

Appendix 5

The chemical composition of the 137 samples compiled in this study is given in the following Table. Data are grouped according to the study from which they were compiled and listed in the order of decreasing TDS values. Major elements (Na^+ , Mg^{2+} , K^+ , Ca^{2+} , HCO_3^- , Cl^- and SO_4^{2-}) were systematically analyzed in the 5 studies. Compared to the other studies, Frappe and Fritz (1987) analyzed 10 more metallic ions (Al^{3+} , Cd^{2+} , Cr^{2+} , Co^{2+} , Cu^{2+} , Mn^{2+} , Ni^{2+} , Zn^{2+} , B^{3+} , Pb^{2+}). Sr^{2+} and Br^- are only missing in Gascoyne and Kamineni (1994).

Frappe and Fritz (1987) provided a summary of the geochemistry of Canadian Shield groundwaters which have been partially presented in previous paper by the authors. For instance, compiled data by Frappe and Fritz (1987) include several data by Frappe et al. (1984) and Frappe and Fritz (1987). Frappe et al. (1984) analyzed chemical content of groundwater from a variety of locations in the crystalline rocks of the Canadian Shield in the province of Ontario (Yellowknife N.W.T and Sudbury Basin) and Manitoba (Thompson). The results of geochemical analyses discussed in Frappe and Fritz (1987) were obtained for groundwater samples collected in five mines and several shallow wells in the Sudbury Basin, Ontario, Canada. Mine samples were obtained from abandoned diamond drill holes or fractures from depths of 152-1219 m. Frappe and Fritz (1987) added data from Matagami area located in the province of Quebec. Chemical data from Bottomley et al. (1999) were collected at depths of 701 m to 1616 m in the Miramar Con gold mine, Yellowknife N.W.T., Canada. Most of the samples were collected from flowing boreholes. In the study by Bottomley et al. (1999) TDS for waters collected above approximately 650 meters and show concentrations for TDS less than 10,000 mg/L, and 22 over the 35 compiled samples show concentrations for TDS above 10,000 mg/L. Gascoyne and Kamineni (1994) determined the composition of groundwater in selected granitic, gabbroic and gneissic plutons in the Canadian Shield as part of the Canadian Nuclear Fuel Waste Management Program. Samples were collected in Ontario (Chalk River, Massey, and Atikokan) and Manitoba (Lac du Bonnet).

Supplementary material

N	Sample	Samples source	Aquifer Type	TDS (mg/L)	T (°C)	Eh (mV)	pH	O.D (mg/L)	Na (mg/L)	Mg (mg/L)	K (mg/L)	Ca (mg/L)	HCO3 (mg/L)	Cl (mg/L)	SO4 (mg/L)	Al (mg/L)	Sb (mg/L)	Ag (mg/L)	Ba (mg/L)	Cd (mg/L)	Cr (mg/L)	Co (mg/L)	Cu (mg/L)	Mn (mg/L)	Mo (mg/L)	Ni (mg/L)	Zn (mg/L)	B (mg/L)	Fe (mg/L)	Li (mg/L)	Se (mg/L)	Sr (mg/L)	Sn (mg/L)	Ti (mg/L)	V (mg/L)	Be (mg/L)	Bi (mg/L)	Si (mg/L)	Pb (mg/L)	U (mg/L)	NH4 (mg/L)	Br (mg/L)	F (mg/L)	NO3 (mg/L)	P (mg/L)										
17	L261400	Frage and Fritz (1982)	Roc	-	-	-	-	213	0.05	47.1	150	-	431	259	-	-	-	-	-	-	-	-	-	0.05	-	-	-	-	-	0.05	-	3.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-								
6	N3601	Frage and Fritz (1982)	Roc	240632	-	-	-	160	0.05	85	160	-	156000	138	-	-	-	-	-	-	-	-	-	0.05	-	-	-	-	-	0.05	-	1.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-								
3	N3640	Frage and Fritz (1982)	Roc	225446	-	-	-	20750	8.3	250	58750	30.6	142000	155	-	-	-	-	-	-	-	-	-	1.3	-	-	-	-	-	5	-	2060	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
29	CCS2000	Frage and Fritz (1982)	Roc	940267	-	-	-	6000	96	44	24000	8.4	-	1.4	-	-	-	-	-	-	-	-	-	1.4	-	-	-	-	-	8.1	-	3.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-								
28	CCS3200	Frage and Fritz (1982)	Roc	85789	-	-	-	7500	82	42	22000	14.3	55200	75.6	-	-	-	-	-	-	-	-	1.25	-	-	-	-	-	3.5	-	395	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-								
8	F33182	Frage and Fritz (1982)	Roc	29737	-	-	-	3500	13.95	87	6800	8.8	18500	566	-	-	-	-	-	-	-	-	0.31	-	-	-	-	-	2	-	123	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
12	L40140	Frage and Fritz (1982)	Roc	23170	-	-	-	2313	24.7	468	42	1	16000	42.3	-	-	-	-	-	-	-	-	0.05	-	-	-	-	-	5.15	-	0.05	-	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-								
7	F33300	Frage and Fritz (1982)	Roc	22594	-	-	-	2625	4	32	4800	9.9	14400	530	-	-	-	-	-	-	-	-	0.14	-	-	-	-	-	1	-	90	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
9	F33170	Frage and Fritz (1982)	Roc	21689	-	-	-	3400	22.5	22	4650	10.5	13900	516	-	-	-	-	-	-	-	-	0.11	-	-	-	-	-	0.75	-	88	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
9	F33182	Frage and Fritz (1982)	Roc	17713	-	-	-	2200	20.8	3625	9.3	11500	486	-	-	-	-	-	-	-	-	-	0.1	-	-	-	-	-	0.37	-	73	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
14	L40143	Frage and Fritz (1982)	Roc	13128	-	-	-	2375	19.4	2938	68.1	8540	26.7	-	-	-	-	-	-	-	-	-	0.62	-	-	-	-	-	0.37	-	60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
13	L40141	Frage and Fritz (1982)	Roc	6862	-	-	-	800	3.78	12.2	1560	96.2	4160	40	-	-	-	-	-	-	-	-	0.4	-	-	-	-	-	0.15	-	30.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
2	N3602	Frage and Fritz (1982)	Roc	6290	-	-	-	800	1.78	8.6	1380	7.6	3820	190	-	-	-	-	-	-	-	-	0.05	-	-	-	-	-	0.47	-	32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
1	N3601	Frage and Fritz (1982)	Roc	5303	-	-	-	675	1.38	7.4	1050	8.7	3310	180	-	-	-	-	-	-	-	-	0.05	-	-	-	-	-	0.15	-	25.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
11	L40139	Frage and Fritz (1982)	Roc	4538	-	-	-	700	2.65	26	855	113	2710	46.2	-	-	-	-	-	-	-	-	0.25	-	-	-	-	-	0.2	-	16.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
30	G1600	Frage and Fritz (1982)	Roc	4279	-	-	-	180	330	23.5	480	213	97	2950	-	-	-	-	-	-	-	-	0.05	-	-	-	-	-	0.3	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
4	N3643	Frage and Fritz (1982)	Roc	4113	-	-	-	500	6.1	6.4	800	28.2	2220	160	-	-	-	-	-	-	-	-	0.15	-	-	-	-	-	0.15	-	18.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
26	CCS20002	Frage and Fritz (1982)	Roc	3889	-	-	-	425	42	9.2	580	107	1470	1320	-	-	-	-	-	-	-	-	0.05	-	-	-	-	-	13	-	5.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
25	CCS26001	Frage and Fritz (1982)	Roc	3544	-	-	-	440	44.5	8	590	111	985	1340	-	-	-	-	-	-	-	-	0.46	-	-	-	-	-	3.5	-	5.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
27	CCS26003	Frage and Fritz (1982)	Roc	3076	-	-	-	385	8.1	5.8	205	19.3	1280	738	-	-	-	-	-	-	-	-	0.05	-	-	-	-	-	0.25	-	6.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
18	L261450	Frage and Fritz (1982)	Roc	2596	-	-	-	370	0.05	300	28	864	620	223	-	-	-	-	-	-	-	-	0.05	-	-	-	-	-	0.13	-	5.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
16	L261350	Frage and Fritz (1982)	Roc	1964	-	-	-	250	15.45	7.6	380	127	870	282	-	-	-	-	-	-	-	-	0.24	-	-	-	-	-	0.05	-	7.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
22	CCS084421	Frage and Fritz (1982)	Roc	1888	-	-	-	70	103.5	17	217	152	38	1240	-	-	-	-	-	-	-	-	0.5	-	-	-	-	-	26	-	1.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
23	CCS084422	Frage and Fritz (1982)	Roc	1295	-	-	-	36	74	11.7	155	190	26	768	-	-	-	-	-	-	-	-	0.3	-	-	-	-	-	8.3	-	0.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
21	L22450	Frage and Fritz (1982)	Roc	1282	-	-	-	140	16.3	5.8	207	211	408	237	-	-	-	-	-	-	-	-	0.33	-	-	-	-	-	0.15	-	3.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
19	L261550	Frage and Fritz (1982)	Roc	1061	-	-	-	145	0.05	44	129	213	180	355	-	-	-	-	-	-	-	-	0.05	-	-	-	-	-	0.05	-	1.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
24	CCS08481	Frage and Fritz (1982)	Roc	791	-	-	-	26	29	4.4	118	129	11	480	-	-	-	-	-	-	-	-	0.05	-	-	-	-	-	0.25	-	0.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1	N3644	Frage and Fritz (1982)	Roc	264	-	-	-	58	3.08	1.3	22	24	84	145	-	-	-	-	-	-	-	-	0.05	-	-	-	-	-	0.05	-	0.12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
31	L26000	Frage and Fritz (1982)	Roc	220	-	-	-	1	7.88	2.4	28	18.8	92	24.3	-	-	-	-	-	-	-	-	0.05	-	-	-	-	-	0.05	-	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
32	L26000	Frage and Fritz (1982)	Roc	187	-	-	-	30	6.03	1.8	21	23.2	63	25.4	-	-	-	-	-	-	-	-	0.05	-	-	-	-	-	0.05	-	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
15	L26000	Frage and Fritz (1982)	Roc	128	-	-	-	12	2.85	1.7	16	32.5	7	43	-	-	-	-	-	-	-	-	0.11	-	-	-	-	-	5	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
33	L26000	Frage and Fritz (1982)	Roc	107	-	-	-	19	2.9	2	10	11.8	34	17.5	-	-	-	-	-	-	-	-	0.05	-	-	-	-	-	0.1	-	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
34	Y5	Bottomley et al. (1999)	Roc	-	-	-	-	995	75	7.8	728	256	2015	1168	-	-	-	-	-	-	-	-	0.068	-	-	-	-	-	1.285	-	0.099	-	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
35	B646	Bottomley et al. (1999)	Roc	-	-	-	-	195	268	5.1	309	680	1145	0.804	-	-	-	-	-	-	-	-	0.145	-	-	-	-	-	0.049	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
36	Seep	Bottomley et al. (1999)	Roc	-	-	-	-	1585	324	12.5	2265	112	6471	880	-	-	-	-	-	-	-	-	0.111	-	-	-	-	-	2.321	-	0.23	-	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
37	B8946	Bottomley et al. (1999)	Roc	-	-	-	-	32	2.18	184	426	308	113	0.023	-	-	-	-	-	-	-	-	0.005	-	-	-	-	-	0.059	-	0.09	-	11.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
38	B9362	Bottomley et al. (1999)	Roc	-	-	-	-	2614	40	10.3	2095	20	7136	-	-	-	-	-	-	-	-	-	0.065	-	-	-	-	-	2.076	-	0.218	-	38	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39	B9452	Bottomley et al. (1999)	Roc	-																																																			

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