.2	<.3	<.3					
	3M	250	240	6.2	6.2	<.3	<.3					
	18M	670	650	15.0	11.4	2.4	1.8					
Sept. 24	At Causeway-0	90		6.4		<0.3						
	Bay behind -3M	350		5.5		<0.3						
	Stitt Island											

Lake: Schist Lake, N.W. Arm, Rose Creek

Date	Depth (m)	pH	Cond.	Cl mg/ℓ	SO_4 mg/ℓ	Na mg/ℓ	K mg/ℓ	Mg mg/ℓ	Ca mg/ℓ
May 30	0-TP	6.43	880	127	245	32.6	4.84	10.5	115
	0-Outlet	6.80	895	135	253	33.0	4.80	10.4	111
June 27	0-Outlet		832	118	235	30.1	4.52	8.21	101
Dec. 12	0-TP	6.63	1650	278	352	84.8	9.56	12.0	224

Date	Depth	Zn unf µg/ℓ	Zn f+a µg/ℓ	Cu unf µg/ℓ	Cu f+a µg/ℓ	Cd unf µg/ℓ	Cd f+a µg/ℓ	Mn unf µg/ℓ	Mn f+a µg/ℓ	Fe unf µg/ℓ	Fe f+a µg/ℓ	As unf µg/ℓ
May 30	0-TP*	6300		262		92		410				5.7
	0-Outlet	6220		223		95		410				5.2
June 27	0-Outlet	4250	4000	241	26	21.2	10.8	100				
Sept. 24	0-Outlet	4450	4340	222	150	<0.3	<0.3					
Oct. 14	0-TP	4200	3900	183	155	40	38					
Dec. 12	0-TP	2120	1610	640	189	33.0	26.0					

Lake: Schist, Northwest Arm, Schist Creek

Date	Depth (m)	pH	Cond.	Cl mg/ℓ	SO_4 mg/ℓ	Na mg/ℓ	K mg/ℓ	Mg mg/ℓ	Ca mg/ℓ
June 27	0-SC1	9.13	759	127	129	32.4	3.67	3.08	93.3
	3-SC2		650	107	105	27.4	3.31	2.14	79.3
Dec. 12	0-SC1	7.66	810	132	160	36.6	3.45	11.7	101

Date	Depth	Zn unf µg/ℓ	Zn f+a µg/ℓ	Cu unf µg/ℓ	Cu f+a µg/ℓ	Cd unf µg/ℓ	Cd f+a µg/ℓ	Mn unf µg/ℓ	Mn f+a µg/ℓ	Fe unf µg/ℓ	Fe f+a µg/ℓ
June 27	0-SC1	476	167	7	5	1.5	0.8	40			
	3-SC2	333	298	5	5	0.5	0.4	30			
Sept. 24	0-SC1	380	270	4.1	3.6	<0.3	<0.3				
Dec. 12	0-SC1	98	71	4.4	4.4	<0.3	<0.3				

Lake: Schist, West Arm

Date	Depth (m)	pH	Cond.	Cl mg/ℓ	SO_4 mg/ℓ	Na mg/ℓ	K mg/ℓ	Mg mg/ℓ	Ca mg/ℓ
June 27	W1-0		551	87.5	81	21.6	2.85	3.17	67.3
	W2-3M	8.11	562	90.0	86	22.5	2.87	3.76	68.0
	W3-3M		681	112	111	28.4	3.36	8.21	82.0
Dec. 12	W1-3M					27.3	2.84	10.8	77.1
	W2-0	7.50	690	114	118	29.3	3.02	11.4	86.2
	3M	7.56	670	112	131	28.3	2.96	10.7	85.2
	9M	6.79	705	121	139	30.8	3.14	11.2	92.1
	W3-3M	7.69	710	121	141	30.8	3.16	11.5	90.5
	W4-3M	7.37	845	150	177	37.9	3.59	11.8	106

Date	Depth	Zn unf µg/ℓ	Zn f+a µg/ℓ	Cu unf µg/ℓ	Cu f+a µg/ℓ	Cd unf µg/ℓ	Cd f+a µg/ℓ	Mn unf µg/ℓ	Mn f+a µg/ℓ	Fe unf µg/ℓ	Fe f+a µg/ℓ
June 27	St.3-3M	310	265	5	4	0.5	0.2	30			
Sept. 24	St.3-3M	190	150	5.5	3.4	<0.3	<0.3				
Dec. 12	St.W1-3M	15	13	1.4	2.2	<0.3	<0.3				
	W2-0	39	35	2.8	4.1	<0.3	<0.3				
	3M	25	19	2.2	2.5	<0.3	<0.3				
	9M	52	49	3.0	3.6	<0.3	<0.3				
	W3-3M	34	29	2.5	2.2	<0.3	<0.3				
	W4-3M	180	170	4.0	4.0	<0.3	<0.3				

*Transverse Plane

Table 1. 1975. Continued

Lake: Thompson

Date	Depth (m)	pH	Cond.	Cl mg/ℓ	SO_4 mg/ℓ	Na mg/ℓ	K mg/ℓ	Mg mg/ℓ	Ca mg/ℓ
June 27	Acid Mind Drainage		1400	7.4	63.0	1.84	1.34	7.70	13.3
Dec. 12	3M	7.78	120	0.8	10.8	2.05	1.30	4.14	15.4

Date	Depth	Zn unf µg/ℓ	Zn f+a µg/ℓ	Cu unf µg/ℓ	Cu f+a µg/ℓ	Cd unf µg/ℓ	Cd f+a µg/ℓ	Mn unf µg/ℓ	Mn f+a µg/ℓ	Fe unf µg/ℓ	Fe f+a µg/ℓ
June 27	Acid Mine Drainage	22		7		0.1				350	
Dec. 12	3M	<1	<1	9.1	10.2	<.3	<.3				

Lake: Whitehead

Date	Depth (m)	pH	Cond.	Cl mg/ℓ	SO_4 mg/ℓ	Na mg/ℓ	K mg/ℓ	Mg mg/ℓ	Ca mg/ℓ
June 27	1.5M		55	1.0	7.6	1.06	1.10	5.90	5.33

Lake 6:

Date	Depth (m)	pH	Cond.	Cl mg/ℓ	SO_4 mg/ℓ	Na mg/ℓ	K mg/ℓ	Mg mg/ℓ	Ca mg/ℓ
May 30	0	7.58							
Dec. 12	0	7.80	130	1.6	16.4	1.57	1.11	4.36	18.1
Dec. 12	3M	7.76	125	0.4	15.6	1.20	0.96	4.36	16.8

Date	Depth	Zn unf µg/ℓ	Zn f+a µg/ℓ	Cu unf µg/ℓ	Cu f+a µg/ℓ	Cd unf µg/ℓ	Cd f+a µg/ℓ	Mn unf µg/ℓ	Mn f+a µg/ℓ	Fe unf µg/ℓ	Fe f+a µg/ℓ
May 30	0	260	200	13	13	0.2	0.2				

Lake: 6, West Bay Stream

Date	Depth	Zn unf µg/ℓ	Zn f+a µg/ℓ	Cu unf µg/ℓ	Cu f+a µg/ℓ	Cd unf µg/ℓ	Cd f+a µg/ℓ	Mn unf µg/ℓ	Mn f+a µg/ℓ	Fe unf µg/ℓ	Fe f+a µg/ℓ
Sept. 11	0	106		7.4		<0.2					
Oct. 14	0	181	176	14	12	<0.3	<0.3				
Dec. 12	0	270	240	13.6	13.8	0.5	0.4				
Dec. 12	3M	260	240	13.8	13.3	<0.3	<0.3				

Lake: 6, South End Stream

Date	Depth	Zn unf µg/ℓ	Zn f+a µg/ℓ	Cu unf µg/ℓ	Cu f+a µg/ℓ	Cd unf µg/ℓ	Cd f+a µg/ℓ	Mn unf µg/ℓ	Mn f+a µg/ℓ	Fe unf µg/ℓ	Fe f+a µg/ℓ
Sept. 11	0	116		10		<0.2					

Table 1. 1975. Continued

Lake: 10

Date	Depth (m)	pH	Cond.	Cl mg/ℓ	SO_4 mg/ℓ	Na mg/ℓ	K mg/ℓ	Mg mg/ℓ	Ca mg/ℓ
June 27	3M		151	1.6	12.4	1.37	1.80	4.37	20.0

Date	Depth	Zn µg/ℓ		Cu µg/ℓ		Cd µg/ℓ		Mn µg/ℓ		Fe µg/ℓ	
		unf	f+a	unf	f+a	unf	f+a	unf	f+a	unf	f+a
June 27	3M	35	23	2	1	0.1	0.1			10	

Lake: 25

Date	Depth	Zn µg/ℓ		Cu µg/ℓ		Cd µg/ℓ		Mn µg/ℓ		Fe µg/ℓ	
		unf	f+a	unf	f+a	unf	f+a	unf	f+a	unf	f+a
July 14	0	150	140	9	12	0.2	0.2				

Lake: 27

Date	Depth	Zn µg/ℓ		Cu µg/ℓ		Cd µg/ℓ		Mn µg/ℓ		Fe µg/ℓ	
		unf	f+a	unf	f+a	unf	f+a	unf	f+a	unf	f+a
July 14	0	43	43	5	5	0.2	0.1				

Lake: 13

Date	Depth (m)	pH	Cond.	Cl mg/ℓ	SO_4 mg/ℓ	Na mg/ℓ	K mg/ℓ	Mg mg/ℓ	Ca mg/ℓ
June 27	3M		140	1.0	9.6	1.34	1.85	4.02	18.0

Table 1. 1976. Chemical analyses of water of selected lakes in the Flin Flon area.

Lake: Hamell

Date	Depth (m)	pH	Cond.	Cl mg/ℓ	SO_4 mg/ℓ	Na mg/ℓ	K mg/ℓ	Mg mg/ℓ	Ca mg/ℓ
6/2/76	0	7.22	130	4.6	18.2	1.91	1.86	3.95	20.8
	3M	7.23	120	3.8	17.2	1.51	1.68	3.55	18.0
9/4/76	0		70	2.4	10.0	1.04	0.93	1.91	7.67
	1M		110	3.2	15.8	1.43	1.39	3.24	15.1
	2M		130	3.8	17.5	1.61	1.64	3.67	17.2
	3M		130	3.6	16.8	1.62	1.57	3.67	17.3
	4M		130	3.8	17.8	1.67	1.63	3.95	16.6
	5M		140	3.8	18.8	1.78	1.75	4.02	17.4
7/6/76	0			3.2	14.0	1.31	1.33	3.05	14.3
	1M			3.2	14.2	1.32	1.31	3.05	14.1
	2M			3.2	14.2	1.34	1.23	3.11	14.0
	3M			3.2	14.2	1.31	1.25	3.00	14.0
	4M			3.3	14.2	1.35	1.23	3.05	14.1
	5M			3.2	14.2	1.34	1.25	3.00	13.5
9/8/76	0		100	2.6	15.2	1.36	1.51	3.09	14.7
	1M		100	3.2	14.2	1.31	1.44	2.92	13.8
	2M		100	3.2	13.8	1.28	1.34	2.98	14.6
	3M		100	3.2	13.6	1.30	1.48	2.98	13.9
	4M		100	3.6	13.4	1.33	1.40	2.98	13.9
	5M		100	3.2	13.4	1.30	1.48	2.98	13.9
12/10/76	0	7.5	110	3.2	13.8	1.34	1.34	2.78	14.8
	1M	7.5	110	3.2	14.0	1.36	1.34	2.92	14.7
	2M	7.5	110	3.0	14.0	1.28	1.34	2.92	14.7
	3M	7.6	110	3.0	14.0	1.29	1.34	2.64	14.1
	4M	7.6	110	3.0	13.8	1.29	1.36	2.78	14.5
	5M	7.6	110	3.0	13.8	1.29	1.23	2.69	14.8
9/12/76	0	7.49	120	5.4	17.4	2.30	1.51	3.99	19.6
	1M	7.56	120	3.4	17.4	1.56	1.39	3.34	16.5
	2M	7.58	120	3.0	16.8	1.37	1.30	3.19	16.1
	3M	7.50	120	3.0	17.0	1.33	1.32	3.15	15.9
	4M	7.47	130	3.0	17.2	1.32	1.32	3.10	16.2
	5M	7.35	120	-	-	1.30	1.32	3.10	15.8

Date	Depth	Zn unf µg/ℓ	Zn f+a µg/ℓ	Cu unf µg/ℓ	Cu f+a µg/ℓ	Cd unf µg/ℓ	Cd f+a µg/ℓ	Mn unf µg/ℓ	Mn f+a µg/ℓ	Fe unf µg/ℓ	Fe f+a µg/ℓ	As unf µg/ℓ
6/2/76	0	250	250	<10	<10	<3	<3	13.6	8.9	<30	<30	6.0
	3M	270	270	<10	<10	<3	<3	14.4	11.9	<30	<30	6.2
9/4/76	0	1140	1160	27	27	4.6	4.6	13	10	48	17	
	1M	530	500	14	14	2.4	1.5	26	18	36	14	
	2M	320	310	11	12	0.5	0.4	43	19	38	40	
	3M	330	320	12	11	0.5	0.6	103	72	82	42	
	4M	260	250	12	9.5	0.4	0.3	185	130	157	74	
	5M	250	230	8.1	9.5	1.4	0.4	161	143	157	59	
7/6/76	0M	200	190	13	15	0.6	0.9	25	3.7	46	37	
	1M	300	190	19	11	1.0	1.0	26	4.5	129	62	
	2M	230	180	15	8.9	0.6	0.7	27	3.5	58	36	
	3M	230	180	12	8.3	0.9	1.8	26	3.7	69	20	
	4M	220	160	15	9.4	0.6	0.6	25	3.2	103	45	
	5M	220	180	11	8.6	1.1	1.4	25	4.4	52	26	
9/8/76	0	142	99	11	9.7	0.2	<0.2	31	1.8			
	1M	146	110	11	8.2	0.2	<0.2	26	1.8			
	2M	142	102	8.8	8.2	0.2	0.2	26	1.8			
	3M	139	113	11	7.7	0.2	0.2	29	1.8			
	4M	142	110	10	7.7	0.1	0.2	28	1.1			
	5M	142	110	9.9	8.8	0.1	0.2	30	1.1			

Table 1. 1976. Continued

Lake: Hamell

Date	Depth	Zn unf µg/ℓ	Zn f+a µg/ℓ	Cu unf µg/ℓ	Cu f+a µg/ℓ	Cd unf µg/ℓ	Cd f+a µg/ℓ	Mn unf µg/ℓ	Mn f+a µg/ℓ	Fe unf µg/ℓ	Fe f+a µg/ℓ
12/10/76	0	153	126	11.3	10.1	0.2	0.2	17.7	-		
	1M	168	131	10.1	9.5	0.2	0.1	19.2	1.5		
	2M	149	120	9.5	8.9	0.1	0.1	18.2	-		
	3M	150	123	12.5	10.7	0.2	0.1	62.1	1.4		
	4M	144	116	13.7	8.9	0.1	0.1	19.0	3.8		
	5M	144	114	12.5	7.7	0.1	0.1	18.6	8.4		
9/12/76	0	225	190	15.6	13.8	0.69	0.49	11.8	4.5	33	16
	1M	268	211	13.8	12.0	0.60	0.66	11.3	2.9	45	35
	2M	225	211	14.4	13.5	0.47	0.55	11.0	1.0	39	22
	3M	211	197	13.8	12.0	0.47	0.42	11.7	0.8	38	24
	4M	225	197	12.6	13.3	0.42	0.52	12.1	1.0	31	21
	5M	254	246	12.9	14.1	0.60	0.27	18.2	3.2	40	20

Lake: Cliff

Date	Depth (m)	pH	Cond.	Cl mg/ℓ	SO_4 mg/ℓ	Na mg/ℓ	K mg/ℓ	Mg mg/ℓ	Ca mg/ℓ
Aug. 9	3M		120	2.0	14.4	1.78	1.51	3.97	16.2

Date	Depth	Zn unf µg/ℓ	Zn f+a µg/ℓ	Cu unf µg/ℓ	Cu f+a µg/ℓ	Cd unf µg/ℓ	Cd f+a µg/ℓ	Mn unf µg/ℓ	Mn f+a µg/ℓ	Fe unf µg/ℓ	Fe f+a µg/ℓ
Aug. 9	3M	124	95	11	8.6	0.4	0.8	5.4	1.4		

Lake: Hook

Date	Depth (m)	pH	Cond.	Cl mg/ℓ	SO_4 mg/ℓ	Na mg/ℓ	K mg/ℓ	Mg mg/ℓ	Ca mg/ℓ
Aug. 9	3M		230	3.2	15.6	2.35	1.48	7.73	38.8

Date	Depth	Zn unf µg/ℓ	Zn f+a µg/ℓ	Cu unf µg/ℓ	Cu f+a µg/ℓ	Cd unf µg/ℓ	Cd f+a µg/ℓ	Mn unf µg/ℓ	Mn f+a µg/ℓ	Fe unf µg/ℓ	Fe f+a µg/ℓ
Aug. 9	3M	44	29	3.8	3.2	0.6	0.6	11	<0.1		

Lake: Nesootao

Date	Depth (m)	pH	Cond.	Cl mg/ℓ	SO_4 mg/ℓ	Na mg/ℓ	K mg/ℓ	Mg mg/ℓ	Ca mg/ℓ
Aug. 9	3M		70	0.8	12.2	1.67	1.31	2.37	10.0

Date	Depth	Zn unf µg/ℓ	Zn f+a µg/ℓ	Cu unf µg/ℓ	Cu f+a µg/ℓ	Cd unf µg/ℓ	Cd f+a µg/ℓ	Mn unf µg/ℓ	Mn f+a µg/ℓ	Fe unf µg/ℓ	Fe f+a µg/ℓ
Aug. 9	3M	80	55	7.0	7.0	0.3	0.2	14	3.1		
Oct. 12	3M	20	16	4.8	4.8	0.2	0.1	21.3	1.6		

Table 1. 1976. Continued

Lake: Schist; N.W. Arm

Date	Depth (m)	pH	Cond.	Cl mg/ℓ	SO_4 mg/ℓ	Na mg/ℓ	K mg/ℓ	Mg mg/ℓ	Ca mg/ℓ
9/4/76	0		340	69.5	53.0	13.3	1.58	6.08	38.9
	3M		930	188	191	41.9	4.78	12.5	120
	6M		1090	218	228	49.3	5.53	12.6	134
	9M		1180	245	259	58.3	6.30	13.3	153
	12M		1820	432	412	96.9	9.82	13.7	257
	15M		1860	436	412	98.9	9.85	15.6	240
7/6/76	1.5M			173	204	45.1	3.86	12.3	117
	4.5M			169	196	43.4	3.90	12.7	119
	7.5M			175	206	45.6	4.06	11.9	128
	10.5M			180	212	45.8	4.15	11.8	126
	13.5M			182	211	46.7	4.11	11.9	125
9/8/76	1.5M		840	157	147	37.4	4.26	10.9	106
	4.5M		860	155	150	38.1	4.02	11.8	114
	7.5M		880	160	150	39.3	4.66	11.6	109
	10.5M		900	166	157	51.7	4.90	11.6	119
	13.5		960	287	212	43.3	4.93	11.8	121
12/10/76	1.5M	7.4	860	144	182	38.7	4.41	11.9	112
	4.5M	7.4	860	144	182	36.9	4.41	10.6	112
	7.5M	7.4	860	147	184	37.8	4.71	11.0	114
	10.5M	7.4	860	147	183	36.9	4.41	10.8	114
	13.5M	-	870	149	185	36.9	4.71	11.4	112
9/12/76	1.5M	7.71	850	176	9.8	3.67	3.77	11.2	110
	4.5M	7.61	870	177	9.2	38.1	3.93	11.6	115
	7.5M	-	-	-	-	39.7	4.06	10.7	99
	10.5M	7.33	980	263	263	42.7	4.33	10.6	132
	13.5M	6.80	1370	176	176	62.2	6.50	12.0	190

Date	Depth	Zn µg/ℓ		Cu µg/ℓ		Cd µg/ℓ		Mn µg/ℓ		Fe µg/ℓ	
		unf	f+a	unf	f+a	unf	f+a	unf	f+a	unf	f+a
9/4/76	0	1970	1970	23	18	3.7	7.3	21	19	61	17
	3M	390	380	12	17	0.7	0.3	52	29	40	28
	6M	830	800	27	22	2.0	1.6	155	140	36	18
	9M	630	210	29	4.3	1.5	0.2	257	252	120	56
	12M	620	12	71	10	4.0	0.4	171	160	174	158
	15M	570	7	62	7.1	5.4	0.2	277	273	146	90
7/6/76	1.5M	480	280	14	12	1.4	-	103	40	68	26
	4.5M	580	380	8.1	8.6	0.7	0.4	86	16	46	44
	7.5M	770	640	13	8.1	0.7	0.4	106	4.8	69	23
	10.5M	730	590	11	5.9	0.6	0.4	160	12	78	31
	13.5M	630	510	8.6	8.1	18	4	460	197	61	59
9/8/76	1.5M	1300	460	27	10	2.5	0.6	136	48		
	4.5M	1140	960	19	8.6	2.5	0.8	93	36		
	7.5M	880	540	14.0	4.0	2.0	0.9	212	183		
	10.5M	1100	80	17	2.9	2.4	0.3	840	800		
	13.5M	1020	60	16	4.1	1.6	1.0	560	600		

Table 1. 1976. Continued

Lake: Schinz; N.W. Arm

Date	Depth	Zn unf µg/ℓ	Zn f+a µg/ℓ	Cu unf µg/ℓ	Cu f+a µg/ℓ	Cd unf µg/ℓ	Cd f+a µg/ℓ	Mn unf µg/ℓ	Mn f+a µg/ℓ	Fe unf µg/ℓ	Fe f+a µg/ℓ
12/10/76	1.5M	332	204	10.7	5.4	0.3	0.1	128	6		
	4.5M	318	197	8.9	4.2	0.3	0.1	134	1.9		
	7.5M	318	197	8.9	3.6	0.3	0.2	421	2.3		
	10.5M	321	197	13.1	3.6	0.4	0.4	138	1.8		
	13.5M	336	208	10.1	6.0	0.6	0.5	145	2.2		
9/12/76	1.5M	225	225	7.5	7.8	0.3	0.22	50.0	44.7	36	16
	4.5M	366	331	9.0	8.5	0.15	0.20	37.1	19.7	27	18
	7.5M	732	669	14.0	16.8	0.62	0.55	45.3	4.2	49	42
	10.5M	1060	979	16.5	9.8	0.96	0.64	240	160	101	50
	13.5M	2040	1970	47.6	9.2	4.3	2.9	520	480	166	51

Lake: Thompson

Date	Depth (m)	pH	Cond.	Cl mg/ℓ	SO_4 mg/ℓ	Na mg/ℓ	K mg/ℓ	Mg mg/ℓ	Ca mg/ℓ
6/2/76	0	7.48	130	0.6	12.0	2.15	1.43	5.08	17.8
	3M	7.45	120	1.2	11.0	2.03	1.27	4.84	15.2
9/4/76	1M		120	1.0	10.8	2.09	1.32	4.66	16.1
	3M		130	0.8	11.0	2.09	1.18	4.87	16.8
	4M		130	0.8	11.2	2.21	1.30	5.01	16.6
	4.5M		130	1.0	11.2	2.22	1.33	4.87	16.8
7/6/76	0			1.2	8.6	1.86	1.13	4.56	16.6
	2M			0.6	9.6	1.82	1.11	4.45	15.2
	4M			0.8	9.2	1.83	1.11	4.35	15.2
	6M			1.0	9.0	1.79	1.07	4.66	14.9
	8M			1.0	8.6	1.82	1.07	4.25	14.7
	9M			1.2	8.4	1.87	1.11	4.25	14.6
9/8/76	0		110	1.0	8.4	1.94	1.31	4.46	15.3
	2M		110	1.4	5.6	1.93	1.34	4.38	14.7
	4M		110	1.2	8.6	1.94	1.24	4.24	14.5
	6M		110	1.2	8.4	1.88	1.28	4.24	14.9
	8M		120	1.4	7.6	1.91	1.31	4.41	15.9
	10M		120	1.4	7.4	1.91	1.34	4.46	15.3
12/10/76	0	8.3	120	1.6	9.0	2.06	1.17	4.05	17.4
	2M	7.9	120	1.0	8.8	1.85	1.17	4.01	16.1
	4M	7.7	120	1.0	8.8	1.87	1.21	4.15	15.6
	6M	7.7	120	0.8	8.6	1.82	1.21	4.10	15.3
	8M	7.8	110	0.8	8.6	1.82	1.19	4.01	15.9
	10M	-	110	0.4	8.6	1.80	1.17	4.15	15.3
9/12/76	0	7.44	130	0.4	-	2.13	1.39	4.46	18.7
	2M	7.75	120	0.8	-	1.90	1.22	4.32	15.7
	4M	7.59	120	0.8	-	1.81	1.19	4.42	15.6
	6M	7.49	120	0.6	-	1.85	1.19	4.32	16.0
	8M	7.37	120	1.0	-	1.85	1.17	4.46	16.8
	10M	7.41	130	0.8	-	1.90	1.24	4.42	15.9

Table 1. 1976. Continued

Lake: Thompson

Date	Depth	Zn unf µg/ℓ	Zn f+a µg/ℓ	Cu unf µg/ℓ	Cu f+a µg/ℓ	Cd unf µg/ℓ	Cd f+a µg/ℓ	Mn unf µg/ℓ	Mn f+a µg/ℓ	Fe unf µg/ℓ	Fe f+a µg/ℓ
6/2/76	0	<8	<8	<10	<10	<3	<3	1.9	1.9	<30	<30
	3M	<8	<8	<10	<10	<3	<3	2.2	0.8	<30	<30
9/4/76	1M	32	31	13	10	0.2	0.2	3.5	2.8	119	18
	3M	4.1	5.3	9.5	9.5	0.2	0.5	5.8	2.2	40	45
	4M	10	6.2	8.8	12	0.1	0.1	12	8.5	54	40
	4.5M	4.4	5.2	8.8	10	0.1	0.1	17	8.9	66	36
7/6/76	0	40	13	13	13	0.5	1.2	14	1.1	69	18
	2M	61	51	17	14	0.2	0.5	18	1.4	80	21
	4M	19	15	15	11	0.2	0.4	15	1.2	74	23
	6M	<10	<10	13	13	0.4	0.4	24	1.7	92	45
	8M	20	13	17	12	0.3	0.3	111	44	93	24
	9M	29	13	30	7.5	0.8	0.5	193	66	2110	49
9/8/76	0	11	7	20	14	<.1	<.1	30	<1		
	2M	29	18	30	17	<.1	<.1	34	2.3		
	4M	15	15	20	14	<.1	<.1	41	<1		
	6M	11	11	15	18	<.1	<.1	125	5.6		
	8M	15	11	18	12	<.1	<.1	700	600		
	10M	13	11	13	11	<.3	<.1	1180	1140		
12/10/76	0	36	20	8.9	8.3	<.05	<.05	30	6.7		
	2M	51	30	8.9	8.3	<0.05	<.05	37.9	0.8		
	4M	95	40	10.7	8.3	<.05	<.05	245	4.4		
	6M	21	15	10.1	8.9	<.05	<.05	266	7.2		
	8M	12	15	8.9	8.9	<.05	<.05	51.7	1.0		
	10M	14	12	10.7	8.9	<.05	<.05	30	1.6		
9/12/76	0	29	29	15.8	18.6	<0.2	<0.2	11.6	9.5	78	42
	2M	42	29	19.8	22.6	<0.2	<0.2	11.8	6.0	133	31
	4M	32	26	28.7	14.9	<0.2	<0.2	26.8	15.5	59	32
	6M	32	26	15.2	13.7	<0.2	<0.2	27.1	20.5	74	41
	8M	32	26	18.9	13.7	<0.2	<0.2	160	140	123	53
	10M	29	29	13.4	14.0	<0.2	<0.2	280	280	161	99

Lake: 6

Date	Depth (m)	pH	Cond.	Cl mg/	SO_4 mg/	Na mg/	K mg/	Mg mg/	Ca mg/
Aug. 9	3M		100	1.4	11.8	0.97	0.91	3.64	15.0

Date	Depth	Zn unf µg/ℓ	Zn f+a µg/ℓ	Cu unf µg/ℓ	Cu f+a µg/ℓ	Cd unf µg/ℓ	Cd f+a µg/ℓ	Mn unf µg/ℓ	Mn f+a µg/ℓ	Fe unf µg/ℓ	Fe f+a µg/ℓ
Aug. 9	3M	223	190	10	10	0.3	0.6	11	5.8		

Table 1 cont: Chemical analyses of water of selected lakes in the Flin Flon area, 1977.

Lake: Cliff

Date	Depth (m)	pH	Cond.	Cl mg/ℓ	SO_4 mg/ℓ	Na mg/ℓ	K mg/ℓ	Mg mg/ℓ	Ca mg/ℓ
5/8/77	3M		120	1.6	14.4	1.88	1.35	3.54	15.4

Date	Depth	Zn unf µg/ℓ	Zn f+a µg/ℓ	Cu unf µg/ℓ	Cu f+a µg/ℓ	Cd unf µg/ℓ	Cd f+a µg/ℓ	Mn unf µg/ℓ	Mn f+a µg/ℓ	Fe unf µg/ℓ	Fe f+a µg/ℓ
5/8/77	3M	133	110	15	14	0.4	0.4	11	2.9	25	11

Lake: Hook

Date	Depth (m)	pH	Cond.	Cl mg/ℓ	SO_4 mg/ℓ	Na mg/ℓ	K mg/ℓ	Mg mg/ℓ	Ca mg/ℓ
5/8/77	3M		280	2.6	14.8	2.92	1.25	6.99	36.2

Date	Depth	Zn unf µg/ℓ	Zn f+a µg/ℓ	Cu unf µg/ℓ	Cu f+a µg/ℓ	Cd unf µg/ℓ	Cd f+a µg/ℓ	Mn unf µg/ℓ	Mn f+a µg/ℓ	Fe unf µg/ℓ	Fe f+a µg/ℓ
5/8/77	3M	44	33	9.0	9.0	<0.2	<0.2	13	2.2	14	5

Lake: Hamell

Date	Depth	pH	Cond.	Cl mg/ℓ	SO_4 mg/ℓ	Na mg/ℓ	K mg/ℓ	Mg mg/ℓ	Ca mg/ℓ
7/2/77	0	6.93	130	4.8	18.6	2.00	1.62	3.81	19.8
	1M	6.92	130	4.0	17.4	1.72	1.58	3.65	18.5
	2M	6.92	130	3.6	16.8	1.62	1.52	3.50	18.4
	3M	6.88	130	3.6	16.8	1.61	1.45	3.50	18.0
	4M	6.85	130	4.2	16.6	1.59	1.47	3.45	18.3
	5M	6.75	120	3.6	16.0	1.59	1.49	3.24	17.0
28/3/77	0	4.0		4.0	16.2	1.75	1.69	3.52	18.5
	.9M			4.0	17.0	1.63	1.65	3.33	18.9
	1M			4.0	16.8	1.65	1.69	3.28	18.2
	1.1M			4.0	16.4	1.63	1.71	3.28	18.0
	1.2M			3.4	16.8	1.61	1.61	3.33	18.8
	1.3M			3.6	16.4	1.59	1.59	3.28	18.3
	1.4M			3.6	16.4	1.58	1.55	3.37	18.0
	1.5M			3.6	16.2	1.59	1.61	3.23	18.1
	2M			3.4	16.4	1.56	1.61	3.28	17.9
	Ice			<0.2	<0.2	<0.02	<0.02	0.08	0.25
	Snow			0.8	4.2	0.09	0.02	0.23	0.96
7/4/77	0			5.4	17.6	2.12	1.83	3.25	21.5
	1M			4.4	16.4	1.41	1.60	3.12	18.4
	2M			4.0	17.8	1.44	1.56	3.08	18.1
	3M			3.8	17.0	1.35	1.54	3.25	17.7
	4M			4.2	16.0	1.39	1.56	3.16	17.7
	5M			4.2	15.4	1.39	1.62	3.34	18.2

Table 1. 197 Continued

Lake: Hamall

Date	Depth (m)	pH	Cond.	Cl mg/ℓ	SO_4 mg/ℓ	Na mg/ℓ	K mg/ℓ	Mg mg/ℓ	Ca mg/ℓ
12/4/77	0			1.4	4.0	0.49	0.38	0.94	3.94
	.9M			3.6	16.2	1.33	1.94	3.12	17.4
	1M			3.6	17.0	1.36	1.56	3.21	17.8
	1.1M			3.6	16.8	1.36	1.87	3.08	17.8
	1.2M			3.8	17.0	1.36	1.56	3.21	17.7
	1.3M			3.6	17.0	1.35	1.52	3.21	17.6
	1.4M			3.6	16.8	1.36	1.56	3.25	17.8
	1.5M			3.6	16.8	1.57	1.56	3.08	17.4
	2M			3.4	16.6	1.33	1.56	3.03	17.1
	3M			3.6	15.8	1.32	1.54	3.16	17.4
14/4/77	0			0.2	0.2	0.09	<0.02	0.04	0.05
	.8M			1.4	5.8	0.45	0.48	1.08	6.14
	.9M			3.4	15.6	1.29	1.47	2.90	16.6
	1M			3.8	16.0	1.30	1.47	2.95	16.9
	1.1M			4.0	16.4	1.35	1.52	3.08	17.7
	1.2M			4.2	16.4	1.36	1.54	3.08	17.7
	1.3M			4.2	16.4	1.38	1.56	3.16	17.5
	1.4M			4.0	16.0	1.39	1.54	3.08	17.1
	1.5M			4.0	16.2	1.35	1.52	3.03	17.5
	2M			4.0	16.2	1.33	1.52	2.99	16.9
	3M			3.2	16.4	1.39	1.49	3.16	17.5
6/5/77	0			3.2	12.0	1.41	1.37	2.80	14.7
	1M			3.0	12.2	1.21	1.28	2.53	15.0
	2M			3.0	12.4	1.23	1.37	2.58	15.0
	3M			3.0	12.2	1.23	1.31	2.76	14.8
	4M			2.8	12.6	1.23	1.33	2.80	14.5
	5M			3.0	12.6	1.21	1.28	2.80	14.6
1/6/77	0			3.6	12.0	-	1.22	3.75	12.9
	1M			3.4	12.2	1.42	1.22	2.70	13.0
	2M			3.4	12.4	1.32	1.22	2.67	12.2
	3M			3.4	12.6	1.29	1.24	2.70	12.6
	4M			3.4	12.2	1.24	1.24	2.67	12.3
	5M			3.8	12.2	1.24	1.24	2.67	12.1
5/8/77	0		100	3.0	12.4	1.44	1.21	2.36	13.6
	1M		100	3.0	12.6	1.38	1.19	2.60	14.6
	2M		100	3.0	12.8	1.44	1.19	2.55	14.4
	3M		100	3.0	12.8	1.46	1.23	2.55	14.6
	4M		100	3.2	12.6	1.53	1.19	2.41	14.4
	5M		100	3.2	12.6	1.59	1.21	2.41	14.6

Date	Depth	Zn unf µg/ℓ	Zn f+a µg/ℓ	Cu unf µg/ℓ	Cu f+a µg/ℓ	Cd unf µg/ℓ	Cd f+a µg/ℓ	Mn unf µg/ℓ	Mn f+a µg/ℓ	Fe unf µg/ℓ	Fe f+a µg/ℓ	Pb unf µg/ℓ
28/3/77	0	374	346	17	14	0.7	0.7	5.2	5.2	52	85	2.4
	.9M	353	329	12	13	1.3	1.3	7.9	3.2	41	54	6.0
	1M	367	311	18	12	1.5	1.3	4.8	3.5	46	76	6.0
	1.5M	361	333									<1
	2M	356	311									<1
	Ice	31	24	4.9	3.0	0.5	1.0	3.2	1.2	130	16	1.0
	Snow	11100	2850	482	32	36	29	61	14	15500	103	153
7/4/77	0	386	371	14	17	0.8	1.0	5.3	3.5	59	38	
	1M	343	317	15	15	0.7	0.7	-	19	46	42	
	2M	323	303	14	16	0.7	0.6	6.8	3.8	47	38	
	3M	331	317	12	16	0.7	0.6	17	8.1	52	44	
	4M	346	334	12	14	0.6	0.5	55	26	74	54	
	5M	314	320	9.0	14	0.5	0.5	226	175	139	116	

Lake: Hamell

Table 1. 1977. Continued

Date	Depth	Zn unf µg/l	Zn f+a µg/l	Cu unf µg/l	Cu f+a µg/l	Cd unf µg/l	Cd f+a µg/l	Mn unf µg/l	Mn f+a µg/l	Fe unf µg/l	Fe f+a µg/l	Pb unf µg/l	Pb f+a µg/l
12/4/77	0	734	660	16	14	5.3	4.5	6.4	4.6	57	29	8.9	4.7
	.9M	367	339	14	14	0.7	1.1	4.3	3.7	45	39	<1.1	<1
	1M	330	303	15	15	0.4	0.5	4.2	3.3	40	41	<1	<1
	1.1M	356	328			0.5	0.4					<1	<1
	1.2M	361	344			0.4	0.5					<1	<1
	1.3M	356	328			0.6	0.5					<1	<1
	1.4M	356	333			0.6	0.5					<1	<1
	1.5M	356	350			0.5	0.4					<1	<1
	2M	361	350			0.6	0.6					<1	<1
	3M	378	361			0.5	0.5					<1	<1
14/4/77	0	258	196	12	7.7	1.0	1.2	3.1	2.5	62	56	9.1	3.2
	.8M	635	596	12	11	2.2	2.2	8.7	8.2	44	33	9.7	8.9
	.9M	481	442	12	12	0.8	1.2	32	32	42	-	2.3	<1
	1M	446	415	15	12	0.8	0.7	39	30	45	34	<1	<1
	1.1M	389	361			0.5	0.5					<1	<1
	1.2M	389	356			0.7	0.6					<1	<1
	1.3M	383	356			0.6	0.6					<1	<1
	1.4M	383	356			0.7	0.6					<1	<1
	1.5M	389	361			0.6	0.5					<1	<1
	2M	378	344			0.6	0.5					<1	<1
	3M	383	350			0.6	0.5					<1	<1
	Runoff #1	1610		68		6.6		120		892		6.0	
	#2	385		28		2.0		78		908		6.4	
	#3	1380		57		4.9		100		1690		6.4	

Date	Depth	Zn unf µg/l	Zn f+a µg/l	Cu unf µg/l	Cu f+a µg/l	Cd unf µg/l	Cd f+a µg/l	Mn unf µg/l	Mn f+a µg/l	Fe unf µg/l	Fe f+a µg/l
6/5/77	0	394	326	11	9.6	0.9	0.9	80	46	97	48
	1M	371	326	11	11	0.9	0.9	85	42	108	56
	2M	371	330	11	10	0.9	0.8	85	40	103	54
	3M	364	330	11	12	0.9	0.8	80	38	70	48
	4M	367	326	12	10	0.9	1.0	85	35	108	43
	5M	360	318	11	12	0.9	1.4	83	41	114	54
1/6/77	0	304	256	30	30	0.5	0.5	52	29	49	38
	1M	300	248	12	23	0.5	0.5	50	15	49	33
	2M	296	256	10	22	0.6	0.5	53	13	49	38
	3M	296	244	10	22	0.5	0.5	51	12	67	42
	4M	304	244	11	22	0.4	0.4	53	11	49	42
	5M	311	252	10	20	0.4	0.4	50	11	49	43
5/8/77	0	166	129	16	13	<0.3	1	23	4.8	42	17
	1M	161	142	12	12	<0.2	0.7	24	4.7	40	16
	2M	166	156	12	11	<0.2	0.6	23	4.6	39	26
	3M	166	147	11	9.8	<0.2	1.1	22	4.6	42	18
	4M	156	133	9.8	9.8	<0.2	0.6	23	3.8	39	15
	5M	170	133	10	9.8	<0.2	0.4	23	3.8	47	17

Lake: Nesootae

Date	Depth (m)	pH	Cond.	Cl mg/l	SO_4 mg/l	Na mg/l	K mg/l	Mg mg/l	Ca mg/l
5/8/77	3M		80	1.4	10.8	1.79	1.06	1.94	10.1

Date	Depth	Zn unf µg/l	Zn f+a µg/l	Cu unf µg/l	Cu f+a µg/l	Cd unf µg/l	Cd f+a µg/l	Mn unf µg/l	Mn f+a µg/l	Fe unf µg/l	Fe f+a µg/l
5/8/77	3M	42	34	11	9	0.2	0.2	21	3.4	18	12

Table 1. 1977. Continued

Lake: Schist; N.W. Arm

Date	Depth (m)	pH	Cond.	Cl mg/ℓ	SO_4 mg/ℓ	Na mg/ℓ	K mg/ℓ	Mg mg/ℓ	Ca mg/ℓ
7/2/77	1.5M	7.32	830	149	175	38.2	4.42	16.2	122
	4.5M	7.32	890	155	190	39.8	4.53	13.1	126
	7.5M	7.23	890	158	190	39.8	4.53	15.7	120
	10.5M	6.78	1110	195	252	49.3	5.26	13.1	152
	13.5M	6.30	1690	305	418	84.3	8.63	13.4	262
7/4/77	0			127	156	30.1	4.21	11.7	99.5
	1.5M			129	162	30.2	4.25	12.1	105
	4.5M			189	189	36.3	4.59	11.3	121
	7.5M			210	185	40.8	4.93	11.3	136
	10.5M			307	338	63.9	7.66	13.0	238
	13.5M			463	455	97.2	9.26	14.1	2.99
1/6/77	1.5M			154	162	35.0	5.16	10.6	102
	4.5M			160	156	35.0	5.16	11.5	112
	7.5M			164	165	35.0	5.45	12.2	115
	10.5M			212	227	47.4	6.31	11.7	138
	13.5M			330	396	80.3	9.74	13.7	232
5/8/77	1.5M		880	129	200	41.1	4.14	10.5	135
	4.5M		880	132	200	42.3	4.20	10.3	131
	7.5M		780	147	191	44.6	4.05	10.3	128
	10.5M		960	160	201	48.4	4.46	10.8	139
	13.5M		1270	224	273	67.1	5.57	12.0	181

Date	Depth	Zn unf µg/ℓ	Zn f+a µg/ℓ	Cu unf µg/ℓ	Cu f+a µg/ℓ	Cd unf µg/ℓ	Cd f+a µg/ℓ	Mn unf µg/ℓ	Mn f+a µg/ℓ	Fe unf µg/ℓ	Fe f+a µg/ℓ
7/2/77											
7/4/77	0	343	248	22	10	0.3	<0.2	23	30	86	34
	1.5M	308	260	6.8	8.8	<0.2	0.4	21	27	53	96
	4.5M	724	638	8.3	7.8	0.8	0.9	492	26	49	41
	7.5M	858	819	11	8.3	0.9	0.9	38	166	88	28
	10.5M	968	32	16	4.2	1.1	0.5	984	952	648	566
	13.5M	346	39	5.2	3.1	2.9	0.5	150	142	275	264
1/6/77	1.5M	662	68	15	28	0.6	0.2	109	82	65	47
	4.5M	699	113	16	26	0.5	0.2	109	90	65	59
	7.5M	902	459	16	22	0.6	0.4	145	40	81	32
	10.5M	669	241	11	16	0.9	0.3	300	234	162	38
	13.5M	436	30	6.0	4.9	1.5	0.4	278	278	508	411
5/8/77	1.5M	823	510	18	12	1.1	0.8	83	22	52	14
	4.5M	749	478	17	8.8	0.9	0.7	67	33	50	17
	7.5M	805	593	18	8.4	0.9	0.6	83	18	47	13
	10.5M	570	55	19	12	0.4	<0.2	494	378	198	84
	13.5M	317	46	16	9.8	0.4	<0.2	633	600	375	273

Table 1. 1977 Continued

Lake: Thompson

Date	Depth (m)	pH	Cond.	Cl mg/ℓ	SO_4 mg/ℓ	Na mg/ℓ	K mg/ℓ	Mg mg/ℓ	Ca mg/ℓ
7/2/77	0	7.15	140	1.2	10.6	2.37	1.39	4.84	19.1
	2M	7.12	430	1.0	10.0	2.20	1.28	4.68	18.3
	4M	7.08	130	1.0	9.8	2.23	1.24	4.58	17.5
	6M	6.88	130	1.2	9.2	2.25	1.31	4.68	17.4
	8M	6.86	130	1.2	9.2	2.12	1.26	4.74	17.8
	10M	7.06	120	1.2	9.8	2.15	1.26	4.79	17.5
28/3/77	0			1.0	10.2	2.28	1.42	4.58	18.9
	.8M			1.0	10.2	2.30	1.42	4.48	18.2
	.9M			1.0	10.4	2.25	1.44	4.58	18.3
	1M			1.0	10.2	2.25	1.46	4.34	17.8
	1.1M			1.0	10.2	2.21	1.44	4.53	18.1
	1.2M			1.2	9.8	2.19	1.44	4.43	17.9
	1.3M			1.2	9.8	2.32	1.40	4.48	17.8
	1.4M			1.2	9.8	2.18	1.38	4.48	18.0
	1.5M			0.8	9.8	2.16	1.65	4.48	17.5
	2M			1.0	9.6	2.12	1.30	4.39	17.3
	3M			1.0	9.4	2.09	1.34	4.39	17.4
	Ice			<0.2	<0.2	0.04	<0.02	0.25	0.10
7/4/77	0			1.6	9.8	2.12	1.47	5.50	18.2
	1M			1.4	10.0	1.97	1.45	4.16	18.0
	2M			1.4	9.2	2.03	1.37	4.25	17.4
	4M			1.4	8.6	1.84	1.31	4.07	16.8
	6M			1.4	8.6	1.85	1.33	4.33	17.4
	8M			1.4	8.2	1.96	1.35	4.29	17.4
	10M			1.4	7.6	1.93	1.37	4.38	18.3
13/4/77	0			3.4	5.2	2.47	1.37	1.95	8.26
	.8M			1.2	9.0	1.60	1.20	3.38	14.9
	.9M			1.0	9.4	1.79	1.31	3.86	16.6
	1M			1.2	9.6	1.78	1.31	3.90	16.7
	1.1M			1.0	9.6	1.81	1.35	3.77	17.0
	1.2M			1.0	9.4	1.81	1.33	3.94	16.9
	1.3M			1.0	9.6	1.81	1.33	4.12	17.3
	1.4M			1.0	9.6	1.81	1.35	3.94	17.1
	1.5M			0.8	9.8	1.82	1.33	3.90	17.3
	2M			1.0	9.4	1.81	1.37	4.25	17.1
	3M			1.0	9.2	1.79	1.31	3.90	16.5
14/4/77	0			1.4	<0.2	0.79	0.42	0.04	0.25
	.8M			1.2	8.0	1.70	1.16	3.29	15.9
	.9M			1.2	8.8	1.84	1.24	3.73	16.3
	1M			1.2	8.8	1.81	1.22	4.03	16.3
	1.1M			1.2	8.8	1.79	1.24	4.07	16.4
	1.2M			1.2	9.0	2.02	1.28	4.07	16.6
	1.3M			1.2	8.8	1.78	1.26	3.86	16.3
	1.4M			1.2	8.6	1.76	1.26	3.99	16.7
	1.5M			1.2	8.6	1.75	1.24	4.12	16.5
	2M			1.0	9.0	1.76	1.24	3.99	16.6
	3M			1.2	9.0	1.78	1.28	3.90	16.7

Lake: Thompson

Table 1. 1977. Continued

Date	Depth (m)	pH	Cond.	Cl mg/ℓ	SO_4 mg/ℓ	Na mg/ℓ	K mg/ℓ	Mg mg/ℓ	Ca mg/ℓ
6/5/77	0			0.6	8.2	1.81	1.18	4.09	15.7
	1M			0.8	7.8	1.81	1.18	3.91	15.2
	2M			0.6	8.0	1.81	1.16	4.00	14.9
	4M			0.6	7.8	1.76	1.16	4.04	15.1
	6M			0.8	8.0	1.77	1.16	4.04	15.2
	8M			0.6	7.8	1.79	1.16	3.91	15.2
	10M			0.8	8.0	1.77	1.14	4.18	15.8
1/6/77	0			2.8	8.4	2.43	1.20	4.33	17.9
	2M			1.8	7.8	1.88	1.15	4.07	13.3
	4M			1.6	7.6	1.80	1.13	4.04	13.5
	6M			1.8	7.4	1.85	1.15	4.00	12.9
	8M			2.0	7.0	1.82	1.17	3.86	12.7
	10M			2.0	6.8	1.80	1.15	4.11	13.1
5/8/77	0		140	2.8	9.6	2.72	1.17	3.73	17.0
	2M		120	1.2	7.8	2.19	1.15	3.87	15.9
	4M		120	1.0	7.6	2.06	1.15	3.73	15.9
	6M		110	1.0	7.6	2.07	1.15	3.83	15.6
	8M		110	1.0	7.2	2.01	1.21	3.78	15.9
	10M		130	1.2	5.8	2.10	1.31	4.02	18.0

Date	Depth	Zn unf µg/ℓ	Zn f+a µg/ℓ	Cu unf µg/ℓ	Cu f+a µg/ℓ	Cd unf µg/ℓ	Cd f+a µg/ℓ	Mn unf µg/ℓ	Mn f+a µg/ℓ	Fe unf µg/ℓ	Fe f+a µg/ℓ	Pb unf µg/ℓ	Pb f+a µg/ℓ
28/3/77	0	10	7.4	12	10	0.2	0.2	11	6.3	49	29	<1	<1
	.8M	13	5.9	22	23	0.4	0.4	11	6.7	54	32	1.8	1.0
	.9M	8.9	5.9	16	14	0.2	0.2	11	6.2	70	37	2.4	1.0
	1.5M	3.6	3.0			0.5	0.1					<1	<1
	2M	5.1	3.3			0.3	0.4					<1	<1
	3M	3.1	3.0			0.3	0.3					<1	<1
	Ice	22	21	3.7	2.5	0.5	0.2	5.4	1.2	27	25	2.4	<1
7/4/77	0	20	-	12	17	0.4	0.4	8.0	5.4	72	52		
	1M	17	14	13	11	<0.2	<0.2	7.6	4.5	67	40		
	2M	11	20	14	13	0.2	0.2	24	8.5	112	37		
	4M	31	14	13	12	0.3	0.4	23	2.7	87	41		
	6M	-	17	11	12	<0.2	0.2	112	24	181	99		
	8M	34	14	11	13	0.2	0.2	148	6	308	170		
	10M	17	-	11	9.7	<0.2	0.2	1590	1250	1070	522		
13/4/77	0	308	381	27	23	1.1	1.1	10	10	70	68	6.8	4.5
	.8M	101	105	17	13	0.3	0.2	12	8.9	52	40	<1	<1
	.9M	35	31	13	13	0.2	0.2	14	11	69	42	<1	<1
	1M	35	35	15	12	0.2	0.2	10	7.6	63	35	<1	<1
	1.1M	34	36			0.2	0.2					<1	<1
	1.2M	29	41			0.1	0.4					<1	<1
	1.3M	6.9	-			<0.1	<0.1					<1	<1
	1.4M	5.6	-			0.2	<0.1					<1	<1
	1.5M	4.6	-			<0.1	<0.1					<1	<1
	2M	8.1	-			<0.1	<0.1					<1	<1
	3M	4.1	-			<0.1	<0.1					<1	<1
14/4/77	0	137	118	7.6	5.6	0.5	-	2.9	2.5	60	41	6.0	1.9
	.8M	35	34	5.8	4.3	0.3	0.3	8.2	6.8	76	52	<1	<1
	.9M	15	10	9.4	11	<0.2	<0.2	9.6	6.0	56	41	<1	<1
	1M	7.3	5.8	10	8.4	<0.2	<0.2	10	5.7	47	32	<1	<1
	1.1M	7.4	5.2			0.3	0.2					<1	<1
	1.2M	5.4	4.9			0.4	<0.1					<1	<1
	1.3M	5.6	4.4			0.2	0.3					<1	<1
	1.4M	6.0	5.6			0.1	<0.1					<1	<1
	1.5M	4.5	7.2			0.1	0.3					<1	<1
	2M	6.0	-			0.3	0.2					<1	<1
	3M	6.0	5.6			0.4	0.3					<1	<1

Table 1. 1977. Continued

Lake: Thompson

Date	Depth	Zn unf µg/ℓ	Zn f+a µg/ℓ	Cu unf µg/ℓ	Cu f+a µg/ℓ	Cd unf µg/ℓ	Cd f+a µg/ℓ	Mn unf µg/ℓ	Mn f+a µg/ℓ	Fe unf µg/ℓ	Fe f+a µg/ℓ	Pb unf µg/ℓ	Pb f+a µg/ℓ
6/5/77	0	23	23	15	14	0.3	0.2	41	2.8	124	55	<2	<2
	1M	21	15	16	15	<0.2	<0.2	42	2.5	124	50	<2	<2
	2M	23	21	18	16	0.3	0.3	44	3.0	130	41	<2	<2
	4M	23	11	15	16	0.3	<0.2	40	2.6	114	45	<2	<2
	6M	14	11	17	17	0.3	0.3	40	3.6	119	42	<2	<2
	8M	21	18	17	15	0.3	<0.2	49	2.4	114	46	<2	<2
	10M	18	17	16	16	<0.2	<0.2	46	2.9	135	40	<2	<2
1/6/77	0	3.8	3.2	18	19	<0.1	<0.1	34	6.0	60	26		
	2M	5.9	3.3	19	19	<0.1	<0.1	33	4.7	65	27		
	4M	4.9	4.0	18	17	<0.1	<0.1	42	3.3	76	42		
	6M	4.3	-	17	-	<0.1	0.1	70	6.0	92	35		
	8M	5.8	4.9	16	14	<0.1	<0.1	109	36	124	45		
	10M	5.9	5.2	14	12	<0.1	<0.1	254	145	238	77		
5/8/77	0	14	14	12	11	<0.2	<0.2	56	4.0	94	<5		
	2M	14	14	12	9.8	<0.2	<0.2	56	3.5	87	<5		
	4M	14	14	9.8	8.9	<0.2	<0.2	56	5.1	95	<5		
	6M	14	14	12	10	0.4	<0.2	67	5.6	93	16		
	8M	16	14	8.9	8.5	<0.2	<0.2	478	256	198	<5		
	10M	16	15	8.9	5.4	<0.2	<0.2	2820	2670	395	184		

Lake: 6

Date	Depth (m)	pH	Cond.	Cl mg/ℓ	SO_4 mg/ℓ	Na mg/ℓ	K mg/ℓ	Mg mg/ℓ	Ca mg/ℓ
5/8/77	0		110	1.0	12.2	1.29	0.84	3.35	15.6

Date	Depth	Zn unf µg/ℓ	Zn f+a µg/ℓ	Cu unf µg/ℓ	Cu f+a µg/ℓ	Cd unf µg/ℓ	Cd f+a µg/ℓ	Mn unf µg/ℓ	Mn f+a µg/ℓ	Fe unf µg/ℓ	Fe f+a µg/ℓ
5/8/77	0	267	221	15	14	1.0	0.8	18	2.6	28	14

Table 2. Chemical analyses of precipitation at selected sites in the Flin Flon area, 1976-1977.

Amisk Lake Station

	Days	Fe	Mn	Pb	As	Cd	Cu	Zn	Cl	SO_4	
		$\mu g/m^2$							mg/m^2		
Aug.-Sept.	59	783	145	231	6	14	315	4163	-	-	
Oct.-Nov.	-										
Dec.-Jan.	58	868	363	181	25	13	376	2824	13	16	
Feb.-March	60	1908	136	687	59	41	933	22559	-	-	
April-May	55	21813	2476	814	54	17	278	2035	.47	61	
June-July	63	2407	173	831	76	57	507	7988	11	86	
Totals	295	27779	3293	2744	220	142	2409	39569	[71	163]176	days
$\mu g/m^2/day$		94.2	11.2	9.3	.75	.48	8.2	134.1	.40	.93	
Annual Deposition mg/m^2		34	4.1	3.4	0.27	0.18	3.0	49	146	339	

Patmore Station

	Days	Fe	Mn	Pb	As	Cd	Cu	Zn	Cl	SO_4	
Aug.-Sept.	60	10362	293	968	89	89	956	39321	12	99	
Oct.-Nov.	61	2504	199	492	38	40	449	15802	-	-	
Dec.-Jan.	58	1795	130	472	56	37	1693	12213	5.6	1.9	
Feb.-March	62	3545	278	1582	136	220	2095	53029	-	-	
April-May	-	-	-	-	-	-	-	-	-	-	
June-July	-	-	-	-	-	-	-	-	-	-	
Totals	241	18206	900	3514	319	386	5193	120365	[17.6	100.9]118	
$\mu g/m^2/day$		75.5	3.7	14.6	1.3	1.6	21.5	499	.15	.86	
Annual Deposition mg/m^2		27.6	1.4	5.3	0.47	0.58	7.8	182	55	314	

Douglas Lake Station

	Days	Fe	Mn	Pb	As	Cd	Cu	Zn	Cl	SO_4	
Aug.-Sept.	59	5258	382	1776	327	438	1912	59675	11	126	
Oct.-Nov.	-										
Dec.-Jan.	-										
Feb.-March	62	9241	434	6052	583	909	5021	240182	-	-	
April-May	57	15144	1561	1525	188	113	958	45751	50	128	
June-July	62	5912	416	10339	1082	597	7730	154046	8.3	241	
Totals	240	35555	2793	19692	2180	2057	15621	499654	[69.3	495]178	
$\mu g/m^2/day$		148.1	11.6	82.1	9.1	8.6	65.1	2081.9	.39	2.8	
$mg/m^2/year$		54	4.2	30	3.3	3.1	24	760	142	1022	

Table 2. Continued

Channing Station

	Days	Fe	Mn	Pb	As	Cd	Cu	Zn	Cl	SO_4
		$\mu g/m^2$							mg/m^2	
Aug.-Sept.	60	19343	1557	1462	934	302	4006	63469	9	336
Oct.-Nov.	61	35259	381	4002	648	635	3558	127378	32	172
Dec.-Jan.	57	44508	1750	24018	2890	1750	28089	1073355	8.1	147
Feb.-March	62	10203	444	4796	511	833	4330	207615	-	-
April-May	56	26970	2341	1628	417	148	3308	56992	-	-
June-July	62	24398	1249	5246	687	749	13031	217329	50	608
Totals	358	160681	7722	41152	6087	4417	56332	1746138	99.1	1263 240
$\mu g/m^2$/day		448.8	21.6	114.9	17.0	12.3	157.4	4877.5	.41	5.3
Annual Deposition mg/m^2		164	7.9	42	6.2	4.5	57	1780	150	1935

Hook Lake

	Days	Fe	Mn	Pb	As	Cd	Cu	Zn	Cl	SO_4
Aug.-Sept.	59	9930	1616	2467	296	80	2356	24302	9	59
Oct.-Nov.	61	15614	282	3609	417	333	2867	79351	15	67
Dec.-Jan.	58	19318	788	9881	1166	711	10780	358608	9	76
Feb.-March	61	3420	200	1998	222	266	1443	70093	-	-
Total	239	48282	2886	17955	2101	1390	17446	532354	33	202
$\mu g/m^2$/day		202.0	12.1	75.1	8.8	5.8	73.0	2227.4	0.14	0.85
Annual Deposition mg/m^2		74	4.4	27	3.2	2.1	27	813	51	310

Baker's Narrows

	Days	Fe	Mn	Pb	As	Cd	Cu	Zn	Cl	SO_4
Aug.-Sept.	59	2378	253	281	77	30	324	10270	20	74
Oct.-Nov.	61	4156	196	1035	177	121	944	29241	-	-
Dec.-Jan.	58	8632	319	3414	513	180	3067	76329	11	36
Feb.-March	-	-	-	-	-	-	-	-	-	-
April-May	55	15004	1198	470	16	18	151	2342	16	4.3
June-July	64	3870	216	709	23	40	509	6029	19	111
Total	297	34040	2182	5909	806	389	4995	124211	56	225
$\mu g/m^2$/day		114.6	7.3	19.9	2.7	1.3	16.8	418.2	.24	.95
Annual Deposition mg/m^2		42	2.7	7.3	1.0	.47	6.1	153	88	347

236 day

Table 2. Continued

Thompson Lake:

Point Station

	Days	Fe	Mn	Pb	As	Cd	Cu	Zn	Cl	SO_4
		$\mu g/m^2$							mg/m^2	
Aug.-Sept.	59	4123	1116	200	111	40	361	16530	13	91
Oct.-Nov.	61	3281	185	738	41	139	738	13618	16	16
Dec.-Jan.	58	2125	168	1082	176	104	1062	31272	8	16
Feb.-March	61	2361	97	1087	78	59	402	17574	-	-
April-May	55	15844	2737	617	62	35	386	7556	54	54
June-July	64	1133	810	583	52	65	648	16223	39	194

Island Station

	Days	Fe	Mn	Pb	As	Cd	Cu	Zn	Cl	SO_4
		$\mu g/m^2$								
Aug.-Sept.	59	14942	638	617	105	43	1804	41017	15	145
Oct.-Nov.	61	2045	76	505	51	47	746	11859	10	29
Dec.-Jan.	58	1152	122	1013	112	72	999	22066	6	6
Feb.-March	61	1143	116	625	69	53	389	19707	-	-
April-May	55	5675	1511	237	59	22	160	4626	49	74
June-July	64	7803	1493	1357	142	129	1018	26970	34	455
Aug-Sept-Oct-Nov	120	16987	714	1122	156	90	2560	52876		

Island Tupperware

	Days	Fe	Mn	Pb	As	Cd	Cu	Zn	Cl	SO_4
		$\mu g/m^2$								
Aug.-Sept.	59	7716	860	283	200	39	8493	20733		
Oct.-Nov.	61	3581	320	452	34	72	509	10649		
Total	120	11297	1180	735	234	111	9002	31382		

Hill Station

	Days	Fe	Mn	Pb	As	Cd	Cu	Zn	Cl	SO_4
		$\mu g/m^2$								
Aug.-Sept.	59	4697	830	376	213	19	3790	34973	19	130
Oct.-Nov.	61	6245	229	1166	117	117	1124	24980	25	25
Dec.-Jan.	58	2058	107	942	101	55	876	17385	9	<4
Feb.-March	61	2010	202	683	73	51	506	18840	-	-
April-May	55	21511	2220	694	97	65	463	11149	65	96
June-July	64	7941	578	694	39	89	501	12413	15	146

Table 2. Continued

Thompson Lake:		Days	Fe	Mn	Pb	As	Cd	Cu	Zn	Cl	SO_4	
			$\mu g/m^2$							mg/m^2		
Totals	Point	358	28867	5113	4307	520	442	3597	102773	130	371*	*Days 297
	$\mu g/m^2$/day		80.6	14.3	12.0	1.5	1.2	10.0	287.1	.44	1.2	
	Island	358	32766	3956	4354	538	366	5116	126245	114	709	
			91.5	11.1	12.2	1.5	1.0	14.3	352.6	.38	2.4	
	Hill	358	44462	4166	4555	640	396	7260	119740	133	397	Days 239
			124.2	11.6	12.7	1.8	1.1	20.3	334.5	.45	1.7	
$\bar{X}$ Deposition/Day			98.8	12.3	12.3	1.6	1.1	14.9	324.7	.42	1.8	
Annual mg/m^2			36	4.5	4.5	0.6	0.4	5.4	119	153	657	
On Lake Surface kg Annual			79	10	10	1.3	0.9	12	262	337	1445	

Table 2. Continued

Deposition				$\mu g/m^2$					mg/m^2	
Hamell Lake:	Days	Fe	Mn	Pb	As	Cd	Cu	Zn	Cl	SO_4
Hamell Lake Point Stn.										
Aug.-Sept.	60	2085	318	740	77	22	1406	9375	-	-
Oct.-Nov.	-	-	-	-	-	-	-	-	-	-
Dec.-Jan.	57	2426	90	883	122	82	564	25962	15	11
Feb.-March	63	5363	326	3572	387	489	2178	85488	-	-
April-May	54	12729	2355	1052	386	150	1403	63145	80	251
June-July	-	-	-	-	-	-	-	-	-	-
Hill Stn.										
Aug.-Sept.	60	13563	894	1351	423	204	3423	63839	11	155
Oct.-Nov.	62	198654	923	10460	2492	659	7120	235133	35	114
Dec.-Jan.	57	13869	200	2048	325	150	1515	70596	13	13
Feb.-March	63	-	-	-	-	-	-	-	-	-
April-May	54	35790	3901	3732	721	221	4071	80315	102	288
June-July	-	-	-	-	-	-	-	-	-	-
Island										
Aug.-Sept.	60	2831	536	1610	174	56	4113	17431	-	-
Oct.-Nov.	62	116538	522	3609	809	478	3261	73489	71	86
Dec.-Jan.	57	7168	270	3799	560	431	2076	145308	24	39
Feb.-March	63	10392	614	9317	1126	1382	7321	233958	-	-
April-May	54	87879	6322	8409	3667	1581	96097	701764	126	1296
June-July	-	-	-	-	-	-	-	-	-	-
Aug-Sept-Oct-Nov	122	119369	1058	5219	983	534	7374	90920		
$\mu g/m^2$/day		978.4	8.7	42.8	8.1	4.4	60.4	745.2		

Hamell Lake Deposition	Days	Fe	Mn	Pb	As	Cd	Cu	Zn	Cl	SO_4
Point	234	22603	3089	6247	972	743	5551	183970		
		96.6	13.2	26.7	4.2	3.2	23.7	786.2		
Hill	233	261876	5918	17611	3961	1234	16129	449883		
		1123.9	25.4	75.6	17	5.3	69.2	1930.8		
Island	296	224808	8264	26744	6336	3928	112868	1171950		
		759.5	27.9	90.4	21.4	13.3	381.3	3959.3		
Totals									417	2253

Table 2. Continued

	Days	Fe	Mn	Pb	As	Cd	Cu	Zn	Cl	SO_4	
		$\mu g/m^2$							mg/m^2		
Deposition $\bar{x}$/day		660	22	64	14	7.3	474	2225	.81	4.4	517 Days
Annual Deposition mg/m^2		241	8	23	5	2.5	173	812	296	1606	
Deposition Lake kg Annual		561.5	18.6	53.5	11.7	5.8	403.1	1892	689	3742	

Hamell Island Tupperware:

	Days	Fe	Mn	Pb	As	Cd	Cu	Zn	Cl	SO_4
Aug.-Sept.	60	6078	650	428	1213	55	1602	48651	-	-
Oct.-Nov.	62	75392	306	2003	836	271	2179	57486	-	-
Total	122	81470	956	2431	2049	326	3781	106137	-	-
$\mu g/m^2$/day		667.8	7.8	19.9	16.8	2.7	31.0	870.0		

Identification of sampling sites for deposition data presented in Tables 3 and 4.

Lake	Collection I.D.	Map Number
Amisk	AMI	40
Athapapuskow	ATH ,BAK,SOO	46
Birch	BIR	9
Cliff	CLI	15
Douglas	DOU	5
Embury	EMB	16
Hamell	HAM	1
Hook	HOO	21
Kisseynew (Weetago Bay)	WEB	42
Manistikwan	BIL	44
Meridan	MER	7
Nesootao	NES	4
Patmore	PAT	8
Phantom	PHA,POT	19
Precipice	PRE	14
Schist	SCH ,NWA,WA,NEA	41
Simonhouse	SIM	47
Thompson	THO	45
Tulabi	TUL	39
Tyrrell	TYR	35
Whitefish	WHF	30
Whitehead	WHI	3
Lake 6	L-SIX	6

Table 3: Deposition , in mg/m^2 , of selected chemicals in snow on lake surfaces near Flin Flon for the period November 20,1975-February 5,1976.

1976 SNOW DATA-1

OBS	ID	KM	MM	WIND	PH	CL	SO4	NA	K	MG	CA	FE	MN	PB	AS	CD	CU	ZN
1	WHI	56	505	156	659	40	162	4.5	3.5	7.1	30.0	15.0	1.00	16.0	2.80	1.9	21.0	873.0
2	PRE	116	466	156	623	28	75	4.2	1.0	1.9	8.4	3.2	0.20	3.5	0.70	0.5	0.9	158.0
3	CLI-A	40	627	96	668	88	213	17.0	3.1	5.0	23.0	16.0	0.90	20.0	2.30	3.1	8.1	718.0
4	CLI-B	40	481	96	675	39	250	11.0	1.9	3.9	20.0	18.0	1.00	21.0	1.90	2.9	15.0	903.0
5	CLI-C	40	543	96	692	43	250	5.4	2.2	4.3	33.0	39.0	1.20	40.0	0.60	4.5	48.0	2403.0
6	LSIX-A	56	352	96	676	42	127	11.0	3.5	2.5	17.0	4.6	0.30	9.5	1.30	1.3	4.6	324.0
7	LSIX-B	56	352	96	677	28	106	1.1	0.4	2.5	8.5	4.6	0.50	8.8	0.80	1.1	4.6	410.0
8	LSIX-C	56	401	96	691	40	145	4.0	0.8	2.8	12.0	6.4	0.50	13.0	1.10	1.8	5.2	505.0
9	EMB	72	536	96	668	54	97	6.4	1.6	5.4	23.0	4.7	0.30	5.0	1.10	0.9	1.6	221.0
10	RTL-A	56	536	61	648	43	75	2.1	0.0	3.8	16.0	11.0	0.50	7.7	1.00	0.9	9.1	413.0
11	RTL-B	89	344	61	638	21	41	1.0	0.0	1.4	8.3	0.0	0.10	2.4	0.40	0.3	1.4	142.0
12	SOO-B	185	459	61	583	37	37	6.0	2.3	3.2	14.0	3.4	0.20	0.0	0.20	0.0	0.0	60.0
13	THO-A	200	440	61	589	52	26	6.6	2.6	1.8	16.0	0.0	0.10	0.0	0.10	0.0	0.0	72.0
14	THO-B	200	279	61	568	22	17	1.7	0.0	0.8	3.4	0.0	0.04	0.0	0.10	0.0	0.0	30.0
15	THO-C	200	363	61	620	44	15	15.0	8.3	2.2	15.0	0.0	0.20	0.0	0.10	0.0	0.0	75.0
16	NWA-A	40	421	232	672	34	152	3.0	1.3	5.1	20.0	30.0	1.50	32.0	3.60	3.5	45.0	2185.0
17	NWA-B	80	406	232	664	33	106	2.4	0.4	2.4	15.0	18.0	0.90	19.0	2.50	2.0	16.0	962.0
18	SCH	129	519	232	632	42	104	3.1	0.5	2.1	9.3	4.4	0.40	7.5	1.10	0.7	1.1	263.0
19	HOO-N	97	460	232	681	46	221	8.7	7.4	6.0	38.0	20.0	1.20	19.0	1.60	2.0	11.0	536.0
20	NEA	137	573	232	605	46	138	5.7	0.6	4.0	28.0	20.0	0.90	15.0	1.90	1.1	4.9	334.0
21	ATH	370	413	232	534	25	17	1.7	0.0	1.7	9.9	0.0	0.40	0.0	0.05	0.0	0.0	9.9
22	PHA-A	32	577	170	670	46	185	2.3	0.6	3.5	21.0	31.0	1.00	17.0	2.80	2.5	14.0	954.0
23	PHA-B	89	463	170	647	37	83	7.0	1.4	9.3	25.0	4.5	0.40	6.9	0.90	0.7	1.0	278.0
24	WA	120	413	170	622	33	58	4.1	0.8	1.7	9.9	5.9	0.20	6.2	0.90	0.7	0.8	124.0
25	ACU	48	424	71	635	42	93	2.6	2.6	3.0	18.0	0.0	0.10	0.0	0.10	0.0	0.0	21.0
26	BTR	137	496	71	573	40	30	2.0	0.0	2.5	8.9	3.6	0.20	0.0	0.20	0.2	0.0	43.0
27	AMI	177	403	71	533	24	16	1.2	0.0	2.8	17.0	0.0	0.10	0.0	0.20	0.0	0.0	15.0
28	HAM-A	48	438	52	664	35	123	3.9	1.3	1.8	11.0	21.0	0.70	14.0	2.00	1.4	13.0	782.0
29	HAM-B	48	345	52	682	35	118	3.5	2.1	4.2	23.0	11.0	0.40	8.2	0.30	1.2	5.8	299.0
30	HAM-C	72	481	52	694	48	67	3.4	1.4	3.9	20.0	11.0	0.30	5.7	1.70	0.6	1.0	172.0
31	HAM-D	72	335	52	673	34	74	4.0	1.3	4.0	22.0	5.0	0.30	5.0	0.60	0.6	0.7	233.0
32	NES-E	129	412	52	609	17	33	2.5	0.0	1.2	15.0	6.8	0.10	2.8	0.70	0.1	0.4	45.0

Note: For ease of computation , km, mm and wind(%) are 10X, pH is 100X. MM refers to water equivalent of snow collected; wind refers to % of wind hours that plume was in the sample direction during the snow accumulation period.

Table 4: Deposition, in mg/m^2, of selected chemicals in snow on lake surfaces near Flin Flon for the period November 8,1976-February 2,1977.

1977 SNOW DATA-1

OBS	ID	KM	MM	#IND	PH	CL	SO4	NA	K	MG	CA	FE	MN	PB	AS	CD	CM	ZN
1	WHI-W	56	384	103	548	16.0	70.0	6.6	0.0	2.7	11.0	14.0	0.3	9.1	1.40	0.90	15.0	412.0
2	WHI-E	56	497	103	573	30.0	109.0	7.8	0.0	3.5	11.0	26.0	0.4	14.0	1.70	1.40	16.0	586.0
3	PRF-S	116	476	103	532	29.0	19.0	8.1	0.0	1.4	4.3	25.0	0.2	3.1	0.50	0.30	2.3	104.0
4	PRF-N	116	434	103	564	18.0	35.0	5.3	0.0	3.9	16.0	14.0	0.2	4.1	0.60	0.40	2.7	142.0
5	WFR-A	136	629	103	613	38.0	76.0	16.0	2.5	15.0	43.0	16.0	1.1	4.3	0.80	0.40	3.6	132.0
6	WFH-H	136	562	103	546	34.0	45.0	16.0	0.0	6.2	21.0	13.0	0.2	3.2	0.70	0.30	2.7	77.0
7	CLI-W	40	577	95	617	92.0	150.0	28.0	0.0	13.0	48.0	31.0	1.2	15.0	2.30	1.40	50.0	733.0
8	CLI-E	40	573	95	522	34.0	115.0	9.2	0.0	5.7	24.0	26.0	0.9	17.0	1.90	1.30	34.0	619.0
9	L-SIA	52	502	95	537	20.0	40.0	3.0	0.0	1.0	4.5	12.0	0.5	5.9	1.10	0.70	31.0	335.0
10	EMR-S	80	469	95	590	27.0	67.0	8.0	0.0	5.4	25.0	6.8	1.1	6.0	0.90	0.50	8.3	203.0
11	EMR-N	80	577	95	633	35.0	115.0	13.0	2.3	22.0	72.0	6.2	0.4	6.1	0.80	0.40	8.0	222.0
12	EIL-WW	62	406	120	736	33.0	219.0	13.0	5.3	38.0	135.0	9.5	0.9	10.0	1.30	1.10	23.0	467.0
13	EIL-WN	62	339	120	660	20.0	115.0	6.5	0.0	17.0	53.0	8.6	0.5	11.0	1.20	0.90	22.0	482.0
14	EIL-EW	86	346	120	664	21.0	116.0	8.0	1.4	16.0	59.0	9.0	0.4	8.5	0.90	0.80	12.0	360.0
15	EIL-EE	86	430	120	669	43.0	138.0	14.0	1.7	21.0	70.0	9.2	0.6	11.0	1.20	0.90	15.0	428.0
16	WHF-W	146	441	120	614	26.0	44.0	8.4	0.0	4.8	30.0	4.8	0.2	5.2	0.70	0.40	7.2	152.0
17	WHF-E	146	569	120	674	46.0	80.0	22.0	4.6	22.0	79.0	5.0	0.3	4.5	0.70	0.40	5.5	124.0
18	THO-W	202	509	120	532	20.0	41.0	11.0	0.0	3.6	14.0	5.2	0.2	2.8	0.30	0.20	2.4	63.0
19	THO-E	202	515	120	630	31.0	41.0	12.0	0.0	13.0	57.0	3.1	0.2	2.0	0.30	0.10	1.7	44.0
20	NWA-W	65	609	410	637	146.0	658.0	33.0	0.0	15.0	81.0	192.0	3.3	81.0	10.00	7.00	113.0	3735.0
21	NWA-E	69	299	410	636	72.0	263.0	21.0	0.0	5.7	64.0	47.0	1.2	23.0	2.60	2.00	27.0	1039.0
22	NOO-A	95	464	410	601	28.0	149.0	3.7	0.0	2.3	6.5	25.0	0.9	18.0	2.10	1.70	18.0	696.0
23	NOO-B	95	764	410	621	46.0	245.0	6.9	0.0	4.6	18.0	78.0	1.5	36.0	4.00	3.10	35.0	1414.0
24	NAK-W	194	405	410	719	81.0	154.0	19.0	0.0	11.0	71.0	12.0	0.4	6.1	0.90	0.50	5.6	174.0
25	NAK-E	194	427	410	712	772.0	813.0	178.0	22.0	86.0	513.0	20.0	0.6	9.8	0.90	0.80	8.0	255.0
26	STH-A	380	583	410	490	47.0	23.0	19.0	0.0	2.9	8.2	3.5	0.2	1.5	0.30	0.10	0.9	19.0
27	STH-B	380	836	410	615	34.0	34.0	13.0	0.0	20.0	54.0	4.5	0.2	3.7	0.60	0.20	2.1	34.0
28	SIM-A	540	754	410	539	30.0	15.0	4.6	0.0	6.1	18.0	4.1	0.2	1.2	0.30	0.01	1.0	16.0
29	SIM-B	540	562	410	650	23.0	23.0	11.0	0.0	41.0	21.0	2.9	0.3	1.7	0.30	0.01	0.8	17.0
30	POT-W	45	448	73	620	27.0	496.0	9.0	0.0	8.5	33.0	104.0	1.6	28.0	3.60	3.70	36.0	1277.0
31	POT-E	45	601	73	617	36.0	313.0	1.8	0.0	4.2	22.0	145.0	23.0	34.0	6.10	3.80	63.0	1347.0
32	PHA-SW	85	536	73	584	32.0	118.0	1.6	0.0	2.7	9.6	50.0	1.8	18.0	2.40	1.70	16.0	825.0
33	PHA-SE	85	565	73	804	57.0	362.0	36.0	18.0	66.0	203.0	58.0	1.6	25.0	4.00	2.00	21.0	1062.0
34	WA-N	120	453	73	606	25.0	220.0	1.3	0.0	3.0	16.0	20.0	0.4	17.0	2.30	1.40	16.0	630.0
35	WA-S	120	478	73	621	38.0	134.0	5.3	0.0	3.3	11.0	21.0	0.8	15.0	2.20	1.30	14.0	564.0
36	POU-E	50	550	40	668	44.0	86.0	11.0	0.0	9.9	79.0	25.0	0.5	6.8	0.90	0.60	13.0	261.0
37	POU-W	50	393	40	609	24.0	55.0	7.9	0.0	3.5	31.0	19.0	0.4	5.9	0.70	0.50	12.0	214.0
38	PAT-E	95	447	40	545	27.0	27.0	10.0	0.0	4.0	14.0	19.0	0.4	2.6	0.50	0.30	4.9	114.0
39	PAT-W	95	534	40	564	32.0	21.0	11.0	0.0	5.3	35.0	15.0	0.3	2.5	0.30	0.20	3.3	83.0
40	WIR-E	140	408	40	495	33.0	8.2	5.7	0.0	4.1	15.0	8.0	0.3	0.7	0.20	0.10	1.0	26.0
41	WIR-W	140	399	40	545	56.0	8.0	19.0	0.0	6.8	22.0	7.0	0.2	0.8	0.10	0.10	0.7	25.0
42	WMI-E	175	567	40	500	36.0	12.0	22.0	0.0	3.6	11.0	5.1	0.1	1.0	0.10	0.05	1.0	14.0
43	WMI-W	175	430	40	482	26.0	0.0	12.0	0.0	3.0	10.0	3.5	0.1	1.2	0.02	0.03	1.0	7.6
44	WFR-E	70	486	15	524	29.0	19.0	16.0	0.0	2.4	6.8	5.2	0.1	4.1	0.40	0.20	1.8	97.0
45	WFW-W	70	621	15	526	37.0	25.0	19.0	0.0	5.0	20.0	5.3	0.2	2.7	0.40	0.20	2.4	109.0
46	TUL-A	710	577	15	481	23.0	11.0	9.2	0.0	2.9	10.0	4.4	0.2	1.0	0.10	0.10	1.4	36.0
47	TUL-H	710	372	15	491	22.0	0.0	10.0	0.0	1.9	3.3	27.0	0.1	0.7	0.10	0.01	0.1	1.8
48	WAN-N	42	577	84	575	46.0	23.0	23.0	0.0	4.6	27.0	74.0	0.8	5.3	2.70	0.40	4.2	151.0
49	WAW-S	42	493	84	527	39.0	20.0	18.0	0.0	2.0	8.9	25.0	0.4	4.0	0.60	0.40	3.1	181.0
50	WFS-E	125	498	84	508	61.0	26.0	36.0	0.0	3.1	6.1	19.0	0.2	0.9	0.30	0.10	0.5	13.0
51	WFS-W	125	466	84	518	24.0	0.0	11.0	0.0	2.4	5.6	5.5	0.4	1.2	0.20	0.10	0.8	20.0
52	TYW-A	210	403	84	487	24.0	0.0	11.0	0.0	2.4	7.3	5.7	0.1	0.6	0.10	0.04	0.4	5.1
53	TYW-W	210	470	84	475	9.4	0.0	3.8	0.0	1.4	4.2	5.0	0.2	0.3	0.04	0.02	0.2	4.2

N.B. See note, bottom Table 3.

Figure 1. Study area, Flin Flon, Manitoba, showing sample collection sites.

Lake	Number
Amisk	40
Athapapuskow	46
Beaverdam	2
Birch	9
Bluenose	18
Byklum	20
Cleaver	34
Cliff	15
Douglas	5
Embury	16
Flin Flon	12
Hamell	1
Hook	21
Johnson	36
Kisseynen (Weetano Bay)	42
Little Spruce	22
Manistikwan	44
Maligne	37
Meridian	7
Mosher	11
Naosap	43
Neso	23
Nesootao	4
Otter	24
Patmore	8
Phanton	19
Pothook	32
Precipice	14
Ross	33
Ruby	17
Schist	41
Scotty	26
Simonhouse	47
Thompson	45
Tulabi	39
Twin	28
Tyrrell	35
We	29
Whitefish	30
Whitehead	3
Winteringham	38
Wonderland	31
Lake 6	6
Lake 10	10
Lake 13	13
Lake 25	25
Lake 27	27

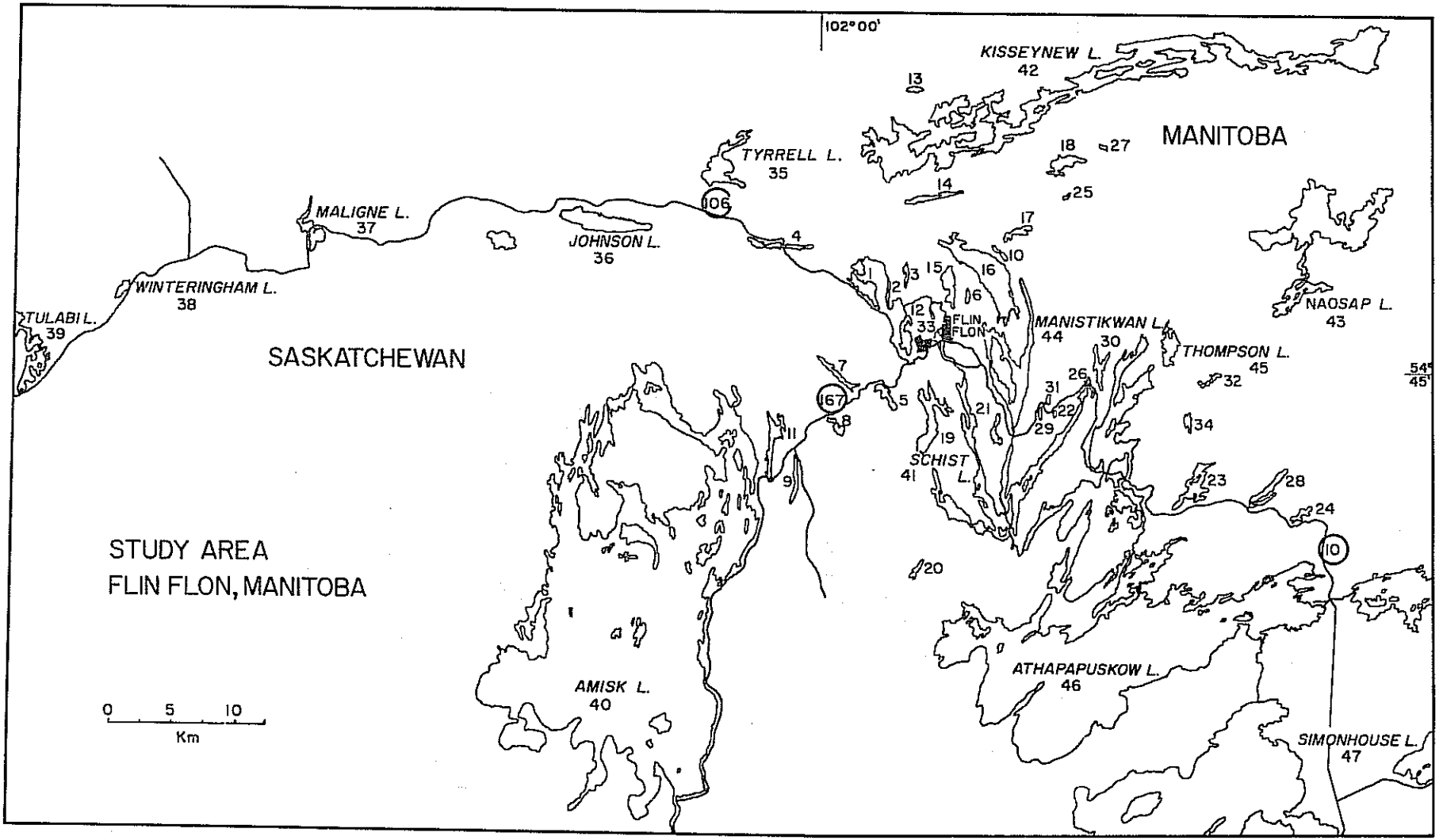

Fig. 1. Study area, Flin Flon, Manitoba, showing sample collection sites.

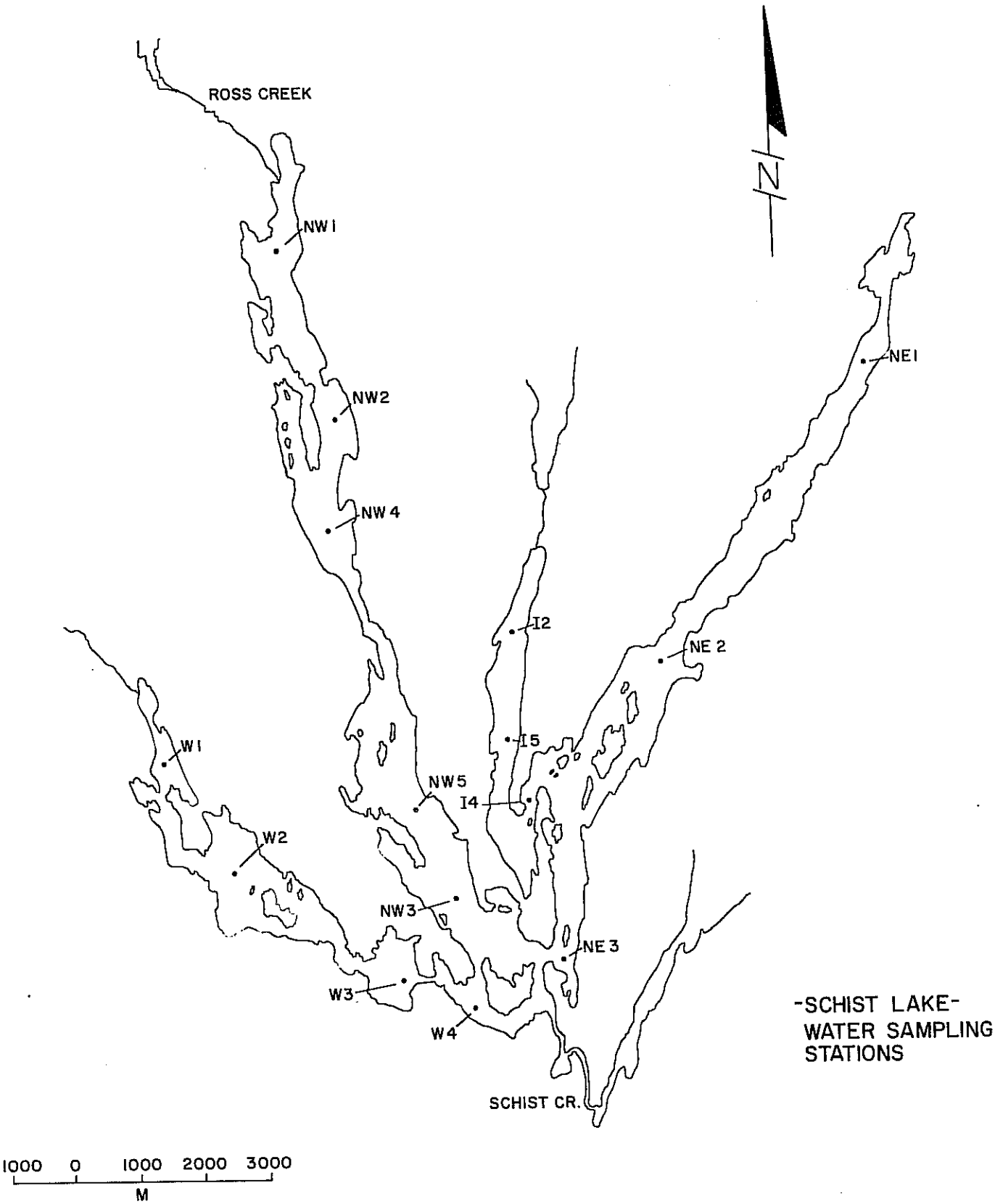

Fig. 2. Schist Lake - water sampling stations.