



ONTARIO SOIL BASELINE SURVEY

ANALYTICAL DATA 1980-1981

VOLUME 3

ANALYTICAL DATA FOR NORTHERN ONTARIO

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A.P.I.O.S. #002/85

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Ministry
of the
Environment

The Honourable
Morley Kells
Minister

Dr. Allan E. Dyer
Deputy Minister

ONTARIO SOIL BASELINE SURVEY
- ANALYTICAL DATA 1980-1981 -

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VOLUME 3
ANALYTICAL DATA FOR NORTHERN ONTARIO

TERRESTRIAL EFFECTS PROGRAM
ACIDIC PRECIPITATION IN ONTARIO STUDY

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ONTARIO MINISTRY OF THE ENVIRONMENT
NOVEMBER, 1984

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ACKNOWLEDGEMENTS

S.N. Linzon, Chairman of the A.P.I.O.S. Terrestrial Effects Working Group, originated the concept of the soil baseline program and has guided its development.

During 1980 and 1981, the collection of soil samples throughout Ontario involved a number of people. This work was accomplished under the co-ordination of M.A. Griffith (Southern Ontario), T. Spires (Northeastern Region) and W. Carswell (Northwestern Region). The development of an A.P.I.O.S. soils' laboratory and the chemical analyses of all soil samples were undertaken by the Laboratory Services Branch under the direction of A. Neary. The tables that form the bulk of Volumes 2 and 3 were typed by 2001 Word Processing Services .

Volume 1 of this report was written by M. A. Griffith, A.P.I.O.S., Soil Specialist, Phytotoxicology Section, Air Resources Branch. T. Spires of Northern Terrestrial Consultants and P. Barclay, Lakehead University provided most of the information regarding Northeastern and Northwestern Ontario, respectively. All members of the Terrestrial Effects Working Group's Technical Subcommittee assisted in various editing stages of the report, principally D. Griffin, W. McIlveen, D. Dimma, A. Neary and T. Spires.

III SUMMARY

The soil baseline program began in 1980 and is part of the Ministry of Environment's Acidic Precipitation in Ontario Study (A.P.I.O.S.). The major objectives of the soil baseline program and methods used to sample soils are provided in Volume 1. In addition, the glacial history of Ontario, some theories of soil development, and the effect of acidic precipitation on soils are briefly outlined in Volume 1. Over 300 locations were sampled in 1980 and 1981 throughout the province. A reliable, current and uniform data base for soils across Ontario now exists and is presented in Volumes 2 (Analytical Data for Southern Ontario) and 3 (Analytical Data for Northern Ontario) of this report. This data base is being used by A.P.I.O.S. researchers to produce a map which will show the relative sensitivities of Ontario soils to acidic deposition. Resampling baseline soil profiles over an extended period will also provide a means of monitoring trends in soil chemistry due to environmental stress.

This report is mainly a presentation of field and laboratory soil information (Volumes 2 and 3). Each baseline site has been given a 6 digit location code number. Within each region, sites are presented in ascending order based on location code number. The numbers which appear on Maps 3 to 8 in Volume 1 correspond to the last 3 digits of the location code. Soil samples were analyzed at the Ministry's central laboratory in Toronto for pH, texture, extractable iron, aluminum and manganese, inorganic and organic carbon, major cations (NaCl exchangeable), CEC (sum of cations measured), anions, and trace metals (HNO_3 - HClO_4 extractable). Further description of the analytical methods can be found in Volume 1 and in the "Procedures Manual Terrestrial Effects, Acid Precipitation in Ontario Study" (A.P.I.O.S.) Report No. 007/83 Ontario Ministry of the Environment. Data are reported to two significant figures. For the 14000, 17000 and 18000 series samples, organic carbon values were rounded to the nearest percent. This has since changed to provide better data at low levels.

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Wahnapitae (Camp)	NE	38
Wahnapitae	NE	70-76

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NORTHEASTERN REGION

Bedrock Geology

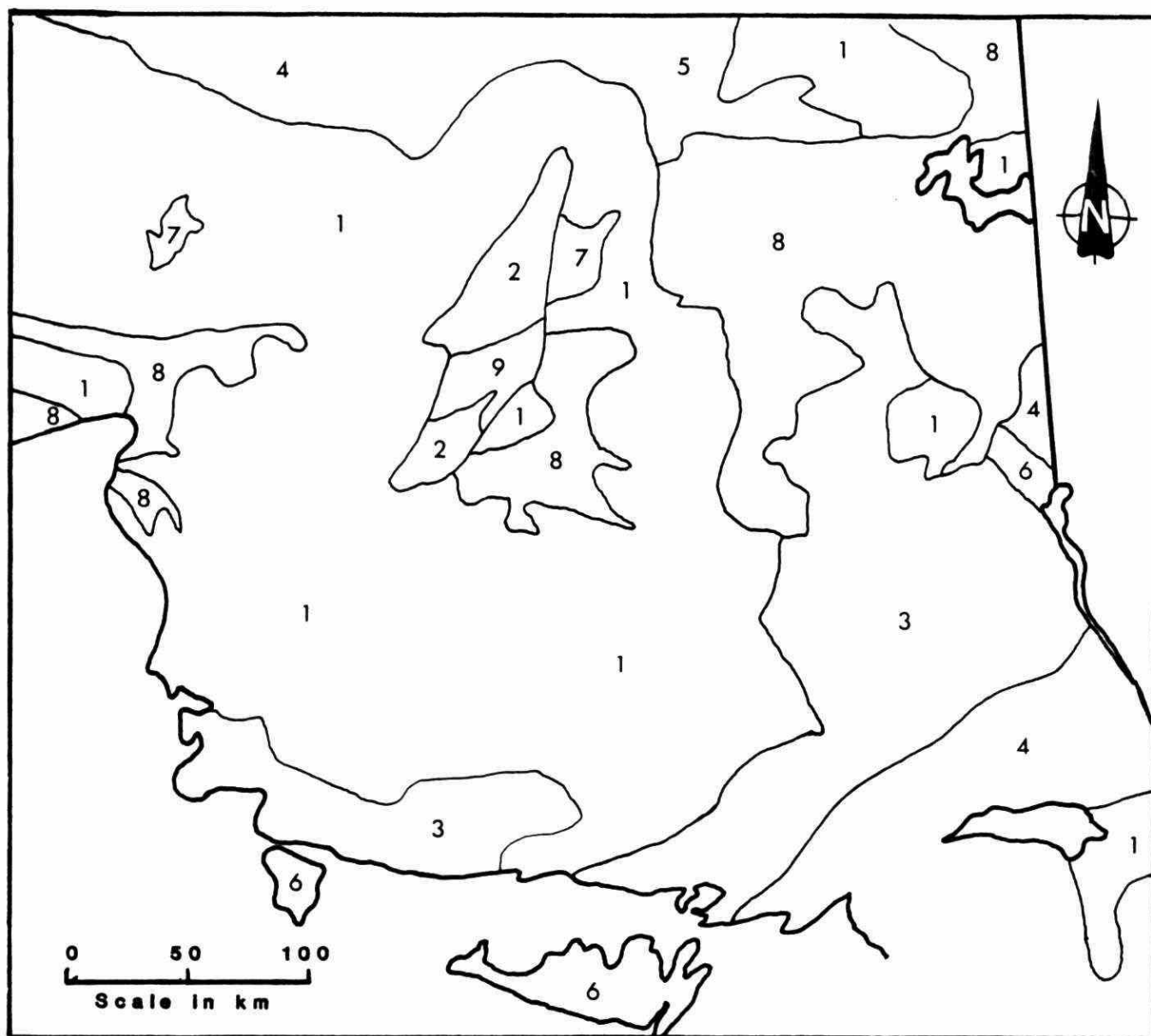
Bedrock geology has a predominant influence on the mineralogy and chemical properties of the soils in Northeastern Ontario. The area consists mainly of Precambrian rocks, most commonly felsic igneous types, such as granite. Mafic volcanic rocks are common in the Timmins - Kirkland Lake area and around both Sultan and Wawa. Precambrian sedimentary deposits predominate in the eastern part of the area and along the north shore of Lake Huron (Figure 1). These rocks offer little buffering capacity to acid precipitation inputs.

The area around James Bay consists of Ordovician and Silurian limestones which have had considerable influence on the soil chemistry of Northeastern Ontario. The calcareous soils of the Great Northern Clay Belt are derived from this limestone and extend much further south than the bedrock itself. Limestone bedrock is also found on Manitoulin Island, in the New Liskeard area and to a much lesser extent, around Espanola and Onaping Lake. Acidic inputs are well buffered in these areas.

Glacial History and Surficial Geology

As postulated by Boissonneau (1966, 1968), the last movement of ice over Northeastern Ontario consisted of two lobes (Figure 2). The western lobe fanned out in a southerly direction but was partially cut off by an eastern lobe which moved in a southwesterly direction.

As the ice retreated over 11,000 years ago, the areas around Sudbury, North Bay, and Sault Ste. Marie were the first to be exposed. The ice front then remained stationary, creating the Whiskey Lake moraine (Figure 2) and glacial Lake Algonquin (in the upper Great Lakes basin). In this lake the lacustrine areas along the north shore of Lake Huron and at Sudbury, North Bay and St. Charles were formed. The ice front then retreated to the Cartier I morainic belt at which time a number of deltas were formed (eg. northeast of Thessalon and near Capreol).



Key:

1. Felsic Igneous and Metamorphic
2. Mafic Metaigneous
3. Sediments
4. Metasediments
5. Metasediments and Metavolcanics
6. Limestone
7. Mafic Metavolcanic
8. Mafic Metavolcanic and Felsic Metavolcanic
9. Anorthosite

Figure 1. Bedrock Geology of Northeastern Ontario.

(from Ontario Geological Compilation Series, Ministry of Natural Resources)

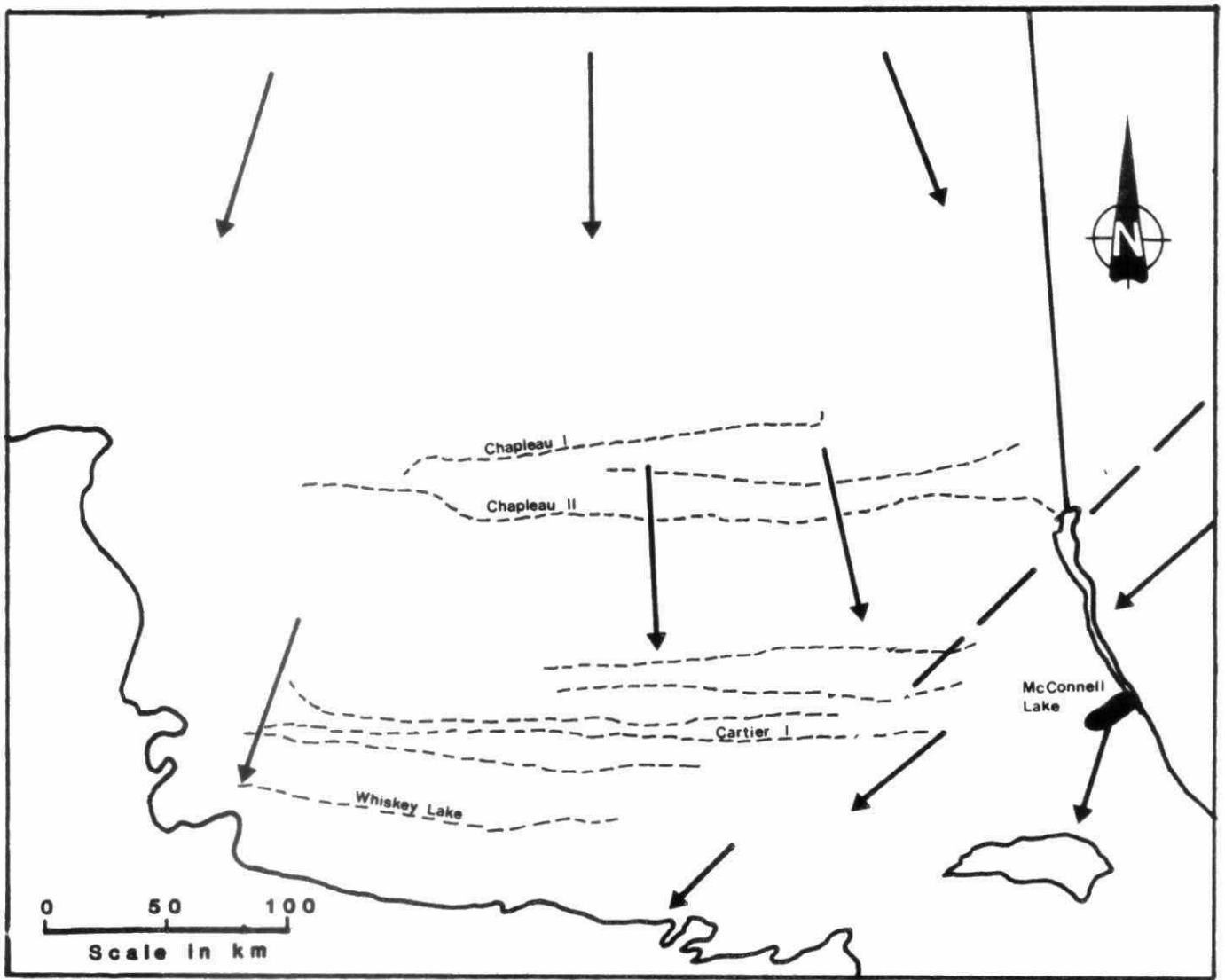


Figure 2. Direction of Ice Movements and Morainic Belts in Northeastern Ontario. (from Boissonneau, 1968)

The stationary ice front along the Cartier I morainic belt caused the formation of the McConnell Lake moraine near the south end of the present Lake Timiskaming, and the blocking of the Timiskaming Valley resulted in a large glacial lake between the ice, the moraine and the uplands to the northeast. This lake is known as glacial Lake Barlow-Ojibway. In this lake the extensive lacustrine clays and silts, which comprise the Northern Clay Belt, were deposited. The southern boundaries of the lake followed the line separating the lacustrine deposits from the sandy till. At the western boundary, near Hornepayne, ice remained, blocking meltwater flow.

As the formation of Lake Barlow-Ojibway occurred the ice front was retreating. It became stationary at the Chapleau I moraine forming a shallow lake known as Lake Sultan, in which lacustrine sands were deposited. The northern part of this lake was overridden by a readvance to the Chapleau II moraine where two small lakes were formed, lakes Ostrom and Ogilvie, to the east of Lake Sultan bearing lacustrine sand deposits.

The Superior basin was occupied by Lake Minong. Materials deposited within this lake are restricted to narrow areas along the shores of Lake Superior.

A major ice readvance (Cochrane readvance) occurred in the northern part of Lake Barlow-Ojibway depositing clay till over the lacustrine clays and eskers (Figure 3). Moraines in this area are capped with clay till. The ice must then have retreated rapidly and the waters drained northwards since only minor lacustrine deposits overlie the clay till. This retreat is believed to have occurred between 6,000 and 7,000 years ago. Figure 3 indicates the present surficial geology.

Soils in Northeastern Ontario

A shallow, sandy, glacial till is the predominant surficial deposit in the southern part of Northeastern Ontario. Bedrock exposure is common. The soils are usually Orthic Humoferric Podzols or Eluviated Dystric Brunisols both of which occur typically in coarse to medium textured acidic parent materials.

In both types of soils, aluminum and iron, in conjunction with organic acids, are removed from the top part of the soil and redeposited further down the profile. Orthic Humo-Ferric Podzols usually have organic surface horizons

Key:

1. Moderately rolling thin till over bedrock with local morainic deposits and outwash.
2. Moderately rolling, thin till over bedrock and wave washed bedrock with local pockets of lacustrine deposits and outwash.
3. Moderately rolling wave washed bedrock with local pockets of lacustrine deposits.
4. Gently rolling lacustrine deposits and outwash.
5. Gently to moderately rolling lacustrine deposits with knolls of thin till over bedrock.
6. Gently to moderately rolling lacustrine deposits with wave washed bedrock knolls.
7. Outwash deltaic sand plains.
8. Moderately rolling till uplands with local pockets of lacustrine sediments.
9. Gently undulating lacustrine plains.
10. Gently to moderately rolling clay till plains.

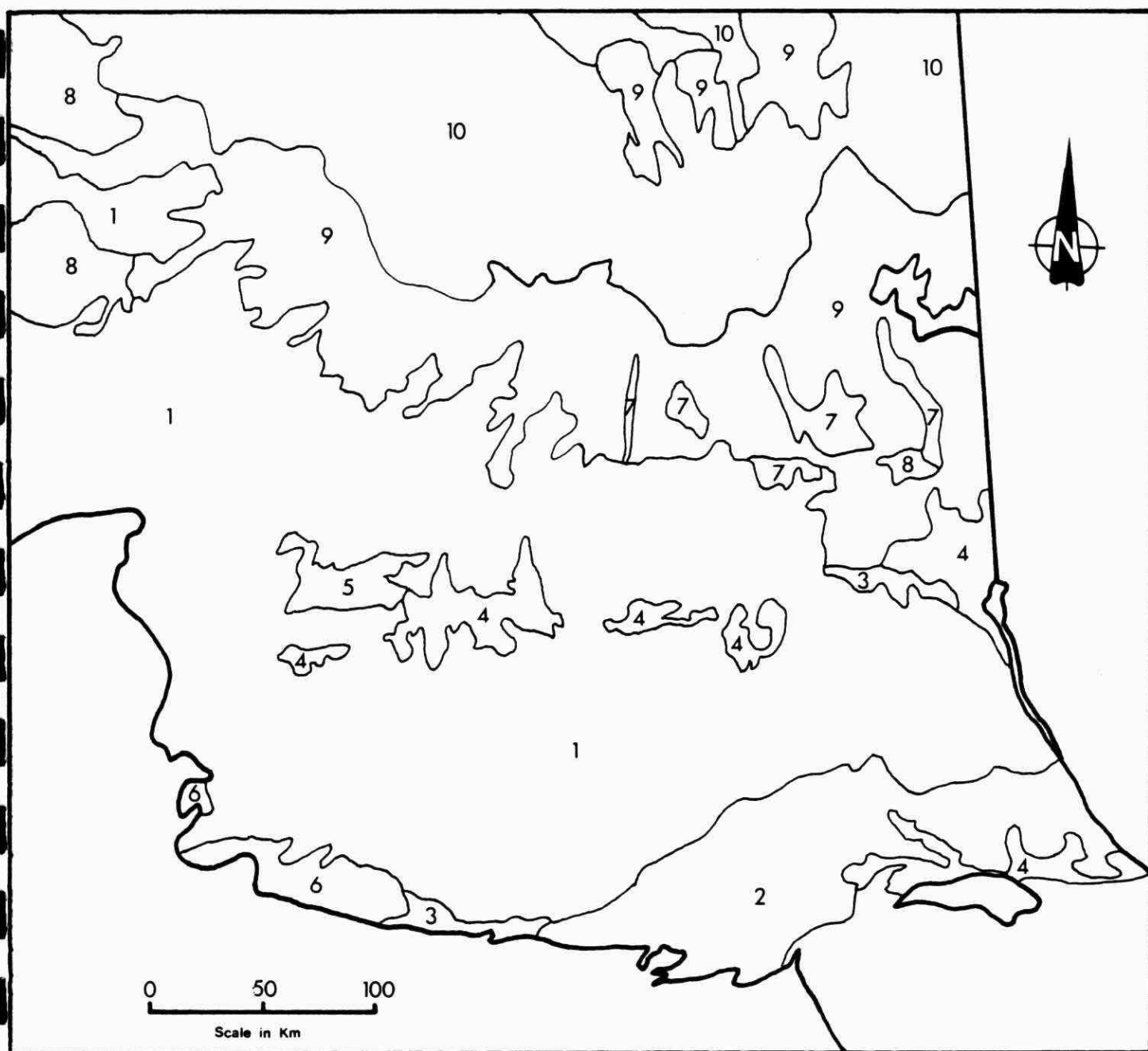


Figure 3. Surficial Geology of Northeastern Ontario.
(from Boissonneau, 1966, 1968)

(LFH) and a whitish or greyish eluvial horizon (Ae). This is underlain by a reddish-brown horizon (Bf), a result of the redeposited iron and organic material. This layer gradually merges into the more yellow C or parent material horizon (Figure 4). Eluviated Dystric Brunisols (Figure 5) differ from Orthic Humo-Ferric Podzols only in their degree of development, the movement of iron, aluminum and organic acids having occurred to a lesser extent.

From Sault Ste. Marie along the north shore of Lake Huron to Lake Nipissing and including areas around Sudbury, many lacustrine silt and clay deposits occur. Soils developed on these types of deposits are usually poorly or imperfectly drained and are classified as Orthic Humic Gleysols, or Gleyed Dystric Brunisols.

Gleysolic soils develop in areas that are saturated with water for long periods of time. Reduced iron in the soils gives a blue grey colour to the soil. Localized iron oxidization often imparts reddish colourations known as mottles within the soil. This reduction-oxidation process is known as gleying. Orthic Humic Gleysols (Figure 6) usually have a humus enriched surface horizon, (Ah) followed by a gleyed horizon (Bg) and the original parent material (Cg). Orthic Gleysols (Figure 7) are similar except that the surface horizons are usually organic (LFH) and the Ah horizon, if present, is less than 10 cm thick. Gleyed Dystric Brunisols are similar to the gleysol but the reduction and oxidation processes are less marked or occur at a greater depth in the soil profile. The surface horizons are usually organic (LFH) followed by a faint to distinct mottled mineral horizon (Bmgj) and the parent material (Cg).

In the northern section of Northeastern Ontario substantial areas of lacustrine clay deposits and varved clays occur. Further north these lacustrine clays are overlain by clay tills (Figure 3). These deposits together comprise the Northern Clay Belt and are extremely rich in carbonates. The soils of the northern clay belt have not been sampled in this study because their high content of carbonates enable them to be extremely well buffered against acidic inputs. More detailed work in this area has been carried out by Mr. K. Jones, Ontario Institute of Pedology, Guelph.

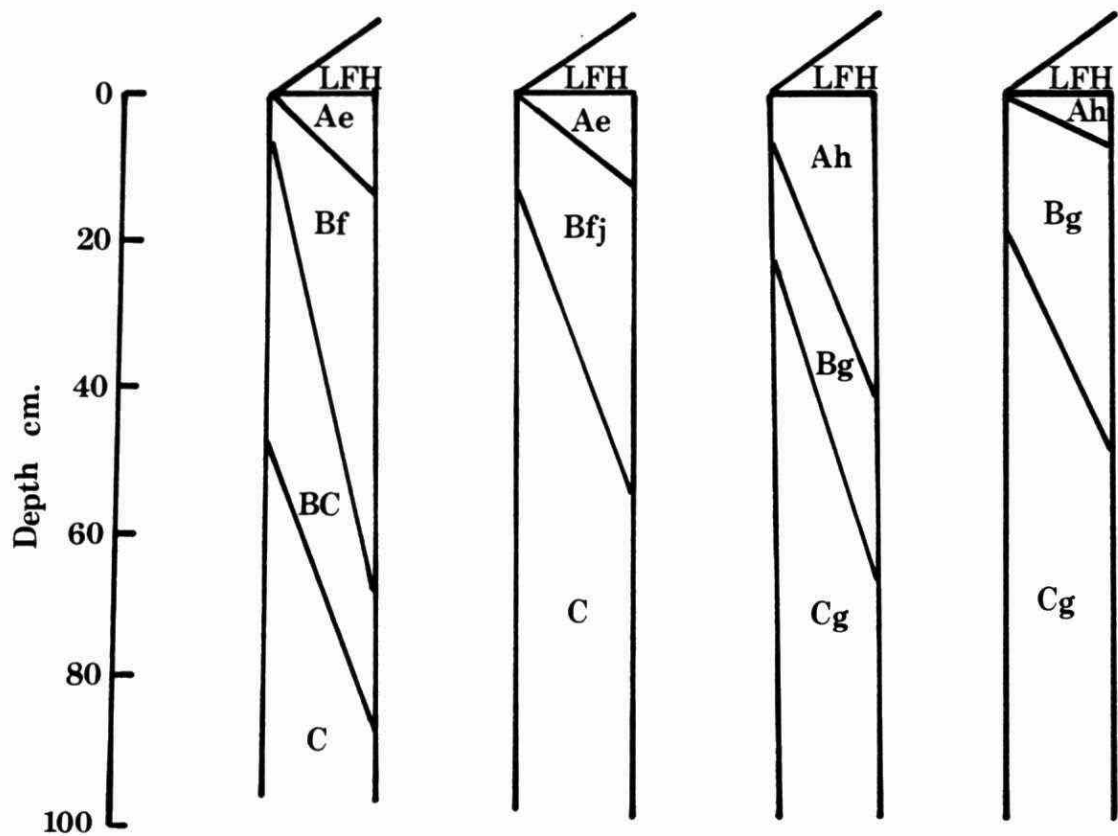


Figure 4

Figure 5

Figure 6

Figure 7

Figure 4. Typical horizon sequence of an Orthic Humo-Ferric Podzol.

Figure 5. Typical horizon sequence of an Eluviated Dystric Brunisol.

Figure 6. Typical horizon sequence of an Orthic Humic Gleysol.

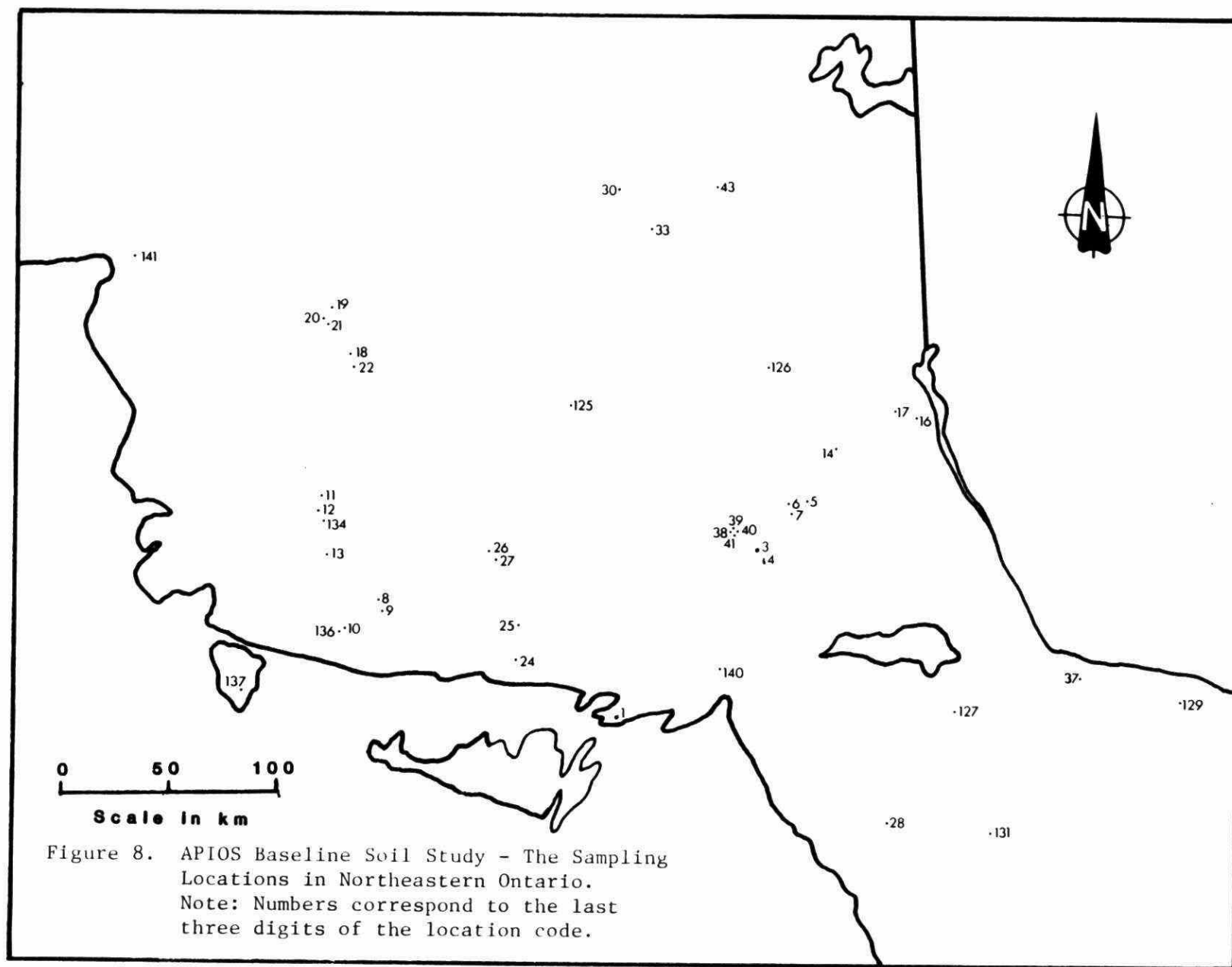
Figure 7. Typical horizon sequence of an Orthic Gleysol.

(Figures 4 - 7 from Canadian System of Soil Classification, 1978.)

Sampling Locations

Baseline sampling was done along three transects (Figure 8). The first extends northeast from Sudbury in the direction of the prevailing winds. Soils along this transect will have had historically high acidic inputs from the Sudbury mining operations with those closest to Sudbury expected to have the highest inputs. Two north-south transects were sampled, one extending from Massey to the area north of Ramsey and the other from Thessalon to Missinabi Lake. Along each transect sampling was restricted to sites having birch or poplar canopies where the soils were developed on glacial till, outwash or lacustrine sands.

As part of the overall soils study for the province of Ontario several soils were sampled within a 20 km radius of each of the acidic precipitation collectors and at experimental sites currently being monitored by the Ministry of the Environment.



Bibliography

Boissonneau, A.N. Glacial History of Northern Ontario: I The Cochrane-Hearst Area. Can. J. Earth Sci., 3, 1966, pp. 559-578.

Boissonneau, A.N. Glacial History of Northeastern Ontario: II The Timiskaming-Algoma Area. Can. J. Earth Sci., 5, 1968, pp. 97-109.

Canada Soil Survey Committee, Subcommittee on Soil Classification 1978. The Canadian System of Soil Classification. Can. Dept. Agri. 1646. Supply and Services Canada, Ottawa, 164 pp.

SOIL BASELINE ANALYTICAL DATA, 1980-1981

NORTHEASTERN REGION

SOIL PROFILE INFORMATION

Horizon	Depth (cm)	Site: Killarney	Date: 81/05
Ah	0 - 4	Location Code: 5017001	Parent Material: till
Ae	4 - 8	UTM: 17T 04653 50938	Vegetation: maple, balsam fir, aspen
Bm	8 - 30	Classification: Orthic Humo Ferric Podzol	
Bf	30 - 46	Landform: moraine	Comments: bedrock at 46 cm
	46+	Slope: level	



Sample No.	Horizon	Depth (cm)	Colour (dry, moist)	Sand (%)	Silt (%)	Clay (%)	pH (H ₂ O)	pH (CaCl ₂)	Organic C (%)	Total Nitrogen (mg/g)	Extr. S (ug/g)	Extr. SO ₄ (ug/g)	Avail. P (ug/g)	Total P (ug/g)	Avail. Al (ug/g)
14798	Ah	0 - 4	7.5YR 3/0, 2/0m	78	12	9.0	4.8	3.8	16	3.9			20		5.1
14799	Ae	4 - 8	7.5YR 6/2, 5/2m	89	7.0	4.0	5.0	4.0	1.0	0.50			4.0		4.0
14800	Bm	8 - 30	7.5YR 5/6, 4/6m	96	<1.0	4.0	5.5	4.6	1.0	0.70			<3.0		3.6
14801	Bf	30 - 46	7.5YR 4/6, 3/6m	94	1.0	4.0	5.1	4.5	1.0	0.80			<3.0		4.6

SOIL PROFILE INFORMATION (cont'd.)

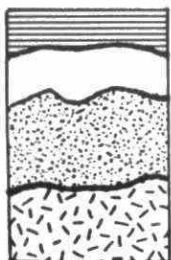
Site: Killarney

Classification: Orthic Humo Ferric Podzol

Sample No.	Horizon	Exchangeable Cations (ug/g)				C.E.C. (m.e.) 100g	Pyrophosphate (%)			Dithionite (%)			CaCO ₃ (%)	Metals (ug/g)			
		Ca	Mg	K	Al		Fe	Al	Mn	Fe	Al	Mn		Zn	Cu	Ni	Pb
14798	Ah	870	140	89	62	6.4	0.11	0.044	0.011	0.27	0.074	0.010		73	59	46	98
14799	Ae	87	28	14	72	1.5	0.059	0.022	0.0017	0.28	0.042	0.0012		18	18	7.2	3.4
14800	Bm	35	9.0	2.0	22	0.5	0.13	0.092	0.0011	0.38	0.16	0.0026		25	28	13	<3.0
14801	Bf	110	18	2.0	53	1.3	0.23	0.22	0.00060	0.45	0.29	0.0016		29	21	15	<3.0

SOIL PROFILE INFORMATION

Horizon	Depth (cm)	Site: Kukagami Road	Date: 81/05
LFH	6 - 0	Location Code: 5017003	Parent Material: glacial/fluvial deposit
Ae	0 - 8	UTM: 17T 05284 51765	Vegetation: aspen, white birch
Bfj	8 - 38	Classification: Eluviated Dystric Brunisol	
C	38+	Landform: outwash plain	Comments:
		Slope: level	



Sample No.	Horizon	Depth (cm)	Colour (dry, moist)	Sand (%)	Silt (%)	Clay (%)	pH (H ₂ O)	pH (CaCl ₂)	Organic C (%)	Total Nitrogen (mg/g)	Extr. S (ug/g)	Extr. SO ₄ (ug/g)	Avail. P (ug/g)	Total P (ug/g)	Avail. Al (ug/g)
14802	LFH	6 - 0	10YR 3/1, 2/1m				4.3	3.7	23	8.6			38		12
14803	Ae	0 - 8	10YR 7/1, 6/1m	53	42	5.0	4.4	3.6	<0.50	0.30			3.0		13
14804	Bfj	8 - 38	10YR 6/4, 5/4m	68	28	4.0	5.0	4.7	1.0	0.40			4.0		3.9
14805	C	38+	10YR 7/4, 6/4m	81	16	3.0	5.5	4.9	<0.50	<0.10			<3.0		0.45

SOIL PROFILE INFORMATION (cont'd.)

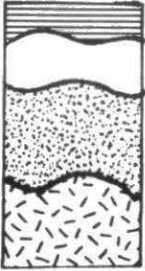
Site: Kukagami Road

Classification: Eluviated Dystric Brunisol

Sample No.	Horizon	Exchangeable Cations (ug/g)				C.E.C. (m.e.) 100g	Pyrophosphate (%)			Dithionite (%)			CaCO ₃ (%)	Metals (ug/g)			
		Ca	Mg	K	Al		Fe	Al	Mn	Fe	Al	Mn		Zn	Cu	Ni	Pb
14802	LFH	1100	160	200	40	7.6	0.17	0.047	0.027	0.57	0.079	0.024		100	380	500	120
14803	Ae	26	13	7.0	160	2.0	0.015	0.022	0.00070	0.066	0.031	0.0016		11	15	4.1	5.3
14804	Bfj	26	8.0	5.0	33	0.6	0.16	0.29	0.0028	0.84	0.52	0.0052		61	11	23	3.9
14805	C	15	4.0	4.0	3.0	0.2	0.028	0.066	0.0020	0.20	0.12	0.0057		18	13	16	<3.0

SOIL PROFILE INFORMATION

Horizon	Depth (cm)	Site: Kukagami Rd.	Date: 81/05
Ah	0 - 4	Location Code: 5017004	Parent Material: glacial/fluvial deposit
Ae	4 - 6	UTM: 17T 05295 51708	Vegetation: white birch
Bfj	6 - 36	Classification: Eluviated Dystric Brunisol	
C	36+	Landform: outwash plain	Comments:



Slope: level

Sample No.	Horizon	Depth (cm)	Colour (dry, moist)	Sand (%)	Silt (%)	Clay (%)	pH (H ₂ O)	pH (CaCl ₂)	Organic C (%)	Total Nitrogen (mg/g)	Extr. S (ug/g)	Extr. SO ₄ (ug/g)	Avail. P (ug/g)	Total P (ug/g)	Avail. Al (ug/g)
14806	Ah	0 - 4	10YR 3/1, 2/1m	66	25	9.0	5.6	4.5	10	4.4			65		4.1
14807	Ae	4 - 6	10YR 7/2, 6/2m	69	26	5.0	4.4	3.7	<0.50	0.60			24		21
14808	Bfj	6 - 36	10YR 6/4, 4/4m	76	20	4.0	5.0	4.6	2.0	0.70			<3.0		4.4
14809	C	36+	2.5YR 6/4, 5/4m	92	<1.0	8.0	5.5	5.1	<0.50	<0.10			<3.0		<0.080

SOIL PROFILE INFORMATION (cont'd.)

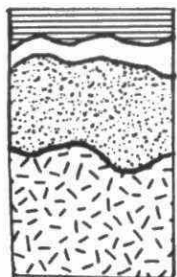
Site: Kukagami Road

Classification: Eluviated Dystric Brunisol

Sample No.	Horizon	Exchangeable Cations (ug/g)				C.E.C. (m.e.) 100g	Pyrophosphate (%)			Dithionite (%)			CaCO ₃ (%)	Metals (ug/g)			
		Ca	Mg	K	Al		Fe	Al	Mn	Fe	Al	Mn		Zn	Cu	Ni	Pb
14806	Ah	680	130	100	24	4.8	0.17	0.12	0.046	0.52	0.15	0.053		52	210	180	64
14807	Ae	24	10	15	140	1.8	0.013	0.015	0.0013	0.44	0.057	0.027		58	68	28	7.8
14808	Bfj	11	5.0	7.0	25	0.4	0.12	0.32	0.0079	1.0	0.71	0.018		75	22	39	<3.0
14809	C	11	3.0	2.0	2.0	0.1	0.011	0.030	0.0010	0.15	0.057	0.0028	<1.0	26	16	23	<3.0

SOIL PROFILE INFORMATION

Horizon	Depth (cm)	Site: Emerald Lake	Date: 81/05
Ah	0 - 4	Location Code: 5017005	Parent Material: glacial/fluvi al deposit
Ae	4 - 6	UTM: 17T 05529 51951	Vegetation: white birch
Bfj	6 - 26	Classification: Eluviated Dystric Brunisol	
C	26+	Landform: outwash plain	Comments:
		Slope: level	



Sample No.	Horizon	Depth (cm)	Colour (dry, moist)	Sand (%)	Silt (%)	Clay (%)	pH (H ₂ O)	pH (CaCl ₂)	Organic C (%)	Total Nitrogen (mg/g)	Extr. S (ug/g)	Extr. SO ₄ (ug/g)	Avail. P (ug/g)	Total P (ug/g)	Avail. Al (ug/g)
14810	Ah	0 - 4	10YR 3/1, 2/1m	42	39	19	5.3	4.4	13	4.1			19		7.3
14811	Ae	4 - 6	10YR 7/2, 6/2m	55	38	7.0	4.5	2.9	3.0	0.70			<3.0		22
14812	Bfj	6 - 26	10YR 6/4, 4/4m	79	16	4.0	4.9	4.5	2.0	1.5			<3.0		<0.080
14813	C	26+	10YR 7/4, 5/4m	97	<1.0	2.0	5.5	5.0	<0.50	0.10			<3.0		0.72

SOIL PROFILE INFORMATION (cont'd.)

Site: Emerald Lake

Classification: Eluviated Dystric Brunisol

Sample No.	Horizon	Exchangeable Cations (ug/g)				C.E.C. (m.e.) 100g	Pyrophosphate (%)			Dithionite (%)			CaCO ₃ (%) ³	Zn	Metals (ug/g)		
		Ca	Mg	K	Al		Fe	Al	Mn	Fe	Al	Mn			Cu	Ni	Pb
14810	Ah	620	110	150	61	5.1	0.24	0.14	0.031	0.54	0.18	0.034		69	81	53	56
14811	Ae	71	15	11	290	3.7	0.20	0.071	0.0024	0.61	0.10	0.018		19	12	8.0	<3.0
14812	Bfj	28	5.0	6.0	29	0.5	0.22	0.28	0.0037	0.80	0.60	0.012		57	49	31	<3.0
14813	C	11	3.0	<1.7	4.0	0.1	0.030	0.064	0.0017	0.24	0.13	0.0066	<1.0	43	31	34	<3.0

SOIL PROFILE INFORMATION

Horizon	Depth (cm)	Site: Sturgeon River	Date: 81/06
LFH	9 - 0	Location Code: 5017006	Parent Material: glacial/fluvial deposit
Ae	0 - 8	UTM: 17T 05467 51929	Vegetation: aspen, white birch
Bfj	8 - 23	Classification: Eluviated Dystric Brunisol	
C	23+	Landform: outwash plain	Comments:
		Slope: level	



Sample No.	Horizon	Depth (cm)	Colour (dry, moist)	Sand (%)	Silt (%)	Clay (%)	pH (H ₂ O)	pH (CaCl ₂)	Organic C (%)	Total Nitrogen (mg/g)	Extr. S (ug/g)	Extr. SO ₄ (ug/g)	Avail. P (ug/g)	Total P (ug/g)	Avail. Al (ug/g)
14814	LFH	9 - 0	10YR 3/2, 2/2m				4.4	4.0	30	15			120		20
14815	Ae	0 - 8	10YR 7/2, 6/2m	22	72	6.0	4.5	3.7	1.0	0.60			<3.0		10
14816	Bfj	8 - 23	10YR 6/6, 5/6m	24	72	4.0	5.3	4.8	1.0	1.0			<3.0		2.1
14817	C	23+	5Y 7/3, 6/3m	18	72	11	5.8	5.2	<0.50	0.20			<3.0		<0.080

SOIL PROFILE INFORMATION (cont'd.)

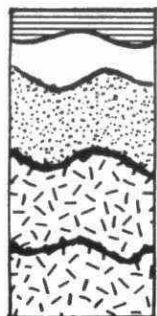
Site: Sturgeon River

Classification: Eluviated Dystric Brunisol

Sample No.	Horizon	Exchangeable Cations (ug/g)				C.E.C. (m.e.) 100g	Pyrophosphate (%)			Dithionite (%)			CaCO ₃ (%)	Metals (ug/g)			
		Ca	Mg	K	Al		Fe	Al	Mn	Fe	Al	Mn		Zn	Cu	Ni	Pb
14814	LFH	1500	440	280	25	12	0.069	0.045	0.068	0.26	0.051	0.053		84	160	150	100
14815	Ae	37	10	13	110	1.5	0.092	0.031	0.0014	0.16	0.041	0.0031		8.4	12	2.5	4.4
14816	Bfj	110	13	7.0	20	0.9	0.20	0.27	0.0032	1.3	0.59	0.0094		24	18	18	<3.0
14817	C	37	5.0	<1.7	5.0	<0.3	0.027	0.090	0.0020	0.20	0.15	0.0061	<1.0	18	100	16	<3.0

SOIL PROFILE INFORMATION

Horizon	Depth (cm)	Site: Sturgeon River	Date: 81/06
LFH	4 - 0	Location Code: 5017007	Parent Material: glacial/fluvial deposit
Ae	0 - 5	UTM: 17T 05468 51890	Vegetation: white birch
Bfj	5 - 17	Classification: Eluviated Dystric Brunisol	
BC	17 - 47	Landform: outwash plain	Comments:
C	47+	Slope: middle slope 5%	



Sample No.	Horizon	Depth (cm)	Colour (dry, moist)	Sand (%)	Silt (%)	Clay (%)	pH (H ₂ O)	pH (CaCl ₂)	Organic C (%)	Total Nitrogen (mg/g)	Extr. S (ug/g)	Extr. SO ₄ (ug/g)	Avail. P (ug/g)	Total P (ug/g)	Avail. Al (ug/g)
14818	LFH	4 - 0	10YR 3/2, 2/2m				4.9	4.2	24	15			76		15
14819	Ae	0 - 5	10YR 6/2, 5/2m	52	42	6.0	4.7	3.8	2.0	1.3			4.0		2.6
14820	Bfj	5 - 17	10YR 5/4, 4/4m	66	29	5.0	4.7	4.3	1.0	0.80			5.0		10
14821	BC	17 - 47	10YR 6/4, 5/4m	90	7.0	2.0	5.6	4.8	<0.50	0.30			<3.0		1.6
14822	C	47+	2.5Y 6/4, 5/4m	88	1.0	10	5.9	5.1	<0.50	0.20			<3.0		0.39

SOIL PROFILE INFORMATION (cont'd.)

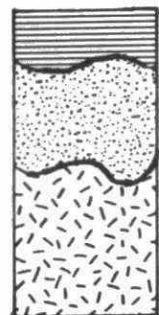
Site: Sturgeon River

Classification: Eluviated Dystric Brunisol

Sample No.	Horizon	Exchangeable Cations (ug/g)				C.E.C. (m.e.) 100g	Pyrophosphate (%)			Dithionite (%)			CaCO ₃ (%)	Metals (ug/g)			
		Ca	Mg	K	Al		Fe	Al	Mn	Fe	Al	Mn		Zn	Cu	Ni	Pb
14818	LFH	1200	460	240	15	10	0.14	0.077	0.15	0.34	0.092	0.13		170	150	160	91
14819	Ae	350	48	9.0	71	2.9	0.055	0.033	0.0017	0.16	0.041	0.0028		18	21	6.4	<3.0
14820	Bfj	140	18	4.0	100	2.0	0.20	0.20	0.0017	0.64	0.29	0.0053		20	16	11	<3.0
14821	BC	50	6.0	<1.7	8.0	0.4	0.11	0.094	0.0018	0.27	0.13	0.0050		18	6.5	13	<3.0
14822	C	50	5.0	3.0	3.0	0.3	0.068	0.056	0.0025	0.19	0.070	0.0054	<1.0	16	9.4	12	<3.0

SOIL PROFILE INFORMATION

Horizon	Depth (cm)	Site: Little White River	Date: 81/06
Ahe	0 - 14	Location Code: 5017008	Parent Material: glacial/fluvial deposit
Bfj	14 - 36	UTM: 17T 03423 51555	Vegetation: aspen
C	36+	Classification: Orthic Sombric Brunisol	Comments:
		Landform: outwash plain	
		Slope: level	



Sample No.	Horizon	Depth (cm)	Colour (dry, (moist)	Sand (%)	Silt (%)	Clay (%)	pH (H ₂ O)	pH (CaCl ₂)	Organic C (%)	Total Nitrogen (mg/g)	Extr. S (ug/g)	Extr. SO ₄ (ug/g)	Avail. P (ug/g)	Total P (ug/g)	Avail. Al (ug/g)
14823	Ahe	0 - 14	10YR 5/2, 3/2m	82	16	2.0	5.4	4.5	2.0	1.1			<3.0		1.0
14824	Bfj	14 - 36	10YR 5/4, 4/4m	85	11	4.0	5.6	5.0	1.0	0.90			<3.0		2.0
14825	C	36+	10YR 6/4, 5/4m	93	<1.0	7.0	5.9	5.1	<0.50	<0.10			<3.0		<0.080

SOIL PROFILE INFORMATION (cont'd.)

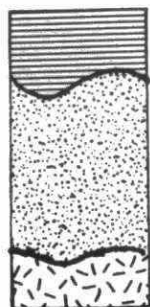
Site: Little White River

Classification: Orthic Sombric Brunisol

Sample No.	Horizon	Exchangeable Cations (ug/g)				C.E.C. (m.e.) 100g	Pyrophosphate (%)			Dithionite (%)			CaCO ₃ (%)	Metals (ug/g)			
		Ca	Mg	K	Al		Fe	Al	Mn	Fe	Al	Mn		Zn	Cu	Ni	Pb
14823	Ahe	220	32	14	28	1.7	0.17	0.19	0.016	0.48	0.22	0.022		44	12	4.0	8.0
14824	Bfj	64	6.0	4.0	8.0	0.5	0.19	0.19	0.0029	0.61	0.37	0.014	<1.0	35	41	8.1	<3.0
14825	C	20	4.0	2.0	<2.3	0.1	0.025	0.058	0.0015	0.21	0.085	0.0059	<1.0	32	16	10	5.8

SOIL PROFILE INFORMATION

Horizon	Depth (cm)	Site: Little White River	Date: 81/06
Ahe	0 - 16	Location Code: 5017009	Parent Material: glacial/fluvial
Bm	16 - 50	UTM: 17T 03412 51534	Vegetation: aspen, balsam fir, white birch
C	50+	Classification: Orthic Sombric Brunisol	Comments:
		Landform: outwash channel	
		Slope: mid-slope 8%	



Sample No.	Horizon	Depth (cm)	Colour (dry, moist)	Sand (%)	Silt (%)	Clay (%)	pH (H ₂ O)	pH (CaCl ₂)	Organic C (%)	Total Nitrogen (mg/g)	Extr. S (ug/g)	Extr. SO ₄ (ug/g)	Avail. P (ug/g)	Total P (ug/g)	Avail. Al (ug/g)
14826	Ahe	0 - 16	10YR 5/2, 3/2m	79	14	6.0	5.1	4.8	3.0	2.7			20		0.44
14827	Bm	16 - 50	10YR 5/4, 3/4m	92	4.0	4.0	5.3	4.7	1.0	0.40			23		1.4
14828	C	50+	2.5Y 6/4, 5/4m	89	7.0	5.0	5.8	4.9	<0.50	0.20			10		1.1

SOIL PROFILE INFORMATION (cont'd.)

Site: Little White River

Classification: Orthic Sombric Brunisol

Sample No.	Horizon	Exchangeable Cations (ug/g)				C.E.C. (m.e.) 100g	Pyrophosphate (%)			Dithionite (%)			CaCO ₃ (%)	Metals (ug/g)			
		Ca	Mg	K	Al		Fe	Al	Mn	Fe	Al	Mn		Zn	Cu	Ni	Pb
14826	Ahe	820	150	34	<4.5	5.5	0.23	0.079	0.020	0.39	0.092	0.020		51	27	7.7	14
14827	Bm	64	13	5.0	11	0.6	0.16	0.069	0.0037	0.40	0.14	0.010		27	20	7.0	7.6
14828	C	30	5.0	3.0	5.0	0.3	0.042	0.060	0.0013	0.25	0.17	0.0066		21	15	10	8.0

SOIL PROFILE INFORMATION

Horizon	Depth (cm)	Site: Parkinson Township	Date: 81/06
Ah	0 - 5	Location Code: 5017010	Parent Material: glacial/fluviat deposit
Ae	5 - 10	UTM: 17T 03268 51426	Vegetation: aspen, white spruce, white pine
Bm	10 - 65	Classification: Eluviated Dystric Brunisol	
C	65+	Landform: outwash plain	Comments:

Slope: level



Sample No.	Horizon	Depth (cm)	Colour (dry, moist)	Sand (%)	Silt (%)	Clay (%)	pH (H ₂ O)	pH (CaCl ₂)	Organic C (%)	Total Nitrogen (mg/g)	Extr. S (ug/g)	Extr. SO ₄ (ug/g)	Avail. P (ug/g)	Total P (ug/g)	Avail. Al (ug/g)
14829	Ah	0 - 5	10YR 4/1, 3/1m	83	10	7.0	5.8	4.9	3.0	2.1			38		2.7
14830	Ae	5 - 10	10YR 6/2, 5/2m	86	9.0	4.0	5.0	4.1	1.0	0.40			9.0		10
14831	Bm	10 - 65	10YR 5/4, 4/4m	90	7.0	3.0	5.5	4.9	1.0	0.70			<3.0		2.2
14832	C	65+	10YR 7/3, 6/3m	93	<1.0	7.0	6.0	5.2	<0.50	<0.10			17		0.38

SOIL PROFILE INFORMATION (cont'd.)

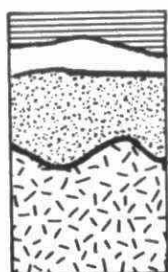
Site: Parkinson Twshp.

Classification: Eluviated Dystric Brunisol

Sample No.	Horizon	Exchangeable Cations (ug/g)				C.E.C. (m.e.) 100g	Pyrophosphate (%)			Dithionite (%)			CaCO ₃ (%)	Metals (ug/g)			
		Ca	Mg	K	Al		Fe	Al	Mn	Fe	Al	Mn		Zn	Cu	Ni	Pb
14829	Ah	260	73	71	4	2.1	0.067	0.035	0.010	0.21	0.052	0.011		40	8.9	2.5	40
14830	Ae	20	8.0	6.0	70	1.0	0.12	0.073	0.0071	0.32	0.070	0.011		13	14	<2.0	<3.0
14831	Bm	42	6.0	3.0	9.0	0.4	0.14	0.16	0.0042	0.43	0.31	0.070		34	15	7.6	5.6
14832	C	28	3.0	<1.7	<2.3	0.2	0.018	0.038	0.00040	0.17	0.085	0.0040	<1.0	20	21	7.2	5.9

SOIL PROFILE INFORMATION

Horizon	Depth (cm)	Site: Ranger Lake Road	Date: 81/06
LFH	4 - 0	Location Code: 5017011	Parent Material: glacial/fluvial deposit
Ae	0 - 2	UTM: 17T 03159 52031	Vegetation: white birch, aspen
Bfj	2 - 25	Classification: Eluviated Dystric Brunisol	
C	25+	Landform: outwash channel	Comments:
		Slope: lower slope 2%	



Sample No.	Horizon	Depth (cm)	Colour (dry, moist)	Sand (%)	Silt (%)	Clay (%)	pH (H2O)	pH (CaCl2)	Organic C (%)	Total Nitrogen (mg/g)	Extr. S (ug/g)	Extr. SO4 (ug/g)	Avail. P (ug/g)	Total P (ug/g)	Avail. Al (ug/g)
14833	LFH	4 - 0	10YR 3/1, 2/1m				5.5	5.3	19	14			150		1.2
14834	Ae	0 - 2	10YR 6/2, 5/2m	64	30	4.0	5.0	4.1	1.0	1.0			28		4.0
14835	Bfj	2 - 25	10YR 5/6, 4/6m	60	36	4.0	5.5	4.8	2.0	1.0			<3.0		1.9
14836	C	25+	10YR 7/4, 6/4m	82	14	4.0	5.7	4.8	<0.50	0.20			<3.0		1.6

SOIL PROFILE INFORMATION (cont'd.)

Site: Ranger Lake Road

Classification: Eluviated Dystric Brunisol

Sample No.	Horizon	Exchangeable Cations (ug/g)				C.E.C. (m.e.) 100g	Pyrophosphate (%)			Dithionite (%)			CaCO ₃ (%)	Metals (ug/g)			
		Ca	Mg	K	Al		Fe	Al	Mn	Fe	Al	Mn		Zn	Cu	Ni	Pb
14833	LFH	1600	640	110	7.0	14	0.11	0.12	0.18	0.29	0.14	0.20	<1.0	180	65	11	100
14834	Ae	220	51	26	49	2.1	0.083	0.044	0.0014	0.29	0.050	0.0046		8.0	7.5	<2.0	<3.0
14835	Bfj	230	25	5.0	28	1.7	0.15	0.31	0.00030	0.85	0.55	0.0026		21	15	14	<3.0
14836	C	85	10	5.0	17	0.7	0.050	0.12	0.00040	0.27	0.12	0.0019		16	19	10	<3.0

SOIL PROFILE INFORMATION

Horizon Depth (cm)

Site: Ranger Lake Road

Date: 81/06

LFH 5 - 0
Ae 0 - 2

Location Code: 5017012

Parent Material: glacial/fluvial deposit

Bm 2 - 40

UTM: 17T 03154 51981

Vegetation: aspen, white birch, jack pine

C 40+

Classification: Eluviated Dystric Brunisol

Landform: outwash

Comments:

Slope: lower slope 5%

Sample No.	Horizon	Depth (cm)	Colour (dry, moist)	Sand (%)	Silt (%)	Clay (%)	pH (H ₂ O)	pH (CaCl ₂)	Organic C (%)	Total Nitrogen (mg/g)	Extr. S (ug/g)	Extr. SO ₄ (ug/g)	Avail. P (ug/g)	Total P (ug/g)	Avail. Al (ug/g)
14837	LFH	5 - 0	10YR 3/2, 2/2m				5.3	4.7	22	11			52		
14838	Ae	0 - 2	10YR 6/2 5/2m	54	40	6.0	5.4	4.4	1.0	0.50			22		1.5
14839	Bm	2 - 40	10YR 6/6, 5/6m	59	35	6.0	5.5	4.9	1.0	0.70			<3.0		1.8
14840	C	40+	2.5Y 7/4, 5/4m	72	15	13	5.7	5.3	<0.50	<0.10			5.0		0.24

SOIL PROFILE INFORMATION (cont'd.)

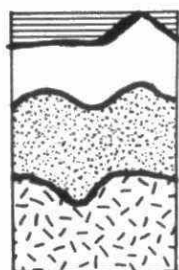
Site: Ranger Lake Road

Classification: Eluviated Dystric Brunisol

Sample No.	Horizon	Exchangeable Cations (ug/g)				C.E.C. (m.e.) 100g	Pyrophosphate (%)			Dithionite (%)			CaCO ₃ (%)	Metals (ug/g)			
		Ca	Mg	K	Al		Fe	Al	Mn	Fe	Al	Mn		Zn	Cu	Ni	Pb
14837	LFH	1600	450	570	9.8	13	0.095	0.096	0.14	0.30	0.12	0.28		180	61	11	160
14838	Ae	120	28	87	15	1.2	0.051	0.034	0.0052	0.18	0.041	0.0090		10	16	<2.0	6.3
14839	Bm	110	15	46	18	1.0	0.062	0.21	0.00070	0.48	0.46	0.0025		20	9.4	11	<3.0
14840	C	<2.0	3.0	13	<2.3	<0.1	0.0050	0.088	0.00030	0.14	0.11	0.0013	<1.0	14	11	8.4	<3.0

SOIL PROFILE INFORMATION

Horizon	Depth (cm)	Site: Highway 129	Date: 81/06
LFH	4 - 0	Location Code: 5017013	Parent Material: glacial/ fluvial deposit
Ae	0 - 4	UTM: 17T 03183 51728	Vegetation: aspen, white birch, maple
Bf	4 - 35	Classification: Orthic Humo-Ferric Podzol	
C	35+	Landform: outwash plain	Comments:
		Slope: level	



Sample No.	Horizon	Depth (cm)	Colour (dry, moist)	Sand (%)	Silt (%)	Clay (%)	pH (H ₂ O)	pH (CaCl ₂)	Organic C (%)	Total Nitrogen (mg/g)	Extr. S (ug/g)	Extr. SO ₄ (ug/g)	Avail. P (ug/g)	Total P (ug/g)	Avail. Al (ug/g)
14841	LFH	4 - 0	10YR 2/1, 2/1m				6.1	5.6	22	15			93		2.4
14842	Ae	0 - 4	10YR 7/1, 6/1m	53	41	6.0	4.7	4.4	1.0	0.70			7.0		1.4
14843	Bf	4 - 35	10YR 5/4, 3/4m	60	34	5.0	5.5	4.8	2.0	1.4			<3.0		1.4
14844	C	35+	2.5Y 7/4, 5/4m	57	34	10	5.8	5.3	<0.50	0.40			<3.0		1.0

SOIL PROFILE INFORMATION (cont'd.)

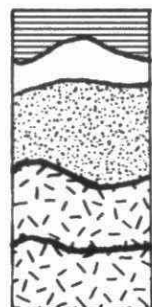
Site: Highway 129

Classification: Orthic Humo-Ferric Podzol

Sample No.	Horizon	Exchangeable Cations (ug/g)				C.E.C. (m.e.) 100g	Pyrophosphate (%)			Dithionite (%)			CaCO ₃ (%)	Metals (ug/g)			
		Ca	Mg	K	Al		Fe	Al	Mn	Fe	Al	Mn		Zn	Cu	Ni	Pb
14841	LFH	3400	460	640	<4.5	22	0.24	0.14	0.17	0.41	0.18	0.23		270	61	16	120
14842	Ae	410	35	34	17	2.6	0.066	0.032	0.0094	0.14	0.040	0.019		17	23	<2.0	3.4
14843	Bf	300	36	27	24	2.1	0.27	0.41	0.0012	0.58	0.70	0.0045		31	27	12	<3.0
14844	C	51	5.0	18	9.0	0.4	0.033	0.16	0.00090	0.14	0.20	0.0033	<1.0	13	15	11	<3.0

SOIL PROFILE INFORMATION

Horizon	Depth (cm)	Site: Camp Wahnapiatae	Date: 81/06
Ah	0 - 7	Location Code: 5017014	Parent Material: glacial/fluvial deposit
Ae	7 - 12	UTM: 17T 05694 52253	Vegetation: white birch, spruce, jack pine
Bfj	12 - 24	Classification: Eluviated Dystric Brunisol	
B/C	24 - 63	Landform: outwash plain	Comments:
C	63+	Slope: lower slope 2%	



Sample No.	Horizon	Depth (cm)	Colour (dry, moist)	Sand (%)	Silt (%)	Clay (%)	pH (H ₂ O)	pH (CaCl ₂)	Organic C (%)	Total Nitrogen (mg/g)	Extr. S (ug/g)	Extr. SO ₄ (ug/g)	Avail. P (ug/g)	Total P (ug/g)	Avail. Al (ug/g)
14845	Ah	0 - 7	10YR 3/1	66	12	22	4.7	3.9	12	11			36		12
14846	Ae	7 - 12	10YR 7/2, 5/2m	84	12	4.0	4.3	3.5	1.0	0.30			4.0		14
14847	Bfj	12 - 24	10YR 6/4, 4/4m	90	5.0	5.0	4.9	4.7	1.0	0.50			<3.0		4.0
14848	B/C	24 - 63	10YR 7/4, 6/4m	93	3.0	5.0	5.0	4.9	1.0	0.20			7.0		1.0
14849	C	63+	2.5Y 6/4, 5/4m	94	2.0	4.0	5.2	4.9	<0.50	0.20			<3.0		1.1

SOIL PROFILE INFORMATION (cont'd.)

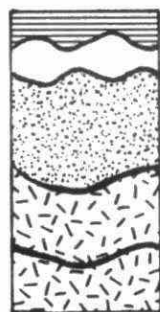
Site: Camp Wahnapiatae

Classification: Eluviated Dystric Brunisol

Sample No.	Horizon	Exchangeable Cations (ug/g)				C.E.C. (m.e.) 100g	Pyrophosphate (%)			Dithionite (%)			CaCO ₃ (%)	Metals (ug/g)			
		Ca	Mg	K	Al		Fe	Al	Mn	Fe	Al	Mn		Zn	Cu	Ni	Pb
14845	Ah	1700	340	360	30	13	0.15	0.099	0.039	0.34	0.13	0.014		36	57	35	44
14846	Ae	45	9.0	29	140	1.8	0.020	0.024	<0.00010	0.11	0.043	0.0013		5.8	19	<2.0	3.6
14847	Bfj	4.2	2.6	18	30	0.4	0.078	0.21	0.0034	0.56	0.35	0.019		37	23	11	3.9
14848	B/C	21	<1.0	16	3.3	0.2	0.024	0.080	0.0010	0.30	0.21	0.0053		23	24	19	<3.0
14849	C	6.3	2.6	17	4.4	0.1	0.022	0.076	0.0010	0.20	0.13	0.0059		22	31	20	<3.0

SOIL PROFILE INFORMATION

Horizon	Depth (cm)	Site: Cobalt	Date: 81/06
Ah	0 - 4	Location Code: 5017016	Parent Material: glacial/fluvial deposit
Ae	4 - 7	UTM: 17T 05991 52409	Vegetation: aspen, birch, spruce
Bfj	7 - 19	Classification: Eluviated Dystric Brunisol	Comments:
B/C	19 - 64	Landform: outwash plain	
C	64+	Slope: mid-slope 5%	



Sample No.	Horizon	Depth (cm)	Colour (dry, moist)	Sand (%)	Silt (%)	Clay (%)	pH (H ₂ O)	pH (CaCl ₂)	Organic C (%)	Total Nitrogen (mg/g)	Extr. S (ug/g)	Extr. SO ₄ (ug/g)	Avail. P (ug/g)	Total P (ug/g)	Avail. Al (ug/g)
14854	Ah	0 - 4	10YR 4/1, 3/1m	85	8.0	7.0	5.1	4.3	12	2.7			28		5.5
14855	Ae	4 - 7	10YR 6/2, 5/2m	83	13	4.0	4.6	4.0	1.0	0.40			3.0		9.7
14856	Bfj	7 - 19	10YR 5/6, 4/6m	91	4.0	4.0	4.8	4.7	1.0	0.70			6.0		3.7
14857	B/C	19 - 64	10YR 6/4, 5/4m	96	1.0	3.0	5.6	4.9	1.0	0.30			3.0		0.62
14858	C	64+	2.5Y 7/4, 6/4m	96	2.0	2.0	6.0	5.0	0.50	0.10			3.0		0.41

SOIL PROFILE INFORMATION (cont'd.)

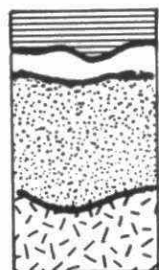
Site: Cobalt

Classification: Eluviated Dystric Brunisol

Sample No.	Horizon	Exchangeable Cations (ug/g)				C.E.C. (m.e.) 100g	Pyrophosphate (%)			Dithionite (%)			CaCO ₃ (%)	Metals (ug/g)			
		Ca	Mg	K	Al		Fe	Al	Mn	Fe	Al	Mn		Zn	Cu	Ni	Pb
14854	Ah	750	200	260	6.6	6.1	0.092	0.052	0.017	0.28	0.11	0.032		110	41	26	65
14855	Ae	36	17	36	110	1.6	0.044	0.032	0.0018	0.17	0.054	0.0052		8.4	14	<2.0	<3.0
14856	Bfj	30	7.7	14	13	0.4	0.15	0.21	0.0034	0.52	0.44	0.013		9.5	14	<2.0	3.2
14857	B/C	60	12	25	3.3	0.5	0.071	0.19	0.0010	0.29	0.27	0.0030		34	16	13	<3.0
14858	C	30	9.0	15	5.5	0.3	0.031	0.074	0.00070	0.20	0.10	0.0033	<1.0	20	23	18	<3.0

SOIL PROFILE INFORMATION

Horizon	Depth (cm)	Site: Cobalt	Date: 81/06
Ah	0 - 6	Location Code: 5017017	Parent Material: glacial/fluviat deposit
Aej	6 - 8	UTM: 17T 05955 52477	Vegetation: white birch, aspen
Bfj	8 - 46	Classification: Eluviated Dystric Brunisol	
IIC	46+	Landform: outwash channel	Comments:
		Slope: upper slope 2%	



Sample No.	Horizon	Depth (cm)	Colour (dry, moist)	Sand (%)	Silt (%)	Clay (%)	pH (H ₂ O)	pH (CaCl ₂)	Organic C (%)	Total Nitrogen (mg/g)	Extr. S (ug/g)	Extr. SO ₄ (ug/g)	Avail. P (ug/g)	Total P (ug/g)	Avail. Al (ug/g)
14859	Ah	0 - 6	10YR 4/1, 3/1m	43	44	13	5.4	4.7	7.0	2.7			15		3.2
14860	Bfj	8 - 46	10YR 5/6, 4/6m	60	34	6.0	5.2	4.6	2.0	0.90			4.0		4.6
14861	IIC	46+	10YR 6/4, 4/4m	94	3.0	3.0	5.4	4.7	1.0	0.30			<3.0		2.1

SOIL PROFILE INFORMATION (cont'd.)

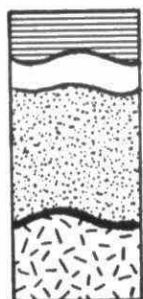
Site: Cobalt

Classification: Eluviated Dystric Brunisol

Sample No.	Horizon	Exchangeable Cations (ug/g)				C.E.C. (m.e.) 100g	Pyrophosphate (%)			Dithionite (%)			CaCO ₃ (%)	Metals (ug/g)			
		Ca	Mg	K	Al		Fe	Al	Mn	Fe	Al	Mn		Zn	Cu	Ni	Pb
14859	Ah	320	94	100	4.4	2.7	0.21	0.11	0.050	0.63	0.17	0.059		81	34	20	27
14860	Bfj	64	18	38	63	1.2	0.19	0.29	0.0025	1.0	0.56	0.025		78	14	21	<3.0
14861	IIC	30	15	10	12	0.4	0.062	0.15	0.00040	0.39	0.19	0.0054		46	38	39	3.9

SOIL PROFILE INFORMATION

Horizon	Depth (cm)	Site: Chapleau	Date: 81/07
Ah	0 - 5	Location Code: 5017018	Parent Material: lacustrine
Ae	5 - 8	UTM: 17T 03342 52733	Vegetation: white birch, aspen, spruce
Bm	8 - 35	Classification: Eluviated Dystric Brunisol	
IIC	35+	Landform: lacustrine plain	Comments:
		Slope: level	



Sample No.	Horizon	Depth (cm)	Colour (dry, moist)	Sand (%)	Silt (%)	Clay (%)	pH (H ₂ O)	pH (CaCl ₂)	Organic C (%)	Total Nitrogen (mg/g)	Extr. S (ug/g)	Extr. SO ₄ (ug/g)	Avail. P (ug/g)	Total P (ug/g)	Avail. Al (ug/g)
14862	Ah	0 - 5	10YR 3/2, 2/2m	43	34	23	5.1	5.0	16	9.8			46		0.75
14863	Ae	5 - 8	10YR 7/2, 5/2m	49	45	6.0	5.2	4.8	1.0	0.70			<3.0		2.0
14864	Bm	8 - 35	10YR 6/6, 5/6m	47	49	4.0	5.5	4.9	1.0	1.0			<3.0		1.1
14865	IIC	35+	2.5Y 7/4, 6/4m	90	1.0	9.0	5.9	5.2	<0.50	<0.10			<3.0		0.46

SOIL PROFILE INFORMATION (cont'd.)

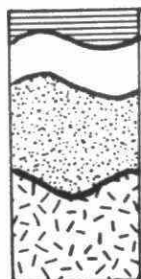
Site: Chapleau

Classification: Eluviated Dystric Brunisol

Sample No.	Horizon	Exchangeable Cations (ug/g)				C.E.C. (m.e.) 100g	Pyrophosphate (%)			Dithionite (%)			CaCO ₃ (%)	Metals (ug/g)			
		Ca	Mg	K	Al		Fe	Al	Mn	Fe	Al	Mn		Zn	Cu	Ni	Pb
14862	Ah	2400	430	110	<4.5	16	0.071	0.11	0.14	0.26	0.11	0.19	<1.0	140	33	8.6	66
14863	Ae	300	160	60	<4.5	3.0	0.062	0.038	0.0022	0.16	0.029	0.0042		9.0	17	2.2	3.1
14864	Bm	94	41	63	6.6	1.0	0.067	0.25	0.00090	0.48	0.47	0.0025		19	10	16	<3.0
14865	IIC	15	5.1	18	<4.5	0.2	0.0070	0.070	0.00090	0.095	0.081	0.0040	<1.0	12	14	10	<3.0

SOIL PROFILE INFORMATION

Horizon	Depth (cm)	Site: Chapleau	Date: 81/07
Ah	0 - 2	Location Code: 5017019	Parent Material: lacustrine
Ae	2 - 7	UTM: 17T 03216 52958	Vegetation: aspen, white spruce
Bm	7 - 26	Classification: Eluviated Dystric Brunisol	
IIC	26+	Landform: lacustrine plain	Comments:
		Slope: lower slope 5%	



Sample No.	Horizon	Depth (cm)	Colour (dry, moist)	Sand (%)	Silt (%)	Clay (%)	pH (H ₂ O)	pH (CaCl ₂)	Organic C (%)	Total Nitrogen (mg/g)	Extr. S (ug/g)	Extr. SO ₄ (ug/g)	Avail. P (ug/g)	Total P (ug/g)	Avail. Al (ug/g)
14866	Ah	0 - 2	10YR 4/1, 3/1m	45	45	10	4.8	4.3	7.0	2.3			28		3.8
14867	Ae	2 - 7	10YR 7/2, 5/2m	48	45	7.0	4.9	4.1	2.0	0.60			62		9.8
14868	Bm	7 - 26	10YR 6/6, 5/6m	54	42	5.0	5.4	5.0	1.0	0.40			8.0		0.29
14869	IIC	26+	2.5Y 7/4, 6/4m	84	6.0	10	5.8	5.2	<0.50	<0.10			6.0		0.16

SOIL PROFILE INFORMATION (cont'd.)

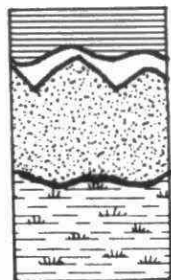
Site: Chapleau

Classification: Eluviated Dystric Brunisol

Sample No.	Horizon	Exchangeable Cations (ug/g)				C.E.C. (m.e.) 100g	Pyrophosphate (%)			Dithionite (%)			CaCO ₃ (%)	Metals (ug/g)			
		Ca	Mg	K	Al		Fe	Al	Mn	Fe	Al	Mn		Zn	Cu	Ni	Pb
14866	Ah	800	140	180	54	6.2	0.11	0.088	0.0086	0.24	0.10	0.015		26	35	2.9	19
14867	Ae	92	31	53	120	2.2	0.14	0.14	0.00070	0.24	0.14	0.0018		7.5	7.9	<2.0	<3.0
14868	Bm	36	13	22	3.3	0.4	0.12	0.23	0.00090	0.59	0.36	0.0028	<1.0	14	9.0	8.3	<3.0
14869	IIC	23	9.0	11	<2.3	0.2	0.016	0.053	0.0010	0.14	0.092	0.0047	<1.0	14	8.8	10	<3.0

SOIL PROFILE INFORMATION

Horizon	Depth (cm)	Site: Chapleau	Date: 81/07
Ah	0 - 4	Location Code: 5017020	Parent Material: lacustrine
Ae	4 - 6	UTM: 17T 03213 52891	Vegetation: aspen, black spruce
Bfj	6 - 34	Classification: Gleyed Eluviated Dystric Brunisol	
Cgj	34+	Landform: lacustrine plain	Comments:
		Slope: level	



Sample No.	Horizon	Depth (cm)	Colour (dry, moist)	Sand (%)	Silt (%)	Clay (%)	pH (H ₂ O)	pH (CaCl ₂)	Organic C (%)	Total Nitrogen (mg/g)	Extr. S (ug/g)	Extr. SO ₄ (ug/g)	Avail. P (ug/g)	Total P (ug/g)	Avail. Al (ug/g)
14870	Ah	0 - 4	10YR 3/2, 2/2m	46	38	16	5.3	4.5	13	7.2			46		3.8
14871	Ae	4 - 6	10YR 7/2, 5/2m	46	47	7.0	5.1	4.3	2.0	0.70			<3.0		5.3
14872	Bfj	6 - 34	10YR 5/4, 4/4m	55	39	6.0	5.5	4.8	1.0	0.70			<3.0		1.6
14873	Cgj	34+	2.5Y 8/4, 6/4m	17	79	4.0	5.4	4.8	<0.50	0.30			<3.0		2.0

SOIL PROFILE INFORMATION (cont'd.)

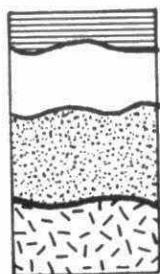
Site: Chapleau

Classification: Gleyed Eluviated Dystric Brunisol

Sample No.	Horizon	Exchangeable Cations (ug/g)				C.E.C. (m.e.) 100g	Pyrophosphate (%)			Dithionite (%)			CaCO ₃ (%)	Metals (ug/g)			
		Ca	Mg	K	Al		Fe	Al	Mn	Fe	Al	Mn		Zn	Cu	Ni	Pb
14870	Ah	660	270	410	6.6	6.6	0.18	0.099	0.096	0.29	0.099	0.080		25	19	4.1	33
14871	Ae	230	43	33	67	2.3	0.15	0.17	0.00030	0.21	0.17	0.0018		9.0	6.6	3.2	<3.0
14872	Bfj	110	22	15	16	0.95	0.24	0.31	<0.00010	0.24	0.43	0.0030		22	19	9.8	<3.0
14873	Cgj	21	10	12	20	0.4	0.13	0.14	<0.00010	0.31	0.18	0.0028		20	19	16	<3.0

SOIL PROFILE INFORMATION

Horizon	Depth (cm)	Site: Chapleau	Date: 81/07
Ah	0 - 4	Location Code: 5017021	Parent Material: lacustrine
Ae	4 - 10	UTM: 17T 03233 52888	Vegetation: aspen, white birch, jack pine
Bm	10 - 39	Classification: Eluviated Dystric Brunisol	
C	39+	Landform: lacustrine plain	Comments:
		Slope: level	



Sample No.	Horizon	Depth (cm)	Colour (dry, moist)	Sand (%)	Silt (%)	Clay (%)	pH (H ₂ O)	pH (CaCl ₂)	Organic C (%)	Total Nitrogen (mg/g)	Extr. S (ug/g)	Extr. SO ₄ (ug/g)	Avail. P (ug/g)	Total P (ug/g)	Avail. Al (ug/g)
14874	Ah	0 - 4	10YR 3/1, 2/1m	71	18	11	5.1	3.9	10	5.4			60		7.5
14875	Ae	4 - 10	10YR 7/2, 5/2m	79	17	4.0	4.5	3.7	1.0	0.60			6.0		16
14876	Bm	10 - 39	10YR 5/4, 4/4m	63	32	5.0	5.3	4.5	1.0	0.70			<3.0		4.6
14877	C	39+	2.5Y 7/4, 5/4m	96	1.0	2.0	5.4	4.9	<0.50	0.20			<3.0		1.2

SOIL PROFILE INFORMATION (cont'd.)

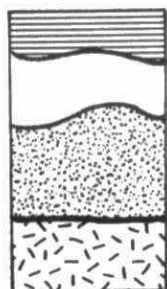
Site: Chapleau

Classification: Eluviated Dystric Brunisol

Sample No.	Horizon	Exchangeable Cations (ug/g)				C.E.C. (m.e.) 100g	Pyrophosphate (%)			Dithionite (%)			CaCO ₃ (%)	Metals (ug/g)			
		Ca	Mg	K	Al		Fe	Al	Mn	Fe	Al	Mn		Zn	Cu	Ni	Pb
14874	Ah	860	200	150	80	7.2	0.13	0.096	0.011	0.25	0.13	0.014		23	25	7.6	30
14875	Ae	30	17	28	140	1.9	0.058	0.059	0.00030	0.14	0.060	0.0011		5.4	11	<2.0	<3.0
14876	Bm	36	13	15	23	0.55	0.10	0.19	0.00050	0.48	0.38	0.0023		22	18	15	<3.0
14877	C	15	5.1	1.9	7.6	0.2	0.022	0.069	0.00090	0.16	0.10	0.0028		19	30	12	<3.0

SOIL PROFILE INFORMATION

Horizon	Depth (cm)	Site: Chapleau	Date: 81/07
LFH	4 - 0	Location Code: 5017022	Parent Material: lacustrine
Ae	0 - 4	UTM: 17T 03334 52681	Vegetation: aspen, balsam fir, white birch
Bf	4 - 28	Classification: Orthic Humo-Ferric Podzol	
C	28+	Landform: lacustrine plain	Comments:
		Slope: lower slope 2%	



Sample No.	Horizon	Depth (cm)	Colour (dry, moist)	Sand (%)	Silt (%)	Clay (%)	pH (H ₂ O)	pH (CaCl ₂)	Organic C (%)	Total Nitrogen (mg/g)	Extr. S (ug/g)	Extr. SO ₄ (ug/g)	Avail. P (ug/g)	Total P (ug/g)	Avail. Al (ug/g)
14878	LFH	4 - 0	10YR 3/2, 2/2m				5.3	4.8	23	12			95		4.3
14879	Ae	0 - 4	10YR 7/2, 5/2m	8.0	86	6.0	4.6	3.8	1.0	0.50			16		5.3
14880	Bf	4 - 28	10YR 5/6, 4/6m	15	79	6.0	5.4	4.7	2.0	1.0			<3.0		2.4
14881	C	28+	2.5Y 7/4, 6/4m	16	68	16	6.0	5.2	<0.50	0.20			10		0.42

SOIL PROFILE INFORMATION (cont'd.)

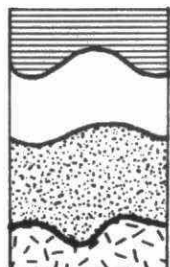
Site: Chapleau

Classification: Orthic Humo-Ferric Podzol

Sample No.	Horizon	Exchangeable Cations (ug/g)				C.E.C. (m.e.) 100g	Pyrophosphate (%)			Dithionite (%)			CaCO ₃ (%)	Metals (ug/g)			
		Ca	Mg	K	Al		Fe	Al	Mn	Fe	Al	Mn		Zn	Cu	Ni	Pb
14878	LFH	2300	290	71	<4.5	14	0.096	0.095	0.20	0.27	0.10	0.34		80	110	8.7	77
14879	Ae	120	18	41	110	2.1	0.066	0.046	0.0061	0.13	0.050	0.014		8.6	16	2.3	<3.0
14880	Bf	150	12	26	20	1.1	0.23	0.39	0.0017	0.96	0.63	0.0054		18	9.6	11	<3.0
14881	C	85	7.0	10	5.0	0.6	0.028	0.12	0.00090	0.22	0.17	0.0025	<1.0	14	7.1	16	<3.0

SOIL PROFILE INFORMATION

Horizon	Depth (cm)	Site: Massey	Date: 81/07
LFH	12 - 0	Location Code: 5017024	Parent Material: glacial/fluvial deposit
Ae	0 - 12	UTM: 17T 04112 51236	Vegetation: aspen, white spruce
Bfj	12 - 42	Classification: Eluviated Dystric Brunisol	
C	42+	Landform: outwash plain	Comments:
		Slope: level	



Sample No.	Horizon	Depth (cm)	Colour (dry, moist)	Sand (%)	Silt (%)	Clay (%)	pH (H ₂ O)	pH (CaCl ₂)	Organic C (%)	Total Nitrogen (mg/g)	Extr. S (ug/g)	Extr. SO ₄ (ug/g)	Avail. P (ug/g)	Total P (ug/g)	Avail. Al (ug/g)
14883	LFH	12 - 0	10YR 3/2, 2/2m				6.4	5.9	29	16			85		0.38
14884	Ae	0 - 12	10YR 5/2, 3/2m	81	10	10	6.5	5.9	2.0	0.80			4.0		0.37
14885	Bfj	12 - 42	10YR 5/6, 4/6m	85	5.0	10	6.2	5.4	1.0	0.30			<3.0		0.27
14886	C	42+	10YR 6/4, 5/4m	94	<1.0	6.0	6.3	5.4	<0.50	<0.10			<3.0		0.24

SOIL PROFILE INFORMATION (cont'd.)

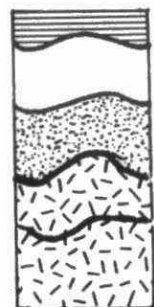
Site: Massey

Classification: Eluviated Dystric Brunisol

Sample No.	Horizon	Exchangeable Cations (ug/g)				C.E.C. (m.e.) 100g	Pyrophosphate (%)			Dithionite (%)			CaCO ₃ (%)	Metals (ug/g)			
		Ca	Mg	K	Al		Fe	Al	Mn	Fe	Al	Mn		Zn	Cu	Ni	Pb
14883	LFH	8300	330	630		46	0.024	0.14	0.040	0.14		0.067	<1.0		65		57
14884	Ae	450	15	37		2.5	0.12	0.14	0.0054	0.33	0.18	0.016	<1.0	39	23	2.9	4.2
14885	Bfj	130	72	26	4.0	1.5	0.18	0.27	0.0029	0.48	0.43	0.016	<1.0	37	13	6.0	4.7
14886	C	21	10	14	4.0	0.3	0.022	0.071	0.0014	0.12	0.081	0.0037	<1.0	17	19	4.5	<3.0

SOIL PROFILE INFORMATION

Horizon	Depth (cm)	Site: Massey	Date: 81/07
Ah	0 - 4	Location Code: 5017025	Parent Material: glacial/fluvial deposit
Ae	4 - 12	UTM: 17T 04092 51447	Vegetation: aspen, balsam fir, white birch
Bfj	12 - 27	Classification: Eluviated Dystric Brunisol	
B/C	27 - 67	Landform: outwash channel	Comments:
C	67+	Slope: level	



Sample No.	Horizon	Depth (cm)	Colour (dry, moist)	Sand (%)	Silt (%)	Clay (%)	pH (H ₂ O)	pH (CaCl ₂)	Organic C (%)	Total Nitrogen (mg/g)	Extr. S (ug/g)	Extr. SO ₄ (ug/g)	Avail. P (ug/g)	Total P (ug/g)	Avail. Al (ug/g)
14887	Ah	0 - 4	10YR 3/2, 2/2m	70	20	10	4.3	3.4	13	4.0			13		12
14888	Ae	4 - 12	10YR 7/2, 5/2m	76	20	5.0	4.5	3.8	1.0	0.60			<3.0		19
14889	Bfj	12 - 27	10YR 5/6, 4/6m	89	8.0	3.0	5.1	4.7	1.0	0.60			<3.0		2.9
14890	B/C	27 - 67	10YR 7/6, 5/6m	86	11	3.0	5.1	4.9	<0.50	0.30			<3.0		0.90
14891	C	67+	10YR 6/4, 5/4m	93	4.0	4.0	5.2	4.9	<0.50	<0.10			4.0		0.72

SOIL PROFILE INFORMATION (cont'd.)

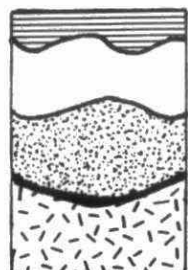
Site: Massey

Classification: Eluviated Dystric Brunisol

Sample No.	Horizon	Exchangeable Cations (ug/g)				C.E.C. (m.e.) 100g	Pyrophosphate (%)			Dithionite (%)			CaCO ₃ (%)	Metals (ug/g)			
		Ca	Mg	K	Al		Fe	Al	Mn	Fe	Al	Mn		Zn	Cu	Ni	Pb
14887	Ah	48	170	260	170	4.2	0.10	0.089	0.0060	0.24	0.12	0.0074					
14888	Ae	13	5.0	19	160	1.9	0.097	0.073	0.00060	0.21	0.080	0.0013		7.5	15	2.1	3.2
14889	Bfj	9.0	3.0	8.0	15	0.3	0.089	0.24	0.00080	0.49	0.47	0.0037		22	13	5.0	3.7
14890	B/C	4.0	1.0	2.0	5.0	0.1	0.025	0.10	0.00060	0.26	0.18	0.00020		20	7.6	5.3	<3.0
14891	C	4.0	1.0	4.0	8.0	0.1	0.019	0.055	0.00050	0.17	0.094	0.0012		21	25	3.7	9.2

SOIL PROFILE INFORMATION

Horizon	Depth (cm)	Site: Massey	Date: 81/07
LFH	4-0	Location Code: 5017026	Parent Material: glacial/fluviol deposit
Ae	0-8	UTM: 17T 04013 51786	Vegetation: aspen, jack pine, spruce
Bfj	8-33	Classification: Eluviated Dystric Brunisol	
IIC	33+	Landform: outwash plain	Comments:
		Slope: level	



Sample No.	Horizon	Depth (cm)	Colour (dry, moist)	Sand (%)	Silt (%)	Clay (%)	pH (H ₂ O)	pH (CaCl ₂)	Organic C (%)	Total Nitrogen (mg/g)	Extr. S (ug/g)	Extr. SO ₄ (ug/g)	Avail. P (ug/g)	Total P (ug/g)	Avail. Al (ug/g)
14892	LFH	4-0	10YR 2/2, 2/2m				4.5	3.8	28	18			80		8.6
14893	Ae	0-8	10YR 7/2, 5/2m	66	30	4.0	4.4	3.4	1.0	0.60			4.0		12
14894	Bfj	8-33	10YR 5.6, 4/6m	62	32	6.0	5.0	4.7	2.0	0.90			<3.0		3.3
14895	IIC	33+	10YR 7/4, 5/4m	90	7.0	3.0	5.1	4.7	1.0	0.40			<3.0		2.2

SOIL PROFILE INFORMATION (cont'd.)

Site: Massey

Classification: Eluviated Dystric Brunisol

Sample No.	Horizon	Exchangeable Cations (ug/g)				C.E.C. (m.e.) 100g	Pyrophosphate (%)			Dithionite (%)			CaCO ₃ (%)	Metals (ug/g)			
		Ca	Mg	K	Al		Fe	Al	Mn	Fe	Al	Mn		Zn	Cu	Ni	Pb
14892	LFH	3000	560	700	18	22	0.028	0.060	0.026	0.19	0.083	0.025		410	85	17	100
14893	Ae	48	14	31	130	1.9	0.022	0.022	0.00030	0.12	0.032	0.00020		10	9.6	<2.0	3.2
14894	Bfj	11	3.0	22	19	0.3	0.17	0.39	0.00060	0.96	0.81	0.0022		53	14	5.8	11
14895	IIC	13	3.0	11	17	0.3	0.054	0.16	0.00030	0.28	0.23	0.00050		24	15	3.3	8.2

SOIL PROFILE INFORMATION

Horizon	Depth (cm)	Site: Massey	Date: 81/07
Ah	0-3	Location Code: 5017027	Parent Material: glacial/fluvial deposit
Ae	3-11	UTM: 17T 04038 51718	Vegetation: aspen, spruce
Bm	11-35	Classification: Eluviated Dystric Brunisol	
C	35+	Landform: outwash plain	Comments:
		Slope: lower slope 5%	



Sample No.	Horizon	Depth (cm)	Colour (dry, moist)	Sand (%)	Silt (%)	Clay (%)	pH (H ₂ O)	pH (CaCl ₂)	Organic C (%)	Total Nitrogen (mg/g)	Extr. S (ug/g)	Extr. SO ₄ (ug/g)	Avail. P (ug/g)	Total P (ug/g)	Avail. Al (ug/g)
14896	Ah	0-3	10YR 3/1, 2/1m	66	21	13	4.5	3.6	11	10			19		5.9
14897	Ae	3-11	7.5Y 6/2, 5/2m	84	12	5.0	4.3	3.6	1.0	0.40			<3.0		14
14898	Bm	11-35	10YR 6/6, 5/6m	89	7.0	4.0	5.2	4.8	1.0	0.40			4.0		1.6
14899	C	35+	10YR 7/4, 6/4m	91	5.0	4.0	5.6	4.9	<0.50	0.20			<3.0		0.75

SOIL PROFILE INFORMATION (cont'd.)

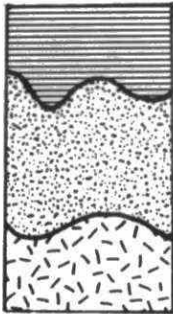
Site: Massey

Classification: Eluviated Dystric Brunisol

Sample No.	Horizon	Exchangeable Cations (ug/g)				C.E.C. (m.e.) 100g	Pyrophosphate (%)			Dithionite (%)			CaCO ₃ (%)	Metals (ug/g)			
		Ca	Mg	K	Al		Fe	Al	Mn	Fe	Al	Mn		Zn	Cu	Ni	Pb
14896	Ah	800	230	480	86	8.1	0.067	0.071	0.019	0.19	0.086	0.020		45	25	9.0	43
14897	Ae	23	5.0	19	120	1.5	0.050	0.034	0.00050	0.16	0.040	0.00070		3.6	7.7	<2.0	<3.0
14898	Bm	11	1.0	7.0	9.0	0.2	0.066	0.14	0.00090	0.43	0.43	0.0029		22	19	4.2	4.7
14899	C	6.0	1.0	7.0	4.0	0.1	0.024	0.068	0.00060	0.19	0.12	0.00050		16	13	3.8	5.2

SOIL PROFILE INFORMATION

Horizon Depth (cm) Site: McKellar - Parry Sound Date: 81/07

Ah  0-26 Location Code: 5017028 Parent Material: shallow till

Bf 26-36 UTM: 17T 05837 50429 Vegetation: maple, white birch

C 36+ Classification: Sombric Humo-Ferric Podzol

Landform: moraine Comments:

Slope: toe of the slope - 5%

Sample No.	Horizon	Depth (cm)	Colour (dry, moist)	Sand (%)	Silt (%)	Clay (%)	pH (H ₂ O)	pH (CaCl ₂)	Organic C (%)	Total Nitrogen (mg/g)	Extr. S (ug/g)	Extr. SO ₄ (ug/g)	Avail. P (ug/g)	Total P (ug/g)	Avail. Al (ug/g)
14900	Ah	0-26	10YR 4/2, 3/2m	62	24	14	4.6	4.3	6.0	3.8			<3.0		19
14901	Bf	26-36	7.5Y 4/4, 3/4m	86	9.0	5.0	5.1	4.4	2.0	1.3			<3.0		7.0
14902	C	36+	10YR 6/6, 5/6m	87	9.0	3.0	5.3	4.6	1.0	0.60			<3.0		5.1

SOIL PROFILE INFORMATION (cont'd.)

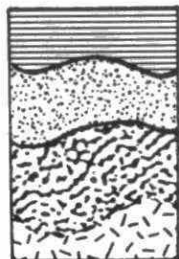
Site: McKellar - Parry Sound

Classification: Sombric Humo-Ferric Podzol

Sample No.	Horizon	Exchangeable Cations (ug/g)				C.E.C. (m.e.) 100g	Pyrophosphate (%)			Dithionite (%)			CaCO ₃ (%)	Metals (ug/g)			
		Ca	Mg	K	Al		Fe	Al	Mn	Fe	Al	Mn		Zn	Cu	Ni	Pb
14900	Ah	73	20	32	140	2.2	0.60	0.98	0.11	1.1	1.1	0.036		69	51	9.0	7.0
14901	Bf	63	8.0	11	51	1.0	0.29	0.49	0.0013	0.80	0.64	0.0026		160	33	12	<3.0
14902	C	36	3.0	2.0	34	0.6	0.064	0.28	0.00080	0.50	0.41	0.0019		21	18	8.5	<3.0

SOIL PROFILE INFORMATION

Horizon	Depth (cm)	Site: Timmins	Date: 81/07
LFH	9-0	Location Code: 5017030	Parent Material: glacial/fluvi al deposit
Ae	0-17	UTM: 17T 04646 53533	Vegetation: balsam fir, black spruce, white birch
Bm	17-41	Classification: Eluviated Dystric Brunisol	
C	41+	Landform: outwash channel	Comments:
		Slope: upper slope - 6%	



Sample No.	Horizon	Depth (cm)	Colour (dry, moist)	Sand (%)	Silt (%)	Clay (%)	pH (H ₂ O)	pH (CaCl ₂)	Organic C (%)	Total Nitrogen (mg/g)	Extr. S (ug/g)	Extr. SO ₄ (ug/g)	Avail. P (ug/g)	Total P (ug/g)	Avail. Al (ug/g)
14906	LFH	9-0	10YR 3/2, 2/2m				4.6	3.9	31	17			190		10
14907	Ae	0-17	10YR 7/2, 6/2m	79	17	4.0	4.8	3.7	<0.50	0.30			6.0		7.5
14908	Bm	17-41	10YR 6/8, 5/8m	85	10	4.0	5.5	4.6	1.0	0.40			16		2.3
14909	C	41+	2.5Y 7/4, 6/4m	95	2.0	3.0	5.9	4.9	<0.50	<0.10			<3.0		0.59

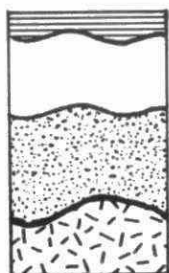
Site: Timmins

Classification: Eluviated Dystric Brunisol

Sample No.	Horizon	Exchangeable Cations (ug/g)				C.E.C. (m.e.) 100g	Pyrophosphate (%)			Dithionite (%)			CaCO ₃ (%)	Metals (ug/g)			
		Ca	Mg	K	Al		Fe	Al	Mn	Fe	Al	Mn		Zn	Cu	Ni	Pb
14906	LFH	1500	500	690	12	13	0.020	0.050	0.050	0.16	0.072	0.050		73	66	9.5	75
14907	Ae	67	11	24	59	1.1	0.021	0.028	0.0011	0.056	0.029	0.0031		3.5	3.5	<2.0	<3.0
14908	Bm	46	5.0	12	14	0.5	0.089	0.19	0.00090	0.51	0.41	0.0014		16	9.9	7.0	<3.0
14909	C	23	3.0	5.0	7.0	0.2	0.025	0.080	0.0013	0.12	0.11	0.0031		8.5	8.3	8.5	<3.0

SOIL PROFILE INFORMATION

Horizon	Depth (cm)	Site: Timmins	Date: 81/07
Ah	0-2	Location Code: 5017033	Parent Material: till
Ae	2-12	UTM: 17T 04777 53383	Vegetation: aspen, spruce, moose maple
Bf	12-50	Classification: Eluviated Dystric Brunisol	
C	50+	Landform: moraine	Comments:
		Slope: lower slope - 2%	



Sample No.	Horizon	Depth (cm)	Colour (dry, moist)	Sand (%)	Silt (%)	Clay (%)	pH (H ₂ O)	pH (CaCl ₂)	Organic C (%)	Total Nitrogen (mg/g)	Extr. S (ug/g)	Extr. SO ₄ (ug/g)	Avail. P (ug/g)	Total P (ug/g)	Avail. Al (ug/g)
14917	Ah	0-2	10YR 3/1, 2/1m	44	39	17	4.7	4.1	16	5.9			54		12
14918	Ae	2-12	10YR 7/3, 6/3m	19	75	6.0	4.8	4.0	1.0	0.60			<3.0		12
14919	Bfj	12-50	10YR 5/6, 4/6m	43	55	2.0	5.5	4.9	1.0	0.70			<3.0		2.0
14920	C	50+	2.5Y 7/4, 6/4m	64	35	2.0	5.4	4.8	1.0	0.30			<3.0		1.7

SOIL PROFILE INFORMATION (cont'd.)

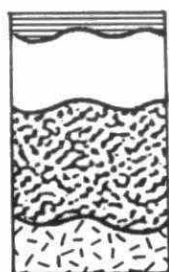
Site: Timmins

Classification: Eluviated Dystric Brunisol

Sample No.	Horizon	Exchangeable Cations (ug/g)				C.E.C. (m.e.) 100g	Pyrophosphate (%)			Dithionite (%)			CaCO ₃ (%)	Metals (ug/g)			
		Ca	Mg	K	Al		Fe	Al	Mn	Fe	Al	Mn		Zn	Cu	Ni	Pb
14917	Ah	1800	510	950	12	16	0.074	0.061	0.30	0.21	0.083	0.033		73	62	8.9	28
14918	Ae	89	9.0	26	110	1.8	0.23	0.14	0.013	0.39	0.13	0.018		10	4.8	4.2	<3.0
14919	Bfj	71	5.0	12	8.0	0.50	0.17	0.31	0.0011	0.59	0.52	0.0046		29	19	30	<3.0
14920	C	22	4.0	11	9.0	0.3	0.065	0.14	0.0021	0.29	0.18	0.0043		26	35	46	<3.0

SOIL PROFILE INFORMATION

Horizon	Depth (cm)	Site: Mattawa	Date: 81/07
Ah	0-4	Location Code: 5017037	Parent Material: glacial/fluviail deposit
Ae	4-14	UTM: 17T 06809 51225	Vegetation: aspen, white pine, red pine
Bm	14-54	Classification: Eluviated Dystric Brunisol	
C	54+	Landform: outwash	Comments:
		Slope: level	



Sample No.	Horizon	Depth (cm)	Colour (dry, moist)	Sand (%)	Silt (%)	Clay (%)	pH (H ₂ O)	pH (CaCl ₂)	Organic C (%)	Total Nitrogen (mg/g)	Extr. S (ug/g)	Extr. SO ₄ (ug/g)	Avail. P (ug/g)	Total P (ug/g)	Avail. Al (ug/g)
14933	Ah	0-4	10YR 3/2, 2/2m	80	9.0	11	4.4	3.7	16	8.0			76		8.0
14934	Ae	4-14	10YR 6/2, 4/2m	93	4.0	3.0	4.7	3.9	1.0	0.40			12		12
14935	Bm	14-54	10YR 6/6, 5/6m	91	1.0	8.0	5.7	5.0	1.0	0.30			10		0.87
14936	C	54+	10YR 7/6, 6/6m	97	1.0	3.0	5.8	5.0	<0.50	<0.10			4.0		0.63

SOIL PROFILE INFORMATION (cont'd.)

Site: Mattawa

Classification: Eluviated Dystric Brunisol

Sample No.	Horizon	Exchangeable Cations (ug/g)				C.E.C. (m.e.) 100g	Pyrophosphate (%)			Dithionite (%)			CaCO ₃ (%)	Metals (ug/g)			
		Ca	Mg	K	Al		Fe	Al	Mn	Fe	Al	Mn		Zn	Cu	Ni	Pb
14933	Ah	630	290	430	25	6.9	0.039	0.036	0.022	0.17	0.065	0.023		59	63	13	63
14934	Ae	15	7.0	17	83	1.1	0.048	0.042	0.00020	0.12	0.058	0.0010		4.2	10	<2.0	<3.0
14935	Bm	40	2.0	2.0	4.0	0.3	0.063	0.12	0.00030	0.36	0.29	0.0020	<1.0	15	9.5	3.6	<3.0
14936	C	24	1.0	4.0	<2.3	0.2	0.048	0.073	0.00020	0.18	0.14	0.00070	<1.0	24	12	4.5	4.2

SOIL PROFILE INFORMATION

Horizon	Depth (cm)	Site: Wahnapiatae	Date: 81/07
LFH	4-0	Location Code: 5017038	Parent Material: glacial/fluvial deposit
Ae	0-6	UTM: 17T 05186 51819	Vegetation: white birch, aspen
Bfj	6-17	Classification: Eluviated Dystric Brunisol	
B/C	17-35	Landform: outwash channel	Comments:
C	35+	Slope: level	

Sample No.	Horizon	Depth (cm)	Colour (dry, moist)	Sand (%)	Silt (%)	Clay (%)	pH (H ₂ O)	pH (CaCl ₂)	Organic C (%)	Total Nitrogen (mg/g)	Extr. S (ug/g)	Extr. SO ₄ (ug/g)	Avail. P (ug/g)	Total P (ug/g)	Avail. Al (ug/g)
14937	LFH	4-0	10YR 3/2, 2/2m				4.4	3.7	19	13			76		13
14938	Ahe	0-6	10YR 5/1, 4/1m	82	13	6.0	4.4	3.5	2.0	1.0			37		12
14939	Bfj	6-17	10YR 6/6, 4/6m	91	5.0	3.0	5.1	4.6	1.0	0.60			4.0		4.2
14940	B/C	17-35	2.5Y 7/4, 6/4m	94	3.0	2.0	5.4	4.9	<0.50	0.20			4.0		1.2
14941	C	35+	5YR 7/3, 6/3m	92	1.0	7.0	5.6	5.1	<0.50	<0.10			4.0		0.26

SOIL PROFILE INFORMATION (cont'd.)

Site: Wahnapiatae

Classification: Eluviated Dystric Brunisol

Sample No.	Horizon	Exchangeable Cations (ug/g)				C.E.C. (m.e.) 100g	Pyrophosphate (%)			Dithionite (%)			CaCO ₃ (%)	Metals (ug/g)			
		Ca	Mg	K	Al		Fe	Al	Mn	Fe	Al	Mn		Zn	Cu	Ni	Pb
14937	LFH	1100	280	380	62	9.2	0.18	0.077	0.061	0.47	0.11	0.062		79	360	380	120
14938	Ahe	87	14	26	160	2.4	0.12	0.079	0.0025	0.19	0.089	0.0027		8.1	17	19	3.2
14939	Bfj	19	2.0	6.0	22	0.4	0.13	0.22	0.0064	0.39	0.42	0.013		24	9.5	15	<3.0
14940	B/C	13	2.0	4.0	6.0	0.2	0.039	0.11	0.0013	0.18	0.18	0.0025		20	16	14	<3.0
14941	C	8.0	3.0	2.0	4.0	0.1	0.015	0.054	0.015	0.12	0.079	0.0042	<1.0	11	21	10	<3.0

SOIL PROFILE INFORMATION

Horizon	Depth (cm)	Site: Wahnapiatae	Date: 81/07
LFH	7-0	Location Code: 5017039	Parent Material: glacial/fluviail deposit
Ahe	0-3	UTM: 17T 05194 51831	Vegetation: jack pine
Bm	3-16	Classification: Eluviated Dystric Brunisol	
B/C	16-33	Landform: outwash channel	Comments:
C	33+	Slope: level	

Sample No.	Horizon	Depth (cm)	Colour (dry, moist)	Sand (%)	Silt (%)	Clay (%)	pH (H ₂ O)	pH (CaCl ₂)	Organic C (%)	Total Nitrogen (mg/g)	Extr. S (ug/g)	Extr. SO ₄ (ug/g)	Avail. P (ug/g)	Total P (ug/g)	Avail. Al (ug/g)
14942	LFH	7-0	10 YR 3/2, 2/2 m				3.9	3.5	25	13			38		30
14943	Ahe	0-3	10 YR 4/1, 3/1 m	77	17	7.0	3.9	3.1	6.0	1.2			42		35
14944	Bm	3-16	10 YR 6/4, 5/4 m	81	14	5.0	5.1	4.6	1.0	0.60			<3.0		5.3
14945	B/C	16-33	2.5 Y 6/4, 5/4 m	83	13	3.0	5.0	4.7	1.0	0.20					2.8
14946	C	33+	2.5 Y 7/4, 6/4 m	90	7.0	3.0	5.1	5.0	<0.50	0.10			<3.0		0.58

SOIL PROFILE INFORMATION (cont'd.)

Site: Wahnapiatae

Classification: Eluviated Dystric Brunisol

Sample No.	Horizon	Exchangeable Cations (ug/g)				C.E.C. (m.e.) 100g	Pyrophosphate (%)			Dithionite (%)			CaCO ₃ (%)	Metals (ug/g)			
		Ca	Mg	K	Al		Fe	Al	Mn	Fe	Al	Mn		Zn	Cu	Ni	Pb
14942	LFH	650	250	310	200	8.3	0.22	0.13	0.0016	0.54	0.16	0.015		64	400	380	120
14943	Ahe	110	26	57	240	3.6	0.18	0.12	0.0016	0.29	0.12	0.0024		48	350	350	100
14944	Bm	2.0	3.0	7.0	28	0.4	0.092	0.20	0.0021	0.47	0.46	0.014		21	13	14	<3.0
14945	B/C	2.0	1.0	7.0	12	0.2	0.035	0.12	0.00050	0.22	0.21	0.0012		12	11	10	<3.0
14946	C	<1.4	1.0	1.0	<2.3	<0.1	0.0050	0.038	0.00090	0.12	0.068	0.0059	<1.0	19	9.1	10	<3.0

SOIL PROFILE INFORMATION

Horizon Depth (cm)

Site: Wahnapiatae

Date: 81/07

LFH
Ae



6-0
0-4

Location Code: 5017040

Parent Material: glacial/fluvial deposit

UTM: 17T 05199 51849

Vegetation: white birch

Bm

4-24

Classification: Eluviated Dystric Brunisol

B/C

24-44
44+

Landform: outwash plain

Comments:

C

Slope: level

Sample No.	Horizon	Depth (cm)	Colour (dry, moist)	Sand (%)	Silt (%)	Clay (%)	pH (H ₂ O)	pH (CaCl ₂)	Organic C (%)	Total Nitrogen (mg/g)	Extr. S (ug/g)	Extr. SO ₄ (ug/g)	Avail. P (ug/g)	Total P (ug/g)	Avail. Al (ug/g)
14947	LFH	6-0	10YR 3/2, 2/2 m				4.1	3.3	30	8.1			86		22
14948	Ae	0-4	10YR 5/2, 4/2 m	87	9.0	4.0	4.3	3.4	2.0	0.50			3.0		21
14949	Bm	4-24	2.5 Y 6/4 5/4 m	89	8.0	3.0	5.0	4.4	1.0	0.40			19		6.1
14950	B/C	24-44	2.5 Y 7/4 6/4 m	91	6.0	3.0	5.0	4.8	<0.50	0.20			<3.0		1.5
14951	C	44+	2.5 Y 7/4 6/4 m	85	12	3.0	5.1	4.8	<0.50	0.10			<3.0		1.8

SOIL PROFILE INFORMATION (cont'd.)

Site: Wahnapiatae

Classification: Eluviated Dystric Brunisol

Sample No.	Horizon	Exchangeable Cations (ug/g)				C.E.C. (m.e.) 100g	Pyrophosphate (%)			Dithionite (%)			CaCO ₃ (%)	Metals (ug/g)			
		Ca	Mg	K	Al		Fe	Al	Mn	Fe	Al	Mn		Zn	Cu	Ni	Pb
14947	LFH	800	220	460	130	8.4	0.16	0.058	0.022	0.60	0.10	0.022		66	360	490	150
14948	Ae	13	8.0	22	130	1.6	0.14	0.081	0.0073	0.22	0.096	0.0081		13	18	7.0	<3.0
14949	Bm	9.0	3.0	17	28	0.4	0.10	0.17	0.0075	0.24	0.25	0.011		22	8.0	11	5.7
14950	B/C	4.0	1.0	2.0	4.0	0.1	0.014	0.071	0.0016	0.14	0.11	0.0027		10	8.0	11	<3.0
14951	C	5.0	2.0	4.0	3.0	0.1	0.011	0.050	0.0014	0.14	0.093	0.0034		10	21	10	5.8

SOIL PROFILE INFORMATION

Horizon	Depth (cm)	Site: Wahnapiatae	Date: 81/07
LFH	3-0	Location Code: 5017041	Parent Material: glacial/fluvial deposit
Aej	0-1	UTM: 17T 05197 51847	Vegetation: jack pine, white birch
Bm	1-27	Classification: Orthic Dystric Brunisol	
B/C	27-52	Landform: outwash plain	Comments:
C	52+	Slope: level	



Sample No.	Horizon	Depth (cm)	Colour (dry, moist)	Sand (%)	Silt (%)	Clay (%)	pH (H ₂ O)	pH (CaCl ₂)	Organic C (%)	Total Nitrogen (mg/g)	Extr. S (ug/g)	Extr. SO ₄ (ug/g)	Avail. P (ug/g)	Total P (ug/g)	Avail. Al (ug/g)
14952	LFH	3-0	10 YR 3/2 2/2 m				4.2	3.4	29	12			42		19
14953	Aej	0-1	10 YR 5/2 3/2 m	72	22	7.0	4.3	3.5	2.0	0.90			30		29
14954	Bm	1-27	10 YR 5/4 4/4 m	76	19	4.0	4.9	4.4	1.0	0.40			<3.0		6.2
14955	B/C	27-52	2.5 Y 7/4 6/4 m	76	21	3.0	5.1	4.7	<0.50	0.20			4.0		2.0
14956	C	52+	2.5 Y 7/3 6/3 m	97	1.0	2.0	5.6	5.0	<0.50	<0.10			<3.0		0.38

SOIL PROFILE INFORMATION (cont'd.)

Site: Wahnapiatae

Classification: Orthic Dystric Brunisol

Sample No.	Horizon	Exchangeable Cations (ug/g)				C.E.C. (m.e.) 100g	Pyrophosphate (%)			Dithionite (%)			CaCO ₃ (%)	Metals (ug/g)			
		Ca	Mg	K	Al		Fe	Al	Mn	Fe	Al	Mn		Zn	Cu	Ni	Pb
14952	LFH	1500	220	460	210	13	0.19	0.12	0.027	0.46	0.13	0.027		34	160	150	46
14953	Aej	61	15	54	300	3.9	0.18	0.15	0.012	0.29	0.16	0.017		17	25	11	11
14954	Bm	4.0	2.0	10	21	0.3	0.054	0.21	0.0046	0.37	0.34	0.014		14	11	14	<3.0
14955	B/C	4.0	3.0	7.0	10	0.2	0.040	0.10	0.00060	0.23	0.14	0.0017		14	25	12	<3.0
14956	C	11	1.0	1.0	<4.5	0.1	0.0090	0.023	0.00050	0.10	0.040	0.0036	<1.0	19	9.1	10	<3.0

SOIL PROFILE INFORMATION

Horizon	Depth (cm)	Site: Timmins	Date: 81/09
Of	5-0	Location Code: 5017043	Parent Material: glacial/fluviat deposit
Ae	0-6	UTM: 17T 05165 53584	Vegetation: jack pine
Bm	6-35	Classification: Eluviated Dystric Brunisol	
C	35+	Landform: outwash plain	Comments:

Slope: level

Sample No.	Horizon	Depth (cm)	Colour (dry, moist)	Sand (%)	Silt (%)	Clay (%)	pH (H ₂ O)	pH (CaCl ₂)	Organic C (%)	Total Nitrogen (mg/g)	Extr. S (ug/g)	Extr. SO ₄ (ug/g)	Avail. P (ug/g)	Total P (ug/g)	Avail. Al (ug/g)
14962	Of	5-0	5 Y 4/2, 2.5/2 m				4.2	3.7	27	7.9			92		24
14963	Ae	0-6	2.5 Y 7/2, 5/2 m	93	3.0	4.0	4.4	3.5	2.0	0.50			<3.0		14
14964	Bm	6-35	2.5 Y 6/4, 5/4 m	96	1.0	3.0	5.1	4.7	1.0	0.30			6.0		2.1
14965	C	35+	2.5 Y 7/4, 6/4 m	97	1.0	2.0	5.5	5.0	<0.50	<0.10			4.0		0.30

SOIL PROFILE INFORMATION (cont'd.)

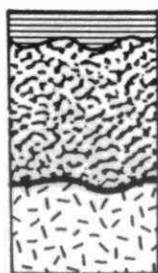
Site: Timmins

Classification: Eluviated Dystric Brunisol

Sample No.	Horizon	Exchangeable Cations (ug/g)				C.E.C. (m.e.) 100g	Pyrophosphate (%)			Dithionite (%)			CaCO ₃ (%)	Metals (ug/g)			
		Ca	Mg	K	Al		Fe	Al	Mn	Fe	Al	Mn		Zn	Cu	Ni	Pb
14962	Of	990	480	690	76	12	0.057	0.099	0.034	0.16	0.12	0.031		54	77	8.5	51
14963	Ae	5.0	4.0	7.0	110	1.3	0.062	0.057	0.020	0.12	0.068	0.032		21	7.8	2.5	<3.0
14964	Bm	1.0	1.0	<1.0	9.0	0.1	0.045	0.13	0.0014	0.25	0.24	0.0029		15	23	11	<3.0
14965	C	18	3.0	<1.0	<2.3	0.2	0.015	0.046	0.0011	0.10	0.090	0.0034	<1.0	11	10	15	<3.0

SOIL PROFILE INFORMATION

Horizon	Depth (cm)	Site: Gogama Experimental Plot	Date: 80/07/21
Ah	0-3	Location Code: 5017125	Parent Material: glacial/fluvial sand
Bm1	3-16	UTM: 17T 04363 52539	Vegetation: jack pine
Bm2	16-30	Classification: Orthic Dystric Brunisol	
C	30+	Landform: outwash plain	Comments: tree seedling plot
		Slope: level	



Sample No.	Horizon	Depth (cm)	Colour (dry, moist)	Sand (%)	Silt (%)	Clay (%)	pH (H ₂ O)	pH (CaCl ₂)	Organic C (%)	Total Nitrogen (mg/g)	Extr. S (ug/g)	Extr. SO ₄ (ug/g)	Avail. P (ug/g)	Total P (ug/g)	Avail. Al (ug/g)
12832	Ah	0-3	10 YR 4/2, 3/2 m	92	8.0	1.0	5.2	4.6	1.3	1.2				270	
12833	Bm1	3-16	10 YR 6/4, 5/4 m	90	5.0	5.0	5.2	4.9	0.73	0.34				190	
12834	Bm2	16-30	2.5 Y 7/4, 6/4 m	95	2.0	2.0	5.2	5.0	0.29	0.88				700	
12835	C	30+	2.5 Y 7/2, 6/2 m	98	1.0	1.0	6.2	5.3	0.080	0.12				240	
12836	Ah	0-3					5.2	4.4		1.1				210	
12837	Bm1	3-16					5.2	4.9		0.91				240	
12838	Bm2	16-30					5.2	4.9		0.21				170	
12839	C	30+					6.3	5.4		0.26				300	
12840	Ah	0-3					5.2	4.5		1.1				280	
12841	Bm1	3-16					5.2	4.9		0.54				240	
12842	Bm2	16-30					5.3	5.0		0.28				280	
12843	C	30+					5.6	5.4		0.11				270	

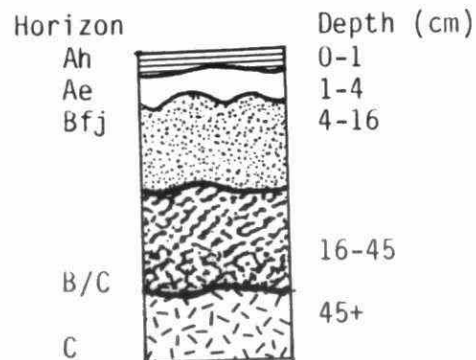
SOIL PROFILE INFORMATION (cont'd.)

Site: Gogama Experimental Plot

Classification: Orthic Dystric Brunisol

Sample No.	Horizon	Exchangeable Cations (ug/g)				C.E.C. (m.e.) 100g	Pyrophosphate (%)			Dithionite (%)			CaCO ₃ (%)	Metals (ug/g)			
		Ca	Mg	K	Al		Fe	Al	Mn	Fe	Al	Mn		Zn	Cu	Ni	Pb
12832	Ah	180	<0.70	22	58	1.5	0.090	0.23	0.0023	0.87	0.23	0.0070		22	8.5	13	<3.0
12833	Bm1	98	9.0	22	5.0	0.66	0.040	0.15	0.00040	0.32	0.19	0.0020		23	13	17	<3.0
12834	Bm2	39	2.0	11	3.5	0.3	0.020	0.080	0.00040	0.22	0.16	0.0020		18	12	15	<3.0
12835	C	39	2.0	11	<2.3	0.3	0.030	0.060	0.0025	0.17	0.10	0.010		16	15		<3.0
12836	Ah	140	9.0	22	110	1.9											
12837	Bm1	49	2.0	11	14	0.4											
12838	Bm2	10	2.2	11	6.5	0.2											
12839	C	29	2.2	5.0	<4.5	0.2											
12840	Ah	98	9.0	32	130	1.9											
12841	Bm1	29	2.2	11	11	0.3											
12842	Bm2	27	<0.70	15	10	0.3											
12843	C	16	<0.70	5.0	4.5	0.1											

SOIL PROFILE INFORMATION



Site: Elk Lake Experimental Plot

Date: 80/07/21

Location Code: 5017126

Parent Material: glacial/fluviol sand

UTM: 17T 05015 52724

Vegetation: jack pine

Classification: Eluviated Dystric Brunisol

Landform: outwash plain

Comments: tree seedling plot

Slope: level

Sample No.	Horizon	Depth (cm)	Colour (dry, moist)	Sand (%)	Silt (%)	Clay (%)	pH (H ₂ O)	pH (CaCl ₂)	Organic C (%)	Total Nitrogen (mg/g)	Extr. S (ug/g)	Extr. SO ₄ (ug/g)	Avail. P (ug/g)	Total P (ug/g)	Avail. Al (ug/g)
12844	Ah	0-1	10 YR 3/2, 2/2 m	73	13	14	4.0	3.3	13	5.2				460	
12845	Ae	1-4	10 YR 7/2, 6/2 m	77	17	6.0	4.2	3.4	0.94	0.52				100	
12846	Bfj	4-16	10 YR 7/6, 5/6 m	81	14	4.0	5.2	4.8	1.1	0.54				540	
12847	B/C	16-45	10 YR 7/4, 5/4 m	86	10	5.0	5.9	5.3	0.29	0.27				330	
12848	C	45+	2.5 Y 7/4, 6/4 m	97	1.0	3.0	5.9	5.5	0.090	0.10				250	
12849	Ah	0-1					4.3	3.4		2.0				210	
12850	Ae	1-4													
12851	Bfj	4-16					5.5	5.1		0.39				410	
12852	B/C	16-45					6.1	5.6		0.19				290	
12853	C	45+					6.1	5.6		0.20				280	

SOIL PROFILE INFORMATION (cont'd.)

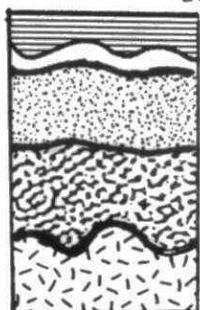
Site: Elk Lake Experimental Plot

Classification: Eluviated Dystric Brunisol

Sample No.	Horizon	Exchangeable Cations (ug/g)				C.E.C. (m.e.) 100g	Pyrophosphate (%)			Dithionite (%)			CaCO ₃ (%)	Metals (ug/g)			
		Ca	Mg	K	Al		Fe	Al	Mn	Fe	Al	Mn		Zn	Cu	Ni	Pb
12844	Ah	1300	190	320	220	11				0.26	0.12	0.010		36	22	21	49
12845	Ae	33	14	29	240	2.8	0.050	0.040	0.00040	0.14	0.050	0.0020		5.3	2.4	2.5	<3.0
12846	Bfj	18	<0.70	5.0	11	0.2	0.070	0.30	0.00060	0.67	0.47	0.0040		27	7.6	18	<3.0
12847	B/C	24	<0.70	12	<2.3	0.2	0.040	0.10	0.00040	0.49	0.22	0.0030	<1.0	22	7.6	13	<3.0
12848	C	18	<0.70	5.0	<2.3	0.1	0.020	0.070	0.0011	0.14	0.10	0.0040	<1.0	13	13		<3.0
12849	Ah	700	78	130	170	5.9											
12850	Ae																
12851	Bfj	7.0	<0.70	10	<2.3	0.1											
12852	B/C	16	<0.70	12	<2.3	0.1											
12853	C	12	<0.70	2.0	<2.3	0.1											

SOIL PROFILE INFORMATION

Horizon	Depth (cm)
Ah	0-1
Ae	1-4
Bfj	4-16
B/C	16-46 46+
C	



Site: Elk Lake Experimental Plot

Date: 80/07/21

Location Code: 5017126

Parent Material: glacial/fluviol sand

UTM: 17T 05015 52724

Vegetation: jack pine

Classification: Eluviated Dystric Brunisol

Landform: outwash plain

Comments: tree seedling plot

Slope: level

Sample No.	Horizon	Depth (cm)	Colour (dry, moist)	Sand (%)	Silt (%)	Clay (%)	pH (H ₂ O)	pH (CaCl ₂)	Organic C (%)	Total Nitrogen (mg/g)	Extr. S (ug/g)	Extr. SO ₄ (ug/g)	Avail. P (ug/g)	Total P (ug/g)	Avail. Al (ug/g)
12854	Ah	0-1	10 YR 3/2, 2/2 m				3.9	3.3		11				690	
12855	Ae	1-4	10 YR 7/2, 6/2 m				3.9	3.3		0.25				50	
12856	Bfj	4-16	10 YR 7/6, 5/6 m				5.3	4.7		0.51				300	
12857	B/C	16-46	10 YR 7/4, 5/4 m				5.8	5.2		0.23				280	
12858	C	46+	2.5 Y 7/4, 6/4 m				5.8	5.5		0.090				280	

SOIL PROFILE INFORMATION (cont'd.)

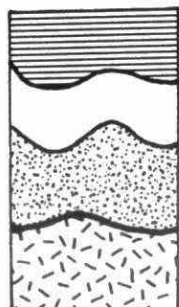
Site: Elk Lake Experimental Plot

Classification: Eluviated Dystric Brunisol

Sample No.	Horizon	Exchangeable Cations (ug/g)				C.E.C. (m.e.) 100g	Pyrophosphate (%)			Dithionite (%)			CaCO ₃ (%)	Metals (ug/g)			
		Ca	Mg	K	Al		Fe	Al	Mn	Fe	Al	Mn		Zn	Cu	Ni	Pb
12854	Ah	710	180	320	170	7.5											
12855	Ae	15	8.0	21	240	2.6											
12856	Bfj	9.0	3.0	11	8.0	0.2											
12857	B/C	13	2.0	16	2.3	0.1											
12858	C	15	3.0	5.0	<2.3	0.1											

SOIL PROFILE INFORMATION

Horizon	Depth (cm)	Site: Gurd Experimental Plot	Date: 80/07/22
Ah	0-19	Location Code: 5017127	Parent Material: glacial/fluvial sand
Ae	19-46	UTM: 17T 06192 50927	Vegetation: red pine
Bf	46-58	Classification: Sombric Humo-Ferric Podzol	
C	58+	Landform: outwash plain	Comments: tree seedling plot
		Slope: level	



Sample No.	Horizon	Depth (cm)	Colour (dry, moist)	Sand (%)	Silt (%)	Clay (%)	pH (H ₂ O)	pH (CaCl ₂)	Organic C (%)	Total Nitrogen (mg/g)	Extr. S (ug/g)	Extr. SO ₄ (ug/g)	Avail. P (ug/g)	Total P (ug/g)	Avail. Al (ug/g)
12859	Ah	0-19	10 YR 5/2, 4/2 m	74	19	6.0	5.6	4.6	1.7	1.4				510	
12860	Ae	19-46	10 YR 7/2, 6/2 m	74	21	5.0	5.8	4.6	0.33	0.43				90	
12861	Bf	46-58	7.5YR 5/4, 3/4 m	72	25	4.0	5.6	4.6	1.5	0.83				1300	
12862	C	58+	10 YR 7/4, 6/4 m	90	7.0	3.0	5.7	4.8	0.44	0.29				590	
12863	Ah	0-19					5.2	4.3		1.3				480	
12864	Ae	19-46					5.7	4.5		0.28				80	
12865	Bf	46-58					5.9	4.8		1.5				1400	
12866	C	58+					5.9	4.9		0.29				470	
12867	Ah	0-19					5.3	4.4		1.4				600	
12868	Ae	19-46					5.6	4.5		0.31				120	
12869	Bf	46-58					5.6	4.7		0.85				850	
12870	C	58+					5.7	4.8		0.27				600	

SOIL PROFILE INFORMATION (cont'd.)

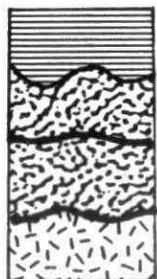
Site: Gurd Experimental Plot

Classification: Sombric Humo-Ferric Podzol

Sample No.	Horizon	Exchangeable Cations (ug/g)				C.E.C. (m.e.) 100g	Pyrophosphate (%)			Dithionite (%)			CaCO ₃ (%)	Metals (ug/g)			
		Ca	Mg	K	Al		Fe	Al	Mn	Fe	Al	Mn		Zn	Cu	Ni	Pb
12859	Ah	230	10	24	26	1.5	0.31	0.21	0.019	0.62	0.21	0.058		49	3.3	3.0	5.1
12860	Ae	140	9.0	10	18	0.95	0.050	0.040	0.0019	0.15	0.040	0.016		9.7	1.1	<2.0	<3.0
12861	Bf	160	5.0	10	28	1.1	0.44	0.41	0.0014	0.66	0.48	0.0080		39	3.4	4.9	<3.0
12862	C	49	<0.70	10	9.5	<0.50	0.060	0.13	0.00090	0.24	0.17	0.0070		25	2.7	6.0	<3.0
12863	Ah	120	9.5	32	47	1.2											
12864	Ae	110	9.0	15	16	0.84											
12865	Bf	350	18	15	28	2.2											
12866	C	49	<0.70	25	7.0	<0.50											
12867	Ah	120	5.0	50	45	1.2											
12868	Ae	170	5.0	35	26	1.2											
12869	Bf	150	14	20	23	1.1											
12870	C	60	9.0	15	12	0.54											

SOIL PROFILE INFORMATION

Horizon	Depth (cm)	Site: Lake Traverse Experimental Plot	Date: 80/07/28
Ah	0-15	Location Code: 5017129	Parent Material: glacial/fluviial sand
Bm	15-31	UTM: 17T 07312 50906	Vegetation: grass
B/C	31-56	Classification: Orthic Sombric Brunisol	
C	56+	Landform: outwash plain	Comments: tree seedling plot
		Slope: level	



Sample No.	Horizon	Depth (cm)	Colour (dry, moist)	Sand (%)	Silt (%)	Clay (%)	pH (H ₂ O)	pH (CaCl ₂)	Organic C (%)	Total Nitrogen (mg/g)	Extr. S (ug/g)	Extr. SO ₄ (ug/g)	Avail. P (ug/g)	Total P (ug/g)	Avail. Al (ug/g)
12905	Ah	0-15	10 YR 4/2, 3/2 m	89	8.0	2.0	5.8	4.8	1.8	0.96				390	
12906	Bm	15-31	10 YR 6/6, 4/6 m	92	6.0	2.0	5.9	5.2	0.61	0.50				520	
12907	B/C	31-56	10 YR 7/6, 5/6 m				5.9	5.4	0.20	0.13				440	
12908	C	56+	10 YR 7/4, 5/4 m				6.0	5.4	0.16	0.19				310	
12909	Ah	0-15					5.8	4.9		1.2				290	
12910	Bm	15-31					6.2	5.4		0.24				470	
12911	B/C	31-56					6.1	5.5		0.11				420	
12912	C	56+					6.0	5.7		0.10				540	
12913	Ah	0-15					5.7	4.7		2.1				450	
12914	Bm	15-31					5.8	5.1		0.26				380	
12915	B/C	31-56					5.9	5.3		0.27				380	
12916	C	56+					5.9	5.6		0.090				330	

SOIL PROFILE INFORMATION (cont'd.)

Site: Lake Traverse Experimental Plot

Classification: Orthic Sombric Brunisol

Sample No.	Horizon	Exchangeable Cations (ug/g)				C.E.C. (m.e.) 100g	Pyrophosphate (%)			Dithionite (%)			CaCO ₃ (%)	Zn	Metals (ug/g)		
		Ca	Mg	K	Al		Fe	Al	Mn	Fe	Al	Mn			Cu	Ni	Pb
12905	Ah	340	37	50	21	2.3	0.080	0.10	0.0029	0.49	0.21	0.0090		.51	8.4	6.8	7.0
12906	Bm	71	9.0	15	3.5	0.5	0.11	0.23	0.00050	0.73	0.46	0.0050	<1.0	33	6.9	50	<3.0
12907	B/C	38	9.0	15	2.5	0.3	0.040	0.090	0.00040	0.46	0.49	0.0070	<1.0	28	9.3	90	<3.0
12908	C	38	9.0	15	2.5	0.3	0.040	0.080	0.00050	0.33	0.12	0.0040	<1.0	23	11	97	<3.0
12909	Ah	350	21	29	28	2.3											
12910	Bm	71	5.0	15	2.5	0.5											
12911	B/C	30	4.6	7.1	<2.3	0.2											
12912	C	23	4.6	10	<2.3	0.2											
12913	Ah	740	40	48	49	4.6											
12914	Bm	38	5.0	15	3.5	0.3											
12915	B/C	49	5.0	10	3.0	0.3											
12916	C	15	4.6	10	<2.3	0.1											

SOIL PROFILE INFORMATION

Horizon	Depth (cm)	Site: Novar Experimental Plot	Date: 80/07/29
Ah	0-12	Location Code: 5017131	Parent Material: glacial/fluviail sand
Bm	12-28	UTM: 17T 06370 50367	Vegetation: mixed hardwood
B/C	28-50	Classification: Orthic Sombric Brunisol	
C	50+	Landform: outwash plain	Comments: tree seedling plot
		Slope: level	



Sample No.	Horizon	Depth (cm)	Colour (dry, moist)	Sand (%)	Silt (%)	Clay (%)	pH (H ₂ O)	pH (CaCl ₂)	Organic C (%)	Total Nitrogen (mg/g)	Extr. S (ug/g)	Extr. SO ₄ (ug/g)	Avail. P (ug/g)	Total P (ug/g)	Avail. Al (ug/g)
12929	Ah	0-12	10YR 4/3, 3/3 m	83	13	4.0	5.7	4.7	2.7	1.3				360	
12930	Bm	12-28	10YR 5/4, 4/4 m	88	9.0	3.0	5.8	4.9	1.5	0.96				440	
12931	B/C	28-50	10YR 6/4, 5/4 m	93	1.0	6.0	5.6	4.9	0.33	0.22				450	
12932	C	50+	10YR 6/4, 5/4 m	100	1.0	1.0	5.3	5.1	0.20	0.22				230	
12933	Ah	0-12					5.2	4.6		1.4				400	
12934	Bm	12-28					5.4	4.8		0.45				410	
12935	B/C	28-50					5.2	5.0		0.23				270	
12936	C	50+					5.4	5.2		0.12				250	
12937	Ah	0-12					5.9	5.0		1.6				370	
12938	Bm	12-28					5.8	5.0		0.98				590	06
12939	B/C	28-50					5.4	5.1		0.20				400	
12940	C	50+					5.0	5.1		0.13				270	

SOIL PROFILE INFORMATION (cont'd.)

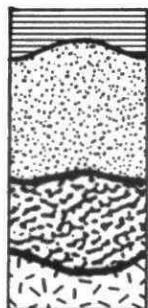
Site: Novar Experimental Plot

Classification: Orthic Sombic Brunisol

Sample No.	Horizon	Exchangeable Cations (ug/g)				C.E.C. (m.e.) 100g	Pyrophosphate (%)			Dithionite (%)			CaCO ₃ (%)	Zn	Metals (ug/g)		
		Ca	Mg	K	Al		Fe	Al	Mn	Fe	Al	Mn			Cu	Ni	Pb
12929	Ah	360	9.0	40	20	2.2	0.47	0.32	0.0085	1.3	0.54	0.031		73	8.9	4.0	3.8
12930	Bm	170	4.0	20	4	1.1	0.11	0.21	0.0012	0.55	0.48	0.0050		51	10	8.2	<3.0
12931	B/C	49	<0.70	10	7.5	0.3	0.050	0.12	0.00050	0.47	0.16	0.0030		39	15	36	<3.0
12932	C	38	<0.70	16	4.0	0.3	0.040	0.070	0.0015	0.29	0.11	0.0030	<1.0	30	12	79	<3.0
12933	Ah	84	4.7	27	54	1.1	0.21	0.18	0.0068								
12934	Bm	57	2.7	8.8	23	0.6	0.070	0.13	0.0015								
12935	B/C	38	<0.70	15	13	0.4	0.030	0.070	0.0012								
12936	C	27	<0.70	15	3.8	0.2	0.020	0.040	0.0010								
12937	Ah	430	9.0	30	12	2.4	0.21	0.15	0.0057								
12938	Bm	160	4.0	20	12	1.0	0.10	0.18	0.0015								
12939	B/C	38	<0.70	15	4.5	0.3	0.030	0.050	0.0012								
12940	C	33	<0.70	10	6.0	0.2	0.010	0.020	0.00090								

SOIL PROFILE INFORMATION

Horizon	Depth (cm)	Site: Timberell Experimental Plot	Date: 80/07/30
LFH	2-0	Location Code: 5017134	Parent Material: glacial/fluvial sand
Ae	0-12	UTM: 17T 03184 51935	Vegetation: jack pine
Bfj	12-33	Classification: Eluviated Dystric Brunisol	
B/C	33-42	Landform: outwash plain	Comments: tree seedling plot
C	42+	Slope: level	



Sample No.	Horizon	Depth (cm)	Colour	Sand (%)	Silt (%)	Clay (%)	pH (H ₂ O)	pH (CaCl ₂)	Organic C (%)	Total Nitrogen (mg/g)	Extr. S (ug/g)	Extr. SO ₄ (ug/g)	Avail. P (ug/g)	Total P (ug/g)	Avail. Al (ug/g)
12951	LFH	2-0	7.5YR 4/2 3/2 m				4.2	3.7		4.8				480	
12952	Ae	0-12	10YR 6/2, 5/2 m	NO SAMPLE											
12953	Bf	12-33	10 YR 5/6 4/6 m				5.6	5.0		0.46				600	
12954	B/C	33-42	10 YR 7/6 6/6 m				5.6	5.3		0.12				270	
12955	C	42+	2.5Y 7/4 6/4 m				6.0	5.3		0.12				310	

SOIL PROFILE INFORMATION (cont'd.)

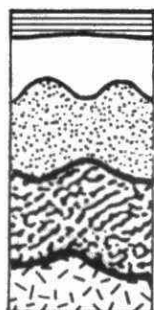
Site: Timberell Experimental Plot

Classification: Eluviated Dystric Brunisol

Sample No.	Horizon	Exchangeable Cations (ug/g)				C.E.C. (m.e.) 100g	Pyrophosphate (%)			Dithionite (%)			CaCO ₃ (%)	Metals (ug/g)			
		Ca	Mg	K	Al		Fe	Al	Mn	Fe	Al	Mn		Zn	Cu	Ni	Pb
12951	LFH	1900	120	220	100	12											
12952		NO SAMPLE															
12953	Bfj	60	4.5	30	3.5	0.5											
12954	B/C	24	<0.70	15	<2.3	0.2											
12955	C	27	<0.70	15	3.0	0.2											

SOIL PROFILE INFORMATION

Horizon	Depth (cm)	Site: Timberell Experimental Plot	Date: 80/07/30
LFH Ae	2-0 0-12	Location Code: 5017134	Parent Material: glacial/fluvial sand
Bfj	12-33	UTM: 17T 03814 51935	Vegetation: jack pine
B/C	33-42	Classification: Eluviated Dystric Brunisol	
C	42+	Landform: outwash plain	Comments: tree seedling plot
		Slope: level	



Sample No.	Horizon	Depth (cm)	Colour (dry, moist)	Sand (%)	Silt (%)	Clay (%)	pH (H ₂ O)	pH (CaCl ₂)	Organic C (%)	Total Nitrogen (mg/g)	Extr. S (ug/g)	Extr. SO ₄ (ug/g)	Avail. P (ug/g)	Total P (ug/g)	Avail. Al (ug/g)
12941	LFH	2-0	7.5YR 4/2 3/2 m				4.5	4.1	21						
12942	Ae	0-12	10YR 6/2, 5/2 m	80	18	2.0	4.1	3.5	0.92	0.79				80	
12943	Bfj	12-33	10YR 5/6, 4/6 m	84	11	5.0	5.2	4.8	1.8	0.78				480	
12944	B/C	33-42	10YR 7/6, 6/6 m	90	7.0	3.0	5.3	5.2	0.49	0.24				380	
12945	C	42+	2.5Y 7/4, 6/4 m	97	<1.0	3.0	5.3	5.4	0.39	0.23				270	
12946	LFH						4.1	3.7		9.1				650	
12947	Ae						4.3	3.5		0.36				70	
12948	Bfj						5.1	4.7		0.74				800	
12949	B/C						5.7	5.3		0.25				330	
12950	C						5.9	5.3		<0.12				280	94

SOIL PROFILE INFORMATION (cont'd.)

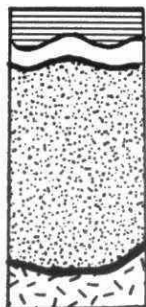
Site: Timbere11 Experimental Plot

Classification: Eluviated Dystric Brunisol

Sample No.	Horizon	Exchangeable Cations (ug/g)				C.E.C. (m.e.) 100g	Pyrophosphate (%)			Dithionite (%)			CaCO ₃ (%)	Metals (ug/g)			
		Ca	Mg	K	Al		Fe	Al	Mn	Fe	Al	Mn		Zn	Cu	Ni	Pb
12941	LFH						0.060	0.070	0.099	0.29	0.15	0.067		84	20	9.0	83
12942	Ae	100	5.0	30	220	2.8	0.020	0.020	0.00090	0.10	0.050	0.0030		7.9	15	<2.0	3.5
12943	Bfj	71	2.0	20	14	0.56	0.16	0.42	0.0025	1.1	1.0	0.015		43	5.7	14	4.5
12944	B/C	38	2.0	15	2.5	0.3	0.010	0.050	0.00070	0.18	0.22	0.0060	<1.0	17	6.8	13	<3.0
12945	C	38	2.0	10	2.5	0.3	0.010	0.070	0.00070	0.55	0.11	0.0040	<1.0	11	7.5	12	<3.0
12946	LFH	2600	240	240	180	17	0.12	0.27	0.058								
12947	Ae	130	9.0	40	180	2.6											
12948	Bfj	38	<0.70	30	14	0.4											
12949	B/C	38	<0.70	20	<2.3	0.3											
12950	C	38	<0.70	15	<2.3	0.3											

SOIL PROFILE INFORMATION

Horizon	Depth (cm)	Site: Parkinson Experimental Plots	Date: 80/08/01
Ah	0-4	Location Code: 5017136	Parent Material: glacial/fluvial sand
Ae	4-5	UTM: 17T 03264 51401	Vegetation: red pine and aspen
Bf ₁	5-22	Classification: Orthic Humo-Ferric Podzol	
Bf ₂	22-50	Landform: outwash plain	Comments: tree seedling plot
C	50+	Slope: level	



Sample No.	Horizon	Depth (cm)	Colour (dry, moist)	Sand (%)	Silt (%)	Clay (%)	pH (H ₂ O)	pH (CaCl ₂)	Organic C (%)	Total Nitrogen (mg/g)	Extr. S (ug/g)	Extr. SO ₄ (ug/g)	Avail. P (ug/g)	Total P (ug/g)	Avail. Al (ug/g)
12986	Ah	0-4	10YR 4/1, 3/1 m	85	9.0	5.0	4.9	4.0	3.1	1.6				180	
12987	Ae	4-5	10YR 6/2, 5/2 m	83	13	4.0	5.1	4.2	1.2	0.70				100	
12988	Bf ₁	5-22	10YR 6/6, 5/6 m	91	6.0	3.0	5.4	4.8	1.1	0.66				260	
12989	Bf ₂	22-50	10YR 7/4, 5/4 m	88	10	3.0	4.9	4.0	2.6	0.41				140	
12990	C	50+	10YR 7/3, 6/3 m	92	1.0	8.0	5.9	5.5	0.01	0.12				120	
12991	Ah	0-4					5.4	4.5		1.5				270	
12992	Ae	4-5		No Sample											
12993	Bf ₁	5-22					5.6	4.9		0.74				290	
12994	Bf ₂	22-50					5.7	5.0		0.33				220	
12995	C	50+					6.0	5.4		0.22				260	96

SOIL PROFILE INFORMATION (cont'd.)

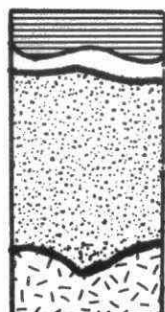
Site: Parkinson Experimental Plots

Classification: Orthic Humo-Ferric Podzol

Sample No.	Horizon	Exchangeable Cations (ug/g)				C.E.C. (m.e.) 100g	Pyrophosphate (%)			Dithionite (%)			CaCO ₃ (%)	Metals (ug/g)			
		Ca	Mg	K	Al		Fe	Al	Mn	Fe	Al	Mn		Zn	Cu	Ni	Pb
12986	Ah	280	18	54	160	3.3	0.16	0.15	0.0062	0.28	0.16	0.0070		65	8.4	5.3	34
12987	Ae	75	5.0	17	130	1.8	0.13	0.11	0.0034	0.33	0.12	0.0080					
12988	Bf1	37	<0.70	7.0	9.0	0.3	0.27	0.44	0.0048	0.36	0.45	0.0080		38	9.0	94	7.9
12989	Bf2	47	2.0	7.0	20	0.5	0.29	0.27	0.0021	0.46	0.27	0.0050		29	14	14	8.6
12990	C	15	2.3	4.3	<2.3	0.1	0.030	0.070	0.0025	0.11	0.070	0.0050	<1.0	20	13	130	4.1
12991	Ah	380	18	44	51	2.7											
12992	Ae					No Sample											
12993	Bf1	37	<0.70	12	4.0	0.3											
12994	Bf2	28	<0.70	7.0	<2.3	0.2											
12995	C	28	<0.70	7.0	<2.3	0.2											

SOIL PROFILE INFORMATION

Horizon	Depth (cm)	Site: Parkinson Experimental Plots	Date: 80/08/01
Ah	0-4	Location Code: 5017136	Parent Material: glacial/fluvial outwash
Ae	4-5	UTM: 17T 03264 51401	Vegetation: red pine and aspen
Bf1	5-22	Classification: Orthic Humo-Ferric Podzol	
Bf2	22-50	Landform: outwash plain	Comments: tree seedling plot
C	50+	Slope: level	



Sample No.	Horizon	Depth (cm)	Colour (dry, moist)	Sand (%)	Silt (%)	Clay (%)	pH (H ₂ O)	pH (CaCl ₂)	Organic C (%)	Total Nitrogen (mg/g)	Extr. S (ug/g)	Extr. SO ₄ (ug/g)	Avail. P (ug/g)	Total P (ug/g)	Avail. Al (ug/g)
12996	Ah	0-4	10YR 4/1, 3/1 m				4.7	3.8		1.9				310	
12997	Ae	4-5	10YR 6/2, 5/2 m				4.8	4.1		0.70				190	
12998	Bf1	5-22	10YR 6/6, 5/6 m				5.3	4.6		0.89				270	
12999	Bf2	22-50	10YR 7/4, 5/4 m				5.8	5.0		0.34				230	
13000	C	50+	10YR 7/3, 6/3 m				6.1	5.3		0.23				320	

SOIL PROFILE INFORMATION (cont'd.)

Site: Parkinson Experimental Plots

Classification: Orthic Humo-Ferric Podzol

Sample No.	Horizon	Exchangeable Cations (ug/g)				C.E.C. (m.e.) 100g	Pyrophosphate (%)			Dithionite (%)			CaCO ₃ (%)	Metals (ug/g)			
		Ca	Mg	K	Al		Fe	Al	Mn	Fe	Al	Mn		Zn	Cu	Ni	Pb
12996	Ah	230	9.0	34	150	2.8											
12997	Ae	47	2.0	12	190	2.2											
12998	Bf1	37	<0.70	8.0	14	0.4											
12999	Bf2	38	<0.70	8.0	<2.3	0.2											
13000	C	38	<0.70	4.0	<2.3	<0.50											

SOIL PROFILE INFORMATION

Horizon Depth (cm) Site: St. Joseph's Island Experimental Plot Date: 80/07/31

Ah 0-3 Location Code: 5017137 Parent Material: glacial/fluvial sand

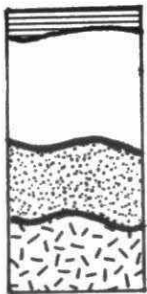
Ae 3-20 UTM: 17T 03264 51401 Vegetation: mixed hardwood forest

Bfc 20-30 Classification: Ortstein Humo-Ferric Podzol

Bfj 30-70 Landform: outwash plain Comments: tree seedling plot

B/C 70-100 Slope: level

C 100+



Sample No.	Horizon	Depth (cm)	Colour (dry, moist)	Sand (%)	Silt (%)	Clay (%)	pH (H ₂ O)	pH (CaCl ₂)	Organic C (%)	Total Nitrogen (mg/g)	Extr. S (ug/g)	Extr. SO ₄ (ug/g)	Avail. P (ug/g)	Total P (ug/g)	Avail. Al (ug/g)
12965	Ah	0-3	10YR 4/1, 3/1 m	47	27	26	4.1	3.3	3.5	1.5				100	
12966	Ae ₁	3-13	10YR 5/2, 4/2 m	90	6.0	5.0	4.6	3.6	1.4	0.49				50	
12967	Ae ₂	13-20	10YR 6/2, 5/2 m	92	4.0	4.0	4.8	3.8	0.94	0.25				30	
12968	Bfc	20-30	7.5YR 4/4 3/4 m	92	2.0	6.0	5.2	4.2	1.6	0.37				100	
12969	Bfj	30-70	10YR 5/4, 4/4 m	95	2.0	3.0	5.5	4.7	0.67	0.24				120	
12970	B/C	70-100	10YR 6/4, 5/4 m	96	1.0	3.0	6.0	5.1	0.23	0.13				90	
12971	C	100+	10YR 7/4, 6/4 m	99	<1.0	2.0	5.8	4.8	0.15	0.13				80	

SOIL PROFILE INFORMATION (cont'd.)

Site: St. Joseph's Island Experimental Plot

Classification: Ortstein Humo-Ferric Podzol

Sample No.	Horizon	Exchangeable Cations (ug/g)				C.E.C. (m.e.) 100g	Pyrophosphate (%)			Dithionite (%)			CaCO ₃ (%)	Metals (ug/g)			
		Ca	Mg	K	Al		Fe	Al	Mn	Fe	Al	Mn		Zn	Cu	Ni	Pb
12965	Ah	230	18	60	120	2.6	0.080	0.050	0.0019	0.22	0.060	0.0050		23	6.4	2.9	29
12966	Ae1	71	4.0	15	76	1.2	0.050	0.040	0.0010	0.16	0.050	0.0020		7.5		85	<3.0
12967	Ae2	82	4.0	15	50	0.99	0.030	0.030	0.00040	0.14	0.030	0.0020		3.7	2.4	69	<3.0
12968	Bfc	93	4.0	15	81	1.4	0.60	0.35	0.00070	0.56	0.40	0.0020		12	27	40	<3.0
12969	Bm	47	5.0	2.0	26	0.5	0.090	0.21	0.0011	0.24	0.22	0.0020		18	6.8		<3.0
12970	B/C	47	2.0	2.0	<2.3	0.5	0.060	0.13	0.0019	0.16	0.13	0.0050	<1.0	11	20	65	<3.0
12971	C	19	<0.70	2.0	<2.3	0.1	0.040	0.070	0.0017	0.15	0.070	0.0040		8.3	14	93	<3.0

SOIL PROFILE INFORMATION

Horizon	Depth (cm)	Site: St. Joseph's Island Experimental Plot	Date: 80/07/31
Ah	0-3	Location Code: 5017137	Parent Material: glacial/fluvial sand
Ae	3-20	UTM: 17T 03264 51401	Vegetation: mixed hardwood forest
Bfc	20-30	Classification: Ortstein Humo-Ferric Podzol	Comments: tree seedling plot
B/C1	30-70	Landform: outwash plain	
B/C2	70-100	Slope: level	
C	100+		

Sample No.	Horizon	Depth (cm)	Colour (dry, moist)	Sand (%)	Silt (%)	Clay (%)	pH (H ₂ O)	pH (CaCl ₂)	Organic C (%)	Total Nitrogen (mg/g)	Extr. S (ug/g)	Extr. SO ₄ (ug/g)	Avail. P (ug/g)	Total P (ug/g)	Avail. Al (ug/g)
12972	Ah	0-3	10 YR 4/1, 3/1 m				4.3	3.4		1.0				80	
12973	Ae1	3-13	10 YR 5/2, 4/2 m				4.7	3.6		0.10				120	
12974	Ae2	13-20	10 YR 6/2, 5/2 m				5.2	4.0		0.58				80	
12975	Bfc	20-30	7.5 YR 4/4 3/4 m				4.8	4.0		0.21				80	
12976	B/C1	30-70	10 YR 5/4, 4/4 m				5.3	4.7		0.12				660	
12977	B/C2	70-100	10 YR 6/4, 5/4 m				5.3	4.7		0.11				90	
12978	C	100+	10 YR 7/4, 6/4 m				5.7	4.9		0.11				90	

SOIL PROFILE INFORMATION (cont'd.)

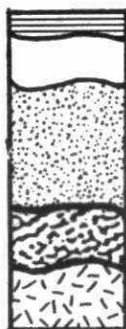
Site: St. Joseph's Island Experimental Plot

Classification: Ortstein Humo-Ferric Podzol

Sample No.	Horizon	Exchangeable Cations (ug/g)				C.E.C. (m.e.) 100g	Pyrophosphate (%)			Dithionite (%)			CaCO ₃ (%)	Metals (ug/g)			
		Ca	Mg	K	Al		Fe	Al	Mn	Fe	Al	Mn		Zn	Cu	Ni	Pb
12972	Ah	230	27	54	100	2.5											
12973	Ae ₁	120	9.0	17	87	1.6											
12974	Ae ₂	100	9.0	7.3	34	0.95											
12975	Bf	240	18	7.0	170	3.0											
12976	Bfj	28	0.70	7.0	18	0.3											
12977	B/C	19	0.70	2.0	5.4	0.2											
12978	C	28	0.70	7.0	2.3	0.2											

SOIL PROFILE INFORMATION

Horizon	Depth (cm)	Site: St. Joseph's Island Experimental Plot	Date: 80/07/31
Ah	0-3	Location Code: 5017137	Parent Material: glacial/fluvial sand
Ae	3-20	UTM: 17T 02741 50143	Vegetation: mixed hardwood forest
Bfc	20-30	Classification: Ortstein Humo-Ferric Podzol	
Bfj	30-70	Landform: outwash plain	Comments: tree seedling plot
B/C	70-100	Slope: level	
C	100		



Sample No.	Horizon	Depth (cm)	Colour (dry, moist)	Sand (%)	Silt (%)	Clay (%)	pH (H ₂ O)	pH (CaCl ₂)	Organic C (%)	Total Nitrogen (mg/g)	Extr. S (ug/g)	Extr. SO ₄ (ug/g)	Avail. P (ug/g)	Total P (ug/g)	Avail. Al (ug/g)
12979	Ah	0-3	10YR 4/1, 3/1m				4.4	3.5		2.7				140	
12980	Ae ₁	3-13	10YR 5/2, 4/2m				4.4	3.5		0.92				50	
12981	Ae ₂	13-30	10YR 6/2, 5/2m				4.7	3.8		0.52				40	
12982	Bfc	20-30	7.5YR 4/4 3/4m				5.6	4.6		0.28				110	
12983	Bfj	30-70	10YR 5/4, 4/4m				5.7	4.8		0.20				70	
12984	B/C	70-100	10YR 6/4, 5/4m				6.0	5.3		<0.13				50	
12985	C	100+	10YR 7/4, 6/4m				6.1	5.3		0.13				80	

SOIL PROFILE INFORMATION (cont'd.)

Site: St. Joseph's Island Experimental Plot

Classification: Ortstein Humo-Ferric Podzol

Sample No.	Horizon	Exchangeable Cations (ug/g)				C.E.C. (m.e.) 100g	Pyrophosphate (%)			Dithionite (%)			CaCO ₃ (%)	Metals (ug/g)			
		Ca	Mg	K	Al		Fe	Al	Mn	Fe	Al	Mn		Zn	Cu	Ni	Pb
12979	Ah	300	18	34	130	2.9											
12980	Ae1	140	9.0	17	82	1.6											
12981	Ae2	56	2.0	7.0	30	0.62											
12982	Bf	75	2.0	7.0	40	0.8											
12983	Bfj	47	2.0	2.0	14	0.4											
12984	B/C	28	<0.70	7.0	<2.3	0.2											
12985	C	37	<0.70	7.0	<2.3	0.2											

SOIL PROFILE INFORMATION

Horizon	Depth (cm)	Site: Burwash Experimental Plot	Date: 80/08/20
Ap	0-22	Location Code: 5017140	Parent Material: glacial/fuvial outwash
Bm ₁	22-30	UTM: 17T 05158 51262	Vegetation: grass
Bm ₂	30-40	Classification: Orthic Dystric Brunisol	
B/C	40-65	Landform: outwash plain	Comments: tree seeding plot
C	65+	Slope: level	



Sample No.	Horizon	Depth (cm)	Colour (dry, moist)	Sand (%)	Silt (%)	Clay (%)	pH (H ₂ O)	pH (CaCl ₂)	Organic C (%)	Total Nitrogen (mg/g)	Extr. S (ug/g)	Extr. SO ₄ (ug/g)	Avail. P (ug/g)	Total P (ug/g)	Avail. Al (ug/g)
13144	Ap	0-22	10YR 6/3, 4/3 m	66	29	6.0	5.6	4.7	1.8	1.5				440	
13145	Bm ₁	22-30	10YR 6/4, 4/4 m	82	13	6.0	5.6	5.1	0.65	0.79				470	
13146	Bm ₂	30-40	10YR 6/6, 4/6 m	96	1.0	3.0	5.7	5.3	0.25	0.22				320	
13147	B/C	40-65	10YR 6/4, 4/6 m	92	<1.0	8.0	6.0	5.6	0.080	0.22				400	
13148	C	65+	2.5Y 6/4, 5/4 m	96	1.0	3.0	6.1	5.4	0.050	<0.21				440	
13149	Ap						5.4	4.6		1.8				450	
13150	Bm						5.6	4.9		1.3				260	
13152	Bm ₂						5.7	5.2		0.39					
13153	B/C						6.1	5.4		0.22				260	106
13154	C						6.2	5.3		0.22				350	

SOIL PROFILE INFORMATION (cont'd.)

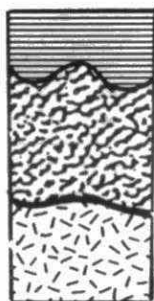
Site: Burwash Experimental Plot

Classification: Orthic Dystric Brunisol

Sample No.	Horizon	Exchangeable Cations (ug/g)				C.E.C. (m.e.) 100g	Pyrophosphate (%)			Dithionite (%)			CaCO ₃ (%)	Zn	Metals (ug/g)		
		Ca	Mg	K	Al		Fe	Al	Mn	Fe	Al	Mn			Cu	Ni	Pb
13144	Ap	190	9.0	47	21	1.4	0.19	0.25	0.0029	0.50	0.26	0.0060		42	34	64	18
13145	Bm ₁	56	2.3	22	<2.3	0.4	0.070	0.21	0.00070	0.41	0.27	0.0040	<1.0	35	12	30	<5.0
13146	Bm ₂	56	2.3	22	<2.3	0.4	0.060	0.14	0.0012	0.35	0.21	0.0070	<1.0	32	13	34	<3.0
13147	B/C	30	4.6	16		0.2	0.030	0.14	0.0013	0.20	0.14	0.0070	<1.0	22	15	25	<3.0
13148	C	46	2.3	17	<2.3	0.2	0.030	0.090	0.0018	0.18	0.08	0.0060	<1.0	31	21	31	<3.0
13149	Ap	280	9.0	54	42	2.0											
13150	Bm ₁	140	5.0	22	9.0	0.87											
13152	Bm ₂	66	2.0	17	<2.3	0.4											
13153	B/C	190	7.0	17	<2.3	1.0											
13154	C	85	5.0	17	<2.3	0.5											

SOIL PROFILE INFORMATION

Horizon	Depth (cm)	Site: Burwash Experimental Plot	Date: 80/08/20
Ap	0-22	Location Code: 5017140	Parent Material: glacial/fuvial outwash
Bm ₁	22-30	UTM: 17T 05158 51262	Vegetation: grass
Bm ₂	30-40	Classification: Orthic Dystric Brunisol	
B/C	40-65	Landform: outwash plain	Comments: tree seedling plot
C	65+	Slope: level	



Sample No.	Horizon	Depth (cm)	Colour (dry, moist)	Sand (%)	Silt (%)	Clay (%)	pH (H ₂ O)	pH (CaCl ₂)	Organic C (%)	Total Nitrogen (mg/g)	Extr. S (ug/g)	Extr. SO ₄ (ug/g)	Avail. P (ug/g)	Total P (ug/g)	Avail. Al (ug/g)
13155	Ap	0-22	10YR 6/3, 4/3 m				5.3	4.6		1.4				310	
13156	Bm ₁	22-30	10YR 6/4, 4/4 m				5.5	4.9		0.62				210	
13157	Bm ₂	30-40	10YR 6/6, 4/6 m				5.6	5.2		0.44				310	
13158	B/C	40-65	10YR 6/4, 4/6 m				6.0	5.6		<0.22				620	
13159	C	65+	2.5Y 6/4, 5/4 m				6.1	5.5		0.23				360	

SOIL PROFILE INFORMATION (cont'd.)

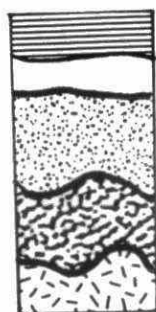
Site: Burwash Experimental Plot

Classification: Orthic Dystric Brunisol

Sample No.	Horizon	Exchangeable Cations (ug/g)				C.E.C. (m.e.) 100g	Pyrophosphate (%)			Dithionite (%)			CaCO ₃ (%)	Metals (ug/g)			
		Ca	Mg	K	Al		Fe	Al	Mn	Fe	Al	Mn		Zn	Cu	Ni	Pb
13155	Ap	94	<1.4	54	43	1.0											
13156	Bm ₁	100	5.0	27	13	0.76											
13157	Bm ₂	94	2.0	27	<2.3	0.58											
13158	B/C	45	4.6	13		0.3											
13159	C	56	2.0	17		0.3											

SOIL PROFILE INFORMATION

Horizon	Depth	Site: Firesand Creek Wawa Experimental Plot	Date: 80/09/16
Ah	0-6	Location Code: 5017141	Parent Material: outwash sand
Ae	6-10	UTM: 16T 06750 53189	Vegetation: jack pine
Bf	10-17	Classification: Eluviated Dystric Brunisol	
B/C	17-37	Landform: outwash plain	Comments: tree seedling plot
C	37+	Slope: level	



Sample No.	Horizon	Depth (cm)	Colour (dry, moist)	Sand (%)	Silt (%)	Clay (%)	pH (H ₂ O)	pH (CaCl ₂)	Organic C (%)	Total Nitrogen (mg/g)	Extr. S (ug/g)	Extr. SO ₄ (ug/g)	Avail. P (ug/g)	Total P (ug/g)	Avail. Al (ug/g)
13214	Ah	0-6	10YR 3/2, 2/2 m	53	26	20	3.8	3.2	17	6.9				570	
13215	Ae	6-10	10YR 6/2, 5/2 m	48	41	11	4.3	3.6	1.7	1.0				300	
13216	Bf	10-17	10YR 5/4, 4/4 m	84	12	5.0	5.4	4.9	1.5	0.61				450	
13217	B/C	17-37	10YR 7/4, 5/4 m	95	2.0	3.0	5.6	5.3	0.20	0.23				370	
13218	C	37+	2.5Y 7/4, 5/4 m	95	3.0	3.0	5.7	5.3	0.19	0.19				280	
13219	Ah	0-6					3.9	3.2		3.3				470	
13220	Bf	10-17					3.3	4.8		0.94				540	
13221	B/C	17-37					5.4	5.2		0.17				210	
13222	C	37+					5.6	5.2		0.15				250	

SOIL PROFILE INFORMATION (cont'd.)

Site: Firesand Creek Wawa Experimental Plot

Classification: Eluviated Dystric Brunisol

Sample No.	Horizon	Exchangeable Cations (ug/g)				C.E.C. (m.e.) 100g	Pyrophosphate (%)			Dithionite (%)			CaCO ₃ (%)	Metals (ug/g)			
		Ca	Mg	K	Al		Fe	Al	Mn	Fe	Al	Mn		Zn	Cu	Ni	Pb
13214	Ah	610	160	160	480	9.5	0.17	0.19	0.0073	0.43	0.19	0.012		61	20	7.9	83
13215	Ae	56	5.0	37	430	4.8	0.33	0.16	0.00070	0.33	0.19	0.0040		23	8.9	5.0	9.5
13216	Bf	47	5.0	17	5.0	0.4	0.22	0.52	0.0018	0.93	0.72	0.0090		66	23	34	8.0
13217	B/C	37	5.0	12	<2.3	0.3	0.050	0.18	0.0026	0.34	0.23	0.11	<1.0	54	36	64	4.5
13218	C	37	5.0	17	<2.3	0.3	0.050	0.17	0.033	0.33	0.22	0.11	<1.0	48	51	53	3.8
13219	Ah	340	44	100	440	6.7											
13220	Bf	47	5.0	22	5.0	0.4											
13221	B/C	19	<0.70	7.0	<2.3	0.1											
13222	C	28	<0.70	17	<2.3	0.2											

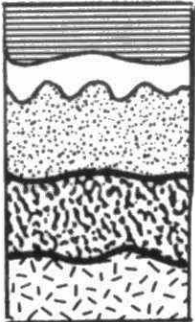
SOIL PROFILE INFORMATION

Horizon Depth (cm)

Site: Firesand Creek Wawa Experimental Plot

Date: 80/09/16

Ah 0-6
Ae 6-10
Bf 10-17
B/C 17-37
C 37+



Location Code: 5017141

Parent Material: outwash sand

UTM: 16T 06750 53189

Vegetation: jack pine

Classification: Eluviated Dystric Brunisol

Landform: outwash plain

Comments: tree seedling plot

Slope: level

Sample No.	Horizon	Depth (cm)	Colour (dry, 2/2 m)	Sand (%)	Silt (%)	Clay (%)	pH (H ₂ O)	pH (CaCl ₂)	Organic C (%)	Total Nitrogen (mg/g)	Extr. S (ug/g)	Extr. SO ₄ (ug/g)	Avail. P (ug/g)	Total P (ug/g)	Avail. Al (ug/g)
13223	Ah	0-6	10YR 3/2, 2/2 m				3.7	3.4		7.8				720	
13224	Ae	6-10	10YR 6/2, 5/2 m				4.4	3.7		0.82				160	
13225	Bf	10-17	10YR 5/4, 4/4 m				5.7	5.3		0.72				1000	
13226	B/C	17-37	10YR 7/4, 5/4 m				5.9	5.6		<0.13				330	
13227	C	37+	2.5Y 7/4, 5/4 m				5.8	4.6							

SOIL PROFILE INFORMATION (cont'd.)

Site: Firesand Creek Wawa Experimental Plot

Classification: Eluviated Dystric Brunisol

Sample No.	Horizon	Exchangeable Cations (ug/g)				C.E.C. (m.e.) 100g	Pyrophosphate (%)			Dithionite (%)			CaCO ₃ (%)	Metals (ug/g)			
		Ca	Mg	K	Al		Fe	Al	Mn	Fe	Al	Mn		Zn	Cu	Ni	Pb
13223	Ah	770	130	290	420	9.9											
13224	Ae	37	9.0	37	430	4.6											
13225	Bf	56	5.0	17	<2.3	0.4											
13226	B/C	15	4.6	10		0.81											
13227	C	37	5.0	12	<2.3	0.3											

NORTHWESTERN REGION

Bedrock Geology

The whole Northwestern Region is underlain by the ancient crystalline rocks of the Canadian Shield. The area is divided into three major geological regions: The Hudson Platform (Hudsons Bay Lowlands), and the Superior and Southern Provinces of the Canadian Shield (Clayton et al., 1977).

The Hudson Platform, in the north of the region, consists of sedimentary formations that occupy a basin in the Canadian Shield and overlie igneous and metamorphic bedrock. These Paleozoic sedimentary bedrock formations are of Ordovician and Silurian age and are primarily limestones, sandstones, siltstones and shales. These rocks are generally high in carbonates and therefore have a high buffering capacity.

The Canadian Shield, the major geological unit in the region, consists primarily of igneous and metamorphic bedrock, more specifically, which are complexes of granitic, gneissic, metasedimentary, volcanic and even some sedimentary material. The northern Superior Province is the larger of the two structural provinces. It is of early Precambrian origin and is mainly acid granodiorite, granite, quartz diorite, granite gneiss, and granitized and derived metamorphic sedimentary and volcanic rock. The bedrock of Superior Province is considered to be of high sensitivity to the effects of acid precipitation (Shilts, 1981).

The smaller Southern Province is in the southern part of the Northwestern Region and is made up of the middle Precambrian rocks of the Port Arthur Hills and the Late Precambrian rocks of the Nipigon Plate. (The Nipigon Plate, also referred to as the Nipigon Plain, is sometimes included as part of Superior Province). The rocks of the Southern Province are mostly basic intrusive diabase sills and dykes as well as sedimentary and volcanic rocks such as sandstone, quartzite, conglomerate, and shale. These rocks have a low to high intermediate sensitivity to acid precipitation (Shilts, 1981).

Glacial History and Surficial Geology

The Quaternary period includes the Pleistocene and Recent epochs. During this period, continental glaciers covered and greatly modified the Northwestern Region. The history of the Quaternary is complex and involved several advances and retreats of the continent ice sheets. The last glaciation, the Wisconsin, is of greatest interest because the present physiography is largely a result of this ice invasion. The ice began to retreat from the southern parts of the Northwestern Region about 12,500 B.P. Although the ice was gone from most of the area by 8,000 B.P. (Prest, 1970), ice may have been present in northern parts as late as 5,000 B.P.

The Laurentide Ice Sheet covering northwestern Ontario was composed of two sectors, the Labrador, which came from the northeast, and the Keewatin, from the northwest. Glacial drift carried by these glaciers could have originated locally or been carried from sources far to the northeast or to the northwest of the region. However, most drift material is thought to be of local provenance and to have come from sources a few kilometers to a few hundred kilometers from the present place of deposition.

The Hudson's Bay Lowlands were scoured and abraded by the passing ice and ice debris. Depression of the area by the weight of the ice resulted in inundation by the Tyrell Sea for several thousand years after the ice retreated.

The flat plain exposed today is covered with marine deposits of clay, silt, sand and gravel. Moraines, eskers, and even raised beaches are found as far as 270 km inland. Many of these glacial and marine deposits are derived from the sedimentary bedrocks of this area, hence the soils formed on them are of high cation exchange capacity, and are resistant to change by acidic deposition. The Lowlands slope gently from south to north and are poorly drained resulting in a surface composed mainly of organic "muskeg" terrain, string bogs, quaking bogs, ponds, lakes, and meandering watercourses. Owing to the limited accessibility and low sensitivity of the Lowlands, there are no baseline study sites located in this region.

The ice sheet also stripped the hard bedrock of the Canadian Shield of its weathered mantle of soil, replacing it with shallow glacial drift made up of gravel, sand, silt, and clay. Ground moraines and drumlins consisting of undifferentiated till were also formed. Much of the Shield area is a peneplain of low relief, with moderately rolling plains and bedrock outcrops (Hutton and Black, 1975), but there are also strongly broken uplands, especially in the south, with maximum elevations of over 600 metres. Drainage in the Shield area was deranged by the glacial action during the Quaternary period and since that time, the hard bedrock has resisted stream channel development. The result is a poorly drained region of many lakes, streams, muskeg areas and rock outcrops. Fluvial deposits, (such as outwash deposits and eskers) are common in the region, and vary in texture from gravels to sands and even fine silts and clays.

The retreat of the Laurentide Ice Sheet caused the formation of large temporary freshwater lakes. These glacier-fed lakes were present in the Northwestern Region for a period of about 4,000 years from about 12,000 B.P. to 8,000 B.P. Three large dynamic lake complexes existed: Lake Agassiz in the west, Duluth-Minong-Houghton Lakes in the Superior Lake Basin in the centre, and Lake Barlow-Ojibway in the east (Prest, 1970). These lakes left raised beaches, sand and gravel ridges and water-cut bluffs in the region, as well as large lacustrine deposits of sand, silt and clay. The flat lacustrine deposits near Thunder Bay, Dryden and Fort Frances, are used for agriculture, and have produced some of the better forest soils in the region. Lake Barlow-Ojibway produced the extensive clay deposits known as the Clay Belt. It should be noted, however, that some fine deposits are not of water origin. Extensive aeolian deposits of fine sand and silts are also present such as those near Lac des Mille Lac northwest of Thunder Bay.

The present clay soils in the Northwestern Region vary from thin, sandy acidic soils to deeper well buffered clay soils. Recent modification of the soil in the region has been due to logging operations, forest fires and to a lesser extent agricultural practices.

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DD/mb/PH5-2

SOIL BASELINE ANALYTICAL DATA, 1980-1981

NORTHWESTERN REGION

SOIL PROFILE INFORMATION

Site: Nakina

Date: 81/06/03

Location Code: 6001001

UTM: 16U 516000 5560000

Vegetation: mature white pine stand

Landform: fluvial

Comments: gravelly organic layer 0 - 3 cm
not sampled. Soil depth >1m.
Igneous, metamorphic bedrock

Slope: level

Sample No.	Horizon	Depth (cm)	Colour	Sand (%)	Silt (%)	Clay (%)	pH (H ₂ O)	pH (CaCl ₂)	Organic C (%)	Total Nitrogen (mg/g)	Extr. S (ug/g)	Extr. SO ₄ (ug/g)	Avail. P (ug/g)	Total P (ug/g)	Avail. Al (ug/g)
16503	surface mineral	5-10	5YR 6/1	67	27	7.0	4.9	3.7	2.0	0.40			<3.0	100	8.9
16504	surface mineral	5-10	5YR 6/1	59	33	8.0	4.8	3.7	2.5	0.50			<3.0	100	7.9
16499	mineral	10-30	7.5YR 4/6	86	10	4.0	5.3	4.7	1.8	0.30			<3.0	400	3.2
16500	mineral	10-30	7.5YR 4/6	81	15	4.0	5.3	4.6	0.90	0.30			<3.0	200	3.9
16501	mineral	30+	10YR 5/6	95	1.0	3.0	5.7	4.8	0.90	0.20			<3.0	300	1.4
16502	mineral	30+	10YR 5/6	86	11	3.0	5.7	4.9	0.60	0.20			<3.0	300	1.4

SOIL PROFILE INFORMATION (cont'd.)

Site: Nakina

Sample No.	Horizon	Exchangeable Cations (ug/g)				C.E.C. (m.e.) 100g	Pyrophosphate (%)			Dithionite (%)			CaCO ₃ (%)	Metals (ug/g)			
		Ca	Mg	K	Al		Fe	Al	Mn	Fe	Al	Mn		Zn	Cu	Ni	Pb
16503	surface mineral	120	13	6.0	280	3.5	0.12	0.10	0.00080	0.32	0.10	0.0026		13	25	<2.0	5.1
16504	surface mineral	190	22	14	280	4.0	0.14	0.11	0.00060	0.33	0.11	0.0011		9.9	21	<2.0	<3.0
16499	mineral	35	2.0	3.0	43	0.63	0.12	0.25	0.00060	0.46	0.27	0.0017		14	19	6.6	<3.0
16500	mineral	22	3.0	3.0	56	0.70	0.12	0.20	0.00080	0.56	0.24	0.0026		13	10	7.0	<3.0
16501	mineral	33	6.0	6.0	14	<0.50	0.044	0.12	0.0050	0.25	0.14	0.012		21	22	13	3.2
16502	mineral	22	1.0	3.0	16	<0.50	0.060	0.18	0.0040	0.33	0.20	0.0097		16	14	9.5	<3.0

SOIL PROFILE INFORMATION

Site: Lake Nipigon Provincial Park

Date: 81/06/04

Location Code: 6001007

Parent Material: bedrock

UTM: 16U 418300 5479700

Vegetation: 60% white spruce and balsam fir,
jack pine, white birch and aspen

Landform: rock outcrop

Comments: shallow soil (20 cm to
bedrock). Organic horizon 0-7 cm.
not sampled.

Slope:

Sample No.	Horizon	Depth (cm)	Colour	Sand (%)	Silt (%)	Clay (%)	pH (H ₂ O)	pH (CaCl ₂)	Organic C (%)	Total Nitrogen (mg/g)	Extr. S (ug/g)	Extr. SO ₄ (ug/g)	Avail. P (ug/g)	Total P (ug/g)	Avail. Al (ug/g)
16597	surface	7-20	10R 3/2	50	42	8	5.6	4.7	9.3	1.5			<3.0	800	4.1
16512	surface	7-20	10R 3/2	53	37	10	6.0	4.9	8.1	1.6			<3.0	800	0.64

SOIL PROFILE INFORMATION (cont'd.)

Site: Lake Nipigon Provincial Park

Sample No.	Horizon	Exchangeable Cations (ug/g)				C.E.C. (m.e.) 100g	Pyrophosphate (%)			Dithionite (%)			CaCO ₃ (%)	Zn	Metals (ug/g)		
		Ca	Mg	K	Al		Fe	Al	Mn	Fe	Al	Mn			Cu	Ni	Pb
16597	surface	420	62	67	62	3.4	0.47	0.72	0.036	2.2	0.97	0.11		130	150	64	<3.0
16512	surface	630	95	98	22	4.5	0.23	0.71	0.011	1.9	1.1	0.021		100	150	72	<3.0

SOIL PROFILE INFORMATION

Site: Dorion Site

Date: 81/06/04

Location Code: 6001008

UTM: 16U 382900 5411300

Vegetation: 80% jack pine, white spruce,
aspen and white birch

Landform: lacustrine

Comments: carbonotite bedrock. Organic
horizon 0-4 cm. not sampled.
Indistinct horizon boundaries.

Slope:

Sample No.	Horizon	Depth (cm)	Colour	Sand (%)	Silt (%)	Clay (%)	pH (H ₂ O)	pH (CaCl ₂)	Organic C (%)	Total Nitrogen (mg/g)	Extr. S (ug/g)	Extr. SO ₄ (ug/g)	Avail. P (ug/g)	Total P (ug/g)	Avail. Al (ug/g)
16517	mineral	4-12	10YR 3/4	76	18	7.0	5.9	4.8	2.3	0.40			35	700	0.54
16596	mineral	4-12	10YR 3/4	74	19	8.0	5.7	4.5	2.7	0.40			40	500	2.8
16599	mineral	12-50	10YR 3/4	93	6.0	1.0	6.0	4.8	1.7	<0.10			4.0	400	1.8
16518	mineral	12-50	10YR 3/4	89	2.0	9.0	6.3	5.2	1.0	<0.10			<3.0	400	0.23

SOIL PROFILE INFORMATION (cont'd.)

Site: Dorion Site

Sample No.	Horizon	Exchangeable Cations (ug/g)				C.E.C. (m.e.) 100g	Pyrophosphate (%)			Dithionite (%)			CaCO ₃ (%)	Zn	Metals (ug/g)		
		Ca	Mg	K	Al		Fe	Al	Mn	Fe	Al	Mn			Cu	Ni	Pb
16517	mineral	720	160	73	61	5.7	0.34	0.25	0.19	1.8	0.27	0.048		78	48	19	10
16596	mineral	530	170	81	120	5.4	0.26	0.16	0.022	1.7	0.18	0.068		68	52	15	<3.0
16599	mineral	300	130	82	42	3.0	0.052	0.10	0.0054	1.4	0.15	0.036		38	25	20	6.3
16518	mineral	480	130	72	13	3.8	0.11	0.18	0.0076	1.5	0.23	0.026	<1.0	43	30	21	7.8

SOIL PROFILE INFORMATION

Site: Sandbar Provincial Park

Date: 81/06/09

Location Code: 6001010

UTM: 15U 606100 5482500

Vegetation: 50% jack pine, balsam fir,
black spruce and aspen

Landform: fluvial/moraine

Comments: stoney below 50 cm, well-drained.
Organic horizon 0-6 cm not
sampled.

Slope: rolling

Sample No.	Horizon	Depth (cm)	Colour	Sand (%)	Silt (%)	Clay (%)	pH (H ₂ O)	pH (CaCl ₂)	Organic C (%)	Total Nitrogen (mg/g)	Extr. S (ug/g)	Extr. SO ₄ (ug/g)	Avail. P (ug/g)	Total P (ug/g)	Avail. Al (ug/g)
16523	surface	6-15	10YR 3/6	37	59	2.0	5.8	4.5	5.6	1.3			<3.0	500	1.9
16530	surface	6-15	10YR 3/6	32	66	2.0	5.7	4.8	4.1	0.80			<3.0	400	0.34
16522	mineral	15-34	10YR 5/4	58	39	4.0	6.1	5.3	1.4	0.40			<3.0	200	0.22
16531	mineral	15-34	10YR 5/4	62	30	8.0	6.1	5.3	1.4	0.40			<3.0	200	0.45
16532	mineral	34-50	10YR 6/4	70	24	6.0	6.3	5.5	0.70	<0.10			<3.0	100	0.32
16521	mineral	34-50	10YR 6/4	77	15	7.0	6.2	5.4	0.30	<0.10			<3.0	100	0.16

SOIL PROFILE INFORMATION (cont'd.)

Site: Sandbar Provincial Park

Sample No.	Horizon	Exchangeable Cations (ug/g)				C.E.C. (m.e.) 100g	Pyrophosphate (%)			Dithionite (%)			CaCO ₃ (%)	Metals (ug/g)			
		Ca	Mg	K	Al		Fe	Al	Mn	Fe	Al	Mn		Zn	Cu	Ni	Pb
16523	surface	150	10	22	43	1.5	0.19	0.53	0.0012	1.1	0.87	0.0039		30	21	12	5.4
16530	surface	120	10	9.0	38	1.0	0.13	0.35	0.0027	0.87	0.66	0.0065		24	21	11	<3.0
16522	mineral	53	3.0	4.0	8.0	<0.50	0.020	0.15	0.00060	0.53	0.30	0.0023	<1.0	24	19	11	<3.0
16531	mineral	57	4.0	6.0	7.0	<0.50	0.021	0.15	<0.00010	0.36	0.31	0.0015	<1.0	14	17	8.0	<3.0
16532	mineral	31	<1.4	3.0	10	<0.50	0.017	0.091	<0.00010	0.20	0.15	0.0005	<1.0	15	19	4.0	4.6
16521	mineral	15	<0.70	2.0	5.0	<0.50	0.014	0.068	0.00040	0.17	0.10	0.0006	<1.0	11	13	4.0	<3.0

SOIL PROFILE INFORMATION

Site: Aaron Provincial Park

Date: 81/06/09

Location Code: 6001013

UTM: 15U 525200 5511600

Vegetation: 70% jack pine, balsam fir,
white spruce and balsam poplar

Landform: lacustrine

Comments: archean metasediments (shales,
arkose). Organic horizon 0-3 cm
not sampled. Deep soil, not
sampled below 20 cm.

Slope: rolling

Sample No.	Horizon	Depth (cm)	Colour	Sand (%)	Silt (%)	Clay (%)	pH (H ₂ O)	pH (CaCl ₂)	Organic C (%)	Total Nitrogen (mg/g)	Extr. S (ug/g)	Extr. SO ₄ (ug/g)	Avail. P (ug/g)	Total P (ug/g)	Avail. Al (ug/g)
16525	surface	3-7	5Y 4/2	3.0	77	19	5.9	4.9	5.9	0.60			14	400	0.58
16526	surface	3-7	5Y 4/2	2.0	99	<1.0	5.8	4.6		0.60			13	300	0.63
16527	mineral	7-20	5Y 6/3	3.0	75	22	6.0	4.8	0.80	0.30			11	300	0.41
16528	mineral	7-20	5Y 6/3	1.0	59	39	6.2	5.0	1.4	0.30			10	400	1.7

SOIL PROFILE INFORMATION (cont'd.)

Site: Aaron Provincial Park

Sample No.	Horizon	Exchangeable Cations (ug/g)				C.E.C. (m.e.) 100g	Pyrophosphate (%)			Dithionite (%)			CaCO ₃ (%)	Metals (ug/g)			
		Ca	Mg	K	Al		Fe	Al	Mn	Fe	Al	Mn		Zn	Cu	Ni	Pb
16525	surface	660	130	110	47	5.0	0.18	0.14	0.011	0.46	0.20	0.016		79	39	23	3.9
16526	surface	680	130	84	42	5.0	0.20	0.16	0.014	0.46	0.20	0.021		59	48	19	<3.0
16527	mineral	610	150	67	34	4.8	0.13	0.098	0.0057	0.49	0.10	0.027		66	40	22	4.8
16528	mineral	1400	330	110	15	10	0.068	0.043	0.0022	0.47	0.10	0.018		64	43	30	<3.0

SOIL PROFILE INFORMATION

Site: Ear Falls Site

Date: 81/06/10

Location Code: 6001015

UTM: 15U 485900 5605800

Vegetation: 95% jack pine, black spruce

Landform: fluvial

Comments: Organic horizon 0-6 cm. not sampled. Not sampled below 36 cm.

Slope: rolling

Sample No.	Horizon	Depth (cm)	Colour	Sand (%)	Silt (%)	Clay (%)	pH (H ₂ O)	pH (CaCl ₂)	Organic C (%)	Total Nitrogen (mg/g)	Extr. S (ug/g)	Extr. SO ₄ (ug/g)	Avail. P (ug/g)	Total P (ug/g)	Avail. Al (ug/g)
16533	mineral	6-16	2.5Y 6/2	91	5.0	3.0	4.7	3.9	1.6	<0.10			17	200	9.8
16534	mineral	6-16	2.5Y 6/2	89	6.0	4.0	4.9	4.1	0.70	<0.10			9.0	100	9.5
16535	mineral	16-36	2.5Y 5/6	91	1.0	8.0	5.9	5.3	0.60	0.20			<3.0	300	0.19
16536	mineral	16-36	2.5Y 5/6	95	2.0	3.0	6.0	5.0	0.80	<0.10			<3.0	200	0.45

SOIL PROFILE INFORMATION (cont'd.)

Site: Ear Falls Site

Sample No.	Horizon	Exchangeable Cations (ug/g)				C.E.C. (m.e.) 100g	Pyrophosphate (%)			Dithionite (%)			CaCO ₃ (%)	Metals (ug/g)			
		Ca	Mg	K	Al		Fe	Al	Mn	Fe	Al	Mn		Zn	Cu	Ni	Pb
16533	mineral	38	5.0	13	130	1.6	0.080	0.072	<0.0001	0.21	0.072	<0.0002		8.5	15	<2.0	<3.0
16534	mineral	26	4.0	16	120	1.4	0.065	0.074	<0.0001	0.16	0.074	0.0018		5.0	10	<2.0	<3.0
16535	mineral	31	3.0	4.0	4	<0.50	0.040	0.067	<0.0001	0.16	0.12	0.0015	<1.0	6.9	38	6.4	<3.0
16536	mineral	53	7.0	10	16	0.50	0.019	0.110	<0.0001	0.24	0.17	0.00030		7.9	28	5.4	<3.0

SOIL PROFILE INFORMATION

Site: Blue Lake Provincial Park

Date: 81/06/10

Location Code: 6001017

UTM: 15U 466300 5527100

Vegetation: 60% jack pine, white birch,
balsam fir and black spruce

Landform: fluvial

Comments: Organic horizon 0-5 cm not
sampled. Soil depth 1.5 m.
Mineral horizons stoney.

Slope: level

Sample No.	Horizon	Depth (cm)	Colour	Sand (%)	Silt (%)	Clay (%)	pH (H ₂ O)	pH (CaCl ₂)	Organic C (%)	Total Nitrogen (mg/g)	Extr. S (ug/g)	Extr. SO ₄ (ug/g)	Avail. P (ug/g)	Total P (ug/g)	Avail. Al (ug/g)
16542	mineral	5-18	10YR 6/2	88	7.0	4.0	5.5	4.5	0.90	0.20			29	300	2.4
16543	mineral	5-18	10YR 6/2	85	9.0	6.0	5.7	4.6	1.2	0.20			31	400	1.7
16544	mineral	18-36	10YR 5/6	91	4.0	5.0	6.4	5.3	0.70	<0.1			19	600	0.42
16545	mineral	18-36	10YR 5/6	88	4.0	8.0	6.3	5.3	0.70	<0.1			19	700	0.17
16547	mineral	36-46	10YR 6/8	89	1.0	10	6.5	5.6	0.40	<0.1			7.0	500	0.38
16546	mineral	36-46	10YR 6/8	84	2.0	14	6.3	5.4	0.60	<0.1			13	500	0.090

SOIL PROFILE INFORMATION (cont'd.)

Site: Blue Lake Provincial Park

Sample No.	Horizon	Exchangeable Cations (ug/g)				C.E.C. (m.e.) 100g	Pyrophosphate (%)			Dithionite (%)			CaCO ₃ (%)	Metals (ug/g)			
		Ca	Mg	K	Al		Fe	Al	Mn	Fe	Al	Mn		Zn	Cu	Ni	Pb
16542	mineral	66	17	22	61	1.0	0.11	0.12	0.021	0.31	0.12	0.043		14	11	2.9	<3.0
16543	mineral	110	24	31	66	1.5	0.15	0.12	0.0096	0.35	0.13	0.017		21	14	2.9	4.2
16544	mineral	66	13	22	7.0	0.50	0.036	0.11	0.00040	0.34	0.20	0.0013	<1.0	17	31	7.9	<3.0
16545	mineral	57	14	21	3.0	<0.50	0.040	0.11	0.00040	0.33	0.18	0.033	<1.0	20	64	7.9	<3.0
16547	mineral	47	9.0	17	3.0	<0.50	0.018	0.058	<0.00010	0.32	0.11	0.0005		12	26	6.2	<3.0
16546	mineral	46	9.0	14	4.0	<0.50	0.020	0.074	0.00020	0.28	0.15	0.0015	<1.0	21	58	7.9	3.4

SOIL PROFILE INFORMATION

Site: Caliper Lake Provincial Park

Date: 81/06/10

Location Code: 6001020

UTM: 15U 433300 5434000

Vegetation: 70% red pine, white spruce,
balsam fir and jack pine

Landform: moraine

Comments: Deep soil not sampled below 22 cm.
Organic horizon 0-10 cm not
sampled. Stoney at 22 cm.

Slope: 35°

Sample No.	Horizon	Depth (cm)	Colour	Sand (%)	Silt (%)	Clay (%)	pH (H ₂ O)	pH (CaCl ₂)	Organic C (%)	Total Nitrogen (mg/g)	Extr. S (ug/g)	Extr. SO ₄ (ug/g)	Avail. P (ug/g)	Total P (ug/g)	Avail. Al (ug/g)
16551	surface	10-15	7.5YR 4/2	82	14	4.0	5.5	4.5	4.2	0.70			150	3100	6.2
16552	surface	10-15	7.5YR 4/2	77	17	6.0	5.4	4.4	4.1	0.80			140	1900	8.6
16553	mineral	15-22	10YR 5/8	92	6.0	2.0	5.8	4.6	3.7	0.70			120	2700	3.5
16554	mineral	15-22	10YR 5/8	93	5.0	2.0	5.6	4.8	3.1	0.40			55	1700	2.9

SOIL PROFILE INFORMATION (cont'd.)

Site: Caliper Lake Provincial Park

Sample No.	Horizon	Exchangeable Cations (ug/g)				C.E.C. (m.e.) 100g	Pyrophosphate (%)			Dithionite (%)			CaCO ₃ (%)	Zn	Metals (ug/g)		
		Ca	Mg	K	Al		Fe	Al	Mn	Fe	Al	Mn			Cu	Ni	Pb
16551	surface	170	43	50	97	2.0	0.54	0.73	0.0054	0.78	0.74	0.0093		79	32	13	<3.0
16552	surface	260	47	98	160	3.5	0.38	0.42	0.018	0.56	0.42	0.029		83	27	12	<3.0
16553	mineral	190	30	49	55	2.0	0.31	0.53	0.0029	0.60	0.56	0.0041		44	26	17	<3.0
16554	mineral	66	15	21	23	0.73	0.21	0.47	0.0017	0.51	0.63	0.0039		34	27	18	<3.0

SOIL PROFILE INFORMATION

Site: French Lake (Quetico)

Date: 81/06/11

Location Code: 6001022

UTM: 15U 637600 5392400

Vegetation: mixed balsam fir, white spruce
white birch, red pine and white pine

Landform: moraine

Comments: Deep soil not sampled below 55 cm.
Organic horizon 0-4 cm not
sampled.

Slope: level

Sample No.	Horizon	Depth (cm)	Colour	Sand (%)	Silt (%)	Clay (%)	pH (H ₂ O)	pH (CaCl ₂)	Organic C (%)	Total Nitrogen (mg/g)	Extr. S (ug/g)	Extr. SO ₄ (ug/g)	Avail. P (ug/g)	Total P (ug/g)	Avail. Al (ug/g)
16556	surface	4-8	10YR 2/1	38	54	8.0	5.5	4.6	3.6	0.60			22	600	4.3
16557	surface	4-8	10YR 2/1	38	55	7.0	5.5	4.6	4.8	0.80			33	800	3.1
16558	mineral	8-45	10YR 3/3	29	63	8.0	5.8	4.7	1.8	0.30			11	600	0.84
16559	mineral	8-45	10YR 3/3	48	47	5.0	5.7	4.7	1.8	0.40			5.0	400	2.3
16561	mineral	45-55	10YR 5/3	62	35	3.0	5.8	4.8	1.1	<0.10			7.0	300	1.3
16560	mineral	45-55	10YR 5/3	52	44	4.0	6.1	5.0	1.0	<0.10			6.0	300	<0.080

SOIL PROFILE INFORMATION (cont'd.)

Site: French Lake (Quetico)

Sample No.	Horizon	Exchangeable Cations (ug/g)				C.E.C. (m.e.) 100g	Pyrophosphate (%)			Dithionite (%)			CaCO ₃ (%)	Zn	Metals (ug/g)		
		Ca	Mg	K	Al		Fe	Al	Mn	Fe	Al	Mn			Cu	Ni	Pb
16556	surface	270	42	34	84	2.5	0.34	0.37	0.017	0.86	0.37	0.047		49	27	17	<3.0
16557	surface	400	54	42	73	3.3	0.35	0.30	0.0081	0.85	0.30	0.018		44	25	15	<3.0
16558	mineral	320	140	22	31	3.1	0.34	0.27	0.0036	0.95	0.27	0.025		55	26	21	<3.0
16559	mineral	210	53	36	79	2.5	0.19	0.14	0.0054	0.48	0.14	0.016		37	29	17	<3.0
16561	mineral	280	95	34	51	2.8	0.11	0.076	0.0016	0.50	0.10	0.0055		34	33	20	<3.0
16560	mineral	440	170	12	17	3.8	0.069	0.043	0.0007	0.44	0.061	0.0045		31	24	18	<3.0

SOIL PROFILE INFORMATION

Site: Sibley Provincial Park

Date: 81/06/25

Location Code: 6001028

UTM: 16U 366250 5356250

Vegetation: 50% aspen, white birch, white spruce and balsam fir

Landform: lacustrine

Comments: conglomerate, sandstone, shale sediments. Organic horizon 0-6 cm not sampled.

Slope: rolling

Sample No.	Horizon	Depth (cm)	Colour	Sand (%)	Silt (%)	Clay (%)	pH (H ₂ O)	pH (CaCl ₂)	Organic C (%)	Total Nitrogen (mg/g)	Extr. S (ug/g)	Extr. SO ₄ (ug/g)	Avail. P (ug/g)	Total P (ug/g)	Avail. Al (ug/g)
16613	mineral	6-55	2.5YR 4/6	95	2.0	3.0	5.6	4.7	2.6	0.30			17	700	4.4
16614	mineral	6-55	2.5YR 4/6	94	6.0	1.0	5.6	4.7	1.8	0.30			<3.0	300	4.4
16615	mineral	55-65	10YR 4/4	92	1.0	7.0	6.2	5.4	0.6	<0.10			<3.0	200	0.27
16616	mineral	55-65	10YR 4/4	95	<1.0	5.0	6.3	5.4	0.6	<0.10			<2.0	200	0.16

SOIL PROFILE INFORMATION (cont'd.)

Site: Sibley Provincial Park

Sample No.	Horizon	Exchangeable Cations (ug/g)				C.E.C. (m.e.) 100g	Pyrophosphate (%)			Dithionite (%)			CaCO ₃ (%)	Zn	Metals (ug/g)		
		Ca	Mg	K	Al		Fe	Al	Mn	Fe	Al	Mn			Cu	Ni	Pb
16613	mineral	110	32	62	41	1.5	0.21	0.21	0.0022	1.0	0.47	0.0067		27	22	18	<3.0
16614	mineral	100	28	20	42	1.0	0.12	0.16	0.0038	1.1	0.32	0.0093		26	19	14	<3.0
16615	mineral	100	12	14	5.0	0.63	0.024	0.080	0.0017	0.84	0.24	0.017	<1.0	19	24	17	<3.0
16616	mineral	130	16	20	6.0	1.0	0.022	0.072	0.0018	0.40	0.12	0.010	<1.0	17	20	13	<3.0

SOIL PROFILE INFORMATION

Site: Middle Falls Provincial Park

Date: 81/06/26

Location Code: 6001030

UTM: 16U 305400 5321400

Vegetation: 70% balsam poplar, black ash
and white spruce

Landform: lacustrine

Comments: middle precambrian sediments,
poor drainage. Deep soil, only
sampled to 20 cm.

Slope:

Sample No.	Horizon	Depth (cm)	Colour	Sand (%)	Silt (%)	Clay (%)	pH (H ₂ O)	pH (CaCl ₂)	Organic C (%)	Total Nitrogen (mg/g)	Extr. S (ug/g)	Extr. SO ₄ (ug/g)	Avail. P (ug/g)	Total P (ug/g)	Avail. Al (ug/g)
16619	surface	0-12	10YR 2/2				6.5	5.9	21	4.3			11	800	0.11
16620	surface	0-12	10YR 2/2				6.6	5.8	18	4.4			16	900	0.17
16621	mineral	12-20	10YR 3/4	6.0	45	49	6.5	5.6	3.9	0.60			<3.0	500	0.19
16622	mineral	12-20	10YR 3/4	7.0	42	52	6.8	5.7	4.3	0.60			<3.0	600	0.082

SOIL PROFILE INFORMATION (cont'd.)

Site: Middle Falls Provincial Park

Sample No.	Horizon	Exchangeable Cations (ug/g)				C.E.C. (m.e.) 100g	Pyrophosphate (%)			Dithionite (%)			CaCO ₃ (%)	Metals (ug/g)			
		Ca	Mg	K	Al		Fe	Al	Mn	Fe	Al	Mn		Zn	Cu	Ni	Pb
16619	surface	4100	220	370		23	0.30	0.19	0.026	1.2	0.25	0.051		82	61	34	10
16620	surface	3600	910	310		26	0.28	0.17	0.024	1.2	0.23	0.048		78	48	30	10
16621	mineral	2100	620	110		16	0.13	0.056	0.0052	1.2	0.14	0.041		68	51	38	5.4
16622	mineral	2500	720	73		18	0.14	0.042	0.0033	1.3	0.13	0.31		66	56	38	6.0

SOIL PROFILE INFORMATION

Site: Ouimet Canyon Provincial Park

Date: 81/07/01

Location Code: 6001032

UTM: 16U 377200 5405200

Vegetation: mainly white birch and jack pine
some black spruce, aspen

Landform: shallow till and bare rock

Comments: Organic horizon 0-2 cm not
sampled. Bedrock at 60 cm.

Slope: gently rolling

Sample No.	Horizon	Depth (cm)	Colour	Sand (%)	Silt (%)	Clay (%)	pH (H ₂ O)	pH (CaCl ₂)	Organic C (%)	Total Nitrogen (mg/g)	Extr. S (ug/g)	Extr. SO ₄ (ug/g)	Avail. P (ug/g)	Total P (ug/g)	Avail. Al (ug/g)
16623	surface	2-12		29	49	22	5.2	4.1	12	2.6			<3.0	400	22
16624	surface	2-12		29	49	22	5.3	4.2	12	2.6			<3.0	400	22
16625	mineral	12-60	2.5YR 4/6	41	45	14	5.4	4.7	5.1	1.0			8.0	300	9.0
16626	mineral	12-60	2.5YR 4/6	37	49	14	5.3	4.5	5.4	1.3			10	300	13

SOIL PROFILE INFORMATION (cont'd.)

Site: Ouimet Canyon Provincial Park

Sample No.	Horizon	Exchangeable Cations (ug/g)				C.E.C. (m.e.) 100g	Pyrophosphate (%)			Dithionite (%)			CaCO ₃ (%)	Metals (ug/g)			
		Ca	Mg	K	Al		Fe	Al	Mn	Fe	Al	Mn		Zn	Cu	Ni	Pb
16623	surface	320	62	39	410	7.3	1.0	0.88	0.0015	2.7	0.96	0.017		51	65	29	7.6
16624	surface	300	54	28	500	7.0	1.2	0.96	0.0023	2.7	0.97	0.018		50	76	27	5.8
16625	mineral	75	8	6	100	1.4	0.25	0.55	0.00020	1.6	0.77	0.0049		27	52	21	3.9
16626	mineral	93	15	9	170	2.3	0.27	0.54	0.00050	1.2	0.63	0.0080		36	60	29	7.0

SOIL PROFILE INFORMATION

Site: Kakabeka Falls Provincial Park

Date: 81/07/01

Location Code: 6001034

UTM: 16U 305000 5363600

Vegetation: 90% jack pine, aspen

Landform: lacustrine

Comments: precambrian carbonotite bedrock, no gravel. Organic horizon 0-3 cm not sampled. Only sampled to 50 cm.

Slope: level

Sample No.	Horizon	Depth (cm)	Colour	Sand (%)	Silt (%)	Clay (%)	pH (H ₂ O)	pH (CaCl ₂)	Organic C (%)	Total Nitrogen (mg/g)	Extr. S (ug/g)	Extr. SO ₄ (ug/g)	Avail. P (ug/g)	Total P (ug/g)	Avail. Al (ug/g)
16630	surface	3-15	2.5YR 3/2	91	6.0	2.0	5.9	4.9	2.8	0.80			<3.0	600	1.1
16631	surface	3-15	2.5YR 3/2	75	11	14	6.3	5.2	3.6	0.60			6.0	700	0.38
16632	mineral	15-35	10YR 5/8	91	3.0	6.0	6.3	5.2	1.1	0.30			<3.0	300	0.43
16633	mineral	15-35	10YR 5/8	81	7.0	11	6.2	5.2	2.1	0.30			<3.0	400	0.25
16634	mineral	35-50	7.5YR 5/2	93	2.0	5.0	6.4	5.4	0.60	<0.10			4.0	400	<0.080
16635	mineral	35-50	7.5YR 5/2	90	2.0	8.0	6.5	5.5	0.9	<0.10			<3.0	300	0.13

SOIL PROFILE INFORMATION (cont'd.)

Site: Kakabeka Falls Provincial Park

Sample No.	Horizon	Exchangeable Cations (ug/g)				C.E.C. (m.e.) 100g	Pyrophosphate (%)			Dithionite (%)			CaCO ₃ (%)	Zn	Metals (ug/g)		
		Ca	Mg	K	Al		Fe	Al	Mn	Fe	Al	Mn			Cu	Ni	Pb
16630	surface	300	42	74	10	2.0	0.077	0.10	0.012	1.0	0.21	0.025		48	51	28	<3.0
16631	surface	480	91	87	6.0	3.4	0.12	0.13	0.014	1.3	0.27	0.043	<1.0	57	25	22	<3.0
16632	mineral	100	17	41	5.0	0.78	0.039	0.078	0.0025	1.0	0.19	0.016	<1.0	33	40	25	<3.0
16633	mineral	300	64	150	12	2.5	0.074	0.065	<0.00010	1.2	0.33	0.010	<1.0	42	34	25	<3.0
16634	mineral	110	21	45	4.0	0.87	0.066	0.076	0.00020	0.79	0.095	0.013	<1.0	27	50	19	<3.0
16635	mineral	95	18	49	5.0	0.79	0.015	0.047	0.00020	0.85	0.12	0.012	<1.0	35	48	23	<3.0

SOIL PROFILE INFORMATION

Site: Klotz Lake Provincial Park

Date: 81/07/14

Location Code: 6001037

UTM: 16U 578000 5510700

Vegetation: 50% aspen, white spruce, white birch and balsam fir

Landform: lacustrine

Comments: well drained, no gravel, metavolcanic rock. Organic horizon 0-5 cm not sampled.

Slope: level

Sample No.	Horizon	Depth (cm)	Colour	Sand (%)	Silt (%)	Clay (%)	pH (H ₂ O)	pH (CaCl ₂)	Organic C (%)	Total Nitrogen (mg/g)	Extr. S (ug/g)	Extr. SO ₄ (ug/g)	Avail. P (ug/g)	Total P (ug/g)	Avail. Al (ug/g)
16686	mineral	5-14	5YR 8/2	10	83	7.0	5.0	4.0	2.7	0.40			<3.0	100	7.4
16687	mineral	5-14	5YR 8/2	9.0	81	9.0	5.5	4.4	2.3	0.40			<3.0	200	5.9
16688	mineral	14-21	10YR 6/4	10	86	3.0	5.5	5.0	1.7	0.30			<3.0	200	4.4
16689	mineral	14-21	10YR 6/4	8.0	65	27	6.2	5.4	2.6	0.40			<3.0	400	0.30
16690	mineral	21-25	10YR 6/6	3.0	47	50	8.2	7.4	3.2	0.50			<3.0	500	0.13
16691	mineral	21-25	10YR 6/6	7.0	68	24	6.0	5.1	2.2	0.30			<3.0	400	0.70

SOIL PROFILE INFORMATION (cont'd.)

Site: Klotz Lake Provincial Park

Sample No.	Horizon	Exchangeable Cations (ug/g)				C.E.C. (m.e.) 100g	Pyrophosphate (%)			Dithionite (%)			CaCO ₃ (%)	Metals (ug/g)			
		Ca	Mg	K	Al		Fe	Al	Mn	Fe	Al	Mn		Zn	Cu	Ni	Pb
16686	mineral	290	30	37	180	3.5	0.055	0.059	0.00020	0.16	0.042	0.00020		10	11	2.8	4.6
16687	mineral	400	58	18	150	3.8	0.096	0.056	0.00050	0.27	0.062	0.00030		16	50	5.3	<3.0
16688	mineral	400	58	29	97	3.5	0.10	0.050	0.00060	0.32	0.068	0.0013		13	10	6.0	<3.0
16689	mineral	920	150	48	<4.5	6.0	0.14	0.081	0.0025	0.56	0.14	0.010	<1.0	31	17	17	7.0
16690	mineral	2000	400	45		13	0.061	0.033	0.0033	0.59	0.11	0.029	12	52	34	29	5.4

SOIL PROFILE INFORMATION

Site: Pakwash Provincial Park

Date: 81/07/20

Location Code: 6001040

UTM: 15U 469300 5623700

Vegetation: 70% jack pine, black spruce and white birch

Landform: moraine

Comments: mafic and ultramafic igneous rock
Organic horizon 0-8 cm not sampled

Slope: level

Sample No.	Horizon	Depth (cm)	Colour	Sand (%)	Silt (%)	Clay (%)	pH (H ₂ O)	pH (CaCl ₂)	Organic C (%)	Total Nitrogen (mg/g)	Extr. S (ug/g)	Extr. SO ₄ (ug/g)	Avail. P (ug/g)	Total P (ug/g)	Avail. Al (ug/g)
16760	mineral	8-15	5YR 5/2	89	8.0	4.0	4.9	3.9	1.8	0.40			33	500	16
16761	mineral	8-15	5YR 5/2	85	10	5.0	4.8	4.0	1.5	0.40			37	400	19
16762	mineral	15-35	10YR 4/6	85	1.0	14	6.1	5.1	1.4	0.20			9.0	400	0.56
16763	mineral	15-35	10YR 4/6	81	2.0	17	6.0	5.1	1.3	0.20			11	600	0.54
16764	mineral	35-55	10YR 4/6	81	2.0	17	6.3	5.4	0.50	<0.10			<3.0	500	0.26
16765	mineral	35-55	10YR 4/6	83	3.0	14	6.3	5.2	0.80	<0.10			7.0	300	0.62

SOIL PROFILE INFORMATION (cont'd.)

Site: Pakwash Provincial Park

Sample No.	Horizon	Exchangeable Cations (ug/g)				C.E.C. (m.e.) 100g	Pyrophosphate (%)			Dithionite (%)			CaCO ₃ (%)	Metals (ug/g)			
		Ca	Mg	K	Al		Fe	Al	Mn	Fe	Al	Mn		Zn	Cu	Ni	Pb
16760	mineral	57	14	34	180	2.0	0.37		0.0023	0.41		0.0049		68	7.2	12	5.3
16761	mineral	45	10	29	210	2.5	0.33		0.0038	0.44		0.0059		60	7.2	11	<3.0
16762	mineral	75	14	31	7.0	<0.50	0.064	0.22	0.00070	0.86	0.44	0.0031	<1.0	100	35	49	4.1
16763	mineral	40	8.0	11	7.0	<0.50	0.046	0.18	0.00030	0.61	0.38	0.0010	<1.0	82	33	39	<3.0
16764	mineral	40	9.0	21	5.0	<0.50	0.022	0.093	0.00090	0.44	0.20	0.0046	<1.0	58	55	40	3.5
16765	mineral	57	15	22	7.0	<0.50	0.060	0.17	0.00050	0.48	0.24	0.0018	<1.0	83	43	48	<3.0

SOIL PROFILE INFORMATION

Site: Experimental Lakes Area

Date: 81/07/21

Location Code: 6001043

UTM: 15U 448000 5503000

Vegetation: 50% jack pine, black spruce,
balsam fir and white birch

Landform: fluvial

Comments: Deep soil. Organic horizon
0-12 cm not sampled.

Slope: base of hill

Sample No.	Horizon	Depth (cm)	Colour	Sand (%)	Silt (%)	Clay (%)	pH (H ₂ O)	pH (CaCl ₂)	Organic C (%)	Total Nitrogen (mg/g)	Extr. S (ug/g)	Extr. SO ₄ (ug/g)	Avail. P (ug/g)	Total P (ug/g)	Avail. Al (ug/g)
16774	mineral	12-26	2.5YR 5/2	78	19	3.0	4.4	3.4	1.3	0.30			<3.0	100	16
16775	mineral	12-26	2.5YR 5/2	79	16	5.0	4.4	3.5	1.3	0.30			<3.0	100	17
16776	mineral	26-46	5YR 3/4	85	11	4.0	5.5	4.6	3.0	0.40			<3.0	300	5.2
16777	mineral	26-46	5YR 3/4	85	11	4.0	5.7	4.7	2.4	0.40			<3.0	300	2.6
16778	mineral	46-49	2.5YR 6/4	86	6.0	8.0	6.1	5.1	0.40	<0.10			<3.0	400	0.68
16779	mineral	46-49	2.5YR 6/4	89	1.0	11	6.0	5.1	0.50	<0.10			<3.0	500	0.42

SOIL PROFILE INFORMATION (cont'd.)

Site: Experimental Lakes Area

Sample No.	Horizon	Exchangeable Cations (ug/g)				C.E.C. (m.e.) 100g	Pyrophosphate (%)			Dithionite (%)			CaCO ₃ (%)	Metals (ug/g)			
		Ca	Mg	K	Al		Fe	Al	Mn	Fe	Al	Mn		Zn	Cu	Ni	Pb
16774	mineral	57	3.0	12	66	1.0	0.035		<0.00010	0.16		0.00050		5.4	3.2	<2.0	<3.0
16775	mineral	62	6.0	12	66	1.0	0.016	0.028	<0.00010	0.17	0.028	0.0018		6.4	3.2	2.5	<3.0
16776	mineral	170	23	42	73	2.0	0.14	0.29	0.00020	0.66	0.46	0.0015		24	5.2	10	4.2
16777	mineral	190	20	34	36	1.5	0.32	0.17	0.00050	0.55	0.39	0.0010		23	9.7	10	6.1
16778	mineral	49	8.0	7.0	7.0	<0.50	0.019	0.059	0.00060	0.19	0.082	0.00080	<1.0	6.9	3.7	5.0	<3.0
16779	mineral	33	6.0	7.0	6.0	<0.50	0.010	0.048	0.00070	0.15	0.065	0.0010	1.0	8.9	4.2	4.5	<3.0

SOIL PROFILE INFORMATION

Site: Beaverhouse Lake (Quetico)

Date: 81/07/22

Location Code: 6001046

UTM: 15U 569000 5381200

Vegetation: 50% jack pine, red pine, white pine, black spruce and red maple

Landform: moraine

Comments: rapidly drained. Organic horizon 0-5 cm not sampled.

Slope:

Sample No.	Horizon	Depth (cm)	Colour	Sand (%)	Silt (%)	Clay (%)	pH (H ₂ O)	pH (CaCl ₂)	Organic C (%)	Total Nitrogen (mg/g)	Extr. S (ug/g)	Extr. SO ₄ (ug/g)	Avail. P (ug/g)	Total P (ug/g)	Avail. Al (ug/g)
16806	mineral	5-38	10YR 4/6	35	55	10	5.4	4.7	6.4	1.3			<3.0	400	10
16807	mineral	5-38	10YR 4/6	34	56	11	5.4	4.6	5.9	1.4			<3.0	400	12
16808	mineral	38-58	10YR 5/6	52	43	6.0	5.4	4.7	4.2	1.1			<3.0	300	6.4
16809	mineral	38-58	10YR 5/6	56	39	5.0	5.3	4.6	3.8	0.80			<3.0	300	5.8

SOIL PROFILE INFORMATION (cont'd.)

Site: Beaverhouse Lake (Quetico)

Sample No.	Horizon	Exchangeable Cations (ug/g)				C.E.C. (m.e.) 100g	Pyrophosphate (%)			Dithionite (%)			CaCO ₃ (%)	Metals (ug/g)			
		Ca	Mg	K	Al		Fe	Al	Mn	Fe	Al	Mn		Zn	Cu	Ni	Pb
16806	mineral	53	15	45	120	1.7	0.25	0.55	<0.00010	1.4	0.78	0.0044		67	25	31	7.0
16807	mineral	62	17	45	110	1.7	0.28	0.59	<0.00010	1.3	0.80	0.0036		72	28	32	9.1
16808	mineral	35	4.0	14	68	1.0	0.18	0.46	<0.00010	0.78	0.60	0.0018		37	23	23	4.1
16809	mineral	18	6.0	11	39	<0.50	0.20	0.45	<0.00010	0.85	0.66	0.0020		36	27	22	7.2

SOIL PROFILE INFORMATION

Site: Eva Lake (Quetico)

Date: 81/07/27

Location Code: 6001048

UTM: 15U 634900 5396400

Vegetation: some white pines

Landform: lacustrine silt

Comments: very bouldery. Organic horizon
0-9 cm. not sampled.

Slope:

Sample No.	Horizon	Depth (cm)	Colour	Sand (%)	Silt (%)	Clay (%)	pH (H ₂ O)	pH (CaCl ₂)	Organic C (%)	Total Nitrogen (mg/g)	Extr. S (ug/g)	Extr. SO ₄ (ug/g)	Avail. P (ug/g)	Total P (ug/g)	Avail. Al (ug/g)
16843	mineral	9-24	5YR 3/3	5.0	86	9.0	5.6	4.5	6.7	1.9			35	1600	4.6
16844	mineral	9-24	5YR 3/3	4.0	86	10	5.6	4.5	6.3	1.7			29	1400	4.6
16845	mineral	24-30	7.5YR 5/6	3.0	91	7.0	5.8	5.0	4.4	1.1			7.0	800	3.0
16846	mineral	24-30	7.5YR 5/6	3.0	89	9.0	5.6	4.8	4.6	0.90			5.0	1000	5.2

SOIL PROFILE INFORMATION (cont'd.)

Site: Eva Lake (Quetico)

Sample No.	Horizon	Exchangeable Cations (ug/g)				C.E.C. (m.e.) 100g	Pyrophosphate (%)			Dithionite (%)			CaCO ₃ (%)	Metals (ug/g)			
		Ca	Mg	K	Al		Fe	Al	Mn	Fe	Al	Mn		Zn	Cu	Ni	Pb
16843	mineral	550	79	24	120	4.6	0.53	0.49	0.0018	1.1	0.62	0.0048		42	19	14	<3.0
16844	mineral	260	35	9.0	32	2.0	0.58	0.49	0.0023	1.2	0.58	0.0063		49	17	14	<3.0
16845	mineral	180	25	3.0	61	1.5	0.22	0.36	0.00020	1.0	0.49	0.0020		40	18	20	<3.0
16846	mineral	280	33	46	92	2.5	0.28	0.35	0.00020	1.1	0.50	0.0030		51	15	18	<3.0

SOIL PROFILE INFORMATION

Site: Lac La Croix Site

Date: 81/07/28

Location Code: 6001050

UTM: 15U 551700 5353200

Vegetation: 70% jack pine, white birch

Landform: lacustrine

Comments: precambrian granitic and gneisses. Organic horizon 0-7 cm not sampled.

Slope:

Sample No.	Horizon	Depth (cm)	Colour	Sand (%)	Silt (%)	Clay (%)	pH (H ₂ O)	pH (CaCl ₂)	Organic C (%)	Total Nitrogen (mg/g)	Extr. S (ug/g)	Extr. SO ₄ (ug/g)	Avail. P (ug/g)	Total P (ug/g)	Avail. Al (ug/g)
16847	surface mineral	7-15	7.5YR 3/2	57	36	7.0	5.3	4.2	2.7	0.60			40	400	4.4
16848	surface mineral	7-15	7.5YR 3/2	57	35	8.0	5.1	4.2	2.5	0.50			37	300	6.7
16849	mineral	15-32	10YR 5/8	72	22	6.0	5.8	5.0	0.9	0.20			46	800	1.3
16850	mineral	15-32	10YR 5/8	65	26	9.0	5.9	5.1	0.5	0.20			34	700	0.86

SOIL PROFILE INFORMATION (cont'd.)

Site: Lac La Croix Site

Sample No.	Horizon	Exchangeable Cations (ug/g)				C.E.C. (m.e.) 100g	Pyrophosphate (%)			Dithionite (%)			CaCO ₃ (%)	Metals (ug/g)			
		Ca	Mg	K	Al		Fe	Al	Mn	Fe	Al	Mn		Zn	Cu	Ni	Pb
16847	surface mineral	300	33	46	90	2.8	0.12	0.097	0.013	0.26	0.097	0.015		19	13	4.5	4.2
16848	surface mineral	300	40	52	110	3.0	0.096	0.084	0.0077	0.21	0.084	0.0088		16	9.2	2.8	<3.0
16849	mineral	140	22	34	19	1.0	0.23	0.20	<0.00010	0.35	0.20	0.0010		20	6.2	8.2	<3.0
16850	mineral	150	30	43	15	1.0	0.20	0.17	0.0002	0.34	0.20	<0.00020	<1.0	21	6.4	8.9	<3.0

SOIL PROFILE INFORMATION

Site: Oiseau Bay (Pukaskwa)

Date: 81/08/04

Location Code: 6001052

UTM: 16U 560300 5360600

Vegetation: 60% jack pine

Landform: lacustrine

Comments: no gravel, rapidly drained.
Organic horizon 0-7 cm not
sampled.

Slope:

Sample No.	Horizon	Depth (cm)	Colour	Sand (%)	Silt (%)	Clay (%)	pH (H ₂ O)	pH (CaCl ₂)	Organic C (%)	Total Nitrogen (mg/g)	Extr. S (ug/g)	Extr. SO ₄ (ug/g)	Avail. P (ug/g)	Total P (ug/g)	Avail. Al (ug/g)
16874	mineral	7-25	10YR 6/1	97	1.0	2.0	4.9	4.0	0.50	<0.10			150	300	6.6
16875	mineral	7-25	10YR 6/1	97	<1.0	2.0	5.1	4.1	0.60	<0.10			9.0	200	5.5
16876	mineral	25-50	10YR 7/3	98	<1.0	1.0	5.6	4.7	0.30	<0.10			<3.0	300	2.3
16877	mineral	25-50	10YR 7/3	98	<1.0	2.0	5.6	4.6	0.30	<0.10			<3.0	200	2.6
16878	mineral	50-57	10YR 7/4	97	1.0	2.0	6.0	4.9	0.30	<0.10			<3.0	300	1.2
16879	mineral	50-57	10YR 7/4	98	<1.0	2.0	5.9	4.8	0.20	<0.10			<3.0	400	1.2

SOIL PROFILE INFORMATION (cont'd.)

Site: Oiseau Bay (Pukaskwa)

Sample No.	Horizon	Exchangeable Cations (ug/g)				C.E.C. (m.e.) 100g	Pyrophosphate (%)			Dithionite (%)			CaCO ₃ (%)	Metals (ug/g)			
		Ca	Mg	K	Al		Fe	Al	Mn	Fe	Al	Mn		Zn	Cu	Ni	Pb
16874	mineral	22	4.0	5.0	46	0.61	0.048	0.016	<0.00010	0.18	0.018	0.0012		8.1	3.9	<2.0	<3.0
16875	mineral	43	6.0	6.0	38	0.66	0.031	0.016	<0.00010	0.091	0.022	0.0010		8.1	9.9	<2.0	<3.0
16876	mineral	22	2.0	<0.80	15	<0.50	0.027	0.017	0.0010	0.10	0.025	0.0017		8.6	8.4	4.1	<3.0
16877	mineral	22	3.0	3.0	20	<0.50	0.046	0.023	0.0010	0.14	0.023	0.0015		9.1	7.9	4.1	<3.0
16878	mineral	35	5.0	<0.80	8.0	<0.50	0.015	0.012	0.00060	0.097	0.022	0.0022		9.6	12	4.2	<3.0
16879	mineral	23	4.0	2.0	8.0	<0.50	0.012	0.0090	0.00060	0.069	0.012	0.0012		8.1	3.4	3.7	<3.0

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