Soil Survey Investigations Report No. 34

Soil Survey Laboratory Data and Descriptions for Some Soils of...

... WISCONSIN

SOIL CONSERVATION SERVICE • U.S. DEPARTMENT OF AGRICULTURE
In cooperation with Research Division of the College of
Agricultural and Life Sciences, University of Wisconsin

Soil survey investigations reports already published:

SSIR No. 1 Soil Survey Laboratory Methods and Procedures for Collecting Soil Samples

Soil Survey Laboratory Data and Descriptions for Some Soils of:

SSIR No. 2 North Dakota
SSIR No. 3 Iowa
SSIR No. 4 Kansas
SSIR No. 5 Nebraska
SSIR No. 6 Arkansas, Louisiana, and Missouri
SSIR No. 7 Montana
SSIR No. 8 Wyoming
SSIR No. 9 Minnesota
SSIR No. 10 Colorado
SSIR No. 11 Oklahoma
SSIR No. 12 Puerto Rico and the Virgin Islands
SSIR No. 13 Mississippi
SSIR No. 14 Kentucky
SSIR No. 15 Tennessee
SSIR No. 16 North Carolina, South Carolina, and Georgia
SSIR No. 17 Wisconsin
SSIR No. 18 Indiana
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SSIR No. 20 New England States
SSIR No. 21 A Toposequence of Soils in Tonalite Grus in the Southern California Peninsular Range

Soil Survey Laboratory Data and Descriptions for Some Soils of:

SSIR No. 22 Alabama and Florida
SSIR No. 23 Nevada
SSIR No. 24 California
SSIR No. 25 New York
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SSIR No. 33 Minnesota

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November 1979

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PREFACE

The Soil Survey Investigations Report (SSIR) Series was established to preserve and make available technical information resulting from soil survey investigations. SSIR No. 1, "Soil Survey Laboratory Methods and Procedures for Collecting Soil Samples," revised April 1972, describes in detail the methods used in the soil survey laboratories. One report involves a single specific study. Other reports in the series contain pedon descriptions and data from the individual states and Puerto Rico and the Virgin Islands. The entire series is listed on the inside front cover.

This report contains pedon descriptions and data obtained in Wisconsin from 1948 to 1975. The majority of laboratory analyses were conducted at the Soil Survey Laboratory, Lincoln, Nebraska.

Laboratory data for different soils cannot always be compared without allowance for the method. Methods are indexed by code or footnote in data sheet column headings and are identified briefly on the following two pages. Detailed explanations of coded procedures are in SSIR No. 1.

Many of the soil descriptions were prepared as working documents, not necessarily for publication. Some contain unusually detailed information pertinent to specific soil survey investigations. Such information, including older concepts of soil series, relationships among pedons, and field estimates of properties, is useful in a publication of this type. Editing is, therefore, minimal with emphasis toward preservation of descriptive data.

Many pedons no longer represent the soil series with which they were originally identified; a few represent series being considered for reclassification. All were checked against the series classification list. Some pedons are called taxadjuncts to series. All pedons are classified to the family level. In the taxonomic and geographic indexes pedons are arranged by taxonomic unit.

METHODS CODE SYMBOLS

1. SAMPLE COLLECTION AND PREPARATION
   - A. Field sampling
     - 1. Site selection
     - 2. Soil sampling
       - a. Stony soils
       - b. Marsh and swamp soils
   - B. Laboratory preparation
     - 1. Standard (airdry)
       - a. Square-hole 2-mm sieve
       - b. Round-hole 2-mm sieve
     - 2. Field moist
     - 3. Carbonate-containing material
     - 4. Carbonate-indurated material
2. CONVENTIONS
   - A. Size-fraction base for reporting
     - 1. < 2-mm
     - 2. < size specified
   - B. Data sheet symbols
     - tr: trace, not measurable by quantitative procedure used or less than reportable amount
     - blank: analysis not run
3. PARTICLE-SIZE ANALYSES
   - A. Particles <2-mm (pipet method)
     - 1. Airdry samples
       - a. Carbonate and noncarbonate clay
       - b. Fine clay
   - B. Particles >2-mm
     - 1. Weight estimates
       - a. By field and laboratory weighing
       - b. From volume and weight estimates
     - 2. Volume estimates
4. FABRIC-RELATED ANALYSES
   - A. Bulk density
     - 1. Saran-coated clods
       - a. Field state
       - b. Airdry
       - c. 30-cm absorption
       - d. 1/3-bar desorption I
       - e. 1/3-bar desorption II
       - f. 1/3-bar desorption III
       - g. 1/10-bar desorption
       - h. Ovendry
   - B. Water retention
     - 1. Pressure-plate extraction (1/3 or 1/10 bar)
       - a. Sieved samples
       - b. Soil pieces
       - c. Natural clods
     - 2. Pressure-membrane extraction (15 bars)
       - a. Field-moist samples
     - 3. Sand-table absorption
     - 4. Field state
     - 5. Airdry
   - C. Water-retention difference
     - 1. 1/3 bar to 15 bars
     - 2. 1/10 bar to 15 bars
   - D. Linear extensibility
     - 1. Dry to moist
   - E. Micromorphology
     - 1. Thin sections
       - a. Preparation
       - b. Interpretation
       - c. Moved-clay percentage
   - F. Plasticity index
     - 1. Liquid limit
     - 2. Upper plastic limit
5. ION-EXCHANGE ANALYSES
   - A. Cation-exchange capacity
     - 1. NH_4OAc, pH 7.0
       - a. Direct distillation
       - b. Displacement, distillation
     - 3. Sum of cations
       - a. Acidity by $BaCl_2$-TEA, pH 8.2; bases by NH_4OAc, pH 7.0
       - b. Sum of bases plus Al
     - 6. NH_4OAc, pH 7.0 leaching tube
       - a. Direct distillation
   - B. Extractable bases
     - 1. NH_4OAc extraction
       - a. Uncorrected
       - b. Corrected (exchangeable)
       - c. See 5B4
     - 2. KCl-TEA extraction, pH 8.2
     - 3. KCl-TEA, pH 8.2 (revised)
       - a. Uncorrected
       - b. Corrected (exchangeable)
     - 4. NH_4OAc, pH 7.0 (modified)
       - a. Uncorrected
       - b. Corrected (exchangeable)
   - C. Base saturation
     - 1. NH_4OAc, pH 7.0
     - 3. Sum of cations
   - E. Sodium-adsorption ratio
   - F. Calcium saturation
     - 1. NH_4OAc, pH 7.0
6. CHEMICAL ANALYSES
   - A. Organic carbon
     - 1. Acid-dichromate digestion
       - a. $FeSO_4$ titration
       - b. CO_2 evolution, gravimetric
   - B. Nitrogen
     - 1. Kjeldahl digestion
       - a. Ammonia distillation
   - C. Iron
     - 1. Dithionite extraction
       - a. Dichromate titration
       - b. EDTA titration
     - 2. Dithionite-citrate extraction
       - a. Orthophenanthroline colorimetry
       - b. Atomic absorption
     - 3. Dithionite-citrate-bicarbonate extraction
       - a. Potassium thiocyanate colorimetry
     - 4. Pyrophosphate-dithionite extraction
     - 5. Sodium-pyrophosphate extraction
       - a. Atomic absorption
     - 6. Ammonium oxalate extraction
       - a. Atomic absorption
   - E. Calcium carbonate
     - 1. HCl treatment
       - b. Manometric
       - e. Titrimetric
     - 2. Sensitive qualitative method
       - a. Visual, gas bubbles
     - 3. H_2SO_4 treatment
       - a. Weight gain
   - F. Gypsum
     - 1. Water extract
       - a. Precipitation in acetone
       - b. Indirect estimate
   - G. Aluminum
     - 1. KCl extraction I, 30 min.
       - d. Fluoride titration
       - e. Atomic absorption
     - 5. Sodium pyrophosphate extraction
       - a. Atomic absorption
     - 6. Ammonium oxalate extraction
       - a. Atomic absorption
     - 7. Dithionite-citrate extraction
       - a. Atomic absorption
   - H. Extractable acidity
     - 1. $BaCl_2$-triethanolamine I
       - a. Back-titration with HCl
     - 2. $BaCl_2$-triethanolamine II
       - a. Back-titration with HCl
   - I. Carbonate
     - 1. Saturation extract
       - a. Acid titration
   - J. Bicarbonate
     - 1. Saturation extract
       - a. Acid titration
   - K. Chloride
     - 1. Saturation extract
       - a. Mohr titration
       - b. Potentiometric titration
   - L. Sulfate
     - 1. Saturation extract
       - a. Gravimetric, $BaSO_4$
       - b. EDTA titration

6. CHEMICAL ANALYSES (cont.)
   - M. Nitrate
     - 1. Saturation extract
       - a. PDS acid colorimetry
       - b. Diphenylamine
   - N. Calcium
     - 1. Saturation extract
       - a. EDTA titration
       - b. Atomic absorption
     - 2. NH_4OAc extraction
       - a. EDTA-alcohol separation
       - b. Oxalate-permanganate I
       - c. Oxalate-permanganate II Fe, Al, and Mn removed
       - d. Oxalate-cerate
       - e. Atomic absorption
     - 4. KCl-TEA extraction
       - a. Oxalate-permanganate
       - b. EDTA titration
       - c. Atomic absorption
   - O. Magnesium
     - 1. Saturation extract
       - a. EDTA titration
       - b. Atomic absorption
     - 2. NH_4OAc extraction
       - a. EDTA-alcohol separation
       - b. Phosphate titration
       - c. Gravimetric, $Mg_2P_2O_7$
       - d. Atomic absorption
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       - a. EDTA titration
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       - c. Atomic absorption
   - P. Sodium
     - 1. Saturation extract
       - a. Flame photometry
       - b. Atomic absorption
     - 2. NH_4OAc extraction
       - a. Flame photometry
       - b. Atomic absorption
   - Q. Potassium
     - 1. Saturation extract
       - a. Flame photometry
       - b. Atomic absorption
     - 2. NH_4OAc extraction
       - a. Flame photometry
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   - R. Sulfur
     - 1. $NaHCO_3$ extract, pH 8.5
       - a. Methylene blue
     - 2. HCl release (sulfide)
       - a. Iodine titration
   - S. Total phosphorus
     - 1. Perchloric acid digestion
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       - a. Carbonate removal
       - b. Organic-matter removal
       - c. Iron removal
       - d. Particle-size fractionation
       - e. PSDA pretreatment
     - 2. X-ray diffraction
       - a. Thin film on glass, solution pretreatment
       - b. Thin film on glass, resin pretreatment
     - 3. Differential thermal analysis
   - B. Optical analysis
     - 1. Grain studies
     - 2. Electron microscopy
   - C. Total analysis
     - 1. Chemical
     - 2. X-ray emission spectrography
   - D. Surface area
     - 1. Glycerol retention

8. MISCELLANEOUS
   - A. Saturated paste, mixed
     - 1. Saturation extract
       - a. Conductivity
       - b. Conductivity, quick test
     - 2. Conductivity, saturated paste
   - B. Saturated paste, capillary rise
     - 1. Saturation extract
       - a. Conductivity
   - C. pH
     - 1. Soil suspensions
       - a. Water dilution
       - b. Saturated paste
       - c. KCl
       - d. NaF
       - e. $CaCl_2$
   - D. Ratios and estimates
     - 1. To total clay
     - 2. To noncarbonate clay
     - 3. Ca to Mg (extractable)
     - 4. Estimated clay percentage
     - 5. Estimated total salt
   - E. Soil resistivity
     - 1. Saturated paste

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Fine-silty, mixed, mesic
Palsgrove taxadjunct 23/ 149
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ENTISOL

PSAMMENT

QUARTZIPSAMMENT

Typic Quartzipsamment
Mesic, uncoated
Boone 25
Boone 27

UDIPSAMMENT

Typic Udipsamment
Mixed, frigid
Menahga 19/ 119
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INCEPTISOL

AQUEPT

HAPLAQUEPT

Mollic Haplaquept
Fine-silty, mixed, nonacid, frigid
Barronett taxadjunct 8/ 3

MOLLISOL

AQUOLL

HAPLAQUOLL

Typic Haplaquoll
Coarse-loamy, mixed, frigid
Adolph 5

Fine-silty, mixed, frigid
Adolph variant 2/ 7

Fine-silty, mixed, mesic
Ossian 22/ 43
Pella 24/ 45

Fine, mixed, mesic
Ashkum 17
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UDOLL--Continued

HAPLUDOLL--Continued

Very-fine, mixed, mesic
Poygan taxadjunct 28/ 185

Clayey over sandy or sandy-skeletal, mixed, mesic
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ARGIUDOLL

Typic Argiudoll
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Ringwood 193
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Fine-silty, mixed, mesic
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Fine, illitic, mesic
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Typic Hapludoll
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Port Byron 26/ 177
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Entic Hapludoll
Sandy, mixed, mesic
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SPODOSOL

ORTHOD

HAPLORTHOD

Alfic Haplorthod
Coarse-loamy, mixed, frigid
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Emmet 11/ 125
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Santiago silt loam	S60WI-55-2	Glossoboralf	199*
Santiago silt loam	S60WI-55-3	Glossoboralf	201*
Sarona taxadjunct	S69WI-65-1	Dystrochrept	115
Sarona taxadjunct	S69WI-65-2	Dystrochrept	117
Seaton taxadjunct	S56WI-32-5 30/	Hapludalf	203*
Seaton taxadjunct	S56WI-32-6 30/	Hapludalf	205*
Seaton silt loam	10 11/	Hapludalf	207*
Seaton taxadjunct	S60WI-47-4 31/	Hapludalf	209*
Seaton silt loam	S60WI-47-5	Hapludalf	211*
Seelyeville	S74WI-83-3	Borosaprist	119
Sherry variant	S70WI-71-1	Haplaquept	121
Sherry taxadjunct	S70WI-71-4	Haplaquept	123
Sparta loamy sand	S57WI-32-4	Hapludoll	213*
Sparta loamy sand	S57WI-32-5	Hapludoll	215*
Spencer silt loam	S47WI-3-28	Glossoboralf	217*
Stambaugh taxadjunct	S72WI-21-7	Glossoboralf	125
Tawas	S74WI-75-1	Borosaprist	127
Theresa	S68WI-8-3	Hapludalf	129
Theresa	S68WI-8-4	Hapludalf	131
Varna silt loam	S58WI-51-1	Argiudoll	219*
Varna silt loam	S58WI-51-2	Argiudoll	221*
Waymor taxadjunct	S68WI-36-1	Hapludalf	133
Waymor taxadjunct	S68WI-36-2	Hapludalf	135
Withee silt loam	S61WI-37-3	Glossaqualf	223*
Withee silt loam	S61WI-71-1	Glossaqualf	225*

* Page number refers to SSIR 17.

SOIL SERIES INDEX

1/ County numbers (the number following "WI" in the Soil Survey No.) are as follows:

Projects sampled before 1974

1.	Adams	42.	Oconto
2.	Ashland	44.	Outagamie
3.	Barron	45.	Ozaukee
4.	Bayfield	47.	Pierce
8.	Calumet	48.	Polk
11.	Columbia	49.	Portage
13.	Dane	51.	Racine
14.	Dodge	52.	Richland
16.	Douglas	54.	Rusk
20.	Fond du Lac	55.	St. Croix
21.	Forest	60.	Taylor
24.	Green Lake	61.	Trempealeau
26.	Iron	63.	Vilas
27.	Jackson	65.	Washburn
30.	Kenosha	66.	Washington
32.	La Crosse	69.	Waushara
36.	Manitowoc	70.	Winnebago
37.	Marathon	71.	Wood

Projects sampled during 1974

25.	Dane		
55.	Jefferson	83.	Oconto
67.	Langlade	85.	Oneida
75.	Marinette	95.	Polk

(The following footnotes were designed to be copied and posted on appropriate pages of SSIR No. 17.)

2/ This pedon is a variant of Adolph because the sand content is lower and the clay content higher than normal; this pedon is fine-silty rather than coarse-loamy.

3/ This pedon is classified in a fine-silty family because 17.5 percent clay rounds to 18 percent.

4/ This pedon was sampled as Milaca silt loam; however it is in a coarse-loamy family and belongs in the Amery series.

5/ This pedon was sampled as Santiago silt loam; however it is in a coarse-loamy family and belongs in the Amery series.

6/ This pedon is classified in a fine-loamy family because the clay content in the upper portion of the control section rounds to 18 percent.

7/ No tonguing was described when this pedon was sampled. Tonguing was not commonly described in 1961; therefore, it is assumed that tonguing was present and the pedon is classified as a Glossaqualf.

8/ This pedon was sampled as Adolph silt loam; however it is in a fine-silty family; it has been correlated as a taxadjunct to the Barronett series.

9/ This pedon was sampled Meridian fine sandy loam; however, it is in a coarse-loamy family and lacks high base saturation with depth. This pedon is a taxadjunct to the Billett series.

10/ Pedon placement based on series classification because chemical data are incomplete.

11/ This pedon was sampled as Onaway loam; however, it is in a coarse-loamy family and belongs in the Emmet series; pedon placement based on series classification because chemical data are incomplete.

12/ Pedon sampled as part of Project Z-1-2-8.

13/ This pedon of Markesan silt loam has a thinner solum and less pronounced subsoil clay accumulation than is common for the series.

14/ This pedon, sampled as Cassel silt loam, has been correlated with Marshfield; it is a taxadjunct because the chroma in the A21 horizon is too high for the typic subgroup.

15/ This pedon, sampled as Cassel silt loam, has been correlated with Marshfield silt loam.

16/ This pedon is in a fine-silty family; it is a taxadjunct to the Marshfield series.

17/ This pedon has the B horizon clay accumulation at greater depth than is common for the Marshfield series.

18/ This pedon is in a fine-silty family; it is a taxadjunct to the McHenry series.

19/ This pedon, sampled as Omega loamy sand, has been correlated with Menahga loamy sand because of parent material color and coarseness of sand.

20/ This pedon, sampled as Markesan silt loam, has been correlated with Mendota silt loam.

21/ This pedon, sampled as Kellner loamy sand, has been correlated with Nymore loamy sand.

22/ This pedon, sampled as Elba silty clay loam, has been correlated with Ossian silty clay loam because it has no carbonates in the control section and is in a fine-silty family.

23/ This pedon does not have the base saturation required for a typic subgroup; it is a taxadjunct to the Palsgrove series.

24/ This pedon, sampled as Elba silt loam, has been correlated with Pella silty clay loam.

25/ This pedon, sampled as Keyser silt loam, has been correlated with Plano silt loam as a moderately well-drained phase.

26/ This pedon has less clay contrast among horizons within the solum than is common for the Port Byron series.

27/ This pedon, sampled as Richwood silt loam, has been correlated with the Port Byron series as a bench phase.

28/ This pedon is in a very-fine family; it is a taxadjunct to the Poygan series.

29/ This pedon, sampled as Calamus silt loam, has been correlated with the St. Charles series as a moderately well-drained phase.

30/ This pedon does not have the base saturation required for a typic subgroup; it is a taxadjunct to the Seaton series.

31/ This pedon is in a coarse-silty family; it is a taxadjunct to the Seaton series.

SOIL CLASSIFICATION-

SERIES - - - - - - -

SOIL NO- - - - - - -

GENERAL METHODS- - -

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE, MRTSC
SOIL SURVEY INVESTIGATIONS UNIT
LINCOLN, NEBRASKA

COUNTY - - -

SAMPLE NOS.-

DEPTH	HORIZON	PARTICLE SIZE ANALYSIS, LT 2MM, 3A1, 3A1A, 3A1B																RATIO
		SAND	SILT	CLAY	FINE CLAY	SAND					SILT			FAML TEXT	INTR II	FINE CLAY	NON-CO3-	8D1 15-BAR TO CLAY
		2-.05	.05-.002	LT .002	LT .0002	VCOS 2-1	CORS 1-.5	MEDS .5-.25	FNES .25-.10	VFNS .10-.05	COSI .05-.02	FNSI .02-.002	VFSI .005-.002	SAND 2-.1	.2-.02			
CM		PCT LT 2MM														PCT	PCT	

Depth (in.)	Horizon	Size class and particle diameter (mm) — Total: Sand (2-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Fine clay <0.0002	Sand: Very coarse (2-1)	Coarse 1-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)	Silt: (0.05-0.02)	Int. III (0.02-0.002)	(0.005-0.002)	Family texture sand (2-0.1	International II (0.2-0.02)	Ratio fine clay to clay	Non-carbonate clay pct	Ratio 15-bar to clay
		Pct of < 2mm																
COLUMN 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19

DEPTH	PARTICLE SIZE ANALYSIS, MM, 3B, 3B1, 3B2					BULK DENSITY			WATER CONTENT					CARBONATE		PH	
	VOL.	WEIGHT				4A1D	4A1H	4D1	4B1C	4B1C	4B2	4C1		6E1B	3A1A	8C1A	8C1E
	GT 2	GT 75	75-20	20-5	5-2	LT .074	20-2	1/3-BAR	OVEN DRY	COLE	1/10 BAR	1/3-BAR	15-BAR	WRD CM/CM	LT 2	LT .002	1/1 H2O	1/2 CACL
CM	PCT	PCT	PCT LT 75				PCT LT20	G/CC	G/CC		PCT	PCT	PCT	CM	PCT	PCT		

Depth (in.)	Size class and particle diameter (mm): Volume > 2	Weight: > 75	75-20	20-5	5-2	<0.074 (Pass 200 mesh)	20-2	Bulk density: 1/3-bar	Oven-dry	COLE	Water content: 1/10-bar	1/3-bar	15-bar	1/3-to 15-bar	Carbonate as $CaCO_3$: < 2mm	<0.002 mm	pH: (1:1) H_2O	(1:2) $CaCl_2$
	pct	pct	pct < 75mm				pct < 20	g/cc	g/cc		pct	pct	pct	cm/cm (in./in.)	pct	pct		
COLUMN 1	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38

DEPTH	ORGANIC MATTER			IRON	PHOS	EXTRACTABLE BASES 5B4A-					ACTY	AL	(CAT EXCH)		RATIO	RATIO	CA	(BASE SAT)	
	6A1A ORGN CARB	6B1A NITG	C/N	6C2A EXT FE	6S1A TOTL	6N2E CA	6O2D MG	6P2A NA	6Q2A K	SUM EXTB	6H1A BACL TEA	6G1D KCL EXT	5A3A EXTB ACTY	5A6A NHAC	8D1 NHAC TO CLAY	8D3 CA TO MG	5F SAT NHAC PCT	5C3 EXTB ACTY PCT	5C1 NHAC PCT
CM	PCT	PCT		PCT	PCT	MEQ / 100 G-													

Depth (in.)	Organic matter: Organic carbon	Nitrogen	C/N	Ext. iron as Fe	Total phosphorus	Extractable bases 5B: Ca	Mg	Na	K	Sum extractable bases	Ext. acidity	KCl ext. Al	Cat. exch. cap.: Sum of bases plus acidity	NH_4OAc	Ratio NH_4OAc to clay	Ratio Ca to Mg	Ca saturation NH_4OAc	Base saturation: Extractable acidity	NH_4OAc CEC
	pct	pct		pct	pct	meq/100g											pct	pct	pct
COLUMN 1	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57

DEPTH	SATURATED PASTE			NA	NA	SALT	6YP	SATURATION EXTRACT 8A1									ATTERBERG	
	8E1 REST OHM-	8C1B PH	8A H2O	SD2 ESP	5E SAR	8D5 TOTL SOLU	6F1A	8A1A EC MMHOS/	6N1B CA	6O1B MG	6P1A NA	6Q1A K	6I1A CO3	6J1A HCO3	6K1A CL	6L1A SO4	6M1A NO3	4F1 LQID LMIT	4F2 PLST INDX
CM			PCT	PCT		PPM	PCT	CM	MEQ / LITER									PCT	

Depth (in.)	Saturated paste: Resistivity	pH	Water at sat.	Exch. Na	Sodium adsorption ratio	Total soluble salt	Gypsum	Saturation extract: Electrical conductivity	Ca	Mg	Na	K	CO_3	HCO_3	Cl	SO_4	NO_3	Atterberg: Liquid limit	Plastic index
	ohm-cm		pct	pct		ppm	pct	mmhos/cm	meq/liter									pct	
COLUMN 1	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76

Remarks: EXAMPLE DATA SHEET HEADINGS--This page alternates computer data sheet headings with printed data sheet headings and column numbers. Column numbers refer to more complete column headings on an adjoining page.

COLUMN HEADINGS FOR COMPUTER PRINTED DATA SHEETS

Column	
1	Depth in centimeters
2	Horizon
	Columns 3 through 16 display numbers which are percents of the total weight of particles 2 millimeters or less in size.
3	Total sand (particles range from .05 to 2 millimeters)
4	Total silt (particles range from .002 to .05 millimeter)
5	Total clay (particles are smaller than .002 millimeter)
6	Total fine clay (particles are smaller than .0002 millimeter)
7	Very coarse sand (particles range from 1 to 2 millimeters)
8	Coarse sand (particles range from 0.5 to 1 millimeter)
9	Medium sand (particles range from 0.25 to 0.5 millimeter)
10	Fine sand (particles range from 0.1 to 0.25 millimeter)
11	Very fine sand (particles range from .05 to 0.1 millimeter)
12	Coarse silt (particles range from .02 to .05 millimeter)
13	Fine silt (particles range from .002 to .02 millimeter; these limits also define the range of total silt on the International Soil Science Society Scale.)
14	Very fine silt (particles range from .002 to .005 millimeter)
15	Family texture sand (particles range from 0.1 to 2 millimeters)
16	International II (particles range from .02 to 0.2 millimeter; these limits define the range of the fine sand on the International Soil Science Society Scale.)
17	Fine clay to clay (this is the ratio of fine clay to total clay expressed as percent.)
18	Noncarbonate clay (this is the percentage of total clay, column 5, minus the percentage of carbonate clay, column 36.)
19	Ratio of 15-bar water percentage to total clay percentage
20	Volume of material greater than 2 millimeters given as a percent of total (sample volume)
21	Greater than 75 millimeter material given as a percent of total sample weight
22	Particle size range from 20 to 75 millimeters given as a weight percent of all material 75 millimeters or less in the sample
23	Particle size range from 5 to 20 millimeters given as a weight percent of all material 75 millimeters or less in the sample
24	Particle size range from 2 to 5 millimeters given as a weight percent of all material 75 millimeters or less in the sample
25	Particle size range less than 0.74 millimeter given as a weight percent of all material 75 millimeters or less
26	Particle size range from 2 to 20 millimeters given as a weight percent of all material 20 millimeters or less
27	Bulk density of soil desorbed to 1/3-bar given in grams per cubic centimeter
28	Bulk density of oven dry soil given in grams per cubic centimeter
29	Coefficient of linear extensibility
30	Water content of soil desorbed to 1/10-bar given as a percent of oven dry weight
31	Water content of soil desorbed to 1/3-bar given as a percent of oven dry weight
32	Water content of soil fragments desorbed to 15 bars given as a percent of oven dry weight
33	Water retention difference given in centimeter per centimeter
34	Column used for any water content measurement different from those given in columns 30 through 33
35	Carbonate content of the material 2 millimeters or less given as a percent
36	Carbonate content of the material .002 millimeter or less given as a percent
37	pH of a 1:1 suspension of soil in distilled water
38	pH of a 1:2 suspension of soil in .01 M $CaCl_2$
39	Organic carbon given as a percent
40	Nitrogen given as a percent
41	Organic carbon to nitrogen ratio
42	Extractable iron given as a percent
43	Total phosphorus given as a percent
44	Extractable calcium given in milliequivalents per 100 grams of soil
45	Extractable magnesium given in milliequivalents per 100 grams of soil
46	Extractable sodium given in milliequivalents per 100 grams of soil
47	Extractable potassium given in milliequivalents per 100 grams of soil
48	Sum of the extractable bases given in milliequivalents per 100 grams of soil
49	Acidity - barium chloride with triethanolamine measurement - given in milliequivalents per 100 grams of soil
50	Aluminum - potassium chloride extraction - given in milliequivalents per 100 grams of soil
51	Cation exchange capacity by sum of the extractable bases plus the acidity given in milliequivalents per 100 grams of soil
52	Cation exchange capacity as measured by ammonium acetate given in milliequivalents per 100 grams of soil
53	Ratio of ammonium acetate cation exchange capacity to total clay
54	Ratio of extractable calcium to extractable magnesium
55	Calcium saturation of the ammonium acetate cation exchange capacity given as a percent
56	Base saturation - sum of the extractable bases divided by the acidity plus the sum of the extractable bases - given as a percent

Continued

COLUMN HEADINGS FOR COMPUTER PRINTED DATA SHEETS

Column	
57	Base saturation - sum of the extractable bases divided by the ammonium acetate cation exchange capacity - given as a percent
58	Saturated paste (soil plus water) resistivity given in ohm-cm
59	Saturated paste (soil plus water) pH
60	Saturated paste (soil plus water) water content given as a percent
61	Exchangeable sodium percentage
62	Sodium adsorption ratio
63	Total soluble salt given in parts per million
64	Gypsum given in percent
65	Electrical conductivity of the saturation extract given in mmhos per centimeter
66	Calcium content of the saturation extract given in milliequivalents per liter
67	Magnesium content of the saturation extract given in milliequivalents per liter
68	Sodium content of the saturation extract given in milliequivalents per liter
69	Potassium content of the saturation extract given in milliequivalents per liter
70	Carbonate (CO_3) content of the saturation extract given in milliequivalents per liter
71	Bicarbonate (HCO_3) content of the saturation extract given in milliequivalents per liter
72	Chloride content of the saturation extract given in milliequivalents per liter
73	Sulfate (SO_4) content of the saturation extract given in milliequivalents per liter
74	Nitrate (NO_3) content of the saturation extract given in milliequivalents per liter
75	Liquid limit given as percent water - percentage basis is soil material less than 0.4 millimeter
76	Plastic index

SOIL CLASSIFICATION-TERRIC MEDISAPRIST
SANDY OR SANDY-SKELETAL, MIXED, EUIC, MESIC
SERIES - - - - - - -ADRIAN

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE, MTSC
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

SOIL NO - - - - - ST4WI-55-1 COUNTY - - - JEFFERSON

GENERAL METHODS- - -1A,1B1B,2A1,2B SAMPLE NOS. 74L1474-74L1478

DEPTH CM	HORIZON	PARTICLE SIZE ANALYSIS, LT 2MM, 3A1, 3A1A, 3A1B: SAND 2-.05	SILT .05-.002	CLAY LT .002	FINE CLAY LT .0002	VCOS 2-1	CORS 1-.5	MEDS .5-.25	FNES .25-.10	VFNS .10-.05	COSI .05-.02	FNSI .02-.002	VFSI .002-.05	SAND 2-.10	INTR II .2-.02	FINE CLAY TO CLAY	NON-CO3-CLAY	RATIO 8D1 15-BAR TO CLAY
		PCT LT 2MM														PCT	PCT	
000-25	CAP																	
025-34	OA2																	
034-66	CA3																	
066-95	CA4																	
095-150	2C	91.3	7.5	1.2		7.6	25.2	19.9	26.4	12.2	4.6	2.9		79.1				.92

DEPTH CM	PARTICLE SIZE ANALYSIS, MM, 3B, 3B1, 3B2: VOL. GT 2 PCT	WEIGHT GT 75 PCT	75-20	20-5	5-2	LT .074	BULK DENSITY: 4A1D 1/3-BAR G/CC	4A1H OVEN DRY G/CC	4D1 COLE	WATER CONTENT: 4B1C 1/10 BAR PCT	4B1C 1/3-BAR PCT	4B2A 15-BAR PCT	4C1 WRD CM/CM	CARBONATE: 6E1B LT 2 PCT	3A1A LT .002 PCT	PH: 8C1A 1/1 H2O	8C1E 1/2 CACL
		PCT LT 75															
000-25	TR	0	0	TR	TR		TR					95				4.8	4.5
025-34	TR	0	0	TR	TR		TR	.27	.72	305	247	103	.39			5.0	4.7
034-66	TR	0	0	TR	TR		TR	.26	.70	328	260	102	.41			5.7	5.2
066-95	TR	0	0	TR	TR		TR	.28	1.15	303	259	121	.39			6.1	5.5
095-150	10	0	0	10	5	12	15					1.1				7.3	6.5

DEPTH CM	ORGANIC MATTER: 6A1A ORGN CARB PCT	6B1A NITG PCT	C/N	IRON 6C2B EXT FE PCT	PHOS TOTL PCT	EXTRACTABLE BASES 5B4A: 6N2E CA MEQ	6O2D MG MEQ	6P2B NA MEQ	6Q2B K MEQ	SUM EXTB MEQ / 100 G	ACTY 6H1A BACL TEA MEQ	AL 6G1E KCL EXT MEQ	CAT EXCH: 5A3A EXTB ACTY MEQ	5A6A NHAC MEQ	RATIO 8D1 NHAC TO CLAY	RATIO 8D3 CA TO MG	CA 5F1 SAT NHAC PCT	BASE SAT: 5C3 EXTB ACTY PCT	5C1 NHAC PCT
000-25	41.8	3.33	13			81.7	13.0	.1	1.6	96	102		198	139		6.3	59	49	69
025-34	43.2	3.27	13			103	18.4	.2	1.7	123	97.9		221	156		5.6	66	56	79
034-66	36.0	2.94	12			100	28.6	.1	1.7	130	74.3		205	141		3.5	71	64	92
066-95	29.0	2.78	10			131	46.9	.3	1.1	179	67.1		246	172		2.8	76	73	104
095-150	.18	.008	22																

DEPTH CM	SATURATED PASTE: 8E1 REST OHM-CM	8C1B PH	8A H2O PCT	NA 5D2 ESP PCT	NA 5E SAR	SALT 8D5 TOTL SOLU PPM	GYP 6F1A PCT	SATURATION EXTRACT 8A1: 8A1A EC MMHOS/CM	6N1B CA MEQ / LITER	6O1B MG	6P1B NA	6Q1B K	6I1A CO3	6J1A HCO3	6K1A CL	6L1A SO4	6M1A NO3	ATTERBERG: 4F1 LQID LMIT PCT	4F2 PLST INDX
000-25	830	4.2	403			6900		2.50	18.4	6.7	.1	1.5	0	.3	.5	4.2	23.5		
025-34	1100	4.7	588			6000		1.61	10.7	4.3	TR	1.0	0	.0	.2	3.9	12.4		
034-66	740	4.9	457			7400		2.50	14.6	9.4	TR	1.4	0	.3	.5	4.8	21.0		
066-95	1300	5.8	556			4500		1.14	6.6	5.3	.1	.6	0	.3	.7	5.5	5.8		
095-150																			

DEPTH CM	HISTOSOL CHARACTERIZATION: 8F MINL CONT PCT	(STATE OF DECOMPOSITION) 8G (FIBER VOL) UNRB PCT	RUB PCT	8H PYROPHOSPHT SOLUBILITY (MUNS COLOR)		PH 8C1E .01M CACL	(BULK DEN) 4A3A FILD STAT G/CC	4A1I 1/3B REWT G/CC	COLE 4D1 RE-WET	SUBS RES-IDUE PCT	(WATER CONTENT) 4B4 FILD STAT PCT	4B1C 1/3B REWT PCT	4B2 15-BAR PCT	4C1 WRD CM/CM
000-25	20	35	5	7.5YR	4/2	4.2	.24			71	211		92	
025-34	16	63	5	7.5YR	4/3		.21	.36	.26	98	273	191	94	.35
034-66	30	12	1	10 YR	2/2	5.5	.25	.36	.21	97	246	182	83	1.25
066-95	26	4	1	10 YR	2/2	6.0	.22	.52	.23	90	332	109	87	1.14
095-150													1	

Soil classification: Terric Mediosaprists; sandy or sandy-skeletal, mixed, euic, mesic.
Series: Adrian.
Soil No.: S74WI-55-1.
Location: Jefferson County, Wisconsin; SE¼, NW¼, sec. 20, T. 6 N., R. 15 E.; 210 feet south from culvert where field lane crosses drainage ditch and 102 feet west from field lane (along drainage ditch). About 43°6' N latitude and 88°37' W longitude.
Climate: Humid continental. Mean annual temperature is 47.4° F; mean July temperature is 72.3° F; mean January temperature is 19.8° F; mean annual precipitation is 29.76 inches with nearly two-thirds of the precipitation falling during the growing season; total amount of snow is 32.1 inches; the growing season averages 154 days, but less in organic areas (data from Fort Atkinson, WI, weather bureau substation).
Parent material: Deposits of herbaceous organic material 16 to 50 inches thick over sand.
Physiography: Old glacial lake basin.
Vegetation: Corn.
Size of area: About 1,200 acres.
Distance to adjacent mineral soil: About 230 feet to the north.
Depth to water table: 142 cm.
Microrelief: Slight or none.
Subsidence: Estimated to be moderate.
Described and sampled by: G.W. Hudelson and C.L. Glocker. Sampled from pit to 40 inches. Bucket auger used to sample sand.

Oap 74L1474 0 to 25 cm. Black (10YR 2/1) broken face, rubbed, and pressed sapric material; about 20 percent or less fibers; less than 5 percent rubbed; weak fine granular structure; very friable; fibers primarily herbaceous; about 10 percent mineral soil material; many roots; pH 6.0 (LaMotte); abrupt smooth boundary.

Oa2 74L1475 25 to 34 cm. Black (10YR 2/1) broken face, rubbed, and pressed sapric material; about 20 percent fibers; less than 5 percent rubbed; weak medium subangular blocky structure; very friable; fibers primarily herbaceous; about 10 percent mineral soil material; many roots; pH 6.0 (LaMotte); abrupt wavy boundary.

Oa3 74L1476 34 to 66 cm. Black (N 2/0) broken face, rubbed, and pressed sapric material; about 40-50 percent fibers; less than 5 percent rubbed; weak coarse subangular blocky structure; friable; fibers primarily herbaceous; about 10 percent mineral soil material; few roots; pH 6.4 (LaMotte); abrupt wavy boundary.

Oa4 74L1477 66 to 95 cm. Black (N 2/0) broken face, rubbed, and pressed sapric material; about 40 to 50 percent fibers, less than 5 percent rubbed; weak coarse prismatic parting to weak medium subangular blocky structure; friable; fibers primarily herbaceous; about 10 percent mineral soil material; few roots; pH 6.6 (LaMotte); gradual wavy boundary.

IIC 74L1478 95 to 150 cm. Grayish brown (10YR 5/2) medium sand; single grained; loose; about 15 percent gravel by volume; pH 7.6 (LaMotte); strong effervescence.

Remarks:

1. The 10 cm boundary between mineral and organic horizons contains alternate layers of organic material (sapric) and medium sand. Layers are about 1 cm thick.

2. Boundaries between Oa2 and Oa3 and Oa4 are shear planes. Material immediately above is slightly more fibrous and more matted than remainder of horizon.

3. IIC horizon contains about 15 percent gravel by volume.

Ahmeek — Iron Co., Wisconsin

S49WI-26-1 — Beltsville Soil Survey Lab. Nos. 49990-49996

Depth cm	Horizon	M.E./100 Grams Soil						% B. SAT	pH	% O.C.	Size Classes %							
		Ca	Mg	K	Na	H[1]	S+[2]				Clay	III[3]	USDA Silt	VFS	FS	MS	CS	VCS
0- 6	A1	3.8	0.8	0.3	0.4	14.3	19.6	27	4.1	3.86	8.7	26.8	63.3	10.4	9.4	4.3	2.8	1.1
6- 17	B21	1.9	0.7	0.2	0.1	22.7	25.6	11	4.5	2.76	9.9	23.9	61.2	11.0	8.4	4.1	3.4	2.0
17- 47	B22	0.6	0.2	0.1	<0.1	16.0	16.9	5	5.0	1.61	4.8	23.8	65.4	11.4	8.9	4.6	3.5	1.4
47- 60	B23x	0.2	<0.1	0.2	<0.1	11.8	12.2	3	5.2	0.92	5.4	12.7	35.4	15.1	21.0	11.0	8.3	3.8
60- 75	B24x	0.2	0.1	0.2	<0.1	6.5	7.0	7	5.4	0.42	3.0	10.1	28.1	16.2	25.6	13.1	9.6	4.4
75-105	B3x	0.5	0.1	0.1	<0.1	3.2	3.9	18	5.6	0.15	2.5	22.3	29.3	15.1	24.9	12.4	10.0	5.8
105-120	C1	1.0	0.5	0.2	<0.1	2.2	3.9	44	5.6	0.11	3.7	11.8	29.3	14.8	24.3	12.7	9.8	5.4

1 Acidity
2 CEC by sum of cations
3 International III - This is PSDA fine silt (.02-.002 mm).

Soil classification: Typic Fragiochrept; coarse-loamy, mixed, frigid.
Soil: Ahmeek.
Soil No.: S49WI-26-1.
Location: Iron County, Wisconsin; SE¼, Sec. 6, T. 45 N., R. 1 E.; 60 feet east of State Highway 122, about 2-1/2 miles north of Upson, Wisconsin.
Climate: Continental; air temperature is about 37° to 43° F; average annual precipitation is 25 to 30 inches; frost-free season is 90 to 105 days.
Vegetation and land use: Most of this soil is forested with a cover of trembling aspen, paper birch, maple, balsam fir, and white pine. A small portion is cropped to small grains and hay or is in pasture.
Parent material: Reddish brown sandy loam or fine sandy loam till of the Superior lobe that is late Wisconsin age. In places a thin loess mantle occurs which rarely exceeds 30 cm.
Physiography: Sloping to hilly upland.
Topography: Near crest of hill. Gradient is 8 percent.
Drainage: Well and moderately well drained.
Ground water: Deep.
Erosion: Slight.
Permeability: Moderately slow.
Described by: J.K. Ableiter, I.J. Nyard, R.J. Muckenhirn, and V.T. Kilmer.

(Colors are for moist conditions unless otherwise stated)

A1 49990 0 to 6 cm (0 to 2.5 inches). Dark reddish gray and dark reddish brown (5YR 4/2 and 3/2) silt loam, pinkish gray (5YR 6/2) dry; moderate coarse to fine granular structure; friable; few pebbles in several spots of concentrated gray (A2) occur in this layer; few earthworms; strongly acid.

B21 49991 6 to 17 cm (2.5 to 7 inches). Reddish brown (5YR 4/4) silt loam, yellowish red (5YR 4/6), light reddish brown (5YR 6/4) dry; moderate coarse granular structure parting to weak fine granules; friable; gray spots and patches occasionally found at top of this horizon; common roots; common pebbles; few earthworms; strongly acid.

B22 49992 17 to 47 cm (7 to 19 inches). Reddish brown (5YR 4/4) silt loam, light brown (7.5YR 6/4) dry; moderate coarse subangular blocky structure parting to weak fine granules; firm; few stones 8 to 12 inches in diameter and many pebbles; medium acid.

B23x 49993 47 to 60 cm (19 to 24 inches). Reddish brown (2.5YR 4/4) loam, reddish brown (5YR 5/3) dry; slight to moderately cemented and hardened in place, breaking to irregular fragments; very firm; pebbles and cobblestones of red sandstone and dark basalt rocks, mostly rounded, a few angular; few roots; medium acid.

B24x 49994 60 to 75 cm (24 to 30 inches). Reddish brown (5YR 4/4) gravelly loam, light reddish brown (5YR 6/4) dry; moderately cemented and hardened in place, breaking out into moderate resistant irregular angular blocks; very firm; pebbles and cobblestones made up 10 to 20 percent of volume, they are rounded and consist of dark colored rocks and red sandstone; dark rocks include basalt, gneiss and dense hard red rocks; medium acid.

B3x 49995 75 to 105 cm (30 to 42 inches). Reddish brown (5YR 5/3) sandy loam, light reddish brown to pink (5YR 6/3 to 7/3) dry; moderately cemented; hard in place; breaks to irregular fragments which crush with moderate to strong resistance when moist; very firm; contains up to 20 percent pebbles and cobblestones with the same lithology as horizon above; medium acid.

C1 49996 105 to 120 cm (42 to 48 inches). Reddish brown (2.5YR 4/4) loam, light reddish brown to pink (5YR 6/3 to 7/3) dry; massive; friable; contains about 25 percent pebbles, mostly 1 to 3 inches in diameter; medium acid.

SOIL CLASSIFICATION-GLOSSIC EUTROBORALF
COARSE-LOAMY, MIXED
SERIES - - - - - - -ALBAN TAXADJUNCT

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE, MTSC
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

SOIL NO - - - - - - S75WI-95-7 COUNTY - - - POLK

GENERAL METHODS- - -1A,1B1B,2A1,2B SAMPLE NOS. 760218-760224

DEPTH CM	HORIZON	SAND 2-.05	SILT .05-.002	CLAY LT .002	FINE CLAY LT .0002	VCOS 2-1	CORS 1-.5	MEDS .5-.25	FNES .25-.10	VFNS .10-.05	COSI .05-.02	FNSI .02-.002	VFSI .005-.002	SAND 2-.10	INTR II .2-.02	FINE CLAY TO CLAY PCT	NON-CO3-CLAY PCT	RATIO 8D1 15-BAR TO CLAY
		(- - PARTICLE SIZE ANALYSIS, LT 2MM, 3A1, 3A1A, 3A1B - - PCT LT 2MM																
000-020	AP	72.1	24.3	3.6	1.7	3.3	10.3	21.2	20.4	16.9	13.1	11.2		55.2	38.0	47		1.33
020-051	A2	77.3	19.7	3.0	1.4	5.9	12.6	20.5	23.2	15.1	11.6	8.1		62.2	35.4	47		.60
051-081	A&B	68.9	21.3	9.8	5.6	1.7	3.2	10.3	13.6	40.1	16.5	4.8		28.8	63.8	57		.45
081-112	B&A	57.6	29.4	13.0	7.5	TR	.8	3.2	7.0	46.6	23.2	6.2		11.0	74.5	58		.45
112-120	B3	75.5	15.7	8.8	4.6	.2	.9	11.5	22.3	40.6	12.5	3.2		34.9	66.2	52		.45
120-143	C1	56.2	32.5	11.3	6.1	.1	.8	1.6	6.6	47.1	26.1	6.4		9.1	77.8	54		.47
143-154	C2	95.6	2.9	1.5	1.1	.0	.8	38.6	43.7	12.5	2.7	.2		83.1	30.6	73		.67

DEPTH CM	VOL. GT 2 PCT	WEIGHT GT 75 PCT	75-20 (PCT LT 75)	20-5 (PCT LT 75)	5-2 (PCT LT 75)	LT .074 (PCT LT 75)	20-2 PCT LT20	BULK DENSITY 4A1D 1/3-BAR G/CC	4A1H OVEN DRY G/CC	4D1 COLE	WATER CONTENT 4B1C 1/10 BAR PCT	4B1C 1/3-BAR PCT	4B2 15-BAR PCT	4C1 WRD CM/CM	CARBONATE 6E1B LT 2 PCT	3A1A LT .002 PCT	PH 8C1A 1/1 H2O	8C1E 1/2 CACL
000-020	1	0	0	1	1	40	2	1.59	1.62	.006		16.2	4.8	.18			6.1	5.7
020-051	6	0	0	2	6	31	8	1.74	1.76	.004		9.1	1.8	.12			6.4	5.6
051-081	TR	0	0	TR	TR	62	TR	1.62	1.67	.010		13.5	4.4	.15			6.2	5.6
081-112	0	0	0	0	0	81	0	1.58	1.64	.013		18.6	5.8	.20			5.5	4.9
112-120	0	0	0	0	0	54	0	1.55A					4.0				5.3	4.7
120-143	0	0	0	0	0	82	0	1.53	1.60	.015		14.5	5.3	.14			5.1	4.7
143-154	0	0	0	0	0	12	0	1.52B			4.0C		1.0	.05			5.4	4.7

DEPTH CM	ORGANIC MATTER 6A1A ORGN CARB PCT	6B1A NITG PCT	C/N	IRON 6C2B EXT FE PCT	PHOS TOTL PCT	EXTRACTABLE BASES 5B4A 6N2E CA (MEQ / 100 G)	6O2D MG	6P2B NA	6Q2B K	SUM EXTB	ACTY 6H1A BACL TEA	AL 6G1E KCL EXT	CAT EXCH 5A3A EXTB ACTY	5A6A NHAC	RATIO 8D1 NHAC TO CLAY	RATIO 8D3 CA TO MG	CA 5F1 SAT NHAC PCT	BASE SAT 5C3 EXTB ACTY PCT	5C1 NHAC PCT
000-020	1.24	.106	12			4.9	1.6	TR	.1	6.6	3.7		10.3	7.2	2.00	3.1	68	64	92
020-051	.13	.017	8			2.4	.7	.0	TR	3.1	2.3		5.4	3.4	1.13	3.4	71	57	91
051-081	.13	.020	7			4.9	1.4	.1	.1	6.5	3.6		10.1	6.9	.70	3.5	71	64	94
081-112	.14					5.3	1.9	.1	.1	7.4	4.8	.2	12.2	9.1	.70	2.8	58	61	81
112-120	.11					3.7	1.4	TR	.1	5.2	3.4	.3	8.6	6.8	.77	2.6	54	60	76
120-143	.06					4.6	1.8	TR	.1	6.5	4.2	.4	10.7	8.5	.75	2.6	54	61	76
143-154	.02					1.2	.4	TR	TR	1.6	1.5	.1	3.1	2.1	1.40	3.0	57	52	76

DEPTH CM	SATURATED PASTE 8E1 REST OHM-CM	8C1B PH	NA 8A H2O PCT	NA 5D2 ESP PCT	5E SAR	SALT 8D5 TOTL SOLU PPM	GYP 6F1A PCT	SATURATION EXTRACT 8A1 8A1A EC MMHOS/CM	6N1B CA (MEQ / LITER)	6O1B MG	6P1B NA	6Q1B K	6I1A CO3	6J1A HCO3	6K1A CL	6L1A SO4	6M1A NO3	ATTERBERG 4F1 LQID LMIT PCT	4F2 PLST INDX
000-020																			
020-051																			
051-081																		22D	4D
081-112	08100	5.2	37.3					.14								.6			
112-120																			
120-143																		25D	4D
143-154																			

CLAY MINERALOGY (7A2C).
51-81 KK2 VR2 MI2 MT1
81-112 MT3 KK2 VR1 MI1
112-120 MT3 KK2 VR1 MI1
COMMENTS: CHLORITIC INTERLAYE MATERIAL PRESENT.
RELATIVE AMOUNTS: (X-RAY) 5 = DOMINANT 4 = ABUNDANT 3 = MODERATE 2 = SMALL 1 = TRACE.
MINERAL CODE: MT = MONTMORILLONITE MI = MICA KK = KAOLINITE VR = VERMICULITE.
SAND MINERALOGY (7B1). PLACEMENT: MIXED.
051-81 VFNS - RE77 QZ74 FE2 SP1 TM ZR FD17 HN4 GN1 MS1 EP AU CL EN VR.
081-112 VFNS - RE77 QZ75 FE1 SP1 TM ZR RU FD18 HN2 GS1 MS1 VR1 GN EP AU CL.
112-120 VFNS - RE83 QZ80 FE2 ZR1 TM SP FD14 HN2 MS1 AU EP CL VR BT.
RELATIVE AMOUNTS: AS PERCENT.
MINERAL CODE: BT = BIOTITE CL = CHLORITE EP = EPIDOTE FD = FELDSPARS GS = GLASS HN = HORNBLENDE MS = MUSCOVITE
QZ = QUARTZ TM = TOURMALINE ZR = ZIRCON RE = RESISTANT MINERALS FE = IRON MINERALS SP = SPHENE
GN = GARNET AU = AUGITE EN = ENSTATITE VR = VERMICULITE RU = RUTILE.

(A) ESTIMATED.
(B) CORE SAMPLE, METHOD 4A3A.
(C) SIEVED SAMPLE, METHOD 4B1A.
(D) LIQUID LIMIT AND PLASTIC INDEX BY USDA-SCS, SOIL MECHANICS LAB, LINCOLN, NE.

Soil classification: Glossic Eutroboralf; coarse-loamy, mixed.
Soil: Alban taxadjunct*.
Soil No.: S75WI-95-7.
Location: Polk County, Wisconsin; SE¼, Sec. 35, T. 34 N., R. 15 E; 100 feet east of driveway to the ball park. About 45°24' N latitude and 92°11' W longitude.
Climate: Humid continental; mean annual temperature is 43° F; mean July temperature is 71° F; mean January temperature is 11.8° F; mean annual precipitation is 27.5 inches with about two-thirds of this occurring during the growing season; mean annual snowfall is 41.2 inches; the growing season averages 127 days. (Data from Amery, WI, weather bureau substation).
Vegetation and use: Native vegetation was primarily mixed northern hardwoods with some conifers. Most large areas of this soil have been cleared and are used for general farming. This site was in alfalfa hay meadow when sampled.
Parent material: Loamy slack water deposits.
Physiography: Nearly level to sloping glacial lake basins.
Topography: Nearly level; site sampled was on a 1 percent convex slope.
Drainage: Moderately well and well drained.
Ground water: At 4 feet in July and 5 feet in October.
Erosion: Slight.
Permeability: Moderate.
Described by: A.J. Klingelhoets and G.B. Lee, July 1975.

(Colors are for moist soil unless otherwise stated)

Ap 760218 0 to 20 cm (0 to 8 inches). Very dark grayish brown (10YR 3/2) fine sandy loam; weak medium subangular blocky structure parting to moderate medium granular; very friable; many roots; slightly acid; abrupt smooth boundary.

A2 760219 20 to 51 cm (8 to 20 inches). Brown (10YR 5/3) sandy loam; weak coarse platy structure; very friable; many roots; slightly acid; clear wavy boundary.

A&B 760220 51 to 81 cm (20 to 32 inches). Grayish brown (10YR 5/2) loamy very fine sand (A2); weak coarse platy structure; friable; occupies about 60 percent of the horizon as tongues 20 to 40 mm thick extending into or completely surrounding isolated remnants of dark brown (7.5YR 4/4) very fine sandy loam (B2t); weak medium subangular blocky structure; friable; few patchy thin clay films on some faces of peds (B2t); strong brown (7.5YR 5/6) iron stains occur along edges of A2 tongues; many roots; slightly acid; gradual irregular boundary.

B&A 760221 81 to 112 cm (32 to 44 inches). Dark brown (7.5YR 4/4) very fine sandy loam (B2t); weak medium subangular blocky structure; friable; occupies about 80 percent of the horizon; few thin patchy clay films on faces of peds (B2t); tongues 10 to 30 mm thick of grayish brown (10YR 5/2) fine sandy loam (A2) extend to bottom of horizon; weak coarse platy structure; friable; many roots; slightly acid; clear wavy boundary.

B3 760222 112 to 120 cm (44 to 47 inches). Dark brown (7.5YR 4/4) fine sandy loam; weak coarse platy structure parting to weak medium subangular blocky; very friable; few alfalfa roots; slightly acid; clear wavy boundary.

C1 760223 120 to 143 cm (47 to 56 inches). Brown (7.5YR 5/4) fine sandy loam; weak coarse platy structure; very friable; weakly stratified; few alfalfa roots; slightly acid; clear wavy boundary.

C2 760224 143 to 154 cm (56 to 60 inches). Strong brown (7.5YR 5/6) fine and medium sand; single grained; loose; weakly stratified; few thin (1 to 3 cm) dark brown (7.5YR 4/4) loamy fine sand bands; few alfalfa roots; medium acid.

* This pedon is a taxadjunct because the base saturation is too high for the Alban series.

Additional Notes:

pH's in field determined by Truog Kit

SOIL CLASSIFICATION-AQUIC ARGIBOROLL
FINE-LOAMY,MIXED
SERIES - - - - - - -ALSTAD TAXADJUNCT

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE, MTSC
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

SOIL NO - - - - - - S75WI-95-1 COUNTY - - - POLK

GENERAL METHODS- - -1A,1B1B,2A1,2B SAMPLE NOS. 760169-760177

DEPTH CM	HORIZON	PARTICLE SIZE ANALYSIS, LT 2MM, 3A1, 3A1A, 3A1B (PCT LT 2MM) SAND 2-.05	SILT .05-.002	CLAY LT .002	FINE CLAY LT .0002	SAND VCOS 2-1	CORS 1-.5	MEDS .5-.25	FNES .25-.10	VFNS .10-.05	SILT COSI .05-.02	FNSI .02-.002	VFSI .005-.002	SAND 2-.10	INTR II .2-.02	FINE CLAY TO CLAY PCT	NON-CO3-CLAY PCT	RATIO 8D1 15-BAR TO CLAY
000-028	AP	53.3	38.9	7.8	2.6	3.2	7.7	10.9	17.8	13.7	20.3	18.6		39.6	43.1	33		.77
028-041	A2	57.1	32.7	10.2	3.4	4.2	9.7	12.2	18.7	12.3	16.1	16.6		44.8	37.9	33		.48
041-052	A&B	60.3	21.9	17.8	8.7	4.3	9.7	13.8	20.9	11.6	9.8	12.1		48.7	31.9	49		.51
052-074	B&A	58.7	22.4	18.9	8.8	3.7	10.1	13.8	20.3	10.8	9.7	12.7		47.9	30.7	47		.48
074-096	B&A	56.4	24.1	19.5	9.2	4.2	8.7	12.3	19.9	11.3	11.1	13.0		45.1	32.5	47		.52
096-114	B2T	56.8	23.6	19.6	9.2	4.1	9.1	12.8	19.8	11.0	9.1	14.5		45.8	29.9	47		.52
114-131	B3	53.9	27.2	18.9	9.0	3.7	8.5	12.3	18.6	10.8	13.4	13.8		43.1	33.6	48		.53
131-163	C1	59.8	23.2	17.0	7.2	5.4	10.5	13.3	19.5	11.1	9.6	13.6		48.7	30.6	42		.54
163-178	C2	58.7	27.7	13.6	4.1	4.0	9.4	12.2	21.1	12.0	8.8	18.9		46.7	31.5	30		.50

DEPTH CM	(PARTICLE SIZE ANALYSIS, MM, 3B, 3B1, 3B2) VOL. GT 2 PCT	GT 75 PCT	WEIGHT 75-20	20-5	5-2	LT .074	20-2 PCT LT20	BULK DENSITY 4A1D 1/3-BAR G/CC	4A1H OVEN DRY G/CC	4D1 COLE	WATER CONTENT 4B1C 1/10 BAR PCT	4B1C 1/3-BAR PCT	4B2 15-BAR PCT	4C1 WRD CM/CM	CARBONATE 6E1B LT 2 PCT	3A1A LT .002 PCT	PH 8C1A 1/1 H2O	8C1E 1/2 CACL
000-028	TR	0	TR	1	1	54	2	1.60	1.66	.013		19.5	6.0	.22			6.4	5.8
028-041	3	0	0	2	4	47	6	1.60A					4.9				6.7	5.9
041-052	5	0	TR	2	5	43	7	1.59	1.74	.029		16.5	9.0	.11			6.4	5.9
052-074	5	0	TR	2	5	44	7	1.61	1.72	.021		17.2	9.1	.12			6.1	5.9
074-096	5	0	TR	2	5	46	7	1.60A					10.1				5.8	5.4
096-114	5	0	TR	2	4	46	6	1.64	1.77	.024		19.0	10.2	.14			5.9	5.3
114-131	5	0	TR	3	4	48	7	1.61	1.69	.016		17.8	10.0	.12			6.0	5.4
131-163	5	0	TR	2	7	42	9	1.64	1.69	.010		17.4	9.1	.13			6.6	6.1
163-178	5	0	TR	3	7	43	10	1.65A					6.8		8		7.7	7.3

DEPTH CM	(ORGANIC MATTER) 6A1A ORGN CARB PCT	6B1A NITG PCT	C/N	IRON 6C2B EXT FE PCT	PHOS TOTL PCT	(EXTRACTABLE BASES 5B4A) 6N2E CA	6O2D MG	6P2B NA	6Q2B K	SUM EXTB (MEQ / 100 G)	ACTY 6H1A BACL TEA	AL 6G1E KCL EXT	(CAT EXCH) 5A3A EXTB ACTY	5A6A NHAC	RATIO 8D1 NHAC TO CLAY	RATIO 8D3 CA TO MG	CA 5F1 SAT NHAC PCT	(BASE SAT) 5C3 EXTB ACTY PCT	5C1 NHAC PCT
000-028	1.34	.128	10			7.4	1.8	TR	.2	9.4	3.7		13.1	9.5	1.22	4.1	78	72	99
028-041	.18	.028	6			5.1	1.6	TR	.1	6.8	2.8		9.6	7.0	.69	3.2	73	71	97
041-052	.12	.024	5			9.1	3.9	.1	.3	13.4	3.7		17.1	13.7	.77	2.3	66	78	98
052-074	.12					8.8	4.1	.1	.3	13.3	3.4		16.7	13.7	.72	2.1	64	80	97
074-096	.04					9.1	4.7	.1	.3	14.2	4.2		18.4	15.1	.77	1.9	60	77	94
096-114	.08					9.2	4.9	.1	.3	14.5	3.7		18.2	15.5	.79	1.9	59	80	94
114-131	.08					9.2	4.8	.1	.3	14.4	3.1		17.5	14.9	.79	1.9	62	82	97
131-163	.06						4.7	.1	.2		1.8			14.2	.84				
163-178	.04						3.6	.1	.2					9.6	.71				

DEPTH CM	(SATURATED PASTE) 8E1 REST OHM-CM	8C1B PH	8A H2O PCT	NA 5D2 ESP PCT	NA 5E SAR	SALT 8D5 TOTL SOLU PPM	GYP 6F1A PCT	(SATURATION EXTRACT 8A1) 8A1A EC MMHOS/CM	6N1B CA (MEQ / LITER)	6O1B MG	6P1B NA	6Q1B K	6I1A CO3	6J1A HCO3	6K1A CL	6L1A SO4	6M1A NO3	ATTERBERG 4F1 LQID LMIT PCT	4F2 PLST INDX
000-028																			
028-041																			
041-052																			
052-074																		31B	13B
074-096																			
096-114	3600	5.2	35.4					.17								1.3			
114-131																			
131-163																		29B	11B
163-178																			

CLAY MINERALOGY (7A2C).
41-52 MT5 KK2 MI2 VR1
52-74 MT5 KK2 MI2 VR1
96-114 MT5 KK2 MI1 VR1
RELATIVE AMOUNTS: (X-RAY) 5 = DOMINANT 4 = ABUNDANT 3 = MODERATE 2 = SMALL 1 = TRACE.
MINERAL CODE: MT = MONTMORILLONITE MI = MICA KK = KAOLINITE VR = VERMICULITE.
SAND MINERALOGY (7B1). PLACEMENT: MIXED
041-52 VFNS - RE81 QZ79 FE1 TM1 ZR SP FD18 HN1 TE CL MS GN VR. FNES - RE65 QZ62 FE3 FD34 MS1.
052-74 VFNS - RE81 QZ78 FE2 TM1 ZR SP FD18 GN1 MS HN GS AU. FNES - RE83 QZ75 FE6 SP1 TP1 FD15 MS HN.
074-96 VFNS - RE75 QZ73 FE2 TM FD22 HN1 GN1 MS1 AU. FNES - RE75 QZ66 FE9 FD15 HN6 GN2 MS2.
RELATIVE AMOUNTS: AS PERCENT.
MINERAL CODE: CL = CHLORITE FD = FELDSPARS HN = HORNBLENDE MS = MUSCOVITE QZ = QUARTZ TM = TOURMALINE
ZR = ZIRCON RE = RESISTANT MINERALS GN = GARNET TE = TREMOLITE VR = VERMICULITE AU = AUGITE
FE = IRON MINERALS SP = SPHENE GS = GLASS TP = TOPAZ.

(A) ESTIMATED.
(B) LIQUID LIMIT AND PLASTIC INDEX BY USDA-SCS, SOIL MECHANICS LAB, LINCOLN, NE.

Soil classification: Aquic Argiboroll; fine-loamy, mixed.
Series: Alstad taxadjunct*.
Soil No.: S75WI-95-1.
Location: Polk County, Wisconsin; NW¼, Sec. 25, T. 36 N., R. 16 W.; 120 feet east of road and 200 feet south of large drain. About 45°35' N latitude and 92° 40' W longitude.
Climate: Humid continental. Mean annual temperature is 43° F; mean July temperature is 71° F; mean January temperature is 11.8° F; mean annual precipitation is 27.65 inches with about two-thirds of this occurring during the growing season; mean annual snowfall is 41.2 inches; the growing season averages 127 days. (Data from Amery, WI., weather buereau substation.)
Vegetation and use: Native vegetation was mixed stands of northern hardwoods and conifer forests. Much of this land has been cleared and presently is used for general farming. Present crop is clover hay.
Parent material: Loamy glacial till.
Physiography: Nearly level to gently sloping glacial ground moraine.
Topography: Nearly level with sample site on a 1 percent concave slope.
Drainage: Somewhat poorly drained.
Ground water: 28 inches in July; over 5 feet in September when sampled.
Erosion: Slightly eroded.
Permeability: Moderately slow.
Described by: A.J. Klingelhoets and G.B. Lee, July 1975.

(Colors are for moist soil unless otherwise stated)

Ap 760169 0 to 28 cm (0 to 11 inches). Very dark grayish brown (10YR 3/2) loam; moderate fine subangular blocky structure parting to moderate medium granular; friable; many roots; neutral; abrupt wavy boundary.

A2 760170 28 to 41 cm (11 to 16 inches). Brown (10YR 5/3) light loam; many medium distinct and prominent yellowish brown and grayish brown (10YR 5/6 and 5/2) mottles; moderate medium and coarse platy structure; friable; many roots; neutral; gradual wavy boundary.

A&B 760171 41 to 52 cm (16 to 20 inches). Brown (7.5YR 5/2) light loam (A2); weak coarse platy structure; friable; occupies about 60 percent of the horizon as tongues extending into or completely surrounding isolated remnants of dark brown (7.5YR 4/4) loam (B2t); moderate medium subangular blocky structure; firm; few thin patchy clay films on faces of peds (B2t); estimated less than 5 percent by volume coarse fragments greater than 2 mm in diameter and less than 1 percent greater than 3 inches in diameter; many roots; neutral; gradual irregular boundary.

B&A 760172 52 to 74 cm (20 to 29 inches). Dark brown (7.5YR 4/4) clay loam (B2t); many medium distinct and prominent strong brown (7.5YR 5/6 and 5/8), yellowish red (5YR 5/6) and grayish brown (10YR 5/2) mottles; moderate medium subangular blocky structure; firm; thin patchy clay films on faces of peds; few manganese spots and streaks; tongues up to 40 mm thick of brown (7.5YR 5/2) loam extend to bottom of horizon; weak coarse platy structure; friable; estimated less than 5 percent by volume coarse fragments greater than 2 mm in diameter and less than 1 percent over 3 inches in diameter; many roots; slightly acid; clear wavy boundary.

B&A 760173 74 to 96 cm (29 to 38 inches). Dark brown (7.5YR 4/4) clay loam (B2t); many medium distinct and prominent strong brown (7.5YR 5/6 and 5/8), yellowish red (5YR 5/6), and grayish brown (10YR 5/2) mottles; moderate medium subangular blocky structure; firm; thin patchy clay films on faces of peds; few manganese spots and streaks; tongues up to 40 mm thick of brown (7.5YR 5/2) loam extend to bottom of horizon; weak coarse platy structure; friable; estimated less than 5 percent by volume coarse fragments greater than 2mm in diameter and less than 1 percent over 3 inches in diameter; many roots; slightly acid; clear wavy boundary. (Separated on depth for analysis only.)

B2t 760174 96 to 114 cm (38 to 45 inches). Dark brown (7.5YR 4/4) light clay loam; many medium prominent and distinct grayish brown (10YR 5/2) and reddish brown and yellowish red (5YR 4/4 and 5/6) mottles; moderate medium subangular blocky structure; firm; thin patchy clay films on faces of peds; a few spots and streaks of manganese; estimated less than 5 percent coarse fragments greater than 2 mm in diameter; many roots; slightly acid; gradual wavy boundary.

B3 760175 114 to 131 cm (45 to 51 inches). Dark brown (7.5YR 4/4) loam; many coarse distinct yellowish red and grayish brown (5YR 5/6 and 10YR 5/2) mottles; few thin patchy clay flows on vertical faces of peds and structural cracks; many fine manganese spots and streaks; estimated less than 5 percent coarse fragments over 2 mm in diameter; few roots; medium acid; gradual wavy boundary.

C1 760176 131 to 163 cm (51 to 64 inches). Brown (7.5YR 5/4) loam; many medium distinct grayish brown and strong brown (10YR 5/2 and 7.5YR 5/6) mottles; weak coarse subangular blocky structure; friable; estimated less than 5 percent by volume of coarse fragments over 2 mm in diameter; mildly alkaline.

* This pedon is a taxadjunct to the Alstad series because it has a thick, dark surface that forms a mollic epipedon.

Additional notes:
1. Soil temperature was 14°C at 20 inches in July
2. pH's in field determined by Truog Kit
3. Sample of 163-178 cm material which is similar to C1 horizon material was assigned map number 760177

SOIL CLASSIFICATION-AERIC GLOSSAQUALF
FINE, MIXED, FRIGID
SERIES - - - - - - -ALTOORF

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE, NTSC
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

SOIL NO - - - - - - S70WIS-71-2 COUNTY - - - WOOD

GENERAL METHODS- - -1A,1B1B,2A1,2B SAMPLE NOS. 70L924-70L934

DEPTH CM	HORIZON	SAND 2- .05	SILT .05- .002	CLAY LT .002	FINE CLAY LT .0002	VCOS 2- 1	CORS 1- .5	MEDS .5- .25	FNES .25- .10	VFNS .10- .05	COSI .05 .02	FNSI .02 .002	VFSI .005- .002	FAML TEXT SAND 2-.1	INTR II .2- .02	FINE CLAY TO CLAY	NON- CO3- CLAY	8D1 15- BAR TO CLAY
		PARTICLE SIZE ANALYSIS, LT 2MM, 3A1, 3A1A, 3A1B (PCT LT 2MM)																RATIO
000-21	AP	4.4	78.6	17.0	6.5	.2	.6	.7	.6	2.3	34.3	44.3	7.9	2.1	36.8	38		.50
021-30	A2G	5.8	68.7	25.5	10.5	.2	.8	.8	.8	3.2	34.9	33.8	6.6	2.6	38.4	41		.48
030-43	A&BG	4.7	66.2	29.6	14.4	TR	.5	.5	.4	2.8	32.9	33.3	6.0	1.4	35.9	49		.46
043-58	B&AG	17.2	53.2	29.6	16.3	.8	4.4	5.0	3.9	3.1	27.8	25.4	4.4	14.1	32.2	55		.48
058-72	2B21T	35.9	29.8	34.3	22.2	1.2	10.9	11.5	8.7	3.6	14.1	15.7	3.4	32.3	20.6	65		.46
072-96	2B22T	21.9	30.5	47.6	32.8	.7	5.0	5.4	6.2	4.6	13.3	17.2	5.7	17.3	20.8	69		.45
096-125	2B23T	17.3	30.4	52.3	33.7	.8	3.2	3.1	5.2	5.0	13.4	17.0	6.1	12.3	21.2	64		.44
125-158	2B3T	17.7	30.8	51.5	37.3	.9	2.2	2.8	5.8	6.0	12.4	18.4	6.6	11.7	21.7	72		.45
158-191	2C1	39.7	34.1	26.2	15.5	4.4	8.2	5.8	11.9	9.4	14.3	19.8	4.9	30.3	30.4	59		.53
191-234	2C2	60.7	23.1	16.2	6.0	5.2	17.1	11.1	17.6	9.7	10.4	12.7	3.7	51.0	29.4	37		.59
234-279	2C3	47.9	36.8	15.3	4.7	2.4	6.2	6.8	17.6	14.9	14.6	22.2	6.2	33.0	39.9	31		.83

DEPTH CM	(PARTICLE SIZE ANALYSIS, MM, 3B, 3B1, 3B2) VOL. GT 2 PCT	WEIGHT GT 75 PCT	75-20	20-5	5-2	LT .074 PCT	20-2 LT20	BULK DENSITY 4A1D 1/3- BAR G/CC	4A1H OVEN DRY G/CC	4D1 COLE	4B1C 1/10 BAR PCT	4B1C 1/3- BAR PCT	WATER CONTENT- 4B2 15- BAR PCT	4C1 WRD CM/CM	CARBONATE 6E1B LT 2 PCT	3A1A LT .002 PCT	PH 8C1A 1/1 H2O	8C1E 1/2 CACL
000-21	TR	0	0	TR	TR	97	TR	1.36	1.43	.017	30.6	29.5	8.5	.29	4.3B		6.5	6.0
021-30	TR	0	0	TR	TR	97	TR	1.48	1.59	.025	26.4	24.3	12.2	.18	3.0B		5.1	4.3
030-43	TR	0	0	TR	TR	98	TR	1.50A					13.6				4.4	3.4
043-58	TR	0	0	TR	TR	85	TR	1.49	1.74	.054	25.5	23.6	14.2	.14	3.0B		4.5	3.9
058-72	1	0	0	1	TR	66	1	1.49	2.02	.106	29.8	28.0	15.9	.18			5.2	4.6
072-96	TR	0	0	TR	TR	81	TR	1.51	1.99	.099		27.1	21.3	.09	2.5B		6.5	5.9
096-125	TR	0	0	TR	TR	86	TR	1.45	1.95	.106		30.0	23.0	.10	1.7B		7.0	6.3
125-158	TR	0	0	0	TR	86	TR	1.40	1.94	.118	35.9	33.7	23.1'	.15	1.1B		6.9	6.4
158-191	TR	0	0	0	TR	65	TR	1.50A					13.9				6.7	6.0
191-234	TR	0	0	0	TR	44	TR	1.50A					9.5				5.9	5.2
234-279	TR	0	0	TR	TR	60	TR	1.50A					12.7				5.7	5.2

DEPTH CM	(ORGANIC MATTER) 6A1A ORGN CARB PCT	6B1A NITG PCT	C/N	(IRON) 6C2B EXT FE PCT	PHOS TOTL PCT	(EXTRACTABLE BASES 5B4A-) 6N2E CA	6O2D MG	6P2B NA	6Q2B K	SUM EXTB	ACTY 6H1A BACL TEA G-	AL 6G1E KCL EXT	(CAT EXCH) 5A3A EXTB ACTY	5A6A NHAC	RATIO 8D1 NHAC TO CLAY	RATIO 8D3 CA TO MG	CA 5F1 SAT NHAC PCT	(BASE SAT) 5C3 EXTB ACTY PCT	5C1 NHAC PCT
						MEQ / 100													
000-21	1.89C	.166	11	0.6		13.1	2.2	0.2	0.2	15.7	4.1		19.8	16.4	0.96	6.0	80	79	96
021-30	0.52	.064	8	1.3		8.6	4.4	0.2	0.4	13.6	6.8	0.9	20.4	18.0	0.71	2.0	48	67	76
030-43	0.32	.047	7	1.3		8.5	5.8	0.3	0.4	15.0	11.9	2.9	26.9	22.0	0.74	1.5	39	56	68
043-58	0.20	.029		1.2		9.2	7.6	0.2	0.5	17.5	9.4	1.9	26.9	22.8	0.77	1.2	40	65	77
058-72	0.11			2.2		10.1	8.1	0.2	0.6	19.0	5.8	0.7	24.8	21.8	0.64	1.2	46	77	87
072-96	0.07			3.5		10.2	13.3	0.4	0.6	24.5	3.7		28.2	24.4	0.51	0.8	42	87	100
096-125	0.07			3.5		14.3	11.7	0.4	0.9	27.3	3.3		30.6	26.5	0.51	1.2	54	89	103
125-158	0.06			3.7		13.2	11.2	0.3	1.0	25.7	2.9		28.6	25.6	0.50	1.2	52	90	100
158-191	0.04			3.4		8.8	7.6	0.3	0.5	17.2	2.1		19.3	16.6	0.63	1.2	53	89	104
191-234	0.03			3.2		6.6	5.9	0.2	0.5	13.2	2.3		15.5	13.7	0.85	1.1	48	89	104
234-279	0.03			1.4		9.4	8.0	0.3	0.5	18.2	3.0		21.2	19.2	1.25	1.2	49	86	95

DEPTH CM	(SATURATED PASTE) 8E1 REST OHM-CM	8C1B PH	8A H2O PCT	NA 5D2 ESP PCT	NA 5E SAR	SALT 8D5 TOTL SOLU PPM	GYP 6F1A PCT	(SATURATION EXTRACT 8A1-) 8A1A EC MMHOS/CM	6N1B CA	6O1B MG	6P1B NA	6Q1B K	6I1A CO3	6J1A HCO3	6K1A CL	6L1A SO4	6M1A NO3	ATTERBERG 4F1 LQID LMIT PCT	4F2 PLST INDX
								MEQ / LITER											
000-21																		36D	7
021-30																			
030-43																		41D	16
043-58																			
058-72																			
072-96																		64D	41
096-125	2300	6.8	89.7	1	1	110		0.22	0.6	0.6	0.7	TR							
125-158																		72D	44
158-191																			
191-234																			
234-279																		42D	17

(A) ESTIMATED.
(B) MICRO-PENETRATION RESISTANCE - A ROD 0.6 CM DIA IS SLOWLY PUSHED INTO BULK DENSITY CLOD, EQUILIBRATED AT 1/10- BAR, A DISTANCE OF 0.6 CM USING A POCKET PENETROMETER. UNITS ARE FORCE (KG) AND NOT ESTIMATES OF UNCONFINED COMPRESSIVE STRENGTH.
(C) ORGANIC CARBON IS 8 KG/M SQ TO A DEPTH OF 1 M (6A).
(D) DETERMINED BY SOIL MECHANICS LAB - SCS, LINCOLN, NE.

Soil classification: Aeric Glossaqualf; fine, mixed, frigid.
Soil: Altdorf.
Soil No.: S70WI-71-2.
Location: Wood County, Wisconsin; NW¼, SE¼, SW¼, NE¼, Sec. 23, T. 23 N., R. 5 E; 800 feet east and 450 feet north of road intersection.
Climate: Humid continental; average annual temperature is about 43° F; mean annual precipitation is 30 inches; and frost-free season is about 133 days.
Vegetation and land use: Natural vegetation was sedges and water-tolerant trees. Much of this land is in pasture or woodland.
Parent material: Silty sediments over clayey residuum from schist bedrock.
Physiography: Depressions in rock-controlled upland.
Topography: Nearly level; slope of 1 percent in an old pasture.
Drainage: Poorly drained.
Ground water: 260 cm.
Erosion: Slight.
Permeability: Slow
Described by: Paul H. Carroll.

(Colors are for moist conditions unless otherwise stated)

Ap 70L924 0 to 21 cm (0 to 8 inches). Very dark grayish brown (10YR 3/2) silt loam, gray (10YR 6/1) to light brownish gray (10YR 6/2) dry; weak fine subangular blocky structure; friable; many fine fibrous roots; neutral; abrupt smooth boundary.

A2g 70L925 21 to 30 cm (8 to 12 inches). Grayish brown (2.5Y 5/2) silt loam with many medium prominent mottles of yellowish brown (10YR 5/6-5/8); weak fine subangular blocky structure; friable; common fine fibrous roots; strongly acid; clear smooth boundary.

A&Bg 70L926 30 to 43 cm (12 to 17 inches). Grayish brown (2.5Y 5/2) silt loam (A2) with many medium prominent mottles of yellowish brown (10YR 5/6-5/8); moderate fine and medium subangular blocky structure; friable; strong brown (7.5YR 5/6-5/8) heavy silt loam Bt remnants are scattered through the horizon and occupy about 25 percent of the soil volume; common fine fibrous roots; few thin clay films on faces of peds and in tubular pores of the Bt portion of the horizon; strongly acid; clear wavy boundary.

B&Ag 70L927 43 to 58 cm (17 to 23 inches). Dark grayish brown (2.5Y 4/2) and brown (7.5YR 5/2) silty clay loam (Bt) with many fine and medium prominent mottles of strong brown (7.5YR 5/6-5/8) and reddish brown (5YR 4/4); strong medium prismatic structure parting to moderate fine angular blocky structure; very firm; many thin very dark grayish brown (10YR 3/2) clay films on faces of peds and in tubular pores of the Bt part of the horizon; grayish brown (2.5Y 5/2) tongues of silt loam (A2) penetrate the horizon from above and occupy about 20 percent of the soil volume; few fine fibrous roots; less than 1 percent fine and medium polished rounded and subrounded quartz pebbles; strongly acid; clear wavy boundary.

IIB21t 70L928 58 to 72 cm (23 to 28 inches). Dusky red (10R 3/3-3/4) clay with common fine reddish black (10R 2/1) manganese spots; moderate medium prismatic structure parting to moderate fine angular blocky structure; very firm; few fine roots; continuous thin dark reddish brown (5YR 3/2) clay films on faces of peds and in continuous tubular pores; less than 1 percent fine and medium polished rounded and subrounded quartz pebbles; strongly acid; gradual wavy boundary.

IIB22t 70L929 72 to 96 cm (28 to 38 inches). Dusky red (10R 3/4) clay; moderate medium prismatic structure parting to weak fine angular blocky structure; very firm; common thin reddish brown (5YR 4/4) clay films on faces of angular blocky peds and continuous on faces of prisms and in tubular pores; less than 1 percent fine and medium polished rounded and subrounded quartz pebbles; few light reddish brown (5YR 6/4) weathered rock fragments 1 to 2 mm in size distributed through horizon; neutral; gradual wavy boundary.

IIB23t 70L930 96 to 125 cm (38 to 49 inches). Dusky red (10R 3/3) clay; moderate medium and coarse prismatic structure parting to weak medium angular blocky structure; very firm; clay films thin and continuous on vertical faces of prisms; few weathered remnants of schist bedrock and less than 1 percent rounded and subrounded polished pebbles of quartz; mildly alkaline; gradual wavy boundary.

IIB3t 70L931 125 to 158 cm (49 to 62 inches). Dusky red (10R 3/3) clay; weak medium and coarse angular blocky structure; very firm; nearly continuous clay films along faces of widely-spaced cleavage planes; few fine polished rounded and subrounded quartz pebbles; mildly alkaline; clear wavy boundary.

IIC1 70L932 158 to 191 cm (62 to 76 inches). Dusky red (10R 3/2-3/4) and dark reddish brown (5YR 3/4-3/3) silty clay loam; very thin platy (rock fabric) structure; firm ranging to friable through pedon; many very fine (1 to 2 mm) light reddish brown (5YR 6/4) weathered fragments from micaceous schist bedrock; neutral; clear smooth boundary.

IIC2 70L933 191 to 234 cm (76 to 93 inches). Brownish yellow (10YR 6/8), dark reddish brown (5YR 3/2-3/3) and dusky red (10R 3/2-3/3) very fine sandy loam; weak very fine platy (rock fabric); firm; 5 to 10 percent fine (approximately 2 mm) rock fragments from micaceous schist bedrock; neutral; clear smooth boundary.

IIC3 70L934 234 to 279 cm (93 to 107 inches). Variegated pale brown (10YR 6/3), pale green (5G 6/2) olive yellow (2.5Y 6/6-6/8), and olive (5Y 5/6) very fine sandy loam; weak very fine platy structure (rock fabric); friable; 5 to 10 percent (approximately 2 mm) rock fragments from micaceous schist rock; slightly acid.

Note: Soil temperature: 1-meter depth 59° F; 2-meter depth - 56° F. Vertical cracks of 1 to 2 cm extend from A&Bg to the B3 horizons, having resulted from a month-long period of drought. Cleavages developed along prism faces.

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL Amery taxadjunct SOIL Nos. S69WI-48-1 LOCATION Polk County, Wisconsin

SOIL SURVEY LABORATORY Beltsville, Maryland LAB. Nos. 69B293 - 69B300

Depth (cm)	Horizon	1B1b Total Sand (2-0.05)	Total Silt (0.05-0.002)	Total Clay (< 0.002)	Size class and particle diameter (mm) 3A1 Sand: Very coarse (2-1)	Coarse (1-0.5)	Medium (0.5-0.25)	Fine (0.25-0.1)	Very fine (0.1-0.05)	Silt: 0.05-0.02	Int. III (0.02-0.002)	Int. II (0.2-0.02)	(2-0.1)	<.074 mm Pct.	3B2 Cm	Coarse fragments 3B1: 2A2 > 2 Pct.	2-19	19-76
		Pct. of < 2 mm															Pct. of < 76mm	
0-8	A1	53.1	40.9	6.0	1.7	9.7	14.6	16.1	11.0	22.5	18.4	41.1	42.1	55.0	0.99		3	0
8-23	B1r	55.7	39.5	4.8	2.1	10.4	15.4	16.3	11.5	23.1	16.4	42.1	44.2	52.9	0.99		2	0
23-48	A2	61.2	34.5	4.3	4.5	11.9	15.8	17.7	11.3	20.1	14.4	39.9	49.9	47.0	0.96		6	0
48-66	A&B	74.3	20.7	5.0	4.3	13.4	19.5	25.8	11.3	11.1	9.6	35.3	63.0	32.3	0.87		16	tr.
66-89	B&A	74.8	17.4	7.8	4.6	14.7	19.9	24.9	11.7	8.9	8.5	32.1	64.1	31.4	0.88		12	tr.
89-112	B2t	81.4	11.4	7.2	5.5	21.6	25.0	22.8	6.5	5.7	5.7	22.3	74.9	22.2	0.93		10	tr.
112-137	B3	82.4	10.1	7.5	5.0	18.9	26.0	25.6	6.9	5.0	5.1	22.8	75.5	21.4	0.88		12	tr.
137-196	C	81.8	10.1	8.1	5.4	15.8	24.2	28.1	8.3	5.7	4.4	26.7	73.5	22.7	0.91		12	tr.

Depth (cm)	6A1a Organic carbon Pct.	Na Pyro. ext. 6C5a Fe Pct.	6G5a Al Pct.	C-D Al Pct.	Carbonate as $CaCO_3$ Pct.	Ext. iron as Fe Pct.	Plasticity Index	Bulk density 4A1e ⅓ bar g/cc	4A1h Oven dry g/cc	4D1 COLE	Water content Pct	4B1c ⅓ bar Pct.	4B2 15 bar Pct.	8E1 Resistivity ohms-cm 60°F	4C1 WRD in/in	pH 8C1c (1:1) KCl	8C1a (1:1) H_2O
0-8	2.59			0.1		0.7		1.25	1.70	0.11		22.9	7.3		0.20	4.4	4.9
8-23	0.45	0.2	0.1	0.1		0.6		1.61	1.64	0.01		14.3	2.6		0.19	4.4	5.4
23-48	0.04	0.1	tr.	0.1		0.6		1.73	1.73	0.00		9.6	1.9		0.13	4.2	5.5
48-66	-			0.1		0.1		1.81	1.85	0.01		8.4	2.4		0.11	4.4	5.7
66-89	0.11			0.1		1.0		1.80	1.85	0.01		9.3	3.2		0.11	4.4	5.9
89-112	0.15			0.1		0.9	N.P.	1.70	1.76	0.01		8.0	3.1	15000	0.08	4.6	5.9
112-137	0.10			0.1		1.0		1.71	1.80	0.02		11.5	3.0	15000	0.14	4.5	6.1
137-196	0.14			0.1		1.0		1.73	1.78	0.01		8.0	3.3	10000	0.08	4.5	6.1

Depth (cm)	Extractable bases 5B4a 6N2e Ca	6O2e Mg	6P2b Na	6Q2b K	Sum	6H2a Ext. acidity	CEC 5A3a Sum cations	5A6a NH_4OAc	6G1e Ext. Al		Fine clay <.0002 mm Pct.	Ratios to clay: CEC sum	Ext. iron	15-bar water	Na pyrophosphate Fe+Al		Base saturation 5C3 Sum cations Pct.	5C1 NH_4OAc Pct.
	meq/100 g																	
0-8	6.0	1.2	0.02	0.24	7.5	11.3	18.8	10.6			2.1	3.13	0.12	1.22			40	71
8-23	0.8	0.2	0.02	0.08	1.1	6.1	7.2	4.0			0.5	1.50	0.13	0.54	0.08		15	28
23-48	1.2	0.3	0.02	0.04	1.6	3.5	5.1	3.2			0.4	1.19	0.14	0.44			31	50
48-66	2.4	0.7	0.02	0.08	3.2	2.1	5.3	4.0			1.2	1.06	0.02	0.48			60	80
66-89	3.4	1.0	0.04	0.08	4.5	2.3	6.8	5.4			2.1	0.87	0.13	0.41			66	83
89-112	3.4	1.2	0.04	0.04	4.7	1.9	6.6	5.1			2.0	0.92	0.13	0.43			71	92
112-137	3.4	1.4	0.06	0.04	4.9	1.8	6.7	5.3			2.6	0.89	0.13	0.40			73	92
137-196	3.6	1.5	0.06	0.06	5.2	1.8	7.0	5.4			3.8	0.86	0.12	0.41			74	96

Depth (cm)	Clay fraction analysis 7A1: < 0.002 mm 7A2 X-ray a/b/	7A3 DTA b/ Pct.	Sand fraction analysis 7A1: 0.2-0.02 mm 7B1 Petrographic b/ Pct.	TW
0-8	MV4,CL2,MI1,KK1,QZ1	KK5	QZ76,FE3,ZR<1,SP<1,FD17,HN1,EP1,MS<1,TA<1,GN<1,GS<1	19
8-23				
23-48	VR3,MI1,CL1,KK1,QZ1,FD1	KK5	QZ79,FE2,SP<1,RU<1,PO<1,FD15,HN2,EP1,MS<1,VR<1,TA<1,GN<1	18
48-66				
66-89				
89-112	VR2,MT1,MI1,CL1,KK1,QZ1	KK5	QZ78,FE3,SP<1,FD14,TA2,HN1,EP1,MS<1,GN<1	18
112-137				
137-196	MV3,MI1,KK1,QZ1	KK5	QZ75,FE3,ZR<1,FD16,EP2,TA2,HN1,MS<1,VR<1,EN<1,AU<1	21

a/Relative amounts (X-ray): 5 = dominant, 4 = abundant, 3 = moderate, 2 = small, 1 = trace.
b/Mineral code: MV = montmorillonite-vermiculite, CL = chlorite, MI = mica, KK = kaolinite, QZ = quartz, FE = iron oxides, ZR = zircon, SP = sphene, FD = feldspar, HN = hornblende, EP = epidote, MS = muscovite, TA = talc, GN = garnet, GS = glass, VR = vermiculite, RU = rutile, PO = plant opal, MT = montmorillonite, EN = enstatite, AU = augite.

Soil classification: Glossic Eutroboralf; coarse-loamy, mixed.
Soil: Amery taxadjunct*.
Soil No.: 869WI-48-1.
Location: Polk County, Wisconsin; SW¼, SE¼, SE¼, Sec. 26, T. 34 N., R. 15 W.
Climate: Humid continental; mean annual temperature is about 45° F; mean annual precipitation is about 30 inches; and average frost-free season is 135 days.
Vegetation and land use: Native vegetation was mixed deciduous and coniferous forests with maple, birch, oak, aspen, and white pine predominate. About 50 percent of this soil is cultivated or used for livestock pasture. Corn, small grain, and forages are the principal crops.
Parent material: Acid loamy sand glacial till.
Physiography: Sloping to hilly glacial ground and end moraines.
Topography: Site is a convex slope of about 5 percent near the top of a large hill.
Drainage: Well drained.
Ground water: Deep.
Erosion: Slight.
Permeability: Moderate.
Described by: Paul H. Carroll.

(Colors are for moist soils unless otherwise stated)

A1 69B293 0 to 8 cm (0 to 3 inches). Very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) to light brownish gray (10YR 6/2) dry; moderate and weak fine subangular blocky and granular structure; friable; many roots; strongly acid; abrupt smooth boundary.

Bir 69B294 8 to 23 cm (3 to 9 inches). Dark brown (10YR 4/3) and dark yellowish brown (10YR 4/4) loam; weak very fine and fine subangular blocky structure; friable; many roots; strongly acid; clear wavy boundary.

A2 69B295 23 to 48 cm (9 to 19 inches). Brown (7.5YR 5/2 to 5/3) sandy loam; weak thin platy structure with numerous inped and exped vesicles; very friable; contains 6 to 8 percent gravel and cobblestones; many roots; medium acid; clear wavy boundary.

A&B 69B296 48 to 66 cm (19 to 26 inches). Brown (7.5YR 4/4) light sandy loam A2 material occupies approximately 75 percent of the horizon, extending as tongues into or completely surrounding isolated remnants of reddish brown (5YR 4/4) or yellowish red (5YR 4/6) sandy loam B2t material; weak thin platy structure in the A2 material and weak medium subangular blocky structure in the B2t material; clay films are thin and patchy on the subangular blocky faces of peds; firm with slightly fragic consistence; contains 8 to 10 percent by volume of gravel and cobblestones; common roots; slightly acid; gradual wavy boundary.

B&A 69B297 66 to 89 cm (26 to 35 inches). Reddish brown (5YR 4/4) and yellowish red (5YR 4/6) sandy loam B2t material occupies approximately 70 percent of the horizon and has tongues and interfingers of brown (7.5YR 4/4) loamy sand and light sandy loam that penetrate the horizon from above; weak and moderate fine and medium subangular blocky structure in the B2t portion; clay films are thin and patchy on faces of peds but more numerous than in horizon above; firm in B2t, friable in A2 and slightly fragic throughout; contains 8 to 10 percent by volume of gravel and cobblestones; common roots; slightly acid; gradual wavy boundary.

B2t 69B298 89 to 112 cm (35 to 44 inches). Reddish brown (5YR 4/4) and yellowish red (5YR 4/8) sandy loam; weak and moderate medium subangular blocky structure with weak coarse petrogenic platiness throughout; firm; occasional tongues of A2 material from above penetrate this horizon; thin patchy clay films on faces of peds; contains 8 to 10 percent by volume of gravel and cobblestones; few roots; slightly acid; gradual wavy boundary.

B3 69B299 112 to 137 cm (44 to 54 inches). Reddish brown (5YR 4/4) and yellowish red (5YR 4/6) light sandy loam; weak medium and coarse subangular blocky structure with weak coarse petrogenic platiness throughout; friable; some clay bridging of sand grains; occasional A2 tongues, 30 to 100 cm apart, penetrate this horizon; contains 10 to 12 percent by volume of gravel and cobblestones; few roots; slightly acid; gradual wavy boundary.

C 69B300 137 to 196 cm (54 to 77 inches). Reddish brown (5YR 4/4) and yellowish red (5YR 4/6) loamy sand; massive to weak coarse platy structure; friable; contains 10 to 12 percent by volume of gravel and cobblestones; slightly acid.

* This pedon is a taxadjunct because the base saturation is too high for the Amery series.

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL Amery SOIL Nos. S69WI-48-2 LOCATION Polk County, Wisconsin

SOIL SURVEY LABORATORY Beltsville, Maryland LAB. Nos. 69B301 - 69B308

Depth (cm)	Horizon	1B1b Total Sand (2-0.05)	Total Silt (0.05-0.002)	Total Clay (< 0.002)	Sand Very coarse (2-1)	Sand Coarse (1-0.5)	Sand Medium (0.5-0.25)	Sand Fine (0.25-0.1)	Sand Very fine (0.1-0.05)	Silt 0.05-0.02	Silt Int. III (0.02-0.002)	Int. II (0.2-0.02)	(2-0.1)	<.074 mm	3B2 Cm	Coarse fragments 3B1 2A2 > 2	2-19	19-76
		Size class and particle diameter (mm) 3A1																
		Pct. of < 2 mm												Pct.		Pct.	Pct. of < 76mm	
0-6	A1	55.4	37.4	7.2	2.5	12.3	15.3	16.4	9.0	17.9	19.5	34.8	46.4	50.2	0.96	10	6	4
6-25	Bir	58.5	36.4	5.1	3.4	10.9	16.1	18.1	10.0	19.1	17.3	37.8	48.5	47.9	0.93	12	10	2
25-43	A2	69.7	26.1	4.2	5.3	13.6	18.5	21.3	11.0	14.0	12.1	35.4	58.7	36.9	0.87	19	15	4
43-65	A&B	72.5	20.3	7.2	6.7	15.7	19.9	20.9	9.4	8.6	11.7	28.5	63.1	32.7	0.79	28	24	4
65-79	B&A	67.3	21.1	11.6	4.2	12.0	17.8	22.7	10.6	10.5	10.6	32.6	56.7	38.3	0.80	27	17	10
79-125	B2t	66.9	20.0	13.1	6.7	14.4	16.9	19.8	9.2	9.2	10.8	28.2	57.7	38.1	0.82	24	16	8
125-155	B3t	75.5	14.9	9.6	6.8	17.9	22.2	21.1	7.5	6.9	8.0	24.0	68.0	28.4	0.79	28	23	5
155-178	C	69.3	18.6	12.1	4.9	13.7	18.6	22.2	9.9	9.1	9.5	30.1	59.4	36.0	0.84	22	16	6

Depth (cm)	6A1a Organic carbon	Na Pyro. ext. 6C5a Fe	6G5a Al	C-D Al	Carbonate as $CaCO_3$	Ext. iron as Fe	Plasticity Index	Bulk density 4A1e ⅓ bar	4A1h Oven dry	4D1 COLE	Water content	4B1c ⅓ bar	4B2 15 bar	8E1 Resistivity ohms-cm 60°F	4C1 WRD	pH (1:2) $CaCl_2$	8C1c (1:1) KCl	8C1a (1:1) H_2O
	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.		g/cc	g/cc		Pct.	Pct.	Pct.		in/in			
0-6	3.45	0.2	0.1	0.1		0.9		1.05	1.18	0.04		23.1	7.3		0.17	5.0	4.7	5.3
6-25	0.95	0.2	0.2	0.1		0.7		1.51	1.54	0.01		13.7	2.9		0.16	4.5	3.9	5.1
25-43	0.23			0.1		0.7		1.73	1.74	0.00		9.9	2.0		0.14	4.6	4.0	5.4
43-65	0.24			0.1		0.8		1.79	1.84	0.01		10.0	3.3		0.12	4.7	3.8	5.2
65-79	0.24			0.1		0.9		1.79	1.85	0.01		12.2	4.4		0.14	4.8	4.0	5.4
79-125	0.12			0.1		1.0	N.P.	1.82	1.90	0.01		10.7	4.9	10000	0.11	5.0	4.0	5.5
125-155	0.12			tr.		0.7		1.82	1.91	0.01		11.2	3.7	10000	0.14	5.1	4.1	5.8
155-178	0.24			tr.		0.8		1.81	1.89	0.01		10.0	4.4	10000	0.10	5.1	4.0	5.7

Depth (cm)	Extractable bases 6N2e Ca	6O2d Mg	6P2b Na	6Q2b K	5B4a Sum	6H2a Ext. acidity	CEC 5A3a Sum cations	5A6a NH_4OAc	6G1e Ext. Al		Fine clay <.0002 mm	Ratios to clay 8D1 CEC sum	Ext. iron	15-bar water	6O3 Ca/Mg		Base saturation 5C3 Sum cations	5C1 NH_4OAc
	meq/100 g										Pct.						Pct.	Pct.
0-6	7.9	1.7	tr.	tr.	9.6	11.2	20.8	13.7	tr.		2.8	2.89	0.13	1.01			46	70
6-25	0.9	0.4	tr.	tr.	1.3	7.4	8.7	5.5	1.2		0.9	1.70	0.14	0.57			15	24
25-43	1.0	0.3	tr.	tr.	1.3	3.5	4.8	3.9			0.4	1.14	0.17	0.48			27	33
43-65	2.3	0.9	tr.	tr.	3.2	4.3	7.5	5.7	0.5		1.4	1.04	0.11	0.46			43	56
65-79	3.3	1.4	tr.	tr.	4.7	4.1	8.8	7.1			3.3	0.76	0.08	0.38			53	66
79-125	4.8	1.8	tr.	tr.	6.6	3.5	10.1	8.2			4.3	0.77	0.08	0.37			65	80
125-155	4.1	1.5	tr.	tr.	5.6	2.5	8.1	7.0			3.3	0.84	0.07	0.38			69	80
155-178	4.2	1.8	tr.	tr.	6.0	3.1	9.1	7.6			4.6	0.75	0.07	0.36			66	79

Depth (cm)	Clay fraction analysis 7A1 < 0.002 mm 7A2 X-ray a/b/	7A3 DTA b/ Pct.	Sand fraction analysis 7A1 0.2-0.02 mm 7B1 Petrographic b/ Pct.	TW
0-6	MV3,MI1,KK1,QZ1	KK10	QZ67,FE4,PO<1,FD22,EP4,HN1,TA1,MS<1,AU<1	28
6-25				
25-43	VR4,KK3,QZ2,MT1,MI1,CL1,FD1	KK20	QZ73,FE1,ZR<1,PO<1,FD17,EP5,HN1,TA1,GN1,MS<1,VR<1	25
43-65				
65-79				
79-125	MV4,KK2,CL1,MI1,QZ1,FD1	KK15	QZ74,FE1,FD18,EP2,VR2,HN1,TA1,MS<1,BT<1	24
125-155				
155-178	MV5,MI2,KK2,QZ1,FD1	KK15	QZ77,FE2,ZR<1,SP<1,FD14,EP2,HN1,MS1,VR1,TA1	20

a/Relative amounts (X-ray): 5 = dominant, 4 = abundant, 3 = moderate, 2 = small, 1 = trace.
b/Mineral code: MV = montmorillonite-vermiculite, MI = mica, KK = kaolinite, QZ = quartz, FE = iron oxides, PO = plant opal, FD = feldspar, EP = epidote, HN = hornblende, TA = talc, MS = muscovite, AU = augite, VR = vermiculite, MT = montmorillonite, CL = chlorite, ZR = zircon, GN = garnet, BT = biotite, SP = sphene.

Soil classification: Typic Glossoboralfs; coarse-loamy, mixed.
Soil: Amery.
Soil No.: S69WI-48-2.
Location: Polk County, Wisconsin; NW¼, NE¼, Sec. 3, T. 33 N., R. 15 W.; 200 yards west and 100 feet south of turn in county road.
Climate: Humid continental; mean annual temperature is about 45° F., mean annual precipitation is about 30 inches, and average frost-free season is 135 days.
Vegetation and land use: Native vegetation was mixed hardwood and pine with oak, maple, birch, aspen, ash, and white pine. Much of this soil is used for crop production and livestock pasture. Corn, small grain, and forage are the principal crops.
Parent material: Acid loamy sand to sandy loam glacial till.
Physiography: Sloping to hilly glacial ground and recessional moraines.
Topography: Site is on a convex slope of about 3 percent near the top of the hill.
Drainage: Well and moderately well drained.
Ground water: Deep.
Erosion: Slight.
Permeability: Moderate and moderately slow.
Described by: Paul H. Carroll.

(Colors are for moist soils unless otherwise noted)

A1 69B301 0 to 6 cm (0 to 2 inches). Very dark grayish brown (10YR 3/2) loam, gray (10YR 6/1) dry; weak and moderate fine subangular blocky structure; many roots; strongly acid; abrupt smooth boundary.

B1r 69B302 6 to 25 cm (2 to 10 inches). Dark brown (7.5YR 4/4) fine sandy loam; weak fine and very fine subangular blocky structure; friable; many roots; medium acid; clear wavy boundary.

A2 69B303 25 to 43 cm (10 to 17 inches). Dark brown (7.5YR 4/4) and brown (10YR 5/3) sandy loam; weak fine and very fine subangular blocky structure; friable; contains 6 to 8 percent by volume of gravel and cobblestones; common roots; medium acid; clear wavy boundary.

A&B 69B304 43 to 65 cm (17 to 26 inches). Dark brown (7.5YR 4/4) eluviated light sandy loam occupies 50 to 60 percent of the volume of the horizon and tongues into or completely surrounds isolated remnants of dark reddish brown (5YR 3/4) sandy loam B2t material; weak and moderate medium subangular blocky structure, with the A2 material having the weaker structure; friable; few thin clay films on faces of peds of the B2t; contains 8 to 10 percent by volume of gravel and cobblestones; common roots; strongly acid; clear wavy boundary.

B&A 69B305 65 to 79 cm (26 to 31 inches). Dark reddish brown (5YR 3/4) sandy loam with tongues of dark brown (7.5YR 4/4) sandy loam that occupy 30 to 40 percent of the horizon body; weak and moderate medium subangular blocky structure, with the A2 portion of the horizon being weakest; firm; many clay films on faces of peds in the B2t portion; contains 8 to 10 percent by volume of gravel and cobblestones; few roots; medium acid; clear wavy boundary.

B2t 69B306 79 to 125 cm (31 to 49 inches). Dark reddish brown (5YR 3/4) heavy sandy loam; moderate medium subangular blocky structure that parts under pressure to weak medium platy structure; firm; nearly continuous thin clay films on faces of peds; contains 8 to 10 percent by volume of gravel and cobblestones; few roots; slightly acid; clear wavy boundary.

B3t 69B307 125 to 155 cm (49 to 61 inches). Dark reddish brown (5YR 3/4) and reddish brown (5YR 4/4) sandy loam; weak and moderate thick platy structure that parts under pressure to weak medium subangular blocky structure; firm; few thin clay films on faces of peds, with clay bridging of sand particles; contains 10 to 12 percent by volume of gravel and cobblestones; medium acid; clear wavy boundary.

C 69B308 155 to 178 cm (61 to 70 inches). Dark reddish brown (5YR 3/4) and reddish brown (5YR 4/4) sandy loam; weak thick platy structure; firm; occasional clay films on vertical ped surfaces; contains 10 to 12 percent by volume of gravel and cobblestones; medium acid.

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL Amery SOIL Nos. S69WI-54-1 LOCATION Rusk County, Wisconsin

SOIL SURVEY LABORATORY Beltsville, Maryland LAB. Nos. 69B248 - 69B254

Depth (cm)	Horizon	1B1b Total Sand (2-0.05)	Total Silt (0.05-0.002)	Total Clay (< 0.002)	Sand Very coarse (2-1)	Sand Coarse (1-0.5)	Sand Medium (0.5-0.25)	Sand Fine (0.25-0.1)	Sand Very fine (0.1-0.05)	Silt 0.05-0.02	Silt Int. III (0.02-0.002)	Silt Int. II (0.2-0.02)	Silt (2-0.1)	<.074 mm	3B2 Cm	Coarse fragments 3B1 2A2 > 2	2-19	19-76
		Pct. of < 2 mm												Pct.		Pct.	Pct. of < 76mm	
0-10	A1	52.9	39.3	7.8	3.2	13.7	14.6	14.6	6.8	17.1	22.2	30.6	46.1	51.0	1.00	2	2	0
10-12	A2	NOT SAMPLED																
12-26	Bir	52.5	39.7	7.8	2.8	10.8	14.3	16.0	8.7	20.1	19.6	36.7	43.8	52.9	0.94	9	8	1
26-46	A'2	67.2	28.2	4.6	5.0	13.7	17.1	20.9	10.5	14.9	13.3	35.8	56.7	38.7	0.89	15	12	3
46-62	A&B'	74.1	19.9	6.0	5.9	14.5	18.7	23.9	11.1	10.8	9.1	34.1	63.0	31.9	0.84	20	10	10
62-75	B'2t	73.8	17.0	9.2	3.3	10.7	20.8	27.8	11.2	9.3	7.7	34.4	62.2	32.1	0.81	25	13	12
75-115	B'3tx	74.3	18.0	7.7	4.8	13.2	17.9	25.2	13.2	10.3	7.7	37.0	61.1	32.8	0.83	23	17	6
115-150	Cx	77.6	18.4	4.0	8.4	17.5	18.7	22.1	10.9	10.0	8.4	32.1	66.7	28.4	0.73	34	21	13

Depth (cm)	6A1a Organic carbon	Na Pyro. ext. 6C5a Fe	6G5a Al	C-D Al	Carbonate as $CaCO_3$	Ext. iron as Fe	Plasticity Index	Bulk density 4A1e ⅓ bar	4A1h Oven dry	4D1 COLE	Water content	4B1c ⅓ bar	4B2 15 bar	8E1 Resistivity ohms-cm 60°F	4C1 WRD	pH (1:2) $CaCl_2$	8C1c (1:1) KCl	8C1a (1:1) H_2O
	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.		g/cc	g/cc		Pct.	Pct.	Pct.		in/in			
0-10	6.15			0.1		0.5		1.09	1.19	0.03		26.3	12.5		0.15	5.5	5.3	5.9
10-12																		
12-26	0.89	0.1	0.1	0.1		0.7		1.59	1.67	0.02		12.5	4.2		0.13	4.5	4.0	5.2
26-46	0.25			0.1		0.5		1.77	1.79	0.00		9.0	2.5		0.11	4.5	3.9	5.3
46-62	0.13			tr.		0.6		1.95	1.96	0.00		6.0	2.7		0.06	4.7	4.0	5.5
62-75	-	0.5	0.2	tr.		0.8	N.P.	1.83	1.88	0.01		9.1	3.9	10000	0.10	5.0	4.1	5.4
75-115	-	tr.	tr.	tr.		0.6		1.84	1.90	0.01		8.8	3.0	15000	0.11	5.2	4.1	5.9
115-150	0.12	0.5	0.2	tr.		0.4	N.P.	1.88	1.92	0.01		7.6	1.7		0.11	5.5	4.4	6.2

Depth (cm)	Extractable bases 5B4a 6N2e Ca	6O2d Mg	6P2b Na	6Q2b K	Sum	6N2a Ext. acidity	CEC 6A3a Sum cations	5A6a NH_4OAc	6G1e Ext. Al		Fine clay <.0002 mm	Ratios to clay 8D1 CEC sum	Ext. iron	15-bar water	8D3 Ca/Mg		Base saturation 5C3 Sum cations	5C1 NH_4OAc
	meq/100 g										Pct.						Pct.	Pct.
0-10	13.9	10.9	tr.	tr.	24.8	15.0	39.8	24.7			2.6	5.10	0.06	1.60			62	100
10-12																		
12-26	1.5	0.6	tr.	tr.	2.1	9.9	12.0	7.0	1.4		2.0	1.54	0.09	0.54			18	30
26-46	1.1	0.6	tr.	tr.	1.7	8.3	10.0	4.5	0.8		0.4	2.17	0.11	0.54			17	38
46-62	1.8	1.0	tr.	tr.	2.8	4.1	6.9	4.9			1.7	1.15	0.10	0.45			40	57
62-75	2.9	1.5	tr.	tr.	4.4	7.1	11.5	6.2			3.7	1.25	0.09	0.42			38	70
75-115	2.8	1.4	tr.	tr.	4.2	1.5	5.7	5.9			3.1	0.74	0.08	0.39			74	71
115-150	1.9	1.0	tr.	tr.	2.9	0.6	3.5	3.7			1.4	0.88	0.10	0.42			83	78

Depth (cm)	Clay fraction analysis 7A1 < 0.002 mm 7A2 X-ray a/b/	7A3 DTA b/ Pct.	Sand fraction analysis 7A1 0.2-0.02 mm 7B1 Petrographic b/ Pct.	TW
0-10	MV4,MI1,KK1,QZ1,FD1	KK5	QZ77,FE2,TM< 1,ZR< 1,SP< 1,PO< 1,FD15,HN4,EP< 1	19
12-26				
26-46				
46-62				
62-75	MV5,MI1,KK1	KK5	QZ77,FE1,ZR1,SP< 1,FD12,HN4,EP1,GN1,VR1,TA1,MS< 1,AU< 1	20
75-115				
115-150	MV5,MI1,KK1,QZ1	KK5	QZ73,FE1,FD23,HN1,MS< 1,TA< 1,EP< 1,VR< 1,GN< 1	24

a/Relative amounts (X-ray): 5 = dominant, 4 = abundant, 3 = moderate, 2 = small, 1 = trace.
b/Mineral code: MV = montmorillonite-vermiculite, MI = mica, KK = kaolinite, QZ = quartz, FD = feldspar, FE = iron oxides, TM = tourmaline, ZR = zircon, SP = sphene, PO = plant opal, HN = hornblende, EP = epidote, GN = garnet, VR = vermiculite, TA = talc, MS = muscovite, AU = augite.

Soil classification: Typic Glossoboralfs; coarse-loamy, mixed.
Soil: Amery.
Soil No.: S69WI-54-1.
Location: Rusk County, Wisconsin; SW¼, NE¼, Sec. 7, T. 34 N., R. 6 W; 200 feet west and 1100 feet south of "T" road intersection.
Climate: Humid continental; mean annual temperature is about 42° F., mean annual precipitation is about 30 inches, and average frost-free season is 125 days.
Vegetation and land use: Native vegetation was mixed northern hardwood forest. Much of this soil is used for livestock pasture and crop production. Principal crops are small grain, corn, and forage.
Parent material: Acid sandy loam glacial till.
Physiography: Sloping to hilly glacial ground and end moraines.
Topography: Site is on a convex slope near the top of a ridge.
Drainage: Moderately well and well drained.
Ground water: Deep.
Erosion: Slight.
Permeability: Moderately slow and moderate.
Described by: Paul H. Carroll.

(Colors are for moist soils unless otherwise stated)

A1 69B248 0 to 10 cm (0 to 4 inches). Very dark grayish brown (10YR 3/2) loam, light gray (10YR 6/1) dry; weak fine subangular blocky structure; friable; common roots; slightly acid; abrupt smooth boundary.

A2 (Not sampled) 10 to 12 cm (4 to 5 inches). Dark grayish brown (10YR 4/2) and grayish brown (10YR 5/2) loam; weak thin platy structure; very friable; common roots; medium acid; abrupt smooth boundary.

Bir 69B249 12 to 26 cm (5 to 10 inches). Dark brown (7.5YR 4/4) loam; weak fine subangular blocky structure; friable; common roots; medium acid; clear wavy boundary.

A'2 69B250 26 to 46 cm (10 to 18 inches). Grayish brown (10YR 5/2) and brown (7.5YR 5/2) sandy loam; weak thin platy structure; friable; contains 5 to 7 percent by volume of gravel and cobblestones; common roots; strongly acid; clear wavy boundary.

A&B' 69B251 46 to 62 cm (18 to 24 inches). Grayish brown (10YR 5/2) and brown (7.5YR 5/2) light sandy loam A'2 material interfingers and tongues into the underlying reddish brown (5YR 4/4) to yellowish red (5YR 4/8) sandy loam B'2t material; weak thin platy A'2 and weak medium subangular blocky B'2t; friable; tongues of A'2 material are 2 to 6 cm thick; contains 10 to 12 percent by volume of gravel and cobblestones; common roots; strongly acid; clear irregular boundary.

B'2t 69B252 62 to 75 cm (24 to 30 inches). Reddish brown (5YR 4/4) and yellowish red (5YR 4/6-4/8) sandy loam; the higher chroma colors are marginal to thin gray (5YR 5/1-6/1) horizontal bands (1 to 2 cm thick) of clayey material situated near the horizon's upper boundary; moderate medium subangular blocky structure with weak to moderate coarse platiness throughout; friable and firm; thin patchy clay films on subangular blocky faces of peds; fibrous roots interlace with one another at lower boundary where horizon contacts the underlying fragipan; contains 10 to 12 percent by volume of gravel and cobblestones; medium acid; clear wavy boundary.

B'3tx 69B253 75 to 115 cm (30 to 44 inches). Reddish brown (5YR 4/4) sandy loam with few fine distinct and prominent mottles of yellowish red (5YR 4/6-4/8); weak and moderate medium subangular blocky structure with weak coarse platiness throughout; firm; thin patchy dark reddish brown (5YR 3/4) clay films on faces of peds; contains 10 to 12 percent by volume of gravel and cobblestones; few roots; medium acid; gradual wavy boundary.

Cx 69B254 115 to 150 cm (44 to 60 inches). Reddish brown (7.5YR 4/4) sandy loam with loamy sand pockets; weak coarse platy structure that parts under pressure to weak medium subangular blocky structure; firm; occasional thin clay films on surfaces of plates; medium acid; contains 10 to 12 percent by volume of cobblestones and gravel.

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL Amery taxadjunct SOIL Nos. S69WI-54-4 LOCATION Rusk County, Wisconsin

SOIL SURVEY LABORATORY Beltsville, Maryland LAB. Nos. 69B270 - 69B276

Depth (cm)	Horizon	1B1b Total Sand (2-0.05)	Total Silt (0.05-0.002)	Total Clay (< 0.002)	Sand Very coarse (2-1)	Sand Coarse (1-0.5)	Sand Medium (0.5-0.25)	Sand Fine (0.25-0.1)	Sand Very fine (0.1-0.05)	Silt 0.05-0.02	Silt Int. III (0.02-0.002)	Int. II (0.2-0.02)	(2-0.1)	<.074 mm	3B2 Cm	Coarse fragments 3B1 2A2 > 2	2-19	19-76
		Size class and particle diameter (mm) 3A1																
		Pct. of < 2 mm												Pct.		Pct.	Pct. of < 76mm	
0-14	A1	55.2	37.1	7.7	3.2	11.0	14.5	16.9	9.6	19.0	18.1	36.9	45.6	50.5	0.95	10	9	1
14-27	Bir	53.8	38.4	7.8	4.0	10.7	14.0	15.9	9.3	19.9	18.5	37.2	44.5	52.0	0.89	18	12	6
27-49	A2	56.6	36.0	7.4	4.0	11.6	14.3	16.8	9.9	19.5	16.5	38.0	46.7	49.4	0.90	15	12	3
49-65	B&A	63.8	28.4	7.8	6.2	12.7	15.3	19.1	10.5	14.4	14.0	34.8	53.3	42.2	0.83	24	18	6
65-86	B2t	67.3	23.3	9.4	4.6	12.9	16.2	21.8	11.8	12.1	11.2	35.4	55.5	39.3	0.85	20	13	7
86-114	B3t	66.1	24.2	9.7	3.7	11.3	16.3	22.4	12.4	12.1	12.1	36.1	53.7	40.9	0.83	23	15	8
114-152	C	66.7	24.0	9.3	4.9	11.9	15.7	21.8	12.4	12.6	11.4	36.5	54.3	40.2	0.80	28	19	9

Depth (cm)	6A1a Organic carbon Pct	Na Pyro. ext. 6C5a Fe Pct.	6G5a Al Pct.	C-D Al Pct.	Carbonate as $CaCO_3$ Pct.	Ext. iron as Fe Pct.	Plasticity Index	Bulk density 4A1e ⅓ bar g/cc	4A1h Oven dry g/cc	4D1 COLE	Water content Pct.	4B1c ⅓ bar Pct.	4B2 15 bar Pct.	8E1 Resistivity ohms-cm 60°F	4C1 WRD in/in	pH (1:2) $CaCl_2$	8C1c (1:1) KCl	8C1a (1:1) H_2O
0-14	4.98			0.1		0.7		1.24	1.55	0.08		13.3	8.1		0.06	4.1	3.6	4.7
14-27	0.74	0.3	0.2	0.2		0.7		1.45	1.45	0.00		17.1	4.4		0.18	4.5	4.1	5.2
27-49	0.49	0.4	0.2	0.1		0.8		1.65	1.67	0.01		13.1	3.1		0.16	4.6	4.0	5.3
49-65	-			tr.		0.9		1.73	1.77	0.01		10.6	3.4		0.12	4.9	4.1	5.5
65-86	-			tr.		1.0	N.P.	1.81	1.81	0.00		9.7	4.0		0.10	5.0	4.1	5.5
86-114	-			0.1		1.1		1.79	1.77	0.00		11.0	4.2	7000	0.12	5.2	4.2	5.7
114-152	-			0.1		1.0		1.70	1.72	0.00		10.9	3.8	5000	0.12	5.4	4.3	5.9

Depth (cm)	Extractable bases 5B4a 6N2e Ca	6O2d Mg	6P2b Na	6Q2b K	Sum	6H2a Ext. acidity	CEC 5A3a Sum cations	5A6a NH_4OAc	6G1e Ext. Al	Fine clay <.0002 mm Pct.	Ratios to clay 8D1 CEC sum	Ext. iron	15-bar water	8D3 Ca/Mg	Base saturation 5C3 Sum cations Pct.	5C1 NH_4OAc Pct.
	meq/100 g															
0-14	2.6	0.7	tr.	tr.	3.3	17.6	20.9	14.8	1.5	2.4	2.71	0.09	1.05		16	22
14-27	1.3	0.3	tr.	tr.	1.6	10.7	12.3	6.7	1.3	1.2	1.58	0.09	0.56		13	24
27-49	2.1	0.4	tr.	tr.	2.5	8.8	11.3	5.3	0.7	1.2	1.53	0.11	0.42		22	47
49-65	2.9	0.8	tr.	tr.	3.7	5.8	9.5	5.1		1.6	1.22	0.12	0.44		39	72
65-86	3.4	1.1	tr.	tr.	4.5	4.1	8.6	5.9		2.3	0.91	0.11	0.42		52	76
86-114	4.1	1.6	tr.	tr.	5.7	7.3	13.0	6.7		2.7	1.34	0.11	0.43		44	85
114-152	4.4	1.8	tr.	tr.	6.2	2.1	8.3	6.5		2.9	0.89	0.11	0.41		75	95

Depth (cm)	Clay fraction analysis 7A1 < 0.002 mm 7A2 X-ray a/b/	7A3 DTA b/ Pct.	Sand fraction analysis 7A1 0.2-0.02 mm 7B1 Petrographic b/ Pct.	TW
0-14 14-27 27-49	MV5,KK3,MI1,QZ1,FD1	KK20	QZ74,FE3,ZR<1,SP<1,FD18,HN2,EP2,MS<1,GN<1,VR<1,TA<1	22
49-65 65-86 86-114	VR4,KK3,MI2,MT1,QZ1,FD1	KK20	QZ80,FE3,ZR<1,SP<1,FD13,HN2,EP1,MS<1,VR<1,TA<1	16
114-152	MV5,MI2,KK2,QZ1,FD1	KK15	QZ73,FE5,SP<1,FD17,EP3,HN1,TA1,VR<1,MS<1	22

a/Relative amounts (X-ray): 5 = dominant, 4 = abundant, 3 = moderate, 2 = small, 1 = trace.
b/Mineral code: MV = montmorillonite-vermiculite, KK = kaolinite, MI = mica, QZ = quartz, FE = iron oxides, ZR = zircon, SP = sphene, FD = feldspar, HN = hornblende, EP = epidote, MS = muscovite, GN = garnet, VR = vermiculite, TA = talc, MT = montmorillonite.

Soil classification: Dystric Eutrochrept; coarse-loamy, mixed.
Soil: Amery taxadjunct*.
Soil No.: S69WI-54-4.
Location: Rusk County, Wisconsin; NW¼, NE¼, Sec. 7, T. 34 N., R. 6 W.; 180 yards north of road along pipeline and 15 feet northeast of large oak tree.
Climate: Humid continental; mean annual temperature is about 42° F; mean annual precipitation is about 30 inches; and average frost-free season is 125 days.
Vegetation and land use: Native vegetation was mixed northern hardwood forest. Much of the soil is used for livestock pasture and crop production. Principal crops are small grain, corn, and forage.
Parent material: Acid sandy loam glacial till.
Physiography: Sloping to hilly glacial ground and end moraines.
Topography: Site is on a plane east facing 3 percent slope.
Drainage: Moderately well and well drained.
Ground water: Deep.
Erosion: Slight.
Permeability: Moderate and moderately slow.
Described by: Paul H. Carroll.

(Colors are for moist soils unless otherwise noted)

A1 69B270 0 to 14 cm (0 to 6 inches). Very dark grayish brown (10YR 3/2) loam, gray (10YR 6/1) dry; weak fine subangular blocky structure; many roots; friable; strongly acid; clear smooth boundary.

Bir 69B271 14 to 27 cm (6 to 11 inches). Dark brown (7.5YR 4/4) light loam; weak fine subangular blocky structure; friable; many roots; strongly acid; clear wavy boundary.

A2 69B272 27 to 49 cm (11 to 19 inches). Brown (10YR 5/3) and yellowish brown (10YR 5/4) light loam; weak fine medium subangular blocky structure; friable; common roots; medium acid; clear wavy boundary.

B&A 69B273 49 to 65 cm (19 to 26 inches). Dark brown (7.5YR 4/4) sandy loam with brown (7.5YR 5/3-5/4) somewhat coarser textured tongues of eluviated material that penetrate the horizon and occupy 20 to 40 percent of the horizon body; weak medium subangular blocky structure in the B2t material and weak thin platy structure in the A2 material; friable; contains 8 to 12 percent gravel and cobblestones; common roots; medium acid; clear wavy boundary.

B2t 69B274 65 to 86 cm (26 to 34 inches). Dark reddish brown (5YR 3/4) sandy loam with many fine distinct strong brown (7.5YR 5/6) mottles; weak and moderate fine subangular blocky structure having weak medium platiness throughout; firm with slightly fragic consistence; thin patchy to nearly continuous clay films on most faces of peds; contains 8 to 12 percent gravel and cobblestones; few roots; medium acid; clear wavy boundary.

B3t 69B275 86 to 114 cm (34 to 45 inches). Dark reddish brown (5YR 3/4) and reddish brown (5YR 4/4) sandy loam with common fine distinct strong brown (7.5YR 5/6) mottles; weak coarse platy structure; firm with fragic consistence; clay films continuous on some horizontal faces of peds, patchy on others; contains 8 to 12 percent gravel and cobblestones; few roots; slightly acid; gradual wavy boundary.

C 69B276 114 to 152 cm (45 to 60 inches). Dark reddish brown (5YR 3/4) and reddish brown (5YR 4/4) sandy loam with many fine prominent strong brown (7.5YR 5/8) mottles; weak and moderate coarse platy structure; firm with slightly fragic consistence; few thin patchy clay films on some horizontal faces of peds; contains 8 to 12 percent gravel and cobblestones; slightly acid.

*This pedon is a taxadjunct to the Amery series because it lacks the subsoil clay accumulation typical of that series.

SOIL CLASSIFICATION-TYPIC GLOSSOBORALF
FINE-SILTY OVER SANDY OR SANDY-SKELETAL,MIXED
SERIES - - - - - - -ANTIGO

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE, MTSC
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

SOIL NO - - - - - - S75WI-95-5 COUNTY - - - POLK

GENERAL METHODS- - -1A,1B1B,2A1,2B SAMPLE NOS. 760203-760209

DEPTH CM	HORIZON	SAND 2-.05	SILT .05-.002	CLAY LT .002	FINE CLAY LT .0002	VCOS 2-1	CORS 1-.5	MEDS .5-.25	FNES .25-.10	VFNS .10-.05	COSI .05-.02	FNSI .02-.002	VFSI .005-.002	SAND 2-.10	INTR II .2-.02	FINE CLAY TO CLAY PCT	NON-CO3-CLAY PCT	RATIO 8D1 15-BAR TO CLAY
		(- - - PARTICLE SIZE ANALYSIS, LT 2MM, 3A1, 3A1A, 3A1B; PCT LT 2MM - - -)																
000-025	AP	14.5	74.4	11.1	3.3	.6	3.3	2.7	.9	7.0	40.1	34.3		7.5	47.5	30		.64
025-036	A2	12.5	76.4	11.1	3.6	.2	2.2	1.9	.7	7.5	42.1	34.3		5.0	49.9	32		.45
036-051	B&A	10.3	68.7	21.0	10.2	.2	1.2	1.1	.6	7.2	37.5	31.2		3.1	45.0	49		.42
051-076	B2T	17.1	59.0	23.9	13.0	.2	1.6	1.6	1.0	12.7	35.9	23.1		4.4	49.1	54		.43
076-086	2B3	60.8	24.2	15.0	6.9	3.2	21.9	21.9	6.8	7.0	14.6	9.6		53.8	23.5	46		.39
086-109	2C1	92.7	3.1	4.2	1.0	1.9	36.6	43.8	9.9	.5	2.0	1.1		92.2	4.8	24		.45
109-152	2C2	95.1	3.3	1.6		31.9	37.2	18.5	6.2	1.3	2.0	1.3		93.8	5.3			

DEPTH CM	VOL. GT 2 PCT	WEIGHT GT 75 PCT	75-20 PCT LT 75	20-5 PCT LT 75	5-2 PCT LT 75	LT .074 PCT LT 75	20-2 PCT LT20	BULK DENSITY 4A1D 1/3-BAR G/CC	4A1H OVEN DRY G/CC	4D1 COLE	WATER CONTENT 4B1C 1/10 BAR PCT	4B1C 1/3-BAR PCT	4B2 15-BAR PCT	4C1 WRD CM/CM	CARBONATE 6E1B LT 2 PCT	3A1A LT .002 PCT	PH 8C1A 1/1 H2O	8C1E 1/2 CACL
	(PARTICLE SIZE ANALYSIS, MM, 3B, 3B1, 3B2)																	
000-025	TR	0	0	TR	TR	92	TR	1.28	1.34	.016		28.2	7.1	.28			5.6	5.2
025-036	TR	0	0	TR	TR	94	TR	1.48	1.55	.016		22.1	5.0	.26			5.7	5.2
036-051	0	0	0	TR	TR	96	TR	1.49	1.61	.026		23.0	8.9	.21			5.3	4.5
051-076	TR	0	0	TR	TR	94	TR	1.50	1.65	.033		24.3	10.2	.22			5.0	4.3
076-086	5	0	TR	2	2	43	4	1.71	1.82	.020		13.6	5.8	.13			5.0	4.3
086-109	10					7	2	1.64A			4.0C		1.9	.03			5.2	4.5
109-152	35	0	5	28	15	3	46	1.60B			3.4C		1.6	.03			5.6	5.0

DEPTH CM	ORGANIC MATTER 6A1A ORGN CARB PCT	6B1A NITG PCT	C/N	IRON 6C2B EXT FE PCT	PHOS TOTL PCT	EXTRACTABLE BASES 5B4A 6N2E CA	6O2D MG	6P2B NA	6Q2B K	SUM EXTB	ACTY 6H1A BACL TEA	AL 6G1E KCL EXT	CAT EXCH 5A3A EXTB ACTY	5A6A NHAC	RATIO 8D1 NHAC TO CLAY	RATIO 8D3 CA TO MG	CA 5F1 SAT NHAC PCT	BASE SAT 5C3 EXTB ACTY PCT	5C1 NHAC PCT
						(- - - MEQ / 100 G - - -)													
000-025	1.70	.156	11			7.5	1.0	TR	.1	8.6	7.5		16.1	12.4	1.12	7.5	60	53	69
025-036	.38	.043	9			4.8	.8	TR	.1	5.7	4.8		10.5	8.0	.72	6.0	60	54	71
036-051	.28	.038	7			7.0	2.4	.1	.2	9.7	8.1	.9	17.8	14.1	.67	2.9	50	54	69
051-076	.19					7.5	3.7	.1	.3	11.6	9.8	2.0	21.4	16.4	.69	2.0	46	54	71
076-086	.12					4.5	2.1	.1	.2	6.9	6.1	1.1	13.0	10.1	.67	2.1	45	53	68
086-109	.08					1.8	.7	TR	TR	2.5	2.1	.2	4.6	4.0	.95	2.6	45	54	63
109-152	.06					1.9	.7	TR	.1	2.7	2.2		4.9	3.6	2.25	2.7	53	55	75

DEPTH CM	SATURATED PASTE 8E1 REST OHM-CM	8C1B PH	8A H2O PCT	NA 5D2 ESP PCT	NA 5E SAR	SALT 8D5 TOTL SOLU PPM	GYP 6F1A PCT	SATURATION EXTRACT 8A1 8A1A EC MMHOS/CM	6N1B CA	6O1B MG	6P1B NA	6Q1B K	6I1A CO3	6J1A HCO3	6K1A CL	6L1A SO4	6M1A NO3	ATTERBERG 4F1 LQID LMIT PCT	4F2 PLST INDX
									(- - - MEQ / LITER - - -)										
000-025																			
025-036																			
036-051																			
051-076																		38	16D
076-086																			
086-109	17000	5.0	20.0					.08								1.1			
109-152																			

CLAY MINERALOGY (7A2C).
36-51 MT4 KK3 VR2 MI1 CL1
51-76 MT4 KK3 VR1 MI1 QZ1
76-86 MT4 KK3 MI1 QZ1 VR1
RELATIVE AMOUNTS: (X-RAY) 5 = DOMINANT 4 = ABUNDANT 3 = MODERATE 2 = SMALL 1 = TRACE.
MINERAL CODE: MT = MONTMORILLONITE MI = MICA KK = KAOLINITE CL = CHLORITE VR = VERMICULITE QZ = QUARTZ.
SAND MINERALOGY (7B1), PLACEMENT: MIXED.
036-51 VFNS - RE76 QZ74 FE1 PO1 TM ZR SP FD21 MS1 CL1 HN1 BT EP VR GN KK.
051-76 VFNS - RE72 QZ71 FE1 TM ZR SP FD25 HN2 MS1 EP CL GS KK.
076-86 VFNS - RE78 QZ76 FE2 ZR SP FD18 MS1 HN1 VR1 EP1 GN CL AU.
RELATIVE AMOUNTS: AS PERCENT.
MINERAL CODE: BT = BIOTITE CL = CHLORITE EP = EPIDOTE FD = FELDSPARS GS = GLASS HN = HORNBLENDE MS = MUSCOVITE
PO = PLANT OPAL QZ = QUARTZ TM = TOURMALINE ZR = ZIRCON RE = RESISTANT MINERALS FE = IRON MINERALS
SP = SPHENE VR = VERMICULITE GN = GARNET KK = KAOLINITE AU = AUGITE.
(A) CORE SAMPLE, METHOD 4A3A.
(B) ESTIMATED.
(C) SIEVED SAMPLE, METHOD 4B1A.
(D) LIQUID LIMIT AND PLASTIC INDEX BY USDA-SCS, SOIL MECHANICS LAB, LINCOLN, NE.

Soil classification: Typic Glossoboralfs; fine-silty over sandy or sandy-skeletal, mixed.
Soil: Antigo.
Soil No.: S75-WI-95-5.
Location: Polk County, Wisconsin; SE¼, SE¼, Sec. 25, T. 34 N., R. 17 W.; 150 feet west of road and 800 feet north of Highway 8. About 45°25' N. latitude and 92°26' W. longitude.
Climate: Humid continental; mean annual temperature is 43° F; mean July temperature is 71° F; mean January temperature is 11.8° F; mean annual precipitation is 27.5 inches with about two-thirds of this occurring during the growing season; mean annual snowfall is 41.2 inches; the growing season averages 127 days. (Data from Amery, WI, weather bureau substation.)
Vegetation and use: Native vegetation was mixed northern hardwood and conifer forests. Most large areas of this soil have been cleared and are being used for general farming. This sample site is presently in old hay meadow.
Parent material: Thin loess mantle, 20 to 36 inches thick, and acid outwash sand and gravel.
Physiography: Nearly level to sloping outwash plains and stream terraces in glaciated region.
Topography: Nearly level plain; sample site has a plane slope of less than 1 percent.
Drainage: Well drained.
Ground water: Over 5 feet deep.
Erosion: Slight.
Permeability: Moderate in solum and rapid in substratum.
Described by: A.J. Klingelhoets and G.B. Lee, July 1975.

(Colors are for moist soil unless otherwise stated)

Ap 760203 0 to 25 cm (0 to 10 inches). Very dark grayish brown (10YR 3/2) silt loam; weak fine subangular blocky structure parting to moderate fine granular; friable; many roots; slightly acid; abrupt smooth boundary.

A2 760204 25 to 36 cm (10 to 14 inches). Brown (10YR 5/3) silt loam; moderate fine platy structure; friable; many roots; slightly acid; clear wavy boundary.

B&A 760205 36 to 51 cm (14 to 20 inches). Dark yellowish brown (10YR 4/4) silt loam (B2t); moderate fine subangular blocky structure; friable; occupies about 70 percent of the horizon; few thin patchy clay films on some faces of peds; tongues of brown (10YR 5/3) silt loam (A2) 10 to 20 mm thick extend to bottom of horizon; moderate fine platy structure; many roots; medium acid; clear wavy boundary.

B2t 760206 51 to 76 cm (20 to 30 inches). Dark yellowish brown (10YR 4/4) heavy silt loam; moderate medium subangular blocky structure; firm; thin patchy clay films on most faces of peds; many roots; medium acid; clear wavy boundary.

IIB3 760207 76 to 86 cm (30 to 34 inches). Dark brown (7.5YR 4/4) light loam; moderate medium subangular blocky structure; friable; few thin patchy clay films on faces of peds; about 6 percent cobbles and 10 percent coarser than 2 mm by volume of the matrix; many roots; medium acid; abrupt wavy boundary.

IIC1 760208 86 to 109 cm (34 to 47 inches). Dark brown and reddish brown (7.5YR 4/4 and 5YR 4/4) coarse sand; single grained; loose; stratified; estimated 10 percent by volume coarse fragments over 2 mm in diameter; few roots; medium acid; abrupt wavy boundary.

IIC2 760209 109 to 152 cm (47 to 60 inches). Dark brown (7.5YR 4/4) coarse sand and fine gravel; single grained; loose; stratified; estimated 40 percent by volume coarse fragments over 2 mm in diameter; few roots; medium acid.

Additional notes:
1. Some pedons have more evidence of degradation than the one sampled.
2. pH's in field determined by Truog kit.

SOIL CLASSIFICATION-TYPIC UMBRAQUALF
FINE-SILTY,MIXED,FRIGID
SERIES - - - - - - -BARRONETTE TAXADJUNCT

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE, MTSC
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

SOIL NO - - - - - - S75WI-95-4 COUNTY - - - POLK

GENERAL METHODS- - -1A,1B1B,2A1,2B SAMPLE NOS. 760196-760202

DEPTH CM	HORIZON	PARTICLE SIZE ANALYSIS, LT 2MM, 3A1, 3A1A, 3A1B SAND 2- .05	SILT .05- .002	CLAY LT .002	FINE CLAY LT .0002	VCOS 2- 1	CORS 1- .5	MEDS .5- .25	FNES .25- .10	VFNS .10- .05	COSI .05- .02	FNSI .02- .002	VFSI .002- .10	SAND 2- .10	INTR II .2- .02	FINE CLAY TO CLAY	NON-CO3- CLAY	RATIO 8D1 15-BAR TO CLAY
		PCT LT 2MM														PCT	PCT	
000-025	AP	46.0	46.8	7.2		TR	.7	1.8	6.8	36.7	27.6	19.2		9.3	69.5			1.58
025-038	A12	50.9	43.0	6.1		TR	.4	1.1	7.4	42.0	27.4	15.6		8.9	75.7			.95
038-053	A2G	45.8	39.1	15.1	6.5	.0	.3	.7	4.9	39.9	26.2	12.9		5.9	70.4	43		.41
053-074	B21tg	36.4	42.9	20.7	10.4	TR	.1	.3	2.5	33.5	30.0	12.9		2.9	65.6	50		.47
074-094	B22G	38.7	45.0	16.3	8.1	TR	.2	.4	1.9	36.2	31.2	13.8		2.5	68.9	50		.53
094-122	C1	42.8	44.6	12.6		TR	.3	.4	2.1	40.0	34.1	10.5		2.8	75.8			.55
122-152	C2	35.5	50.5	14.0		.2	.7	.7	1.7	32.2	35.3	15.2		3.3	68.7			.57

DEPTH CM	PARTICLE SIZE ANALYSIS, MM, 3B, 3B1, 3B2 VOL. GT 2 PCT	GT 75 PCT	75-20	20-5	5-2	LT .074	20-2 PCT LT20	BULK DENSITY 4A1D 1/3-BAR G/CC	4A1H OVEN DRY G/CC	4D1 COLE	4B1C 1/10 BAR PCT	WATER CONTENT 4B1C 1/3-BAR PCT	4B2 15-BAR PCT	4C1 WRD CM/CM	CARBONATE 6E1B LT 2 PCT	3A1A LT .002 PCT	PH 8C1A 1/1 H2O	8C1E 1/2 CACL
000-025	TR	0	0	0	TR	83	TR	1.29	1.36	.018		36.1	11.4	.33			4.7	4.4
025-038	TR	0	0	0	TR	80	TR	1.38	1.41	.007		24.9	5.8	.27			4.8	4.3
038-053	TR	0	0	TR	TR	87	TR	1.48	1.56	.018		23.4	6.2	.26			4.7	4.2
053-074	0	0	0	0	0	92	0	1.41	1.52	.025		24.8	9.7	.21			4.9	4.2
074-094	0	0	0	0	0	92	0	1.44	1.51	.016		23.9	8.7	.22			4.8	4.2
094-122	0	0	0	0	0	92	0	1.46	1.53	.016		20.7	6.9	.20			4.9	4.2
122-152	0	0	0	0	0	94	0						8.0				5.0	4.2

DEPTH CM	ORGANIC MATTER 6A1A ORGN CARB PCT	6B1A NITG PCT	C/N	IRON 6C2B EXT FE PCT	PHOS TOTL PCT	EXTRACTABLE BASES 5B4A 6N2E CA	6O2D MG	6P2B NA	6Q2B K	SUM EXTB MEQ / 100 G	ACTY 6H1A BACL TEA	AL 6G1E KCL EXT	CAT EXCH 5A3A EXTB ACTY	5A6A NHAC	RATIO 8D1 NHAC TO CLAY	RATIO 8D3 CA TO MG	CA 5F1 SAT NHAC PCT	BASE SAT 5C3 EXTB ACTY PCT	5C1 NHAC PCT
000-025	4.98	.383	13			3.7	1.1	TR	.1	4.9	23.6	1.7	28.5	19.0	2.64	3.4	19	17	26
025-038	1.91	.124	15			1.1	.3	.0	.1	1.5	14.5	2.5	16.0	9.4	1.54	3.7	12	9	16
038-053	.39	.038	10			2.2	.8	TR	.1	3.1	9.4	4.0	12.5	9.9	.66	2.8	22	25	31
053-074	.39					4.0	1.5	TR	.2	5.7	12.0	5.0	17.7	14.3	.69	2.7	28	32	40
074-094	.31					3.8	1.3	TR	.2	5.3	10.5	3.3	15.8	12.3	.75	2.9	31	34	43
094-122	.26					3.1	1.1	TR	.2	4.4	8.8	2.2	13.2	9.8	.78	2.8	32	33	45
122-152	.15					3.8	1.3	TR	.2	5.3	8.6	1.9	13.9	11.1	.79	2.9	34	38	48

DEPTH CM	SATURATED PASTE 8E1 REST OHM-CM	8C1B PH	8A H2O PCT	NA 5D2 ESP PCT	NA 5E SAR	SALT 8D5 TOTL SOLU PPM	GYP PCT	SATURATION EXTRACT 8A1 6F1A	8A1A EC MMHOS/CM	6N1B CA	6O1B MG	6P1B NA	6Q1B K	6I1A CO3	6J1A HCO3	6K1A CL	6L1A SO4	6M1A NO3	ATTERBERG 4F1 LQID LMIT PCT	4F2 PLST INDX
									MEQ / LITER											
000-025																				
025-038																				
038-053																				
053-074																			32A	10A
074-094																				
094-122	14000	4.5	30.5						.05								1.2		28A	5A
122-152																				

CLAY MINERALOGY (7A2C).
038-53 MT2 KK2 MI2 VR1
074-94 MT3 KK2 MI1 VR1
094-122 MT3 KK2 MI1
COMMENTS - CLAYS IN B AND C HORIZONS FAIRLY WELL ORDERED.
RELATIVE AMOUNTS - (X-RAY) 5 = DOMINANT 4 = ABUNDANT 3 = MODERATE 2 = SMALL 1 = TRACE.
MINERAL CODE - MT = MONTMORILLONITE MI = MICA KK = KAOLINITE VR = VERMICULITE.

SAND MINERALOGY (7B1). PLACEMENT - MIXED.
038-53 VFNS - NW71 QZ67 CD3 ZR1 FK23 FP2 HN2 PR1 MS1 CL PO DU BT.
074-94 VFNS - NW74 QZ70 CD3 OP1 FK20 FP2 HN1 MS1 AR2 ZR TM PR CL.
094-122 VFNS - NW74 QZ70 CD3 FK20 FP2 HN2 AR1 OP ZR RU GN PR.
COMMENTS - MINERAL SUITE IN COARSE SILTS VERY SIMILAR TO VERY FINE SANDS.
RELATIVE AMOUNTS - AS PERCENT.
MINERAL CODE - NW = NON-WEATHERABLE AR = AGGREGATES BT = BIOTITE CL = CHLORITE HN = HORNBLENDE MS = MUSCOVITE
OP = OPAQUE PO = PLANT OPAL PR = PYROXENE QZ = QUARTZ TM = TOURMALINE ZR = ZIRCON
FK = POTASSIUM FELDSPAR FP = PLAGIOCLASE FELDSPAR CD = CHALCEDONY DU = DUMORTIERITE GN = GARNET
RU = RUTILE.

OBSERVATIONS ON NATURAL FABRIC WITH STEREOSCOPIC MICROSCOPE.
A2G 038-053 CM 760198 DEFINITE DEPOSITIONAL CLAY IN CHANNELS, BARELY THICK ENOUGH TO OBSCURE MATRIX GRAINS WHICH ARE PRINCIPALLY VERY FINE SAND AND COARSE SILT.
B21G 053-074 CM 760199 DEFINITE CLAY/IRON DEPOSITION IN CHANNELS AND IN CRACKS (PROBABLE PED FACES). GRAINS OBSCURED BUT SURFACE MORPHOLOGY OF MATRIX NOT SMOOTHED COMPLETELY. MATRIX IS THE SAME AS A2G.
B22G 074-094 CM 760200 DISTINCT CLAY/IRON DEPOSITITION IN CHANNELS, IN CRACKS, AND IN PATCHES THROUGH MATRIX, LESS DISTINCT PATCHES OF DEPOSITIONAL CLAY THROUGH MUCH OF MATRIX, MATRIX IS SAME AS A2G.
EXPRESSION OF DEPOSITIONAL CLAY MORE PRONOUNCED WITH DEPTH. DEFINITE EVIDENCE OF CLAY MOVEMENT AND DEPOSITION.

(A) LIQUID LIMIT AND PLASTIC INDEX BY USDA-SCS, SOIL MECHANICS LAB, LINCOLN, NE.

Soil classification: Typic Umbraqualf; fine-silty, mixed, frigid.
Soil: Barronett taxadjunct*.
Soil No.: S75WI-95-4 .
Location: Polk County, Wisconsin; NW¼, SW¼, Sec. 22, T. 35 N., R. 15 W.; 150 feet south of road and 15 feet west of line fence. About 45°30' N. latitude and 92°13' W. longitude.
Climate: Humid continental; mean annual temperature is 43° F; mean July temperature is 71° F; mean January temperature is 11.8° F; mean annual precipitation is 27.5 inches with about two-thirds of this occuring during the growing season; mean annual snowfall is 41.2 inches; the growing season averages 127 days (data from Amery, WI., weather bureau substation.)
Vegetation and land use: Native vegetation was water tolerant hardwoods, sedges, and grasses. Many of the larger areas of this soil have been partially drained and are used for livestock pasture and general farm crops. The sample site is in a grass meadow.
Parent material: Silty glacial lacustrine deposits.
Physiography: Depressional areas in glacial lake plains.
Topography: Depressional - site is on a 1 percent concave slope.
Drainage: Poorly drained.
Ground water: At 3 feet in July; at 4 feet in September.
Erosion: None.
Permeability: Moderately slow.
Described by: A. J. Klingelhoets and G. B. Lee, July 1975.

(Colors are for moist soil unless otherwise stated)

Ap 760196 0 to 25 cm (0 to 10 inches). Black (10YR 2/1) mucky silt loam; moderate medium subangular blocky structure parting to very fine subangular blocky; friable; many roots; slightly acid; abrupt smooth boundary.

A12 760197 25 to 38 cm (10 to 15 inches). Very dark gray (10YR 3/1) silt; weak medium platy structure; friable; many roots; slightly acid; clear wavy boundary.

A2g 760198 38 to 53 cm (15 to 21 inches). Grayish brown (10YR 5/2) silt; weak coarse platy structure; very friable; many fine prominent mottles of strong brown (7.5YR 5/6 and 5/8); few crawfish holes and sedge root channels; many roots; medium acid; gradual wavy boundary.

B21tg 760199 53 to 74 cm (21 to 29 inches). Grayish brown (2.5Y 5/2) silt loam; many medium prominent brown, strong brown, and yellowish red (7.5YR 4/4, 5/6, and 5YR 5/6) mottles; few penetrations of A2g material less than 10 mm thick are in the upper 4 inches of this horizon; many old sedge root channels and few crawfish holes; many roots; medium acid; gradual wavy boundary.

B22g 760200 74 to 94 cm (29 to 37 inches). Grayish brown (2.5Y 5/2) silt loam; many large prominent dark reddish brown and yellowish red (5YR 3/4 and 5/6) mottles; weak coarse prismatic structure parting to weak fine and medium subangular blocky; friable; many old sedge root channels and few crawfish holes; few sedge roots; medium acid; gradual wavy boundary.

C1 760201 94 to 122 cm (37 to 48 inches). Grayish brown (2.5Y 5/2) silt; many coarse prominent dark reddish brown (5YR 3/4) and yellowish red (5YR 5/6) mottles; weak coarse platy structure; friable; few sedge roots; silt shows evidence of layering; medium acid; abrupt smooth boundary.

C2 760202 122 to 152 cm (48 to 60 inches). Grayish brown (2.5Y 5/2) silt; many coarse prominent dark reddish brown (5YR 3/4) and yellowish red (5YR 5/6) mottles; weak coarse platy structure; friable; few old sedge root channels and crawfish holes; silt shows evidence of stratification; medium acid. C2 horizon separated for purposes of sampling.

*This pedon is a taxadjunct to the Barronett series because it has a subsoil clay accumulation not typical of that series.

Additional notes:
1. Some accumulation has thickened the surface soil on this site; questioned for coarse-silty versus fine-silty family and for cambic versus argillic Bg.
2. pH's in field determined by Truog Kit.

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL Bergland SOIL Nos. S64WI-16-2 LOCATION Douglas County, Wisconsin

SOIL SURVEY LABORATORY Lincoln, Nebraska LAB. Nos. 19863-19870 June, 1968

GENERAL METHODS: 1A, 1B1b, 2A1, 2B

Depth (in.)	Horizon	Size class and particle diameter (mm) 3A1 — Total: Sand (2-0.05) a	Total: Silt (0.05-0.002)	Total: Clay (< 0.002)	Sand: Very coarse (2-1)	Sand: Coarse (1-0.5)	Sand: Medium (0.5-0.25)	Sand: Fine (0.25-0.1)	Sand: Very fine (0.1-0.05)	Silt: 0.05-0.02	Silt: Int. III (0.02-0.002)	Int. II (0.2-0.02)	(2-0.1)	<0.074	0.005-0.002	Coarse fragments 2A2: Vol. 19-2	3B1 Wt. 19-2	
		Pct. of < 2 mm														<-Pct. of <19->		
2-0	O1																-	
0-3	A1	1.8	30.0	68.2	0.2	0.2	0.3	0.6	0.5	5.8	24.2	6.6	1.3	98.5			tr	
3-7	B1g	5.5	20.1	74.4	0.1	0.5	0.9	2.3	1.7	1.2	18.9	4.3	3.8	95.4	9.4		tr	
7-11	B2	3.1	20.9	76.0	tr	0.2	0.4	1.2	1.3	2.4	18.5	4.5	1.8		12.2		tr	
11-19	B3	4.3	21.0	74.7	0.2	0.3	0.5	1.6	1.7	2.9	18.1	5.6	2.6	96.7	11.5		tr	
19-28	C1ca	4.8	22.0	73.2	0.1	0.3	0.7	1.9	1.8	2.9	19.1	5.8	3.0	96.3	9.4		tr	
28-38	C2ca	5.1	22.4	72.5	0.2	0.6	1.0	2.1	1.2	2.4	20.0	4.8	3.9	95.6	13.5		tr	
38-50	C3	2.8	22.0	75.2	0.1	0.4	0.5	1.1	0.7	1.4	20.6	2.7	2.1	97.6	14.9		tr	

Depth (in.)	6A1a Organic carbon Pct.	6B1a Nitrogen Pct.	C/N	Carbonate as $CaCO_3$: 6E1b 6E2a <2mm Pct.	3A1a <0.002 mm Pct.	3A1a Non-Carbonate Clay Pct.	Bulk density: 4A1a Field-State g/cc	4A1d 1/3-Bar g/cc	4A1b Air-Dry g/cc	4D1 COLE	Water content: 4B4 Field-State Pct	4B1c 1/3-Bar Pct.	4B2 15-Bar Pct.	4C1 1/3-to 15-Bar in./in.		pH		8C1a (1:1)
2-0	18.9	0.921	21										33.0					
0-3	12.9	0.663	19			68							29.3					5.7
3-7	1.17	0.095	12			74							22.6					6.5
7-11	0.27	0.038	7	-(s)		76							22.6					6.9
11-19	0.16			tr(s)		75							21.8					7.2
19-28	0.11			8	2	71	1.31	1.37	1.63	0.059	36.8	30.1	22.5	0.10				7.9
28-38	0.12			14	7	66	1.32	1.33	1.65	0.073	37.2	32.8	22.4	0.14				8.1
38-50	0.15			15	8	67							24.7					8.1

Depth (in.)	Extractable bases 6N4b Ca	6O4b Mg	6P2a Na	5B1a 6Q2a K	Sum	6H1a Ext. Acidity	Cat. Exch. Cap.: 5A3a Sum Cations	5A1a NH_4OAc	KCl-Ext. Al	6C2a Ext. Iron as Fe Pct.				8D3 Ca/Mg		Base saturation: 5C3 Sum Cations Pct.	5C1 NH_4OAc CEC Pct.
	meq/100 g																
2-0																	
0-3	32.3b	12.9c	0.3	0.5	46.0	34.3	80.3	52.5		0.7				2.5		57	88
3-7	26.7b	14.9c	0.3	0.6	42.5	8.5	51.0	38.9		2.0				1.8		83	109
7-11	24.0	15.0	0.3	0.7	40.0	6.5	46.5	38.4		1.9				1.6		86	104
11-19	20.8	12.8	0.3	0.6	34.5	5.3	39.8	32.6		1.9				1.6		87	106
19-28	20.1	9.9	0.3	0.7	31.0			26.5		2.0				2.0			
28-38	18.2	8.4	0.3	0.7	27.6			23.9		1.5				2.2			
38-50	18.1	8.9	0.3	0.8	28.1			24.5		1.4				2.0			

Depth (in.)	Ratios to Clay 8D2: NH_4OAc CEC	Ext. Iron	15-Bar Water		
2-0					
0-3	0.77	0.01	0.43		
3-7	0.53	0.03	0.31		
7-11	0.51	0.03	0.30		
11-19	0.43	0.03	0.29		
19-28	0.37	0.03	0.32		
28-38	0.36	0.02	0.34		
38-50	0.37	0.02	0.37		

a. Fe-Mn nodules comprise 10 to 20 percent of the sands above 19 inches. Carbonate comprises 10 to 20 percent of the sands below 19 inches.

b. NH_4OAc extraction (Method 6N2a).

c. NH_4OAc extraction (Method 6O2a).

Soil classification: Aeric Haplaquept; very-fine, mixed, nonacid, frigid.
Soil: Bergland.
Soil No.: S64WI-16-2.
Location: Douglas County, Wisconsin; NW¼, NW¼, Sec. 17, T. 48 N., R. 13 W.; 325 feet south of the road.
Climate: Humid continental; mean annual temperature is about 41° F; mean annual precipitation ranges from 26 to 30 inches; and frost-free season is about 109 days.
Vegetation and land use: Native vegetation was mixed spruce-pine forest. A small part of this soil has been cleared for general livestock farming. Much of this soil has been logged and is in second-growth aspen, tag alder, and willow brush.
Parent material: Calcareous clay lacustrine or glacial till.
Physiography: Slight depressional areas and drainageways on gently undulating lacustrine or till plain.
Topography: Site is in a slight depression with a 1 percent concave slope in an old pasture.
Drainage: Poorly drained.
Ground water: A perched water table exists at or near the surface for several months in most years.
Erosion: Slight.
Permeability: Very slow.
Described by: A.J. Klingelhoets, August 25, 1964.

(Colors are for moist soil unless otherwise stated)

O1 19863 5 to 0 cm (2 to 0 inches). Very dark brown (10YR 2/2) organic mat of fine roots, sedge, moss, and leaf litter.

A1 19864 0 to 8 cm (0 to 3 inches). Black (2.5Y 2/0) silty clay; moderate medium granular structure; friable; very high organic matter content; many fine roots; slightly acid; clear wavy boundary.

B1g 19865 8 to 18 cm (3 to 7 inches). Grayish brown (2.5Y 5/2) clay; moderate fine angular blocky structure; very firm, plastic, sticky; many fine prominent mottles of strong brown (7.5YR 5/6); thin patchy clay films; roots common; slightly acid; gradual irregular boundary.

B2 19866 18 to 28 cm (7 to 11 inches). Reddish brown (5YR 4/4) clay; weak coarse prismatic structure parting to strong very fine angular blocks; very firm, plastic, sticky; many fine distinct mottles of strong brown and brown (7.5YR 5/6 and 5/2); thin continuous clay films; roots common; mildly alkaline; gradual wavy boundary.

B3 19867 28 to 48 cm (11 to 19 inches). Reddish brown (2.5YR 4/4) clay; weak coarse prismatic structure parting to moderate very fine angular blocks; very firm, plastic, sticky; few fine faint mottles of strong brown (7.5YR 5/6); thin continuous clay films; roots common; mildy alkaline; clear wavy boundary.

C1ca 19868 48 to 71 cm (19 to 28 inches). Reddish brown (2.5YR 4/4) clay; weak coarse prismatic structure parting to moderate fine angular blocks; very firm, plastic, sticky; few pinkish gray (5YR 7/2 and 6/2) soft lime segregations less than 10 mm in diameter; clay films prominent on pressure faces along vertical cracks and old root channels; few sedge roots; strong effervescence; gradual wavy boundary.

C2ca 19869 71 to 97 cm (28 to 38 inches). Reddish brown (2.5YR 4/4 to 5/4) clay; moderate fine angular blocky structure; very firm, plastic, sticky; prominent slickensides with thick clay films on pressure faces; few pinkish gray (5YR 6/2) soft lime segregations less than 10 mm in diameter; some lime coatings with a greenish cast along old root channels and vertical cleavage planes; few sedge roots; strong effervescence; gradual wavy boundary.

C3 19870 97 to 127 cm (38 to 50 inches). Reddish brown (2.5YR to 5YR 4/4) clay; moderate coarse subangular blocky structure parting to moderate fine angular blocks; very firm, plastic, sticky; slickensides with thick clay films are prominent; some lime coatings with greenish gray (5G 5/1) colors are on the slickenside faces; strong effervescence.

Remarks: This profile is in a very fine family. Sand content is low and clay content is high. At time of sampling, a perched water table existed at the bottom of the B3 horizon and the entire solum above was saturated.

Soil temperatures:

Depth (inches)	Temperature
20	10° C.
30	8° C.
40	8° C.

SOIL Bergland SOIL Nos. S64WI-16-4 LOCATION Douglas County, Wisconsin

SOIL SURVEY LABORATORY Lincoln, Nebraska LAB. Nos. 19871-19879 June, 1968

GENERAL METHODS: 1A, 1B1b, 2A1, 2B

Depth (In.)	Horizon	Size class and particle diameter (mm) 3A1 — Total: Sand (2-0.05) a	Total: Silt (0.05-0.002)	Total: Clay (< 0.002)	Sand: Very coarse (2-1)	Sand: Coarse (1-0.5)	Sand: Medium (0.5-0.25)	Sand: Fine (0.25-0.1)	Sand: Very fine (0.1-0.05)	Silt: 0.05-0.02	Silt: Int. III (0.02-0.002)	Int. II (0.2-0.02)	(2-0.1)	<0.074	0.005-0.002	Coarse fragments 2A2: 3B2 Vol. 19-2	3B1 Wt. 19-2	
		Pct. of < 2 mm														Pct. of <19		
1-0	O1															-	-	
0-4	A1	0.9	31.9	67.2	0.1	0.1	0.1	0.4	0.2	4.1	27.8	4.6	0.7	99.2	11.9	-	-	
4-8	B1g	5.8	33.3	60.9	0.3	0.9	0.8	2.4	1.4	4.2	29.1	7.0	4.4		14.0	-	-	
8-12	B21g	1.1	24.7	74.2	tr	0.2	0.3	0.4	0.2	1.7	23.0	2.1	0.9	99.0		-	-	
12-19	B22	0.7	32.4	66.9	-	0.1	0.2	0.2	0.2	0.7	31.7	1.0	0.5	99.4		-	-	
19-24	B3	0.5	34.9	64.6	tr	tr	0.1	0.2	0.2	1.3	33.6	1.6	0.3	99.6		-	-	
24-34	C1ca	1.2	32.1	66.7	0.6	0.3	0.1	0.2	-	0.4	31.7	0.5	1.2	98.8	20.1	-	-	
34-48	C2ca	0.8	30.3	68.9	0.1	0.2	0.1	0.2	0.2	1.1	29.2	1.4	0.6	99.3	24.0	-	-	
48-60	C3	0.5	20.0	79.5	0.1	0.1	0.1	0.1	0.1	1.4	18.6	1.6	0.4	99.5		-	-	

Depth (In.)	6A1a Organic carbon Pct	6B1a Nitrogen Pct.	C/N	Carbonate as $CaCO_3$: 6E1b 6E2a <2mm. Pct.	3A1a <0.002 mm. Pct	3A1a Non-Carbonate Clay Pct.	Bulk density: 4A1a Field-State g/cc	4A1d 1/3-Bar g/cc	4A1b Air-Dry g/cc	4D1 COLE	Water content: 4B4 Field-State Pct.	4B1c 1/3-Bar Pct.	4B2 15-Bar Pct.	4C1 1/3-to 15-Bar in./in.	3A1b Fine Clay <0.0002 mm. Pct.	pH: 8C1b Sat. Paste		8C1a (1:1)
1-0	16.7	1.057	16										39.6					
0-4	9.58	0.643	15			67							30.7					5.3
4-8	2.55					61							21.6			4.5		5.7
8-12	0.33			tr(s)		74							22.8		29.2			7.0
12-19	0.18			tr(s)		67	1.30	1.33	1.70	0.087	35.9	30.8	22.0	0.12				7.3
19-24	0.16			7	-	65	1.34	1.35	1.62	0.064	32.7	29.5	21.7	0.11				7.9
24-34	0.14			15	7	60	1.42	1.41	1.65	0.056	30.9	29.0	22.8	0.09				8.2
34-48	0.12			16	9	69	1.39	1.38	1.64	0.059	33.7	31.7	22.2	0.13		7.6		8.2
48-60	0.15			15	5	75	1.34	1.31	1.62	0.073	35.8	34.4	24.8	0.13				8.2

Depth (In.)	Extractable bases 5B1a: 6N4b Ca	6O4b Mg	6P2a Na	6Q2a K	Sum	6H1a Ext. Acidity	Cat. Exch. Cap.: 5A3a Sum Cations	5A1a NH_4OAc	6G1d KCl-Ext. Al	6C2a Ext. Iron as Fe Pct.		8E1 Resistivity ohms-cm.	8B1a Elec. Cond. mmhos/cm.	8B Water at Sat. Pct.	8D5 Est. Total Salt in Soil mm.	8D3 Ca/Mg	Base saturation: 5C3 Sum Cations Pct.	5C1 NH_4OAc CEC Pct.
	mea/100 g																	
1-0																		
0-4	20.0b	12.4c	0.2	0.8	33.4	38.5	71.9	46.8	0.4	1.1						1.6	46	71
4-8	18.3b	13.6c	0.2	0.6	32.7	15.8	48.5	35.1		2.7		2,500	0.37	57.4	240	1.3	67	93
8-12	21.2b	18.7c	0.4	0.8	41.1	5.9	47.0	38.4		1.9						1.1	87	107
12-19	17.8	16.8	0.4	0.6	35.6	3.6	39.2	34.1		1.7						1.1	91	104
19-24	18.0	14.6	0.4	0.6	33.6			30.2		1.7						1.2		
24-34	17.0	12.5	0.4	0.5	30.4			25.9		1.5						1.4		
34-48	15.1	11.8	0.4	0.6	27.9			23.7		1.4		2,000	0.45	60.0	290	1.3		
48-60	15.6	12.3	0.4	0.8	29.1			24.0		1.6						1.3		

Depth (In.)	Ratios to Clay 8D2: NH_4OAc CEC	Ext. Iron	15-Bar Water
1-0			
0-4	0.70	0.02	0.46
4-8	0.58	0.04	0.35
8-12	0.51	0.03	0.31
12-19	0.51	0.03	0.33
19-24	0.46	0.03	0.34
24-34	0.43	0.02	0.38
34-48	0.34	0.02	0.32
48-60	0.32	0.02	0.33

a. Fe-Mn nodules comprise a major portion of the sands above 19 inches. Carbonate comprises a major portion of the sands below 19 inches.
b. NH_4OAc extraction (Method 6N2a).
c. NH_4OAc extraction (Method 6O2a).

Soil classification: Aeric Haplaquept; very-fine, mixed, nonacid, frigid.
Soil: Bergland.
Soil No.: S64WI-16-4
Location: Douglas County, Wisconsin; NW¼, NE¼, Sec. 25, T. 48 N., R. 14 W; 400 feet east and 400 feet south of junction of county roads A and C.
Climate: Humid continental; mean annual temperature is about 41° F; mean annual precipitation ranges from 26 to 30 inches; and frost-free season is about 109 days.
Vegetation and land use: Native vegetation was mixed spruce-pine forest. Much of this soil has been logged and is in second growth aspen, tag alder, and willow brush. Small areas have been cleared for general livestock farming.
Parent material: Calcareous clay lacustrine or glacial till.
Physiography: Slight depressions and drainageways on gently undulating lacustrine or till plain.
Topography: Site is in a slightly depressed area on a 1 percent concave slope.
Drainage: Poorly drained.
Ground water: A perched water table exists at or near the surface for several months in most years.
Erosion: Slight.
Permeability: Very slow.
Described by: A.J. Klingelhoets, August 26, 1964.

(Colors are for moist soils unless otherwise stated)

O1 19871 3 to 0 cm (1 to 0 inch). Very dark brown (10YR 2/2) organic mat of fine roots, sedge leaves and stems, and leaf litter; slightly acid.

A1 19872 0 to 10 cm (0 to 4 inches. Very dark gray (2.5Y N3/) silty clay; moderate fine granular structure; friable; very high in organic matter content; many fine roots; slightly acid; clear wavy boundary.

B1g 19873 10 to 20 cm (4 to 8 inches). Very dark gray to dark gray (5Y 3/1 to 4/1) clay; moderate fine angular blocky structure; very firm, plastic, sticky; few fine prominent mottles of strong brown (7.5YR 5/6); thin patchy clay films; roots common; slightly acid; gradual irregular boundary.

B21g 19874 20 to 30 cm (8 to 12 inches). Reddish brown (5YR 4/4) clay; weak coarse prismatic structure parting to strong very fine angular blocks; very firm, plastic, sticky; many fine distinct mottles of strong brown and brown (7.5YR 5/6 and 5/2); few dark gray and very dark gray (5Y 4/1 and 3/1) tongues, less than 10 mm in width at the top, extend through this horizon; thin continuous clay films; roots common; mildly alkaline; gradual wavy boundary.

B22 19875 30 to 48 cm (12 to 19 inches). Reddish brown (2.5YR 4/4) clay; weak coarse prismatic structure parting to strong very fine angular blocks; very firm, plastic, sticky; few fine distinct mottles of strong brown (7.5YR 5/6); thin continuous clay films; roots common; mildly alkaline; clear wavy boundary.

B3 19876 48 to 61 cm (19 to 24 inches). Reddish brown (2.5YR 4/4) clay; weak coarse prismatic structure parting to moderate very fine angular blocks; very firm, plastic, sticky; few patchy dusky red (2.5YR 3/2) organic stains on vertical faces of peds along structural cracks; thin continuous clay films; roots common; mildly alkaline; clear wavy boundary.

C1ca 19877 61 to 86 cm (24 to 34 inches). Reddish brown (2.5YR 4/4) clay; weak coarse prismatic structure parting to moderate fine angular blocks; very firm, plastic, sticky; many light reddish brown (5YR 6/3) soft lime segregations less than 10 mm in diameter; few hard lime concretions less than 2 mm in diameter; few dusky red (2.5YR 3/2) organic stains along large vertical structural cracks; thin continuous clay films; few sedge roots; strong effervescence; gradual irregular boundary.

C2ca 19878 86 to 122 cm (34 to 48 inches). Reddish brown (2.5YR 4/4) clay; moderate fine angular blocky structure; very firm, plastic, sticky; prominent slickensides with thick clay flows on pressure faces; many pinkish gray (5YR 6/2) soft lime segregations less than 10 mm in diameter; few dark reddish brown (5YR 2/2) mottles or organic spots less than 2 mm in diameter; some lime coatings with greenish gray (5G 5/1) colors occur on the slickenside faces; few sedge roots and old root channels; strong effervescence; clear wavy boundary.

C3 19879 122 to 152 cm (48 to 60 inches). Reddish brown (2.5YR 4/4) clay; moderate coarse subangular blocky structure parting to moderate fine angular blocks; very firm, plastic, sticky; slickensides with thick clay films are prominent; greenish gray (5G 5/1) lime coatings occur on some of the slickenside faces; strong effervescence.

Remarks: This profile is in a very fine family. Sand content is low and clay content is high. At time of sampling a perched water table existed at the bottom of the B3 horizon and the entire solum above was saturated.

Soil temperatures:

Depth (inches)	Temperature
20	11° C.
30	10° C.
40	10° C.

SOIL CLASSIFICATION-TERRIC BOROSAPRIST
LOAMY, MIXED, DYSIC
SERIES - - - - - - -BESEMAN

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE, MTSC
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

SOIL NO - - - - - - S74WI-67-1 COUNTY - - - LANGLADE

GENERAL METHODS- - -1A,1B1B,2A1,2B SAMPLE NOS. 74L835-74L840

DEPTH CM	HORIZON	PARTICLE SIZE ANALYSIS, LT 2MM, 3A1, 3A1A, 3A1B (PCT LT 2MM) SAND 2-.05	SILT .05-.002	CLAY LT .002	FINE CLAY LT .0002	SAND VCOS 2-1	SAND CORS 1-.5	SAND MEDS .5-.25	SAND FNES .25-.10	SAND VFNS .10-.05	SILT COSI .05-.02	SILT FNSI .02-.002	SILT VFSI .005-.002	SAND 2-.10	INTR II .2-.02	FINE CLAY TO CLAY	NON-CO3-CLAY PCT	RATIO 8D1 15-BAR TO CLAY
000-010	O11																	
010-020	CI2																	
020-051	CE1																	
051-089	CE2																	
089-104	2C1	8.2	84.6	7.2		.0	.3	1.2	2.3	4.4	40.6	44.0		3.8				.97
104-140	2C26	11.7	73.3	15.0		.0	.7	2.0	2.8	6.2	39.2	34.1		5.5				.88

DEPTH CM	(PARTICLE SIZE ANALYSIS, MM, 3B, 3B1, 3B2) VGL. GT 2 PCT	GT 75 PCT	WEIGHT 75-20 (PCT LT 75)	20-5	5-2	LT .074	20-2 PCT LT20	(BULK DENSITY) 4A1D 1/3-BAR G/CC	4A1H OVEN DRY G/CC	4D1 COLE	(WATER CONTENT) 4B1C 1/10 BAR PCT	4B1C 1/3-BAR PCT	4B2A 15-BAR PCT	4C1 WRD CM/CM	CARBONATE 6E1B LT 2 PCT	3A1A LT .002 PCT	(PH) 8C1A 1/1 H2O	8C1E 1/2 CACL
000-010	0	0	0	0	0		0						133					
010-020	0	0	0	0	0		0						112				3.4	2.8
020-051	TR	0	0	0	TR		TR	.19	.47		441	372	122	.61			3.6	2.8
051-089	TR	0	0	0	TR		TR	.21	.56		538	475	111	.90			3.8	3.0
089-104	TR	0	0	0	TR		TR						7.0				4.1	3.7
104-140	TR	0	0	0	TR		TR						13.2				4.0	3.3

DEPTH CM	(ORGANIC MATTER) 6A1A ORGN CARB PCT	6B1A NITG PCT	C/N	IRON 6C2B EXT FE PCT	PHOS TOTL PCT	(EXTRACTABLE BASES 5B4A) 6N2E CA	6O2D MG	6P2B NA	6Q2B K	SUM EXTB	ACTY 6H1A BACL TEA	AL 6G1E KCL EXT	(CAT EXCH) 5A3A EXTB ACTY	5A6A NHAC	RATIO 8D1 NHAC TO CLAY	RATIO 8D3 CA TO MG	CA 5F1 SAT NHAC PCT	(BASE SAT) 5C3 EXTB ACTY PCT	5C1 NHAC PCT
						(MEQ / 100 G)													
000-010	53.7	1.10	49			9.1	3.5	.9	2.6	16.1	116		132	105		2.6	9	12	15
010-020	50.8	1.59	32			7.8	2.3	.2	.6	10.9	118		129	91.8		3.4	8	8	12
020-051	47.4	2.26	21			3.4	1.0	.1	.1	4.6	157		162	96.8		3.4	4	3	5
051-089	52.6	2.58	20			1.7	.5	.2	.0	2.4	160		162	104		3.4	2	1	2
089-104	1.60	.085	19			.2	.1	.1	.1	.5	22		22.5	12.8		2.0	2	2	4
104-140	.37	.025	15			1.6	.7	.1	TR	2.4	11.9		14.3	12.0		2.3	13	17	20

DEPTH CM	(SATURATED PASTE) 8E1 REST OHM-CM	8C1B PH	8A H2O PCT	NA 5D2 ESP PCT	NA 5E SAR	SALT 8D5 TOTL SOLU PPM	GYP 6F1A PCT	(SATURATION EXTRACT 8A1) 8A1A EC MMHOS/CM	6N1B CA (MEQ / LITER)	6O1B MG	6P1B NA	6Q1B K	6I1A CO3	6J1A HCO3	6K1A CL	6L1A SO4	6M1A NO3	ATTERBERG 4F1 LQID LMIT PCT	4F2 PLST INDX
000-010	7400	3.3	1020			650		.21	.2	.2	.2	.4	0	7.6	.2	.7	.0		
010-020	9300	3.2	1020			330		.17	.2	.1	.1	.1	0	4.9	.0	.0	.0		
020-051	8500	3.3	741			50		.12	.1	TR	TR	.0	0	2.7	.0	.1	.0		
051-089	11000	3.8	878					.12	TR	.0	TR	.0	0	2.4	.2	.0	.0		
089-104	70000	4.4	49					.04	TR	TR	.1	TR	0	2.1	.0	.7	.0		
104-140	18000	3.7	43					.02	TR	TR	TR	.0	0	1.8	.0	.9	.0		

DEPTH CM	8F MINL CONT PCT	(STATE OF DECOMPOSITION) 8G (FIBER VOL) UNRB PCT	RUB PCT	8H PYROPHOSPHT SOLUBILITY (MUNS COLOR)	PH 8C1E .01M CACL	(BULK DEN) 4A3A FILD STAT G/CC	4A1I 1/3B REWT G/CC	COLE 4D1 RE-WET	SUBS RES-IDUE PCT	(WATER CONTENT) 4B4 FILD STAT PCT	4B1C 1/3B REWT PCT	4B2 15-BAR PCT	4C1 WRD CM/CM
000-010		88	65	10YR 7/4	2.7							133	
010-020		64	43	7.5YR 6/4	2.9							83.9	
020-051	7	70	4	7.5YR 4/2	2.9	.18			93	503		72.7	
051-089	6	52	7	7.5YR 4/4	3.3	.16			84	508		68.1	
089-104												5.1	
104-140												7.7	

Soil classification: Terric Borosaprist; loamy, mixed, dysic.
Series: Beseman (sampled for Merwin but fiber content when rubbed was too low).
Pedon No.: S74WI-67-1.
Location: Langlade County, Wisconsin; SW¼, SE¼, Sec. 18, T. 33 N., R. 11 E.; 280 feet north of town road and 1,000 feet east of Hwy. B. About 45.2 deg. north latitude and about 89.0 deg. west longitude.
Climate: Humid continental. Mean annual temperature is 42.2° F; mean July temperature is 68.5° F; the mean January temperature is 13.8° F. Mean annual precipitation is 29.86 inches with nearly 2/3 of this during the growing season. Total annual snowfall is 48 inches. The frost-free season is 138 days at Antigo but less on the organic soil areas.
Parent material: Organic soil material derived primarily from grasses, reeds, and sedges over silty deposits of lacustrine or loess derivation.
Physiography: Shallow depression in a large glacial outwash plain; area is nearly level and local relief is less than 5 feet. Elevation is about 1,550 feet.
Vegetation: Overstory of black spruce and tamarack; understory of Labrador-tea, leatherleaf, cranberry, blueberry, sphagnum moss.
Size of area: Approximately 300 acres.
Distance to adjacent mineral soils: 150 feet to the east.
Depth to water table: Perched water table in upper 10 inches; ground water table at 30 inches.
Microrelief: Low hummocks of 6 to 18 inches over entire area.
Subsidence: Slight; some areas appear to have been burned, leaving shallow pits less than 1 foot in depth.
Soil temperature: Measured soil temperature of 7.5° C. at 50 cm.
Described and sampled by: G.W. Hudelson, A.J. Klingelhoets, G.B. Lee, Warren Lynn, W.E. McKinzie, R. Newbury, and S. Payne on August 6, 1974. Samples were obtained from a pit dug with a spade.

Mat of living sphagnum with many live roots of ground cover species about 5 cm thick. (Not sampled)

Oi1 74L835 0 to 10 cm. Dark brown (10YR 4/3) broken face fibric material, yellowish brown (10YR 5/4) rubbed, and very pale brown (10YR 7/3) pressed; fiber content about 80 percent undisturbed, 35 percent rubbed; matted structure; friable; sphagnum fiber with a small percent (less than 15 percent) of herbaceous material; many fine roots; less than 5 percent mineral material; pH 4.0 (Truog); clear smooth boundary.

Oi2 74L836 10 to 20 cm. Dark grayish brown (10YR 4/2) broken face, hemic material, very dark grayish brown (10YR 3/2) rubbed, and grayish brown (10YR 5/2) pressed; about 65 percent fibers undisturbed, about 25 percent rubbed; very weak coarse platy to matted structure; very friable; mixed herbaceous and moss fibers; many fine roots; about 15 percent mineral material; pH 4.2 (Truog); clear wavy boundary.

Oe1 74L837 20 to 51 cm. Very dark brown (10YR 2/2) broken face sapric material, dark brown (7.5YR 3/2) rubbed and pressed; about 70 percent fibers undisturbed, about 12 percent rubbed; weak fine and medium subangular blocky structure; very friable; dominantly herbaceous material; few sedge and shrub roots; about 25 percent mineral material; a 2-inch layer of woody material occurs at about 50 cm depth, wood fragments are dark brown (7.5YR 4/4) and appear to be dominantly tamarack and spruce remains; pH 4.2 (Truog); gradual wavy boundary.

Oe2 74L838 51 to 89 cm. Dark brown (7.5YR 3/2) broken face, rubbed and pressed sapric material; about 50 percent fibers, about 10 percent rubbed; weak fine and medium subangular blocky structure; very friable; dominantly herbaceous material with 25 percent mineral material; few sedge roots; pH 4.2 (Truog); clear wavy boundary.

IIC1 74L839 89 to 104 cm. Olive gray (5Y 5/2) silts; massive; friable; pH 4.5 (Truog); gradual irregular boundary.

IIC2g 74L840 104 to 140 cm. Greenish gray (5GY 6/1) silt loam; massive; friable; pH 5.0 (Truog).

Remarks: Except for logging off the original forest and some use of the area for logging operations, this site appears to be in its natural state. There is some evidence of burning in the past and a good possibility that the sphagnum surface developed following the logging and fires in the '30s.

SOIL CLASSIFICATION-TYPIC OCHRAQUALF
COARSE-LOAMY, MIXED, FRIGID
SERIES - - - - - - -CARLF TAXADJUNCT

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE, NTSC
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

SOIL NO - - - - - - S72NI-21-4 COUNTY - - - FOREST

GENERAL METHODS- - -1A,1B1B,2A1,2B SAMPLE NOS. 72L835-72L842

DEPTH CM	HORIZON	PARTICLE SIZE ANALYSIS, LT 2MM, 3A1, 3A1A, 3A1B (PCT LT 2MM) SAND 2-.05	SILT .05-.002	CLAY LT .002	FINE CLAY LT .0002	SAND VCOS 2-1	CORS 1-.5	MEDS .5-.25	FNES .25-.10	VFNS .10-.05	SILT COSI .05-.02	FNSI .02-.002	VFSI .005-.002	SAND 2-.10	INTR SAND .2-.02	FINE CLAY TO CLAY	NON-CO3-CLAY	RATIO 8D1 15-BAR TO CLAY
015-0	01																	
000-26	A2	75.0	21.8	3.2	.2	5.3	12.5	18.8	27.6	10.8	12.3	9.5		64.2	36.5	6		1.2
026-40	B21G	53.2	40.0	6.8	2.1	2.6	8.1	12.4	20.0	10.1	17.3	22.7		43.1	37.6	31		.37
040-59	B22tg	68.0	17.3	14.7	9.4	3.5	8.8	16.9	26.8	12.0	9.9	7.4		56.0	35.1	64		.40
059-87	B23tg	69.9	19.7	10.4	6.2	2.3	9.4	19.2	27.3	11.7	11.8	7.9		58.2	36.4	60		.41
087-117	B3G	72.2	19.5	8.3	4.7	5.0	12.0	19.3	24.9	11.0	11.2	8.3		61.2	33.8	57		.41
117-147	C1G	60.3	34.3	5.4	3.1	5.2	10.1	13.9	17.7	13.4	18.8	15.5		46.9	40.6	57		.35
147-175	C2	76.6	15.9	7.5	2.8	6.3	15.3	21.6	23.9	9.5	8.4	7.5		67.1	28.1	37		.28

DEPTH CM	(PARTICLE SIZE ANALYSIS, MM, 3B, 3B1, 3B2) VOL. GT 2 PCT	WEIGHT GT 75 PCT	75-20	20-5	5-2	LT .074	20-2 PCT LT20	(BULK DENSITY) 4A1D 1/3-BAR G/CC	4A1H OVEN DRY G/CC	4D1 COLE	(WATER CONTENT) 4B1C 1/10 BAR PCT	4B1C 1/3-BAR PCT	4B2 15-BAR PCT	4C1 WRD CM/CM	CARBONATE 6E1B LT 2 PCT	3A1A LT .002 PCT	(PH) 8C1A 1/1 H2O	8C1E 1/2 CACL
015-0	0	0	0	0	0		0										3.7	3.3
000-26	5	0	TR	3	4	28	7	1.10A					3.7				5.4	4.6
026-40	2	0	TR	TR	3	50	3	1.86	1.89	.005	16.1	15.0	2.5	.23	7.0B		6.4	5.6
040-59	5	0	TR	2	5	35	7	1.87	1.94	.012	15.7	14.2	5.9	.15	2.8B		7.0	6.3
059-87	6	0	TR	2	6	33	8	1.85	1.90	.008	16.2	14.1	4.3	.17	1.9B		6.9	6.3
087-117	8	0	TR	4	7	30	11	1.91	1.95	.006	14.6	11.8	3.4	.15	2.1B		7.2	6.5
117-147	10	TR	5	4	5	40	10	1.90A					1.9				7.7	7.1
147-175	15	TR	5	11	7	22	20	1.90A					2.1				7.7	6.9

DEPTH CM	(ORGANIC MATTER) 6A1A ORGN CARB PCT	6B1A NITG PCT	C/N	IRON 6C2B EXT FE PCT	PHOS TOTL PCT	(EXTRACTABLE BASES 5B4A) 6N2B CA (MEQ / 100 G)	6O2D MG	6P2B NA	6Q2B K	SUM NXTB	ACTY 6H1A BACL TEA	AL 6G1E KCL EXT	(CAT EXCH) 5A3A EXTB ACTY	5A6A NHAC	RATIO 8D1 NHAC TO CLAY	RATIO 8D3 CA TO NHAC	CA 5F1 SAT NHAC PCT	(BASE SAT) 5C3 EXTB ACTY PCT	5C1 NHAC PCT
015-0	41.4	1.22	34																
000-26	1.02	.047	22	.3		2.3	1.0	.1	.1	3.5	5.8	.5	9.3	6.9	2.2	2.3	33	38	51
026-40	.12	.006		.7		2.1	1.0	.1	.1	3.3	2.2		5.5	3.8	.56	2.1	55	60	87
040-59	.08	.012		.8		6.0	3.4	.1	.2	9.7	2.4		12.1	9.4	.64	1.8	64	80	103
059-87	.07			.7		4.5	2.4	.1	.2	7.2	1.6		8.8	6.8	.65	1.9	66	82	106
087-117	.04			1.0		4.0	2.0	.1	.2	6.3	1.3		7.6	5.9	.71	2.0	68	83	107
117-147	.04			.6		4.3	2.5	.1	.1	7.0	.9		7.9	3.9	.72	1.7	110	89	179
147-175	.01			.5		2.9	1.7	.1	.1	4.8	.7		5.5	2.5	.33	1.7	116	87	192

DEPTH CM	(SATURATED PASTE) 8E1 REST OHM-CM	8C1B PH	8A H2O PCT	NA 5D2 ESP PCT	NA 5E SAR	SALT 8D5 TOTL SOLU PPM	GYP 6F1A PCT	(SATURATION EXTRACT 8A1) 8A1A EC MMHOS/CM	6N1B CA (MEQ / LITER)	6O1B MG	6P1B NA	6Q1B K	6I1A CO3	6J1A HCO3	6K1A CL	6L1A SO4	6M1A NO3	ATTERBERG 4F1 LQID LMIT PCT	4F2 PLST INDX
015-0																			
000-26																			
026-40																			
040-59																			
059-87																			
087-117	6300	6.9	18.2					.30											
117-147																			
147-175																			

(A) ESTIMATED.
(B) MICRO-PENETRATION RESISITANCE. A ROD 0.6 CM IN DIAMETER IS SLOWLY PUSHED INTO BULK DENSITY CLOD, EQUILIBRATED AT 0.1-BAR, A DISTANCE OF 0.6 CM USING A POCKET PENETROMETER. UNITS ARE FORCE (KG) AND NOT ESTIMATES OF UNCONFINED COMPRESSIVE STRENGTH.

Soil classification: Typic Ochraqualf; coarse-loamy, mixed, frigid.
Soil: Cable taxadjunct*.
Soil No.: S72WI-21-4 (LSL Nos. 72L835-72L842).
Location: Forest County, Wisconsin; NW¼, SW¼, Sec. 32, T. 38 N., R. 12 E.; in Argonne Experimental Forest near State Highway 32.
Climate: Humid continental; mean annual temperature is about 40° to 45° F; mean annual precipitation is about 30 inches; and frost-free season is about 130 days.
Vegetation and land use: Native vegetation was primarily deciduous forests, with elm and ash predominating. Most of this soil is in forest. Small areas are used for pasture. When drained, small grain and hay are grown.
Parent material: Sandy loam glacial till.
Physiography: Depressional areas in glacial ground moraine.
Topography: Site is on a 1 percent slope in a depressional area.
Drainage: Poorly drained.
Ground water: Near the surface during wet seasons.
Erosion: Slight.
Permeability: Moderate.
Described by: Steve Payne and Robert Fox.
Sampled by: Robert H. Jordan and Robert L. Juve, September 18, 1972
(Colors are for moist soil unless otherwise stated)

O1 72L835 15 to 0 cm (6 to 0 inches). Black (5YR 2/1) organic matter; many roots; the horizon is hemic to fibric in nature; strongly acid; abrupt boundary.

A2 72L836 0 to 26 cm (0 to 10 inches). Dark grayish brown (10YR 4/2) light sandy loam; weak medium subangular blocky structure; very friable; this horizon is a mixture of 10YR 4/2 and 10YR 3/2; roots common; few medium size gravel; thickness of the horizon ranges to about 32 cm in some places; strongly acid; clear wavy boundary.

B21g 72L837 26 to 40 cm (10 to 16 inches). Grayish brown (10YR 5/2) sandy loam with many coarse prominent mottles of strong brown (7.5YR 5/6); weak fine platy structure; firm, brittle, weakly cemented; few fine gravel; slightly acid; clear wavy boundary.

B22tg 72L838 40 to 59 cm (16 to 23 inches). Dark grayish brown (10YR 4/2) sandy loam with many fine faint mottles of brown (10YR 5/3); weak medium platy structure parting to weak fine subangular blocky structure; firm, brittle, weakly cemented; no roots; wide range of thickness of this horizon; neutral; clear wavy boundary.

B23tg 72L839 59 to 87 cm (23 to 35 inches). Dark grayish brown (10YR 4/2) heavy sandy loam with common medium faint mottles of brown (10YR 5/3) and distinct mottles of dark yellowish brown (10YR 4/4); weak medium subangular blocky structure; friable; neutral; gradual wavy boundary.

B3g 72L840 87 to 117 cm (35 to 47 inches). Dark gray (10YR 4/1) sandy loam with common fine prominent mottles of reddish brown (5YR 4/4) and faint mottles of brown (7.5YR 4/2); weak medium subangular blocky structure; friable; neutral; gradual boundary.

C1g 72L841 117 to 147 cm (47 to 59 inches). Brown (7.5YR 4/2) sandy loam with many fine faint mottles of grayish brown (10YR 5/2); massive; friable; about 5 percent medium gravel; mildly alkaline; gradual boundary.

C2 72L842 147 to 175 cm (59 to 70 inches). Reddish brown (5YR 4/3) sandy loam; massive; friable; few dark pebbles about 3 mm in diameter; about 5 percent medium gravel; few cobblestones; mildly alkaline.

Remarks: In September 1972, the ground water was at less than 20 cm depth. A few stones are on the surface in the area samples.

*This pedon has an argillic horizon; therefore, it is a taxadjunct to the Cable series.

SOIL CLASSIFICATION-TYPIC GLOSSOBORALF
FINE-SILTY,MIXED
SERIES - - - - - - -CAMPIA

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LINCOLN, NEBRASKA

SOIL NO - - - - - - S75WI-95-8 COUNTY - - - POLK

GENERAL METHODS- - -1A,1B1B,2A1,2B SAMPLE NOS. 760225-760232

DEPTH	HORIZON	(- - - PARTICLE SIZE ANALYSIS, LT 2MM, 3A1, 3A1A, 3A1B																)RATIO
					FINE	(- - SAND					)(- - SILT	- -)			INTR	FINE	NON-	8D1
		SAND 2- .05	SILT .05- .002	CLAY LT .002	CLAY LT .0002	VCOS 2- 1	CORS 1- .5	MEDS .5- .25	FNES .25- .10	VFNS .10- .05	COSI .05 .02	FNSI .02 .002	VFSI .005- .002	SAND 2- .10	II .2- .02	CLAY TO CLAY	CO3- CLAY	15- BAR TO
CM		(- - - PCT LT 2MM													- - -)	PCT	PCT	CLAY
000-020	AP	18.5	73.2	8.3	.7	.1	1.0	1.9	2.8	12.7	43.0	30.2		5.8	57.2	8		.87
020-028	A2	15.7	75.4	8.9	2.1	.1	.5	1.1	1.7	12.3	44.7	30.7		3.4	58.0	24		.37
028-036	A&B	14.5	65.5	20.0	8.4	.1	.3	.6	1.2	12.3	39.5	26.0		2.2	52.5	42		.40
036-061	B&A1	12.8	65.2	22.0	9.3	.1	.2	.3	1.1	11.1	40.2	25.0		1.7	52.0	42		.41
061-081	B&A2	12.8	67.7	19.5	8.6	.0	.1	.3	.9	11.5	43.3	24.4		1.3	55.4	44		.44
081-099	B3	14.1	66.3	19.6	8.6	.0	.1	.1	.9	13.0	41.9	24.4		1.1	55.7	44		.44
099-119	C1	15.2	65.7	19.1	8.5	TR	.3	.6	1.4	12.9	39.3	26.4		2.3	53.1	45		.44
119-152	C2	13.1	67.6	19.3	8.7	.1	.3	.5	1.3	10.9	40.9	26.7		2.2	52.8	45		.43

DEPTH	(PARTICLE SIZE ANALYSIS, MM, 3B, 3B1, 3B2)							(BULK DENSITY		)	(- - -WATER CONTENT- - -)				CARBONATE		(- -PH - -)	
	VOL.	(- - WEIGHT - - -)						4A1D	4A1H	4D1	4B1C	4B1C	4B2	4C1	6E1B	3A1A	8C1A	8C1E
	GT 2	GT 75	75-20	20-5	5-2	LT .074	20-2 PCT	1/3- BAR	OVEN DRY	COLE	1/10 BAR	1/3- BAR	15- BAR	WRD CM/	LT 2	LT .002	1/1 H2O	1/2 CACL
CM	PCT	PCT	(- - - PCT LT 75			- - -)	LT20	G/CC	G/CC		PCT	PCT	PCT	CM	PCT	PCT		
000-020	0	0	0	0	0	92	0	1.36	1.41	.012		27.4	7.2	.27			6.7	6.1
020-028	0	0	0	0	0	95	0	1.65	1.66	.002		16.4	3.3	.22			6.6	6.2
028-036	0	0	0	0	0	96	0	1.60A					7.9				6.3	5.9
036-061	0	0	0	0	0	97	0	1.58	1.66	.017		22.0	9.0	.21			5.1	4.6
061-081	0	0	0	0	0	97	0	1.50	1.56	.013		22.0	8.6	.20			5.0	4.6
081-099	0	0	0	0	0	97	0	1.50A					8.6				5.1	4.6
099-119	TR	0	0	0	TR	96	TR	1.50	1.57	.016		22.4	8.4	.21			5.2	4.6
119-152	0	0	0	0	0	96	0	1.50A					8.3				5.2	4.7

DEPTH	(ORGANIC MATTER	)		IRON	PHOS	(- -EXTRACTABLE BASES 5B4A- -)					ACTY	AL	(CAT EXCH)		RATIO	RATIO	CA	(BASE SAT)	
	6A1A	6B1A	C/N	6C2B		6N2E	6O2D	6P2B	6Q2B		6H1A	6G1E	5A3A	5A6A	8D1	8D3	5F1	5C3	5C1
	ORGN CARB	NITG		EXT FE	TOTL	CA	MG	NA	K	SUM EXTB	BACL TEA	KCL EXT	EXTB ACTY	NHAC	NHAC TO	CA TO	SAT NHAC	EXTB ACTY	NHAC
CM	PCT	PCT		PCT	PCT	(- - -			-MEQ	/ 100	G- - -			- - -)	CLAY	MG	PCT	PCT	PCT
000-020	1.91	.166	12			8.5	3.1	.1	.1	11.8	4.4		16.2	12.6	1.52	2.7	67	73	94
020-028	.23	.028	8			3.7	1.6	TR	TR	5.3	2.7		8.0	5.8	.65	2.3	64	66	91
028-036	.25	.037	7			7.2	2.5	.1	.2	10.0	5.1		15.1	11.4	.57	2.9	63	66	88
036-061	.21					7.2	2.4	.1	.2	9.9	8.0	.7	17.9	14.0	.64	3.0	51	55	71
061-081	.17					7.4	2.6	.1	.2	10.3	7.4	.7	17.7	14.4	.74	2.8	51	58	72
081-099	.17					7.7	2.8	.1	.2	10.8	7.6	.8	18.4	14.5	.74	2.8	53	59	74
099-119	.12					7.5	2.7	.1	.2	10.5	7.1	.7	17.6	14.0	.73	2.8	54	60	75
119-152	.12					8.2	2.7	.1	.2	11.2	6.5	.6	17.7	14.4	.75	3.0	57	63	78

DEPTH	(SATURATED PASTE)			NA	NA	SALT	GYP	(- - - SATURATION EXTRACT 8A1-									- - -)	ATTERBERG	
	8E1	8C1B	8A	5D2	5E	8D5	6F1A	8A1A	6N1B	6O1B	6P1B	6Q1B	6I1A	6J1A	6K1A	6L1A	6M1A	4F1	4F2
	REST OHM-	PH	H2O	ESP	SAR	TOTL SOLU		EC MMHOS/	CA	MG	NA	K	CO3	HCO3	CL	SO4	NO3	LQID LMIT	PLST INDX
CM	CM		PCT	PCT		PPM	PCT	CM	(- - -			MEQ / LITER					- - -)	PCT	
000-020																			
020-028																			
028-036																			
036-061																		33B	12B
061-081																			
081-099																			
099-119	5500	4.2	36.9					.14								.9		30B	10B
119-152																			

CLAY MINERALOGY (7A2C).
36-61 MT2 KK2 VR2 MI1
61-81 MT2 KK2 VR1 MI1
81-99 MT3 KK2 VR1 MI1
RELATIVE AMOUNTS: (X-RAY) 5 = DOMINANT 4 = ABUNDANT 3 = MODERATE 2 = SMALL 1 = TRACE.
MINERAL CODE: MT = MONTMORILLONITE MI = MICA KK = KAOLINITE VR = VERMICULITE.
SAND MINERALOGY (7B1). PLACEMENT: MIXED.
036-61 VFNS - RE73 QZ71 FE2 TM ZR SP FD24 HN1 EP1 GN1 MS CL SO VR.
061-81 VFNS - RE76 QZ74 FE2 TM SP FD21 CL1 HN1 MS1 EP EN VR SO.
081-99 VFNS - RE79 QZ77 FE1 SP1 ZR FD18 HN1 CL1 EP1 GS MS VR GN.
RELATIVE AMOUNTS: AS PERCENT.
MINERAL CODE: CL = CHLORITE EP = EPIDOTE FD = FELDSPARS GS = GLASS HN = HORNBLENDE MS = MUSCOVITE
QZ = QUARTZ TM = TOURMALINE ZR = ZIRCON RE = RESISTANT MINERALS FE = IRON MINERALS SP = SPHENE
GN = GARNET SO = STAUROLITE VR = VERMICULITE EN = ENSTATITE.
(A) ESTIMATED.
(B) LIQUID LIMIT AND PLASTIC INDEX BY USDA-SCS, SOIL MECHANICS LAB, LINCOLN, NE.

Soil classification: Typic Glossoboralfs; fine-silty, mixed.
Soil: Campia.
Soil No: S75-WI-95-8.
Location: Polk County, Wisconsin; NE¼, SW¼, sec. 36, T. 34 N., R. 16 W.; 100 feet west of windbreak and 120 feet south of road. About 45°24' N. latitude and 92°10' W. longitude.
Climate: Humid continental; mean annual temperature is 43° F; mean July temperature is 71° F; mean January temperature is 11.8° F; mean annual precipitation is 27.5 inches with about two-thirds of this occurring during the growing season; mean annual snowfall is 41.2 inches; the growing season averages 127 days. (Data from Amery, WI., weather bureau substation.)
Vegetation and use: Native vegetation was primarily mixed northern hardwoods with some conifers. Most large areas of this soil have been cleared and are used for general farming. This site was in alfalfa hay meadow when sampled.
Parent material: Silty slack water deposits.
Physiography: Nearly level to sloping glacial lake basins.
Topography: Nearly level; site sampled was on a 2 percent plane slope.
Drainage: Well drained.
Ground water: Deep; over 5 feet.
Erosion: Slight.
Permeability: Moderate.
Described by: A.J. Klingelhoets and G. B. Lee, July 1975.

Ap 760225 0 to 20 cm (0 to 8 inches). Very dark grayish brown (10YR 3/2) silt loam; weak medium subangular blocky structure parting to moderate medium granular; friable; many roots; neutral; abrupt smooth boundary.

A2 760226 20 to 28 cm (8 to 11 inches). Brown (10YR 5/3) silt loam; moderate medium platy structure; friable; many roots; neutral; gradual irregular boundary.

A&B 760227 28 to 36 cm (11 to 14 inches). Grayish brown (10YR 5/2) silt (A2); moderate medium platy structure; friable; occupies about 55 percent of horizon as tongues 20 to 40 mm thick extending into or completely surrounding isolated remnants of dark yellowish brown (10YR 4/4) silt loam (B2t); moderate fine subangular blocky structure; friable; few thin patchy clay films on some faces of peds (B2t); many roots; slightly acid; gradual wavy boundary.

B&A1 760228 36 to 61 cm (14 to 24 inches). Dark brown heavy silt loam (B2t); moderate medium subangular blocky structure; firm; occupies about 70 percent of the horizon; thin patchy clay films on faces of peds (B2t); tongues of grayish brown (10YR 5/2) silt loam (A2) extend to bottom of horizon; weak coarse platy structure; friable; many roots; medium acid; gradual wavy boundary.

B&A2 760229 61 to 81 cm (24 to 32 inches). Dark brown (7.5YR 4/4) heavy silt loam (B2t); moderate medium subangular blocky structure; firm; occupies about 85 percent of the horizon; thin patchy clay films on faces of peds (B2t); tongues 10 to 20 mm thick of grayish brown (10YR 5/2) silt loam (A2) extend to bottom of horizon; friable; many roots; medium acid; gradual wavy boundary.

B3 760230 81 to 99 cm (32 to 39 inches). Dark brown (7.5YR 4/4) silt loam; weak coarse subangular blocky structure; friable; many roots; medium acid; gradual wavy boundary.

C1 760231 99 to 119 cm (39 to 47 inches). Dark yellowish brown (10YR 4/4) silt; many fine distinct grayish brown and yellowish brown (10YR 5/2 and 5/6) mottles; weak coarse platy structure; friable; weakly stratified; few alfalfa roots; medium acid.

C2 760232 119 to 152 cm (47 to 60 inches). Dark yellowish brown (10YR 4/4) silt; many fine distinct grayish brown and yellowish brown (10YR 5/2 and 5/6) mottles; few alfalfa roots; slightly acid.

Additional notes:

1. pH's in field determined by Truog kit.

SOIL CLASSIFICATION-TYPIC ARGIBOROLL
COARSE-LOAMY,MIXED
SERIES - - - - - - -CHETEK TAXADJUNCT

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SOIL NO - - - - - - S75WI-95-9 COUNTY - - - POLK

GENERAL METHODS- - -1A,1B1B,2A1,2B SAMPLE NOS. 760233-760238

DEPTH CM	HORIZON	SAND 2-.05	SILT .05-.002	CLAY LT .002	FINE CLAY LT .0002	VCOS 2-1	CORS 1-.5	MEDS .5-.25	FNES .25-.10	VFNS .10-.05	COSI .05-.02	FNSI .02-.002	VFSI .005-.002	SAND 2-.10	INTR II .2-.02	FINE CLAY TO CLAY PCT	NON-CO3-CLAY PCT	RATIO 8D1 15-BAR TO CLAY
		(- - - - - - - - - - - - - - - - PARTICLE SIZE ANALYSIS, LT 2MM, 3A1, 3A1A, 3A1B - - - - - - - - -)																
		(- - - - - - - - - - - - PCT LT 2MM - - - - - - - - - - - -)																
000-017	AP	62.3	31.1	6.6	1.9	5.8	20.9	20.5	10.9	4.2	18.4	12.7		58.1	25.3	29		.59
022-042	B2T	67.8	20.3	11.9	5.3	6.6	27.0	21.2	10.4	2.6	11.5	8.8		65.2	17.0	45		.40
042-053	B3	85.2	9.4	5.4	1.8	8.7	37.5	25.7	11.2	2.1	5.7	3.7		83.1	10.5	33		.39
053-087	C1	88.2	7.0	4.8	1.5	7.3	36.9	27.8	13.7	2.5	4.1	2.9		85.7	10.3	31		.44
087-135	C2	92.9	4.6	2.5	1.0	9.2	42.8	28.5	10.8	1.6	2.6	2.0		91.3	6.3	40		
135-153	C3	97.1	1.8	1.1	.7	12.4	41.5	33.1	9.7	.4	1.1	.7		96.7	3.2	64		

DEPTH CM	VOL. GT 2 PCT	GT 75 PCT	75-20	20-5	5-2	LT .074	20-2 PCT LT20	4A1D 1/3-BAR G/CC	4A1H OVEN DRY G/CC	4D1 COLE	4B1C 1/10 BAR PCT	4B1C 1/3-BAR PCT	4B2 15-BAR PCT	4C1 WRD CM/CM	6E1B LT 2 PCT	3A1A LT .002 PCT	8C1A 1/1 H2O	8C1E 1/2 CACL
	(PARTICLE SIZE ANALYSIS, MM, 3B, 3B1, 3B2)	(- - - - - - - WEIGHT - - - - - - -)	(- - - PCT LT 75 - - -)					(BULK DENSITY)			(- - - -WATER CONTENT- - - -)				CARBONATE		(- -PH - -)	
000-017	5	0	TR	2	2	39	4	1.65	1.70	.010		15.8	3.9	.19			6.3	6.0
022-042	5	0	TR	4	5	31	9	1.70	1.77	.013		13.7	4.7	.15			6.5	6.0
042-053	3	0	0	3	3	15	6	1.56A			7.0C		2.1	.08			6.6	5.9
053-087	5	C	TR	4	3	12	7	1.56B			6.2C		2.1	.06			6.4	5.6
087-135	5	0	TR	3	3	8	6	1.55A					1.5				5.8	5.0
135-153	10	0	TR	7	6	3	14	1.55B			2.4C		1.2	.02			5.8	5.2

DEPTH CM	6A1A ORGN CARB PCT	6B1A NITG PCT	C/N	6C2B EXT FE PCT	PHOS TOTL PCT	6N2E CA	6O2D MG	6P2B NA	6Q2B K	SUM EXTB	6H1A BACL TEA	6G1E KCL EXT	5A3A EXTB ACTY	5A6A NHAC	RATIO 8D1 NHAC TO CLAY	RATIO 8D3 CA TO MG	CA 5F1 SAT NHAC PCT	5C3 EXTB ACTY PCT	5C1 NHAC PCT
	(ORGANIC MATTER)			IRON		(- -EXTRACTABLE BASES 5B4A- -)					ACTY	AL	(CAT EXCH)					(BASE SAT)	
						(- - - - - - - - - - - - -MEQ / 100 G- - - - - - - - - - - -)													
000-017	1.00	.088	11				1.8	TR	.1		1.7			6.9	1.05				
022-042	.19	.020	10			5.2	2.3	TR	.1	7.6	2.5		10.1	8.2	.69	2.3	63	75	93
042-053	.10					2.6	1.0	.0	TR	3.6	1.6		5.2	3.9	.72	2.6	67	69	92
053-087	.09					2.4	1.0	.0	TR	3.4	1.6		5.0	3.8	.79	2.4	63	68	89
087-135	.07					1.9	.8	.0	TR	2.7	1.4		4.1	3.9	1.56	2.4	49	66	69
135-153	.05					1.6	.6	TR	TR	2.2	1.1		3.3	2.6	2.36	2.7	62	67	85

DEPTH CM	8E1 REST OHM-CM	8C1B PH	8A H2O PCT	NA 5D2 ESP PCT	NA 5E SAR	SALT 8D5 TOTL SOLU PPM	GYP 6F1A PCT	8A1A EC MMHOS/CM	6N1B CA	6O1B MG	6P1B NA	6Q1B K	6I1A CO3	6J1A HCO3	6K1A CL	6L1A SO4	6M1A NO3	ATTERBERG 4F1 LQID LMIT PCT	4F2 PLST INDX
	(SATURATED PASTE)							(- - - - - - - - - - SATURATION EXTRACT 8A1- - - - - - - - - -)	(- - - - - - - - - - MEQ / LITER - - - - - - - - - - -)										
000-017																			
022-042																		22D	7D
042-053																			
053-087																			
087-135	31000	5.5	17.9					.08								.5			
135-153																			

CLAY MINERALOGY (7A2C).
22-42 MT3 KK2 VR1 MI1 QZ1
42-53 VR2 KK2 MT2 MI1
53-87 MT3 KK2 VR1
RELATIVE AMOUNTS: (X-RAY) 5 = DOMINANT 4 = ABUNDANT 3 = MODERATE 2 = SMALL 1 = TRACE.
MINERAL CODE: MT = MONTMORILLONITE MI = MICA KK = KAOLINITE VR = VERMICULITE QZ = QUARTZ.
SAND MINERALOGY (7B1). PLACEMENT: MIXED.
022-42 FNES - RE83 QZ77 FE4 TM1 SP1 FD12 MS4 PR1 AG.
042-53 FNES - RE81 QZ77 FE4 FD13 MS4 PR1 HN1.
053-87 FNES - RE86 QZ78 FE7 TM1 FD9 HN2 MS2 AU1.
RELATIVE AMOUNTS: AS PERCENT.
MINERAL CODE: FD = FELDSPARS HN = HORNBLENDE MS = MUSCOVITE PR = PYROXENE QZ = QUARTZ TM = TOURMALINE
RE = RESISTANT MINERALS FE = IRON MINERALS SP = SPHENE AG = ANTIGORITE AU = AUGITE.
(A) ESTIMATED.
(B) CORE SAMPLES, METHOD 4A3A.
(C) SIEVED SAMPLE, METHOD 4B1A.
(D) LIQUID LIMIT AND PLASTIC INDEX BY USDA-SCS, SOIL MECHANICS LAB, LINCOLN, NE.

Soil classification: Typic Argiboroll; coarse loamy, mixed.
Soil: Chetek taxadjunct*.
Soil No.: S75WI-95-9.
Location: Polk County, Wisconsin; SE¼, NE¼, Sec. 2, T. 32 N., R. 17 W.; 75 feet east of fence along gravel road and 110 feet south of east-west fence. About 45°17' N. latitude and 92°24' W. longitude.
Climate: Humid continental. Mean annual temperature is 43° F; mean July temperature is 71° F; mean January temperature is 11.8° F; mean annual precipitation is 27.65 inches with about two-thirds of this occurring during the growing season; mean annual snowfall is 41.2 inches; the growing season average is 127 days. (Data from Amery, WI., weather bureau substation.)
Vegetation and use: Native vegetation was mixed stands of northern hardwood and conifer forests. Much of this soil has been cleared for agriculture. Present crop is alfalfa hay.
Parent material: Thin loamy outwash 12 to 20 inches thick and stratified sand and gravel.
Physiography: Highly pitted glacial outwash plain.
Topography: Undulating with sample site on 13 percent convex slope.
Drainage: Somewhat excessively drained.
Ground water: Deep.
Erosion: Slightly eroded.
Permeability: Moderately rapid in solum and rapid in substratum.
Described by: Frank Anderson, Oct. 2, 1975.

(Colors are for moist soils unless otherwise stated)

Ap 760233 0 to 17 cm (0 to 6 inches). Very dark grayish brown (10YR 3/2) sandy loam; weak medium subangular blocky structure parting to weak medium granular; friable; roots common; about 5 percent by volume fine gravel; slightly acid; abrupt smooth boundary.

B1 Not Sampled 17 to 22 cm (6 to 8 inches). Dark brown (10YR 4/3) sandy loam; weak medium subangular blocky structure parting to weak medium platy; friable; grayish brown (10YR 5/2) one tongue 5 cm in diameter and 10 cm in length extending through this layer and into the horizon below; many roots; estimated 5 percent by volume fine gravel; slightly acid; clear wavy boundary.

B2t 760234 22 to 42 cm (8 to 17 inches). Dark brown (7.5YR 4/4) loam; moderate medium subangular blocky structure; friable; thin patchy clay films on most faces of peds; many roots; estimated 10 percent by volume fine gravel; slightly acid; clear wavy boundary.

B3 760235 42 to 53 cm (17 to 21 inches). Dark brown (7.5YR 4/4) loamy sand; weak medium subangular blocky structure; very friable; many roots; estimated 10 percent by volume fine gravel; neutral; clear irregular boundary.

C1 760236 53 to 87 cm (21 to 34 inches). Strong brown (7.5YR 5/6) coarse sand; single grained; loose; few roots; estimated 10 percent by volume fine gravel; medium acid; clear smooth boundary.

C2 760237 87 to 135 cm (34 to 53 inches). Yellowish brown (10YR 5/4) coarse sand; single grained; loose; thin layers, up to 1.5 cm thick, of reddish brown (5YR 4/4) and dark brown (7.5YR 4/4) sand and loamy sand; few roots; estimated 5 percent by volume fine gravel; medium acid; clear smooth boundary.

C3 760238 135 to 153 cm (53 to 60 inches). Light yellowish brown (10YR 6/4) coarse sand; single grained; loose; thin layers, up to 1.5 cm thick, of reddish brown (5YR 4/4) and dark brown (7.5YR 4/4) sand and loamy sand; few alfalfa roots; estimated 5 percent by volume fine gravel; medium acid.

*This pedon is a taxadjunct to the Chetek series because it has a thick dark surface that forms a mollic epipedon.

Additional notes:
1. Gravel content is lower than typical for the series. No other tonguing was noted in the remainder of the sample pit as was described in the area sampled.
2. pH's in field determined by Truog Kit.

SOIL CLASSIFICATION-TYPIC UDIPSAMMENT
MIXED, FRIGID
SERIES - - - - - - -CROMWELL TAXADJUNCT

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE, MTSC
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

SOIL NO - - - - - - S75WI-95-3 COUNTY - - - POLK

GENERAL METHODS- - -1A,1B1B,2A1,2B SAMPLE NOS. 760186-760195

DEPTH CM	HORIZON	PARTICLE SIZE ANALYSIS, LT 2MM, 3A1, 3A1A, 3A1B (PCT LT 2MM) SAND 2-.05	SILT .05-.002	CLAY LT .002	FINE CLAY LT .0002	VCOS 2-1	CORS 1-.5	MEDS .5-.25	FNES .25-.10	VFNS .10-.05	COSI .05-.02	FNSI .02-.002	VFSI .005-.002	SAND 2-.10	INTR II .2-.02	FINE CLAY TO CLAY PCT	NON-CO3-CLAY PCT	RATIO 8D1 15-BAR TO CLAY
000-003	A1	60.7	30.1	9.2		6.0	18.6	18.5	14.4	3.2	10.7	19.4		57.5	19.2			2.3
003-008	A2	75.1	19.5	5.4	2.8	11.4	23.0	20.9	15.8	4.0	7.1	12.4		71.1	17.1	52		.96
008-023	B21	77.2	18.2	4.6		14.5	22.0	20.0	15.9	4.8	7.0	11.2		72.4	18.0			.70
023-033	B22	75.4	20.4	4.2	1.5	6.0	16.3	21.9	23.0	8.2	9.0	11.4		67.2	27.3	36		.57
033-053	B3	85.8	9.8	4.4	1.9	10.7	20.1	30.0	20.8	4.2	4.1	5.7		81.6	15.4	43		.61
053-078	B3	95.2	2.1	2.7		1.7	15.6	42.2	33.4	2.3	1.1	1.0		92.9	13.4			.59
078-100	C1	96.9	1.9	1.2	.8	1.9	17.0	43.1	30.5	4.4	1.4	.5		92.5	15.9	67		
100-125	C2	96.9	1.8	1.3		17.9	33.9	23.9	18.8	2.4	1.0	.8		94.5	10.1			
125-178	C3	99.0	.6	.4		.1	3.9	34.7	56.4	3.9	.5	.1		95.1	22.1			
000-018	AP (A)	74.0	21.2	4.8		4.4	14.7	19.3	27.4	8.2	8.6	12.6		65.8	29.4			1.3

DEPTH CM	PARTICLE SIZE ANALYSIS, MM, 3B, 3B1, 3B2 (PCT LT 75) VOL. GT 2 PCT	GT 75 PCT	75-20	20-5	5-2	LT .074	20-2 LT20	BULK DENSITY 4A1D 1/3-BAR G/CC	4A1H OVEN DRY G/CC	4D1 COLE	WATER CONTENT 4B1C 1/10 BAR PCT	4B1C 1/3-BAR PCT	4B2 15-BAR PCT	4C1 WRD CM/CM	CARBONATE 6E1B LT 2 PCT	3A1A LT .002 PCT	PH 8C1A 1/1 H2O	8C1E 1/2 CACL
000-003	1	0	0	TR	2	40	2	1.3 B			40.3D		21.0	.25			5.4	5.1
003-008	3	0	0	2	4	25	6	1.3 B			14.3D		5.2	.12			5.4	5.1
008-023	10	TR	15	1	3	24	5	1.33C			14.0D		3.2	.14			4.6	4.3
023-033	30	15	27	3	5	19	10	1.4 B			13.4D		2.4	.15			5.3	4.6
033-053	60	15	47	12	5	6	31	1.6 B			6.9D		2.7	.07			5.2	4.7
053-078	1	0	0	1	1	5	2	1.6 B			3.6D		1.6	.03			5.7	5.5
078-100	1	0	0	1	1	5	2	1.58C			2.8D		1.2	.03			6.0	5.5
100-125	15	0	TR	7	12	3	19	1.62C					1.5				6.0	5.6
125-178	TR	0	0	0	TR	2	TR	1.51C			1.8D		.8	.02			5.9	5.4
000-018	5	0	0	4	4	28	8						6.3				6.1	5.7

DEPTH CM	ORGANIC MATTER 6A1A ORGN CARB PCT	6B1A NITG PCT	C/N	IRON 6C2B EXT FE PCT	PHOS TOTL PCT	EXTRACTABLE BASES 5B4A (MEQ / 100 G) 6N2E CA	6O2D MG	6P2B NA	6Q2B K	SUM EXTB	ACTY 6H1A BACL TEA	AL 6G1E KCL EXT	CAT EXCH 5A3A EXTB ACTY	5A6A NHAC	RATIO 8D1 NHAC TO CLAY	RATIO 8D3 CA TO MG	CA 5F1 SAT NHAC PCT	BASE SAT 5C3 EXTB ACTY PCT	5C1 NHAC PCT
000-003	10.10	.525	19			20.7	3.3	TR	.6	24.6	23.6	TR	48.2	35.6	3.87	6.3	58	51	69
003-008	1.43	.084	17			5.3	.9	.0	.1	6.3	7.6	TR	13.9	10.0	1.85	5.9	53	45	63
008-023	.48	.033	15			.8	.3	.0	.1	1.2	7.0	1.5	8.2	5.9	1.28	2.7	14	15	20
023-033	.29					1.4	.4	.0	.1	1.9	4.7	.7	6.6	4.8	1.14	3.5	29	29	40
033-053	.15					1.6	.8	TR	.1	2.5	4.3	.5	6.8	5.0	1.14	2.0	32	37	50
053-078	.01					1.6	.6	.0	.1	2.3	1.8		4.1	2.8	1.04	2.7	57	56	82
078-100	.01					1.4	.4	.0	TR	1.8	1.6		3.4	2.2	1.83	3.5	64	53	82
100-125	.04					1.7	.4	.0	TR	2.1	1.9		4.0	2.6	2.00	4.3	65	53	81
125-178	.02					1.1	.3	.0	TR	1.4	.8		2.2	1.6	4.00	3.7	69	64	88
000-018	2.14	.161				6.5	2.1	.0	.3	8.9	5.7		14.6	11.6	2.42	3.1	56	61	77

DEPTH CM	SATURATED PASTE 8E1 REST OHM-CM	8C1B PH	8A H2O PCT	NA 5D2 ESP PCT	NA 5E SAR	SALT 8D5 TOTL SOLU PPM	GYP 6F1A PCT	SATURATION EXTRACT 8A1 (MEQ / LITER) 8A1A EC MMHOS/CM	6N1B CA	6O1B MG	6P1B NA	6Q1B K	6I1A CO3	6J1A HCO3	6K1A CL	6L1A SO4	6M1A NO3	ATTERBERG 4F1 LQID LMIT PCT	4F2 PLST INDX
000-003																			
003-008																			
008-023																			
023-033																			
033-053																			
053-078																			
078-100																			
100-125	34000	6.2	19.7					.10								.6			
125-178																			
000-018																			

CLAY MINERALOGY (7A2C).
8-23 VR3 KK2 MI1 QZ1
33-53 VR3 KK2 QZ1
100-125 VR2 KK1 MI1
RELATIVE AMOUNTS: (X-RAY) 5 = DOMINANT 4 = ABUNDANT 3 = MODERATE 2 = SMALL 1 = TRACE.
MINERAL CODE: MI = MICA KK = KAOLINITE VR = VERMICULITE QZ = QUARTZ.

SAND MINERALOGY (7B1). PLACEMENT: MIXED.
008-23 VFNS - RE82 QZ79 FE2 SP1 FD14 HN2 GN1 MS1 VR EP. FNES - RE77 QZ74 FE3 FD17 MS2 HN2 BT1 TE1.
033-53 VFNS - RE79 QZ67 FE4 ZR SP FD27 HN1 MS1 VR EN. FNES - RE80 QZ71 FE6 SP2 TM1 FD14 HN2 VR1 MS1 AU1 SR1.
100-125 VFNS - RE79 QZ69 FE8 TM1 SP1 ZR FD19 HN1 GN1 AU MS VR. FNES - RE76 QZ70 FE6 SP FD19 HN2 MS2 VR1.
RELATIVE AMOUNTS: AS PERCENT.
MINERAL CODE: NW = NON-WEATHERABLE AM = AMPHIBOLE AR = AGGREGATES BT = BIOTITE CA = CALCITE CH = CHERT
CL = CHLORITE EP = EPIDOTE FD = FELDSPARS GS = GLASS HN = HORNBLENDE MS = MUSCOVITE OP = OPAQUE
PO = PLANT OPAL PR = PYROXENE QZ = QUARTZ TM = TOURMALINE ZR = ZIRCON FK = POTASSIUM FELDSPAR
FP = PLAGIOCLASE FELDSPAR RE = RESISTANT MINERALS FE = IRON MINERALS SP = SPHENE GN = GARNET
VR = VERMICULITE TE = TREMOLITE EN = ENSTATITE.

(A) FROM ADJACENT PLOWED FIELD.
(B) ESTIMATED.
(C) CORE SAMPLE, METHOD 4A3A.
(D) SIEVED SAMPLE, METHOD 4B1A.

Soil classification: Typic Udipsamment; mixed, frigid.
Soil: Cromwell taxadjunct*.
Soil No.: S75WI-95-3.
Location: Polk County, Wisconsin; SE¼, Sec. 11, T. 36 N., R. 16 W.; 1,600 feet north and 3,600 feet east of southwest corner of Section 11. About 45°37' N. latitude and 92°18' W. longitude.
Climate: Humid continental; mean annual temperature is 43° F; mean July temperature is 71° F; mean January temperature is 11.8° F; mean annual precipitation is 27.5 inches with about two-thirds of this occurring during the growing season; mean annual snowfall is 41.2 inches; the growing season averages 127 days. (Data from Amery, WI., weather bureau substation.)
Vegetation and use: Native vegetation was primarily pine with pioneer species of hardwood. Some of the less sloping areas have been cleared and are used for general farming. This site has a mature stand of red and white pine with an understory of hazelnut, fern, and forbs.
Parent material: Thin loamy outwash and acid stratified sand and gravel.
Physiography: Nearly level to sloping glacial outwash plains, terminal and recessional moraines, and highly pitted outwash.
Topography: Gently sloping with sample site on 5 percent plane slope.
Drainage: Somewhat excessively drained.
Ground water: Deep.
Erosion: None
Permeability: Moderately rapid in sola and rapid in substratum.
Described by: A.J. Klingelhoets and G.B. Lee, July 1975.

(Colors are for moist soil unless otherwise stated)

A1 760186 0 to 3 cm (0 to 1 inch). Black (10YR 2/1) sandy loam with moderate medium granular structure; very friable; very high in organic matter; estimated less than 5 percent by volume coarse fragments over 2 mm in diameter; many roots; medium acid; abrupt wavy boundary.

A2 760187 3 to 8 cm (1 to 3 inches). Dark brown (7.5YR 4/2) sandy loam; weak coarse platy structure; very friable; estimated less than 5 percent by volume coarse fragments over 2 mm in diameter; many roots; medium acid; clear wavy boundary.

B21 760188 8 to 23 cm (3 to 9 inches). Dark brown (7.5YR 4/4) sandy loam; moderate fine subangular blocky structure; friable; estimated 15 percent by volume coarse fragments 2 mm to 76 mm in diameter; many roots; medium acid; clear wavy boundary.

B22 760189 23 to 33 cm (9 to 13 inches). Dark brown (7.5YR 4/4) sandy loam; moderate fine and medium subangular blocky structure; friable; estimated 12 percent by volume of cobbles greater than 3 inches in diameter and about 8 percent gravel 2 mm to 76 mm in diameter; many roots; strongly acid; gradual wavy boundary.

B3 760190 33 to 53 cm (13 to 21 inches). Dark yellowish brown (10YR 4/4) gravelly loamy sand; weak coarse platy structure; weak fragipan--nondiagnostic; firm when dry, friable when moist; estimated 20 percent by volume of fragments greater than 2 mm in diameter of which 15 percent is cobbles greater than 3 inches in diameter; many roots; strongly acid; abrupt wavy boundary.

B3 760191 53 to 78 cm (21 to 30 inches). Dark brown (7.5YR 4/4) medium and coarse sand; weak coarse platy structure parting to single grained; loose; estimated less than 5 percent by volume of coarse fragments over 2 mm in diameter; few tree roots; medium acid; clear wavy boundary.

C1 760192 78 to 100 cm (30 to 39 inches). Dark brown (7.5YR 4/4) medium sand; single grained; loose; estimated less than 5 percent by volume of coarse fragments greater than 2 mm in diameter; few tree roots; slightly acid; clear wavy boundary.

C2 760193 100 to 125 cm (39 to 49 inches). Dark brown (7.5YR 4/4) medium and coarse sand; single grained; loose; estimated 5 percent by volume coarse fragments over 2 mm in diameter; a 3 to 4 cm thick gravelly sand layer at the lower boundary; few tree roots; slightly acid; abrupt wavy boundary.

C3 760194 125 to 178 cm (49 to 70 inches). Brown (7.5YR 5/4) medium sand; single grained; loose; estimated less than 1 percent by volume of coarse fragments over 2 mm in diameter; thin 1/2 cm color bands in the lower part; slightly acid.

*This pedon is a taxadjunct to the Cromwell series because it lacks the soil development necessary to form a cambic horizon typical of that series.

Additional notes:
1. This pedon has more cobble in the control section than allowed in the range of the series as presently described. It is being questioned for sandy-skeletal family.
2. pH's in field determined by Truog kit.
3. An Ap horizon sample from the adjacent plowed field has been assigned lab number 760195.

SOIL CLASSIFICATION-GLOSSIC EUTROBORALF
FINE-LOAMY,MIXED
SERIES - - - - - - -CUSHING TAXADJUNCT

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE, MTSC
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

SOIL NO - - - - - - S75WI-95-2 COUNTY - - - POLK

GENERAL METHODS- - -1A,1B1B,2A1,2B SAMPLE NOS. 760178-760185

DEPTH CM	HORIZON	SAND 2-.05	SILT .05-.002	CLAY LT .002	FINE CLAY LT .0002	VCOS 2-1	CORS 1-.5	MEDS .5-.25	FNES .25-.10	VFNS .10-.05	COSI .05-.02	FNSI .02-.002	VFSI .005-.002	SAND 2-.10	INTR II .2-.02	FINE CLAY TO CLAY PCT	NON-CO3-CLAY PCT	RATIO 8D1 15-BAR TO CLAY
		(- - - PARTICLE SIZE ANALYSIS, LT 2MM, 3A1, 3A1A, 3A1B - - - PCT LT 2MM																
000-023	AP	59.4	34.2	6.4	1.3	2.7	7.5	11.6	23.0	14.6	19.4	14.8		44.8	45.5	20		.56
023-033	A2	58.7	24.3	17.0	6.9	3.2	8.1	12.7	22.4	12.3	11.7	12.6		46.4	35.4	41		.44
033-052	A&B	58.2	22.0	19.8	9.2	3.9	9.6	12.7	21.3	10.7	10.0	12.0		47.5	31.4	46		.49
052-079	B&A	57.3	22.8	19.9	9.1	3.1	8.6	12.5	21.9	11.2	10.5	12.3		46.1	32.8	46		.46
079-105	B&A	56.3	23.4	20.3	9.4	4.3	9.9	12.0	19.7	10.4	9.7	13.7		45.9	30.1	46		.54
105-126	BG	55.6	23.9	20.5	9.6	4.0	9.3	12.1	19.9	10.3	9.8	14.1		45.3	30.2	47		.53
126-158	C1	52.8	26.2	21.0	9.2	3.1	8.2	11.2	19.6	10.7	10.5	15.7		42.1	31.2	44		.53
158-198	C2	58.2	24.1	17.7		5.0	9.5	13.0	19.6	11.1	10.0	14.1		47.1	30.8			.52

DEPTH CM	(PARTICLE SIZE ANALYSIS, MM, 3B, 3B1, 3B2) VOL. GT 2 PCT	WEIGHT GT 75 PCT	75-20 (PCT LT 75)	20-5 (PCT LT 75)	5-2 (PCT LT 75)	LT .074 (PCT LT 75)	20-2 PCT LT20	BULK DENSITY 4A1D 1/3-BAR G/CC	4A1H OVEN DRY G/CC	4D1 COLE	WATER CONTENT 4B1C 1/10 BAR PCT	4B1C 1/3-BAR PCT	4B2 15-BAR PCT	4C1 WRD CM/CM	CARBONATE 6E1B LT 2 PCT	3A1A LT .002 PCT	PH 8C1A 1/1 H2O	8C1E 1/2 CACL
000-023	5	0	TR	2	3	47	5	1.67	1.72	.009		14.3	3.6	.17			6.1	5.9
023-033	5	0	TR	3	6	44	8	1.64	1.76	.023		16.1	7.5	.13			6.2	5.9
033-052	4	0	0	1	5	45	6	1.61	1.76	.029		17.5	9.7	.12			5.8	5.3
052-079	5	0	TR	1	5	46	6	1.63	1.73	.019		18.1	9.2	.14			5.3	4.7
079-105	5	0	0	2	6	46	8	1.57	1.70	.026		21.6	10.9	.16			5.3	4.7
105-126	5	0	TR	2	6	46	8	1.58	1.73	.029		21.2	10.8	.16			5.9	5.6
126-158	5	0	TR	2	8	48	9	1.48	1.60	.025		24.7	11.2	.19			6.4	6.0
158-198	5	0	TR	2	7	44	9	1.55	1.64	.018		20.3	9.2	.16			7.1	6.8

DEPTH CM	(ORGANIC MATTER) 6A1A ORGN CARB PCT	6B1A NITG PCT	C/N	IRON 6C2B EXT FE PCT	PHOS TOTL PCT	(EXTRACTABLE BASES 5B4A) 6N2E CA	6O2D MG	6P2B NA	6Q2B K	SUM EXTB	ACTY 6H1A BACL TEA	AL 6G1E KCL EXT	(CAT EXCH) 5A3A EXTB ACTY	5A6A NHAC	RATIO 8D1 NHAC TC CLAY	RATIO 8D3 CA TO MG	CA 5F1 SAT NHAC PCT	(BASE SAT) 5C3 EXTB ACTY PCT	5C1 NHAC PCT
						(MEQ / 100 G)													
000-023	.75	.075	10			4.4	1.4	TR	.1	5.9	3.0		8.9	6.4	1.00	3.1	69	66	92
023-033	.21	.032	7			7.6	3.0	.1	.2	10.9	3.3		14.2	11.8	.69	2.5	64	77	92
033-052	.16	.030	5			8.3	3.8	.1	.3	12.5	4.9		17.4	13.7	.69	2.2	61	72	91
052-079	.12					7.6	4.1	.1	.3	12.1	5.5	.4	17.6	14.2	.71	1.9	54	69	85
079-105	.10					8.1	4.5	.2	.3	13.1	4.7	.4	17.8	15.1	.74	1.8	54	74	87
105-126	.07					9.7	5.5	.2	.3	15.7	3.3		19.0	16.2	.79	1.8	60	83	97
126-158	.05					10.0	5.6	.2	.2	16.0	2.9		18.9	16.3	.78	1.8	61	85	98
158-198	.05						5.2	.2	.2		1.6			13.9	.79				

DEPTH CM	(SATURATED PASTE) 8E1 REST OHM-CM	8C1B PH	8A H2O PCT	NA 5D2 ESP PCT	NA 5E SAR	SALT 8D5 TOTL SOLU PPM	GYP 6F1A PCT	(SATURATION EXTRACT 8A1) 8A1A EC MMHOS/CM	6N1B CA	6O1B MG	6P1B NA	6Q1B K	6I1A CO3	6J1A HCO3	6K1A CL	6L1A SO4	6M1A NO3	ATTERBERG 4F1 LQID LMIT PCT	4F2 PLST INDX
									(MEQ / LITER)										
000-023																			
023-033																			
033-052																			
052-079																		37A	17A
079-105	4200	4.8	34.8					.15								2.9			
105-126																			
126-158																			
158-198																		31A	14A

CLAY MINERALOGY (7A2C)
33-52 MT5 KK2 MI2 VR1
79-105 MT5 KK2
105-126 MT5 KK2 MI1 QZ1
COMMENTS: HIGH CHARGE MONTMORILLONITE DOES NOT EXPAND FULLY WITH GLYECOL
RELATIVE AMOUNTS: (X-RAY) 5 = DOMINANT 4 = ABUNDANT 3 = MODERATE 2 = SMALL 1 = TRACE.
MINERAL CODE: MT = MONTMORILLONITE MI = MICA KK = KAOLINITE VR = VERMICULITE QZ = QUARTZ
SAND MINERALOGY (7B1) PLACEMENT: MIXED.
033-52 VFNS - RE80 QZ79 FE1 TM ZR SP FD16 HN3 MS1 GN VR KY. FNES - RE80 QZ72 FE6 SP2 RU FD15 HN2 MS2.
079-105 VFNS - RE75 QZ74 FE1 ZR SP FD19 HN3 MS1 GN1 VR1 AU1. FNES - RE82 QZ78 FE2 SP2 TM FD15 MS1 HN1 GN1 CL.
105-126 VFNS - RE79 QZ77 FE2 ZR SP FD17 HN2 VR1 MS1 GN CL. FNES - RE84 QZ82 FE2 FD13 MS1 HN1 GN1.
RELATIVE AMOUNTS: AS PERCENT
MINERAL CODE: CL = CHLORITE FD = FELDSPARS HN = HORNBLENDE MS = MUSCOVITE QZ = QUARTZ TM = TOURMALINE
ZR = ZIRCON RE = RESISTANT MINERALS SP = SPHENE GN = GARNET VR = VERMICULITE KY = KYANITE
RU = RUTILE AU = AUGITE FE = IRON MINERALS.
(A) LIQUID LIMIT AND PLASTIC INDEX BY USDA-SCS, SOIL MECHANICS LAB, LINCOLN, NE.

Soil classification: Glossic Eutroboralfs; fine-loamy, mixed.
Soil: Cushing taxadjunct*.
Soil No.: S75WI-95-2.
Location: Polk County, Wisconsin; NW¼, Sec. 25, T. 36 N., R. 16 W.; 280 feet east of road and 350 feet south of large drainageway. About 45°35' N. latitude and 92°40' W. longitude.
Climate: Humid continental; mean annual temperature if 43° F; mean July temperature is 71° F; mean January temperature is 11.8° F; mean annual precipitation is 27.5 inches with about two-thirds of this occurring during the growing season; mean annual snowfall is 41.2 inches; the growing season averages 127 days (data from Amery, WI., weather bureau substation.)
Vegetation and land use: Native vegetation was principally mixed northern hardwood forest; much of this soil has been cleared and is used for general farming; present crop on this field is red clover.
Parent material: Loamy glacial till.
Physiography: Gently sloping to moderately steep glacial end and ground moraines.
Topography: Gently sloping with sample site on a 3 percent convex slope.
Drainage: Well and moderately well drained.
Ground water: Deep - over 5 feet at time of sampling.
Erosion: Slightly eroded.
Permeability: Moderately permeable.
Described by: A.J. Klingelhoets and G. B. Lee, July 1975.

(Colors are for moist soil unless otherwise stated)

Ap 760178 to 23 cm (0 to 9 inches). Dark grayish brown (10YR 4/2) light loam; weak medium subangular blocky structure parting to weak fine granular; friable; estimated 5 percent by volume coarse fragments over 2 mm and less than 1 percent over 3 inches in diameter; many roots; medium acid; abrupt wavy boundary.

A2 760179 23 to 33 cm (9 to 13 inches). Brown (10YR 5/3) sandy loam; moderate coarse platy structure; friable; estimated 5 percent by volume coarse fragments over 2 mm and less than 1 percent over 3 inches in diameter; many roots; slightly acid; gradual wavy boundary.

A&B 760180 33 to 52 cm (13 to 20 inches). Grayish brown (10YR 5/2) sandy loam (A2); weak coarse platy stucture; friable; occupies about 60 percent of the horizon as tongues 10 to 30 mm thick extending into or completely surrounding remnants of dark brown (7.5YR 4/4) loam (B2t); moderate medium subangular blocky structure; friable; few thin patchy clay films on faces of peds (B2t); estimated less than 5 percent by volume coarse fragments greater than 2 mm in diameter; many roots; slightly acid; gradual irregular boundary.

B&A 760181 52 to 79 cm (20 to 31 inches). Dark brown (7.5YR 4/4) clay loam (B2t); weak coarse prismatic structure parting to moderate medium subangular blocky; firm; occupies about 75 percent of the horizon; thin patchy clay films on more than 50 percent of surfaces of peds; tongues of brown (7.5YR 5/2) sandy loam (A2) extend to bottom of horizon; weak coarse platy structure; friable; estimated less than 5 percent by volume coarse fragments greater than 2 mm in diameter; many roots; medium acid; clear wavy boundary.

B&A 760182 79 to 105 cm (31 to 41 inches). Dark brown (7.5YR 4/4) clay loam (B2t); few fine distinct mottles of strong brown (7.5YR 5/6); weak coarse prismatic structure parting to moderate medium subangular blocky; firm; occupies about 75 percent of the horizon; thin patchy clay films on more than 50 percent of surfaces of peds; tongues of brown (7.5YR 5/2) sandy loam (A2) extend to bottom of horizon; weak coarse platy structure; friable; estimated less than 5 percent by volume coarse fragments greater than 2 mm in diameter; many roots; medium acid; clear wavy boundary; separated on depth for analysis only.

Bg 760183 105 to 126 cm (41 to 49 inches). Dark brown (7.5YR 4/4) loam; many fine distinct strong brown, brown, and yellowish red (7.5YR 5/6, 5/2, and 5YR 5/6) mottles; moderate medium subangular blocky structure; friable; few manganese spots 1 to 2 mm in diameter; about 5 percent by volume of fragments coarser than 2 mm in diameter, but less than 1 percent with diameter over 3 inches; few roots; slightly acid; gradual wavy boundary.

C1 760184 126 to 158 cm (49 to 62 inches). Dark brown (7.5YR 4/4) loam; many fine distinct pinkish gray and strong brown (7.5YR 6/2, 5/6 and 5/8) mottles; weak medium subangular blocky structure; friable; many manganese spots and streaks; about 5 percent by volume of coarse fragments over 2 mm in diameter; few roots; medium acid; clear wavy boundary.

C2 760185 158 to 198 cm (62 to 78 inches). Brown (7.5YR 5/4) loam; many large distinct pinkish gray and strong brown (7.5YR 6/2 and 5/6) mottles; massive; friable; many manganese spots and streaks; slightly acid.

*This pedon is a taxadjunct to the Cushing series because it lacks a subsoil clay accumulation unmixed with bleached material and lacks carbonates in the subsoil.

Additional notes:
1. Sandy content may be higher than normal due to an inclusion of a pocket of more sandy material near the face in the pit where sampled. Surface soil dries out to a 10YR 6/2 color.
2. pH's field determined by Truog kit.

SOIL CLASSIFICATION-TERRIC BOROSAPRIST
LOAMY, MIXED, EUIC
SERIES - - - - - - - -DAWSON TAXADJUNCT

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE, NTSC
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

SOIL NO - - - - - - - S74NI-85-2 COUNTY - - - ONEIDA

GENERAL METHODS- - -1A,1B1B,2A1,2B SAMPLE NOS. 74L900-74L904

DEPTH CM	HORIZON	PARTICLE SIZE ANALYSIS, LT 2MM, 3A1, 3A1A, 3A1B: SAND 2-.05	SILT .05-.002	CLAY LT .002	FINE CLAY LT .0002	VCOS 2-1	CORS 1-.5	MEDS .5-.25	FNES .25-.10	VFNS .10-.05	COSI .05-.02	FNSI .02-.002	VFSI .005-.002	SAND 2-.10	INTR II .2-.02	FINE CLAY TO CLAY	NON-CO3-CLAY	RATIO 8D1 15-BAR TO CLAY
		PCT LT 2MM														PCT	PCT	
000-015	OE1																	
020-050	OA2																	
050-090	OA3																	
090-120	OA4																	
120-150	CG	73.8	21.7	4.5		.6	18.9	33.1	17.4	3.8	15.6	6.1		70.0				

DEPTH CM	(PARTICLE SIZE ANALYSIS, MM, 3B, 3B1, 3B2) VOL. GT 2 PCT	WEIGHT GT 75 PCT	75-20	20-5	5-2	LT .074	20-2 PCT LT20	(BULK DENSITY) 4A1D 1/3-BAR G/CC	4A1H OVEN DRY G/CC	4D1 COLE	(WATER CONTENT) 4B1C 1/10 BAR PCT	4B1C 1/3-BAR PCT	4B2A 15-BAR PCT	4C1 WRD CM/CM	CARBONATE 6E1B LT 2 PCT	3A1A LT .002 PCT	(PH) 8C1A 1/1 H2O	8C1E 1/2 CACL
000-015	0	0	0	0	0		0	.09	.25		727	556	104	.56			5.3	4.6
020-050	0	0	0	0	0		0	.25	.88		348	334	115	.58			5.4	4.8
050-090	0	0	0	0	0		0	.14	.47		625	620	137	.68			5.4	4.9
090-120	0	0	0	0	0		0	.21	.66		435	405	106	.69			5.4	5.0
120-150	1	0	0	TR	1		1						3.3				5.0	4.8

DEPTH CM	(ORGANIC MATTER) 6A1A ORGN CARB PCT	6B1A NITG PCT	C/N	IRON 6C2B EXT FE PCT	PHOS TOTL PCT	(EXTRACTABLE BASES 5B4A) 6N2E CA	6O2D MG	6P2B NA	6Q2B K	SUM EXTB / 100	ACTY 6H1A BACL TRA G	AL 6G1E KCL EXT	(CAT EXCH) 5A3A EXTB ACTY	5A6A NHAC	RATIO 8D1 NHAC TO CLAY	RATIO 8D3 CA TO MG	CA 5F1 SAT NHAC PCT	(BASE SAT) 5C3 EXTB ACTY PCT	5C1 NHAC PCT
						MEQ													
000-015	44.2	2.51	18			52.1	12.6	.3	1.0	66.0	104		170	111		4.1	47	39	59
020-050	44.0	2.54	17			61.6	13.6	.3	.2	75.7	105		180	113		4.5	55	42	67
050-090	45.9	2.44	19			65.0	17.2	.3	.3	82.8	107		189	107		3.8	61	44	77
090-120	35.1	1.82	19			57.4	15.8	.2	.1	73.5	87.9		161	93.9		3.6	61	46	78
120-150	.42																		

DEPTH CM	(SATURATED PASTE) 8E1 REST OHM-CM	8C1B PH	8A H2O PCT	NA 5D2 ESP PCT	NA 5E SAR	SALT TOTL SOLU PPM	GYP PCT	(SATURATION EXTRACT 8A1) 8A1A EC MMHOS/CM	6N1B CA	6O1B MG	6P1B NA	6Q1B K	6I1A CO3	6J1A HCO3	6K1A CL	6L1A SO4	6M1A NO3	ATTERBERG 4F1 LQID LMIT PCT	4F2 PLST INDX
									MEQ / LITER										
000-015	6200	5.3	698			800		.22	.9	.5	.2	.2	0	.3	.2	.8	.0		
020-050	7700	5.5	592			380		.11	.6	.3	.1	TR	0	.0	.2	.9	.0		
050-090	6300	5.3	935			1000		.19	1.0	.6	.1	TR	0	.3	.0	1.5	.8		
090-120	4800	5.3	797			1200		.26	1.4	.8	.1	TR	0	.3	.2	1.8	.0		
120-150																			

DEPTH CM	(HISTOSOL CHARACTERIZATION) 8F MINL CONT PCT	(STATE OF DECOMPOSITION) 8G (FIBER VOL) UNRB PCT	RUB PCT	8H PYROPHOSPHT SOLUBILITY (MUNS COLOR)		PH 8C1E .01M CACL	(BULK DEN) 4A3A FILD STAT G/CC	4A1I 1/3B REWT G/CC	COLE 4D1 RE-WET	SUBS RES-IDUE PCT	(WATER CONTENT) 4B4 FILD STAT PCT	4B1C 1/3B REWT PCT	4B2 15-BAR PCT	4C1 WRD CM/CM
000-015		15 A	1	10 YR	2/2	6.8	.34	.14	.213	71	181	468	75.7	.55
020-050								.30	.431	71 B		262	66.3	.59
050-090	16	30	4	7.5YR	4/2	6.0	.18	.16	.432	84	450	498	69.5	.69
090-120	16	30	8	7.5YR	4/2	6.0	.18	.28	.330	84	462	297	50.5	.69
120-150	30	48	4	10 YR	6.5/3	5.7	.15			58	523		1.9	

(A) 50 PERCENT BLACK PARTICLES (CHARCOAL?).
(B) ESTIMATED.

Soil classification: Terric Borosaprists; loamy, mixed, euic.
Series: Dawson taxadjunct*.
Soil No.: S74WI-85-2.
Location: Oneida County, Wisconsin; NE¼, NE¼, Sec. 32, T. 35 N., R. 11 E.; 100 feet west of stream and 75 feet north of road. About 45°30' N. latitude and about 89°14' W. longitude.
Climate: Humid continental. Mean annual temperature is 41.6° F; mean July temperature is 68.4° F; mean January temperature is 12.8° F; mean annual precipitation is 30.78 inches with nearly two-thirds of the precipitation falling during the growing season; total amount of snowfall is 55.6 inches; the growing season averages 127 days, but less in the organic areas (data from Rhinelander, WI., weather bureau substation).
Parent material: Deposits of herbaceous organic material 16 to 50 inches thick over sandy mineral deposits.
Physiography: Depressional area along drainageway.
Vegetation: Sedges, willow, tag alder, grasses, forbs, spirea.
Size of area: About 200 acres.
Distance to adjacent mineral soil: About 200 feet to the west.
Depth to water table: 75 cm.
Microrelief: Hummocky. Hummocks are 12 to 18 inches high.
Subsidence: None
Soil temperature: Measured soil temperature of 10.0° C. at 50 cm.
Described and sampled by: G.W. Hudelson, W.C. Lynn, W.E. McKinzie, G.B. Lee, R.L. Newbury, S.W. Payne, and A.J. Klingelhoets. Sampled from pit to 40 inches, posthole digger below 40 inches.

Oe1 74L900 0 to 15 cm. Very dark brown (7.5YR 2/2), dark brown (7.5YR 3/2) rubbed or pressed hemic material; about 80 percent fiber, about 35 percent rubbed; massive (matted); friable; fibers primarily herbaceous; about 15 percent mineral soil material; many fine roots; pH 6.0 (Truog); clear wavy boundary.

Oa1 (not sampled) 15 to 20 cm. Black (7.5YR 2/1) broken face, rubbed, or pressed sapric material; about 40 percent fiber, about 5-10 percent rubbed; weak fine subangular blocky structure; very friable; fibers primarily herbaceous; about 35 percent mineral soil material; common fine roots; pH 5.8 (Truog); clear wavy boundary.

Oa2 74L901 20 to 50 cm. Dark brown (7.5YR 3/2) broken face, rubbed, very dark brown (10YR 2/2) pressed sapric material; about 40 percent fiber, about 5-10 percent rubbed; weak medium and fine subangular blocky structure; friable; fibers primarily herbaceous; about 30 percent mineral soil material; few fine roots; pH 6.2 (Truog); gradual wavy boundary.

Oa3 74L902 50 to 90 cm. Very dark brown (10YR 2/2), very dark grayish brown (10YR 3/2) rubbed, very dark brown (7.5YR 2/2) pressed sapric material; about 60 percent fibers, about 15-20 percent rubbed; weak coarse platy structure; very friable; fibers primarily herbaceous with a few woody fragments; about 25 percent mineral soil material; few fine roots; pH 6.2 (Truog); gradual wavy boundary.

Oa4 74L903 90 to 120 cm. Very dark brown (10YR 2/2), very dark grayish brown (10YR 3/2) rubbed, very dark brown (7.5YR 2/2) pressed sapric material; about 35 percent fibers, about 10-15 percent rubbed; weak coarse platy structure parting to weak fine subangular blocky structure; very friable; fibers primarily herbaceous with a few woody fragments; about 25 percent mineral soil material; pH 6.2 (Truog); abrupt wavy boundary.

Cg 74L904 120 to 152 cm. Dark gray (5Y 4/1) medium and coarse sand; single grained; loose; pH 7.0 (Truog).

*This pedon is a taxadjunct to the Dawson series because it has more fine mineral material than is typically present in that series.

Remarks:
1. Oa3 and Oa4 sedge fibers are dark brown (7.5YR 3/3 and 3/4) and brown (7.5YR 5/4).
2. Cg horizon contains a few thin lenses (1 to 3 cm thick) of sandy-loam and loam.

SOIL CLASSIFICATION-AQUIC GLOSSOBORALF
FINE, MIXED
SERIES - - - - - - -DOLPH

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE, MTSC
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

SOIL NO - - - - - - S70WIS-71-3 COUNTY - - - WOOD

GENERAL METHODS- - -1A,1B1B,2A1,2B SAMPLE NOS. 70L935-70L942

DEPTH	HORIZON	(- - PARTICLE SIZE ANALYSIS, LT 2MM, 3A1, 3A1A, 3A1B - -																RATIO
					FINE	(- - SAND				- -)	(- - SILT		- -)	FAML	INTR	FINE	NON-	8D1
		SAND 2- .05	SILT .05- .002	CLAY LT .002	CLAY LT .0002	VCOS 2- 1	CORS 1- .5	MEDS .5- .25	FNES .25- .10	VFNS .10- .05	COSI .05 .02	FNSI .02 .002	VFSI .005- .002	TEXT SAND 2-.1	II .2- .02	CLAY TO CLAY	CO3- CLAY	15- BAR TO
CM		(- - - - - - - - - - - - - - - - - - PCT LT 2MM - - - - - - - - - - - - - - - - - -)														PCT	PCT	CLAY
000-20	AP	8.6	78.2	13.2	5.1	.6	2.0	1.6	1.6	2.8	37.4	40.8	7.8	5.8	40.9	39		.61
020-26	A2	6.0	75.5	18.5	6.6	.2	.9	.9	.9	3.1	39.6	35.9	6.3	2.9	43.1	36		.48
026-37	A&B	6.1	70.2	23.7	11.7	.4	.8	.8	.8	3.3	36.8	33.4	5.8	2.8	40.4	49		.46
037-49	2B&A	16.9	48.0	35.1	22.9	1.6	4.5	3.6	3.4	3.8	24.5	23.5	4.9	13.1	29.9	65		.48
049-65	2B21T	23.4	39.3	37.3	22.0	2.5	5.1	3.5	5.8	6.5	13.7	25.6	7.0	16.9	23.6	59		.50
065-92	2B22T	21.4	39.2	39.4	19.7	1.2	2.9	3.0	6.2	8.1	14.3	24.9	7.1	13.3	26.1	50		.52
092-146	2C	64.0	27.9	8.1	4.4	1.8	5.6	6.6	22.1	27.9	18.0	9.9	2.4	36.1	60.1	54		.95
146-182	2CR	80.6	15.6	3.8	1.9	10.6	17.0	10.5	23.0	19.5	10.7	4.9	1.8	61.1	44.0	50		1.11

DEPTH	(PARTICLE SIZE ANALYSIS, MM, 3B, 3B1, 3B2)							(BULK DENSITY		)	(- - - WATER CONTENT - - -)					CARBONATE		(- -PH - -)	
	VOL.	(- - - - - - - WEIGHT					- - -)	4A1D	4A1H	4D1	4B1C	4B1C	4B2	4C1		6E1B	3A1A	8C1A	8C1E
	GT 2	GT 75	75-20	20-5	5-2	LT .074	20-2 PCT	1/3- BAR	OVEN DRY	COLE	1/10 BAR	1/3- BAR	15- BAR	WRD CM/		LT 2	LT .002	1/1 H2O	1/2 CACL
CM	PCT	PCT	(- - - PCT LT 75 - - - -)				LT20	G/CC	G/CC		PCT	PCT	PCT	CM		PCT	PCT		
000-20	TR	0	0	TR	TR	93	TR	1.40	1.46	.014	29.1	27.5	8.0	.28	3.58			5.0	4.5
020-26	TR	0	0	TR	TR	96	TR	1.54	1.60	.013	25.1	23.9	8.9	.24	4.38			4.9	3.9
026-37	TR	0	0	TR	TR	97	TR	1.46	1.53	.016	27.6	24.2	10.9	.20	2.38			4.7	3.8
037-49	TR	0	0	TR	1	85	1	1.50A					16.7					4.5	3.7
049-65	TR	0	0	1	TR	80	1	1.44	1.71	.058	28.0	26.2	18.8	.11	2.08			4.2	3.7
065-92	TR	0	0	TR	TR	84	TR	1.44	1.71	.060	29.2	27.1	20.6	.10	1.48			4.6	3.9
092-146	TR	0	0	2	1	51	3	1.60A					7.7					5.4	4.7
146-182	12	0	0	11	7	25	18	1.70A					4.2					6.2	5.2

DEPTH	(ORGANIC MATTER	)		IRON	PHOS	(- -EXTRACTABLE BASES 5B4A- -)					ACTY	AL	(CAT EXCH)		RATIO	RATIO	CA	(BASE SAT)	
	6A1A	6B1A	C/N	6C2B		6N2E	6O2D	6P2B	6Q2B		6H1A	6G1E	5A3A	5A6A	8D1	8D3	5F1	5C3	5C1
	ORGN CARB	NITG		EXT FE	TOTL	CA	MG	NA	K	SUM EXTB	BACL TEA	KCL EXT	EXTB ACTY	NHAC	NHAC TO	CA TO	SAT NHAC	EXTB ACTY	NHAC
CM	PCT	PCT		PCT	PCT	(- - - - - - - - - - -MEQ / 100 G- - - - - - - - - - -)									CLAY	MG	PCT	PCT	PCT
000-20	1.60C	.151	11	1.1		5.6	2.5	0.2	0.2	8.5	9.1	0.3	17.6	13.9	1.05	2.2	40	48	61
020-26	0.32	.036	9	0.9		3.5	2.8	0.2	0.3	6.8	10.0	3.5	16.8	13.6	0.74	1.3	26	40	50
026-37	0.23	.028	8	1.0		3.8	4.5	0.3	0.4	9.0	13.2	5.2	22.2	17.5	0.74	0.8	22	41	51
037-49	0.24	.030		0.7		5.7	8.4	0.3	0.7	15.1	15.6	6.4	30.7	25.6	0.73	0.7	22	50	59
049-65	0.20	.017		3.3		5.8	9.1	0.3	0.7	15.9	14.4	3.4	30.3	25.3	0.68	0.6	23	52	63
065-92	0.16			2.7		8.5	12.8	0.4	0.9	22.6	11.5	2.0	34.1	28.2	0.72	0.7	30	66	80
092-146	0.07			1.3		6.8	6.7	0.4	0.3	14.2	5.2	0.5	19.4	16.0	1.98	1.0	43	73	89
146-182	0.03			1.1		5.0	3.8	0.3	0.2	9.3	2.7		12.0	10.3	2.71	1.3	49	78	90

DEPTH	(SATURATED PASTE)			NA	NA	SALT	GYP	(- - - - - - - - - - SATURATION EXTRACT 8A1- - - - - - - - - -)										ATTERBERG	
	8E1	8C1B	8A	5D2	5E	8D5	6F1A	8A1A	6N1B	6O1B	6P1B	6Q1B	6I1A	6J1A	6K1A	6L1A	6M1A	4F1	4F2
	REST OHM-	PH	H2O	ESP	SAR	TOTL SOLU		EC MMHOS/	CA	MG	NA	K	CO3	HCO3	CL	SO4	NO3	LQID LMIT	PLST INDX
CM	CM		PCT	PCT		PPM	PCT	CM	(- - - - - - - - - - MEQ / LITER - - - - - - - - - -)									PCT	
000-20																		33D	7
020-26																			
026-37																			
037-49																			
049-65																		52D	28
065-92																			
092-146	8000	5.2	35.4	3	1	20		0.11	0.1	0.2	0.5	TR							
146-182																			

(A) ESTIMATED.
(B) MICRO-PENETRATION RESISTANCE - A ROD 0.6 CM DIA IS SLOWLY PUSHED INTO BULK DENSITY CLOD, EQUILIBRATED AT 1/10- BAR, A DISTANCE OF 0.6 CM USING A POCKET PENETROMETER. UNITS ARE FORCE (KG) AND NOT ESTIMATES OF UNCONFINED COMPRESSIVE STRENGTH.
(C) ORGANIC CARBON IS 7 KG/M SQ TO A DEPTH OF 1 M (6A).
(D) DETERMINED BY SOIL MECHANICS LAB - SCS, LINCOLN, NE.

Soil classification: Aquic Glossoboralfs; fine, mixed.
Soil: Dolph.
Soil No.: S70WI-71-3.
Location: Wood County, Wisconsin; NW¼, SE¼, SW¼, NE¼, Sec. 23, T. 23 N., R. 5 E.; 525 feet north of road intersection.
Climate: Humid continental; mean annual temperature is about 43° F; mean annual precipitation is about 30 inches; and frost-free season is about 133 days.
Vegetation and land use: Original vegetation was deciduous forests consisting mainly of elm, oak, soft maple, and some white pine. Much of this land is in pasture or woodland. A few areas are being used for general farming.
Parent material: Thin silty sediments over clay residuum from micaceous schist.
Physiography: Nearly level or depressional areas in rock-controlled upland.
Topography: Nearly level site with a 1 percent plane slope.
Drainage: Poorly drained.
Ground water: Deep
Erosion: None
Permeability: Slow
Described by: Paul H. Carroll

(Colors are for moist soil unless otherwise stated)

Ap 70L935 0 to 20 cm (0 to 8 inches). Dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak medium subangular blocky structure; friable; many fine fibrous roots; medium acid; abrupt smooth boundary.

A2 70L936 20 to 26 cm (8 to 10 inches). Grayish brown (10YR 5/2) silt loam with many fine prominent mottles of strong brown (7.5YR 5/6-5/8); weak thin platy structure; friable; many fine fibrous roots; strongly acid; clear wavy boundary.

A&B 70L937 26 to 37 cm (10 to 15 inches). Grayish brown (10YR 5/2) and light brownish gray (10YR 6/2) silt loam (A2) with common fine prominent mottles of strong brown (7.5YR 5/6-5/8); weak medium prismatic structure parting to very weak fine subangular blocky structure; friable; isolated remnants of reddish brown (5YR 4/4) and yellowish red (5YR 4/6) heavy silt loam (Bt) occupy about 20 percent of the horizon; common fine fibrous roots; few thin clay films on faces of peds and in tubular pores of the Bt remnants; strongly acid; clear wavy boundary.

IIB&A 70L938 37 to 49 cm (15 to 19 inches). Reddish brown (5YR 4/4) and weak red (2.5YR 4/2) clay (Bt) with many fine distinct and prominent mottles of strong brown (7.5YR 5/6-5/8); moderate medium prismatic structure parting to weak fine angular blocky structure; firm; many thin dark brown (10YR 3/3) clay films on faces of peds and in tubular pores of the Bt portion of the horizon; tongues of reddish gray (5YR 5/2), brown (7.5YR 5/2) and light brownish gray (10YR 6/2) silt loam and silty clay loam (A2) penetrate this horizon from above and occupy approximately 20 percent of the horizon; few fine fibrous roots; strongly acid; clear wavy boundary.

IIB21t 70L939 49 to 65 cm (19 to 26 inches). Dark reddish brown (2.5YR 3/4) clay with few medium distinct mottles of yellowish red (5YR 5/6); moderate medium prismatic structure parting to moderate fine and very fine angular blocky structure; very firm; continuous thin clay films on faces of peds and in tubular pores; few (2 to 3 percent by volume) fine weathered rock fragments throughout horizon; very strongly acid; gradual wavy boundary.

IIB22t 70L940 65 to 92 cm (26 to 36 inches). Dark reddish brown (2.5YR 3/4) clay; weak medium prismatic structure parting to weak medium and fine angular blocky structure; very firm; common thin clay films on faces of peds and continuous flows in tubular pores; few (2 to 3 percent by volume) fine weathered rock fragments throughout horizon; very strongly acid; clear wavy boundary.

IIC 70L941 92 to 146 cm (36 to 57 inches). Variegated olive gray (5Y 4/2 and 5/2) and reddish brown (5YR and 2.5YR 4/4) very fine sandy loam; massive to weak coarse platy structure; friable; few moderately thick (2 to 4 inches) tongues of clay loam extend 10 to 12 inches into this horizon from the B2t horizon above; strongly acid; clear wavy boundary.

IICR 70L942 146 to 182 cm (57 to 71 inches). Dark olive gray (5Y 3/2) olive yellow (5Y 6/6) and strong brown (7.5YR 5/6) mica schist bedrock; moderately soft (can be chopped out with spade); thin clay coatings of light olive brown (2.5Y 5/4) on some schist fragments near upper boundary; slightly acid.

SOIL CLASSIFICATION-TYPIC GLOSSOBORALF
COARSE-LOAMY, MIXED
SERIES - - - - - - -EAUPLEINE

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE, MTSC
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

SOIL NO - - - - - - S70WIS-37-1 COUNTY - - - MARATHON

GENERAL METHODS- - -1A,1B1B,2A1,2B SAMPLE NOS. 70L862-70L869

DEPTH	HORIZON	(- - - PARTICLE SIZE ANALYSIS, LT 2MM, 3A1, 3A1A, 3A1B - - -																)RATIO
					FINE	(- - - - - - SAND - - - - - -)					(- - -SILT- - - -)			FAML	INTR	FINE	NON-	8D1
		SAND	SILT	CLAY	CLAY	VCOS	CORS	MEDS	FNES	VFNS	COSI	FNSI	VFSI	TEXT	II	CLAY	CO3-	15-
		2-	.05-	LT	LT	2-	1-	.5-	.25-	.10-	.05	.02	.005-	SAND	.2-	TO	CLAY	BAR
		.05	.002	.002	.0002	1	.5	.25	.10	.05	.02	.002	.002	2-.1	.02	CLAY		TO
CM		(- - - - - - - - - - - - - - - - PCT LT 2MM - - - - - - - - - - - - - - - - -)														PCT	PCT	CLAY
000-22	AP	13.7	76.5	9.8	3.8	.6	1.5	3.3	4.0	4.3	37.5	39.0		9.4	43.3	39		.73
022-30	A2	23.0	68.5	8.5	3.0	1.7	2.7	5.8	6.8	6.0	35.2	33.3		17.0	43.8	35		.52
030-41	A&B	30.7	56.7	12.6	5.8	3.4	3.5	7.9	9.3	6.6	30.2	26.5		24.1	40.2	46		.48
041-61	2B&A	41.3	46.1	12.6	6.8	4.6	5.3	7.9	12.7	10.8	22.8	23.3		30.5	39.8	54		.45
061-97	2B2T	53.6	35.4	11.0	7.3	6.4	8.7	6.1	15.2	17.2	17.8	17.6		36.4	44.4	66		.45
097-127	2B3T	55.4	35.3	9.3	5.6	7.5	8.2	5.0	15.2	19.5	17.9	17.4		35.9	47.2	60		.53
127-177	2R	61.3	31.7	7.0	3.9	12.7	12.3	5.7	14.0	16.6	15.7	16.0		44.7	41.0	56		.50
000-22	AP (A)																	

DEPTH	(PARTICLE SIZE ANALYSIS, MM, 3B, 3B1, 3B2)(							BULK DENSITY		)(- - - -WATER	CONTENT- - - -)				CARBONATE		(- -PH - -)	
	VOL.	(- - - - - - - WEIGHT - - - - - - - -)						4A1D	4A1H	4D1	4B1C	4B1C	4B2	4C1		6E1B	3A1A	8C1A	8C1E
	GT	GT	75-20	20-5	5-2	LT	20-2	1/3-	OVEN	COLE	1/10	1/3-	15-	WRD		LT	LT	1/1	1/2
	2	75				.074	PCT	BAR	DRY		BAR	BAR	BAR	CM/		2	.002	H2O	CACL
CM	PCT	PCT	(- - - PCT LT 75 - - -)				LT20	G/CC	G/CC		PCT	PCT	PCT	CM		PCT	PCT		
000-22	1	0	TR	1	1	88	2	1.41	1.46	.012		27.3	7.2	.29				6.0	5.6
022-30	1	0	0	1	1	79	2	1.64	1.66	.004		17.8	4.4	.22				6.0	5.3
030-41	2	0	TR	2	1	72	3	1.60	1.63	.006		16.3	6.0	.17				5.4	4.8
041-61	1	0	0	1	1	64	2	1.64	1.72	.016	19.4	18.2	5.7	.20	3.1C			4.7	4.0
061-97	3					57	0	1.75	1.85	.019	17.2	15.7	5.0	.19	5.1C			4.4	3.8
097-127	TR	0	TR	0	1	56	1	1.80B					4.9					4.5	3.9
127-177	3	0	0	1	2	47	3	1.90B					3.5					4.6	4.0
000-22	1	0	0	2	1		3						6.7					5.8	5.6

DEPTH	(ORGANIC MATTER		)	IRON	PHOS	(- -EXTRACTABLE BASES 5B4A- -)					ACTY	AL	(CAT EXCH)		RATIO	RATIO	CA	(BASE SAT)	
	6A1A	6B1A	C/N	6C2B		6N2E	6O2D	6P2B	6Q2B		6H1A	6G1E	5A3A	5A6A	8D1	8D3	5F1	5C3	5C1
	ORGN	NITG		EXT	TOTL	CA	MG	NA	K	SUM	BACL	KCL	EXTB	NHAC	NHAC	CA	SAT	EXTB	NHAC
	CARB			FE						EXTB	TEA	EXT	ACTY		TO	TO	NHAC	ACTY	
CM	PCT	PCT		PCT	PCT	(- - - - - - - - - - - -MEQ / 100 G- - - - - - - - - - - -)									CLAY	MG	PCT	PCT	PCT
000-22	2.13D	.187	11	0.9		8.3	1.7	0.1	0.1	10.2	8.0		18.2	13.8	1.41	4.9	60	56	74
022-30	0.37	.035	11	1.0		4.2	0.9	0.2	0.1	5.4	4.4		9.8	8.1	0.95	4.7	52	55	67
030-41	0.20	.032		1.2		5.4	1.1	0.2	0.2	6.9	5.7	0.5	12.6	11.0	0.87	4.9	49	55	63
041-61	0.15	.017		1.3		4.1	1.3	0.2	0.2	5.8	7.7	1.3	13.5	12.5	0.99	3.2	33	43	46
061-97	0.06			0.8		2.8	1.3	0.1	0.2	4.4	6.8	1.2	11.2	9.4	0.85	2.2	30	39	47
097-127	0.04			0.8		4.4	1.5	0.2	0.2	6.3	8.2	1.3	14.5	15.3	1.65	2.9	29	43	41
127-177	0.07			0.6		3.9	1.1	0.2	0.2	5.4	4.8	0.6	10.2	9.9	1.41	3.5	39	53	55
000-22	2.04	.176	12																

DEPTH	(SATURATED PASTE)			NA	NA	SALT	GYP	(- - - - - - - - - - SATURATION EXTRACT 8A1- - - - - - - - - -)										ATTERBERG	
	8E1	8C1B	8A	5D2	5E	8D5	6F1A	8A1A	6N1B	6O1B	6P1B	6Q1B	6I1A	6J1A	6K1A	6L1A	6M1A	4F1	4F2
	REST	PH	H2O	ESP	SAR	TOTL		EC	CA	MG	NA	K	CO3	HCO3	CL	SO4	NO3	LQID	PLST
	OHM-					SOLU		MMHOS/										LMIT	INDX
CM	CM		PCT	PCT		PPM	PCT	CM	(- - - - - - - - - - - MEQ / LITER - - - - - - - - - - -)									PCT	
000-22																		34E	6
022-30																			
030-41	5800	5.1	29.9	2	1	70		.44	2.4	0.6	0.7	0.1							
041-61																			
061-97																		24E	3
097-127	8000	4.4	26.0	1	1	50		.41	1.5	0.7	0.9	0.1							
127-177																			
000-22																			

(A) COMPOSITE OF SEVERAL SURFACE SAMPLES.
(B) ESTIMATED.
(C) MICRO-PENETRATION RESISTANCE - A ROD 0.6 CM DIA IS SLOWLY PUSHED INTO BULK DENSITY CLOD, EQUILIBRATED AT 1/10-BAR, A DISTANCE OF 0.6 CM USING A POCKET PENETROMETER. UNITS ARE FORCE (KG) AND NOT ESTIMATES OF UNCONFINED COMPRESSIVE STRENGTH.
(D) ORGANIC CARBON IS 8 KG/M SQ TO A DEPTH OF 1 M (6A).
(E) DETERMINED BY SOIL MECHANICS LAB - SCS, LINCOLN, NE.

Soil classification: Typic Glossoboralfs; coarse-loamy, mixed.
Soil: EauPleine.
Soil No.: S70WI-37-1
Location: Marathon County, Wisconsin; NE¼, NE¼, Sec. 13, T. 26 N., R. 4 E.; 210 feet and 800 feet west of intersection of county road C and a town road.
Climate: Humid continental; mean annual temperature is about 43° F; mean annual precipitation is about 30 inches; and frost-free season is about 133 days.
Vegetation and land use: Original vegetation was mixed coniferous and deciduous forests. Much of this land has been cleared for general farming. Corn, small grains, and forages are the principal crops.
Parent material: Aeolian sediments over residuum from gneissic rocks high in mica.
Physiography: Rock-controlled uplands. Gently sloping to sloping relief.
Topography: Site is on a 3- to 4-percent plane slope with a northeast aspect.
Drainage: Well and moderately well drained.
Ground water: Deep.
Erosion: None to slight.
Permeability: Moderate.
Described by Paul H. Carroll.

(Colors are for moist soil unless otherwise noted)

Ap 70L862 0 to 22 cm (0 to 9 inches). Dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak fine subangular blocky structure; friable; many fine fibrous roots; neutral; clear smooth boundary.

A2 70L863 22 to 30 cm (9 to 12 inches). Brown (10YR 5/3) silt loam marginal to very fine sandy loam; weak fine platy structure; very friable; common fine fibrous roots; slightly acid; clear wavy boundary.

A&B 70L864 30 to 41 cm (12 to 16 inches). Brown (10YR 5/3) silt loam marginal to very fine sandy loam (A2); weak thin platy structure; very friable; occupies about 75 percent of the horizon and completely surrounds or tongues into remnants of Bt; dark yellowish brown (10YR 4/4) silt loam (Bt); weak fine subangular blocky structure; friable; common fine fibrous roots; very few thin clay films on faces of some peds in the Bt remnants and in some pores; medium acid; clear wavy boundary.

IIB&A 70L865 41 to 61 cm (16 to 24 inches). Dark yellowish brown (10YR 4/4) and dark brown (7.5YR 4/4) loam (Bt); weak medium subangular blocky structure; firm; occupies about 60 percent of the horizon and consists of upward extensions of the underlying Bt horizon; few thin clay films on faces of some peds and in tubular pores; tongues of brown (10YR 5/3) very fine sandy loam (A2) penetrate and completely surround Bt peds in the upper part; weak thin platy structure; very friable; few fine fibrous roots; approximately 1 percent by volume of fine rounded and subrounded pebbles derived from underlying micaceous rocks; strongly acid; clear wavy boundary.

IIB2t 70L866 61 to 97 cm (24 to 38 inches). Dark brown (7.5YR 4/4) loam; moderate medium and fine subangular blocky structure; friable; many thin dark brown (10YR 3/3) clay films in continuous tubular pores and on faces of peds; 2 to 5 percent by volume of subangular and angular pebbles derived from underlying micaceous rocks; strongly acid; gradual wavy boundary.

IIB3t 70L867 97 to 127 cm (38 to 50 inches). Dark brown (7.5YR 4/4) and strong brown (7.5YR 5/6) light loam; weak medium subangular blocky structure; friable; few thin dark brown (10YR 3/3) clay films on faces of peds and in pores throughout the upper and middle parts of the horizon but becoming thick and continuous on peds and in parts of the lower boundary; 10 to 15 percent by volume of angular and subangular pebbles derived from underlying micaceous rocks; strongly acid; clear wavy boundary.

IIR 70L868 127 to 177 cm (50 to 70 inches). Strong brown (7.5YR 5/6-5/8) and grayish brown (2.5Y 5/2) dominantly weakly indurated gneissic rocks high in mica with narrow (1-2") seams of loamy residuum between rocks; the loamy residuum diminishes in quantity with depth; thin continuous clay films on rock fragments at the upper boundary; loamy residuum is strongly acid.

Additional notes: Temperature readings following several days of cold (40° to 50° F) weather:

15 cm	10.5° C
50 cm	11.8° C
100 cm	13.2° C

SOIL CLASSIFICATION-EUTRIC GLOSSOBORALF
COARSE-LOAMY, MIXED
SERIES - - - - - - - -EMMET TAXADJUNCT

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE MRTSC
SOIL SURVEY INVESTIGATIONS UNIT
LINCOLN, NEBRASKA

SOIL NO - - - - - - S68WI-42-1 COUNTY - - - OCONTO

GENERAL METHODS- - -1A,1B1B,2A1,2B SAMPLE NOS. 68L1087-68L1097

DEPTH CM	HORIZON	SAND 2- .05 (PCT LT 2MM)	SILT .05- .002	CLAY LT .002	FINE CLAY LT .0002	VCOS 2- 1	CORS 1- .5	MEDS .5- .25	FNES .25- .10	VFNS .10- .05	COSI .05 .02	FNSI .02 .002	VFSI .005- .002	FAML SAND 2-.1	INTR TEXT II .2- .02	FINE CLAY TO CLAY PCT	NON-CO3-CLAY PCT	RATIO BD1 15-BAR TO CLAY
000-10	A1	50.6	42.9	6.5	2.4	.5	4.1	10.7	22.7	12.6	24.5	18.4		38.0	49.3	37	7	.89
010-20	A2	53.4	41.0	5.6		.8	4.3	11.4	23.8	13.1	23.9	17.1		40.3	49.7		6	.55
020-36	B2HIR	51.8	41.8	6.4	2.3	.6	3.4	9.3	23.2	15.3	24.8	17.0		36.5	53.2	36	6	.55
036-46	B'2	63.1	31.8	5.1		1.5	5.8	13.8	28.2	13.8	17.0	14.8		49.3	45.7		5	.37
046-61	B'2T	56.5	23.6	19.9	10.4	1.1	5.2	12.9	26.1	11.2	12.3	11.3		45.3	37.0	52	20	.39
061-69	B'3	64.7	25.2	10.1		2.4	5.4	12.7	29.6	14.6	14.6	10.6		50.1	45.4		10	.37
069-107	C1	65.4	26.6	8.0		3.8	6.1	12.9	29.1	13.5	15.0	11.6		51.9	44.3		8	.36
107-135	C2	65.7	25.8	8.5	2.8	3.8	7.5	13.5	28.4	12.5	14.5	11.3		53.2	41.9	33	9	.39
135-160	C3	64.7	27.3	8.0		2.6	5.7	11.8	29.4	15.2	15.9	11.4		49.5	47.3		8	.41
160-180	C4	58.7	30.2	11.1		4.5	6.7	11.5	24.5	11.5	15.0	15.2		47.2	39.6		11	.39
000-20	AP (A)	41.4	51.9	6.7		.5	1.9	5.7	17.3	16.0	33.1	18.8		25.4	59.7		7	.63

DEPTH CM	(PARTICLE SIZE ANALYSIS, MM, 3B, 3B1, 3B2) VOL. GT 2 PCT	GT 75 PCT	75-20 (PCT LT 75)	20-5	5-2	LT .074	20-2 PCT LT20	(BULK DENSITY) 4A1D 1/3-BAR G/CC	4A1H OVEN DRY G/CC	4D1 COLE	4B1C 1/10 BAR PCT	(WATER CONTENT) 4B1C 1/3-BAR PCT	4B2 15-BAR PCT	4C1 WRD CM/CM	CARBONATE 6E1B LT 2 PCT	3A1A LT .002 PCT	(PH) 8C1A 1/1 H2O	8C1E 1/2 CACL
000-10	TR	0	0	TR	TR	56	TR	1.08	1.17	.028		35.3	5.8	.33			5.7	5.4
010-20	TR	0	0	TR	TR	53	TR	1.408					3.1				6.1	5.4
020-36	TR	0	0	TR	TR	56	TR	1.49	1.52	.007	16.1		3.5	.19			6.7	5.9
036-46	2	0	0	1	1	42	2	1.64	1.65	.002	11.8		1.9	.16			6.8	5.9
046-61	15	10	15	TR	TR	40	3	1.59	1.68	.016		15.7	7.8	.11	TR	0	7.4	6.7
061-69	20	5	10	10	5	30	14	1.708					3.7		16	TR	8.0	7.2
069-107	20	5	10	10	5	30	14	1.86	1.90	.006	13.5		2.9	.16	19	0	8.3	7.4
107-135	25	5	10	10	5	30	18	1.76	1.81	.007	16.1		3.3	.17	16	0	8.2	7.3
135-160	6	0	0	8	2	39	10	1.708					3.3		20	0	8.3	7.4
160-180	11	0	0	9	6	40	15	1.91	1.97	.009	14.9		4.3	.18	24	0	8.4	7.5
000-20	TR	0	0	TR	TR	68	TR	1.53	1.54	.002	22.2		4.2	.28				

DEPTH CM	(ORGANIC MATTER) 6A1A ORGN CARB PCT	6B1A NITG PCT	C/N	IRON 6C2A EXT FE PCT	PHOS 6S1A TOTL PCT	(EXTRACTABLE BASES 5B4A) 6N2E CA (MEQ / 100 G)	6O2D MG	6P2A NA	6Q2A K	SUM EXTB	ACTY 6H1A BACL TEA	AL 6G1D KCL EXT	(CAT EXCH) 5A3A EXTB ACTY	5A6A NHAC	RATIO 8D1 NHAC TO CLAY	RATIO 8D3 CA TO MG	CA 5F SAT NHAC PCT	(BASE SAT) 5C3 EXTB ACTY PCT	5C1 NHAC PCT
000-10	2.80C	.177	16	0.4		9.1	2.0	0.1	0.1	11.3	8.2		19.5	12.9	2.00	4.6	71	58	88
010-20	0.91	.063	14	0.5		4.5	0.9	TR	0.1	5.5	5.6		11.1	6.3	1.10	5.0	71	50	87
020-36	0.61	.040	15	0.7		5.0	0.5	TR	0.1	5.6	6.2		11.8	6.0	0.94	10.0	83	47	93
036-46	0.24	.018	13	0.6		2.5	0.3	TR	0.1	2.9	2.2		5.1	3.0	0.59	8.3	83	57	97
046-61	0.43	.030	14	1.3		7.8D	2.4D	0.1	0.3	10.6				9.9	0.50				
061-69	0.20			0.6		3.7D	1.3D	0.1	0.2	5.3				4.5	0.45				
069-107	0.05			0.4		4.0D	1.0D	0.1	0.1	5.2				3.1	0.39				
107-135	0.09			0.5		3.0D	1.2D	0.1	0.1	4.4				3.6	0.42				
135-160	0.09			0.4		3.2D	1.0D	TR	0.1	4.3				3.2	0.40				
160-180	0.02			0.4		6.0D	1.0D	0.1	0.1	7.2				3.6	0.32				
000-20	1.50																		

DEPTH CM	(SATURATED PASTE) 8E1 REST OHM-CM	8C1B PH	8A H2O PCT	NA 5D2 ESP PCT	NA 5E SAR	SALT 8D5 TOTL SOLU PPM	GYP PCT	(SATURATION EXTRACT 8A1) 8A1A EC MMHOS/CM	6N1B CA	5D1B MG	6P1A NA	6Q1A K	6I1A CO3	6J1A HCO3	5C1A CL	6L1A SO4	6M1A NO3	ATTERBERG 4F1 LQID LMIT PCT	4F2 PLST INDX
000-10																			
010-20																			
020-36																			
036-46																			
046-61																			
061-69																			
069-107	11000	8.1	26.1			50		0.29											
107-135																			
135-160																			
160-180																			
000-20																			

IDENTIFICATION OF THE SPODIC HORIZON BY LABORATORY CRITERIA. (E)

DEPTH	HORIZON	6C5A EXT FE PCT	6G5A EXT AL PCT	6A1B EXT C PCT	(PYROPHOSPHATE,PH10) 6C2A EXT FE PCT	6G7A EXT AL PCT	(CIT - DIT) FE+AL / CLAY	AL+C / CLAY	(PYROPHOSP) PYRO FE+AL / C + D FE+AL	CEC -1/2 CLAY X THIC
020-36	BIRH	.41	.23		.7		.10			138

CLAY MINERALOGY (7A2C).
020-36 KK1 MI1 VR1.
046-61 MI2 KK1 VR1 MT1 CL1 QZ1 FD1.
COMMENTS - BY INFERENCE, A CONSIDERABLE AMORPHOUS COMPONENT IS PRESENT. CLAY MINERALOGY IS MIXED.
RELATIVE AMOUNTS - (X-RAY) 5 = DOMINANT 4 = ABUNDANT 3 = MODERATE 2 = SMALL 1 = TRACE.
MINERAL CODE - MT = MONTMORILLONITE MI = MICA KK = KAOLINITE CL = CHLORITE VR = VERMICULITE QZ = QUARTZ
FD = FELDSPAR.

(A) SAMPLE COLLECTED FROM CORN FIELD NEAR 42-1.
(B) ESTIMATED.
(C) ORGANIC CARBON IS 7 KG PER SQ M TO A DEPTH OF 1 METER (METHOD 6A).
(D) METHODS 6N4C FOR CA AND 6O4C FOR MG.
(E) BELTSVILLE SOIL SURVEY INVESTIGATIONS UNIT, USDA-SCS, BELTSVILLE, MD.

Soil classification: Eutric Glossoboralf; coarse-loamy, mixed.
Soil: Emmet taxadjunct[1].
Soil No.: S68WI-42-1[2].
Location: Oconto County, Wisconsin; SE¼, SW¼, Sec. 8, T. 27 N., R. 19 E.; 140 feet north of road and 500 feet west of east edge of woodlot.
Climate: Climate is continental. Mean annual temperature is about 43° F., mean annual precipitation ranges from 28 to 31 inches; and average frost-free season is 133 days.
Vegetation and land use: Native vegetation was mixed hardwood forest with sugar maple, beech, ash, aspen, and hemlock the principal species. A large part of this soil is cultivated with small grain, fruits, corn and forages being the main crops.
Parent material: Highly calcareous gravelly loam or sandy loam glacial till.
Physiography: Gently sloping to steep side slopes of drumlins and glacial till plains.
Topography: Undulating ground moraine. Site is on a 3 percent convex slope with a west aspect.
Drainage: Well and moderately well drained.
Ground water: Deep.
Erosion: Slight.
Permeability: Moderate.
Described by: A. Klingelhoets, R. Fox, E. Link, Aug. 22, 1968.

(Colors are for moist soils unless otherwise stated)

O1 1-1/2 to 0 cm (1/2 to 0 inches). Mat of hardwood leaves, twigs, and stems with some grasses.

A1 68L1087 0 to 10 cm (0 to 4 inches). Very dark gray (10YR 3/1) fine sandy loam; moderate medium crumb structure; friable; many of the sand grains have been stripped of color; many roots; neutral; clear wavy boundary.

A2 68L1088 10 to 20 cm (4 to 8 inches). Grayish brown and dark grayish brown (10YR 5/2 and 4/2) fine sandy loam; weak coarse plates parting to weak fine subangular blocks; friable; much earthworm activity and mixing of A1 in holes and casts; roots common; slightly acid; clear wavy boundary.

B2hir 68L1089 20 to 36 cm (8 to 14 inches). Dark brown (7.5YR 4/4) fine sandy loam; weak fine and medium subangular blocky structure; friable; roots common; medium acid; abrupt irregular boundary.

A'2 68L1090 36 to 46 cm (14 to 18 inches). Brown (7.5YR 5/4) light sandy loam; moderate coarse platy structure; slightly hard and brittle when dry (weak fragipan); friable when moist; highly vesicular; few roots going down vertical structural breaks; slightly acid; abrupt irregular boundary.

B'2t 68L1091 46 to 61 cm (18 to 24 inches). Reddish brown (5YR 4/4) sandy clay loam; moderate medium subangular blocky structure; firm when moist; thin patchy clay films with dark reddish gray (5YR 4/2) color; 8 percent of volume is comprised of stones 3/4 to 3 inches in diameter and 5 percent of stones over 3 inches in diameter; roots common; neutral; clear wavy boundary. (5 to 9 inches thick.)

B'3 68L1092 61 to 69 cm (24 to 27 inches). Reddish brown (5YR 4/4) loam with spots and streaks of (5YR 5/4) especially in lower part of the horizon; weak medium subangular blocky structure; friable when moist; 8 percent of volume composed of stones 3/4 to 3 inches in diameter and 5 percent of stones larger than 3 inches in diameter; roots common; slight effervescence; gradual wavy boundary.

C1 68L1093 69 to 107 cm (27 to 42 inches). Reddish brown (5YR 5/4) sandy loam; weak medium fragmental blocky structure; friable; 8 percent of volume made up of stones 3/4 to 3 inches in diameter and 5 percent of larger stones; few roots; strong effervescence.

C2 68L1094 107 to 135 cm (42 to 53 inches). Reddish brown (5YR 5/4) sandy loam; weak medium fragmental blocky structure; friable; 8 percent of volume made up of stones 3/4 to 3 inches in diameter and 5 percent of larger stones; strong effervescence.

C3 68L1095 135 to 160 cm (53 to 63 inches). Reddish brown (5YR 5/4) sandy loam; moderate medium fragmental structure; friable when moist; appears to have a higher bulk density than till above; strong effervescence.

C4 68L1096 160 to 180 cm (63 to 71 inches). Reddish brown (5YR 5/4) sandy loam; moderate medium fragmental structure; friable when moist; very dense till; strong effervescence.

Remarks: Soil was dry in solum and moist in substratum when sampled. The glacial till appears to have a high proportion of dolomite rocks and rock flower. It becomes very compact in the lower part (basal till) and seems to be almost like a dense fragipan. The original vegetation is the same as the present vegetative cover.

Wooded site: Soil temperatures at 10 inches - 18.5° C.
20 inches - 16.5° C.
40 inches - 16.0° C.

[1] This pedon lacks a spodic horizon; therefore it is a taxadjunct to the Emmet series.
[2] S68WI-42-1(1). A sample of the plow layer from a field 100 feet south of the road in a cornfield had the following characteristics:

Ap 68L1097 0 to 8 inches. Dark brown (10YR 4/3, moist) light brownish gray (10YR 6/2, dry) fine sandy loam; weak medium subangular blocky structure; friable; roots plentiful; slightly acid; abrupt smooth boundary. (6 to 9 inches thick.) Temperature at 10 inches - 21.5° C.

The face of the pit at which this profile was described indicated much evidence of solifluction. Tongues of A'2, B2t and B3 materials extended down to the 2- to 3-foot depth and appeared to have been forced and warped out of place.

SOIL CLASSIFICATION- TYPIC EUTROBORALF; FINE-LOAMY, MIXED

SERIES - - - - - - - - EMMET TAXADJUNCT

SOIL NO - - - - - - - S68WI-42-2 COUNTY - - - OCONTO

GENERAL METHODS- - -1A,1B1B,2A1,2B SAMPLE NOS. 68L1098-68L1107

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE MRTSC
SOIL SURVEY INVESTIGATIONS UNIT
LINCOLN, NEBRASKA

DEPTH CM	HORIZON	SAND 2-.05	SILT .05-.002	CLAY LT .002	FINE CLAY LT .0002	VCOS 2-1	CORS 1-.5	MEDS .5-.25	FNES .25-.10	VFNS .10-.05	COSI .05-.02	FNSI .02-.002	VFSI .005-.002	FAML TEXT SAND 2-.1	INTR II .2-.02	FINE CLAY TO CLAY PCT	NON-CO3-CLAY PCT	RATIO 8D1 15-BAR TO CLAY
		(- - PARTICLE SIZE ANALYSIS, LT 2MM, 3A1, 3A1A, 3A1B; PCT LT 2MM - -)																
000-5	A1	59.9	34.3	5.8		.3	3.8	11.1	31.7	13.0	16.7	17.6		46.9	47.9		6	
005-13	A2	65.1	31.0	3.9		.4	3.9	11.5	32.6	16.7	14.8	16.2		48.4	50.4		4	.62
013-30	BHIR	66.9	26.8	6.3		1.5	5.2	13.3	31.0	15.9	11.7	15.1		51.0	43.9		6	.40
030-41	A'2	63.9	30.2	5.9		1.3	5.3	13.9	29.6	13.8	15.2	15.0		50.1	44.7		6	.32
041-58	B'2T	54.1	24.9	21.0		1.5	4.9	11.7	24.9	11.1	12.1	12.8		43.0	35.4		21	.37
058-81	B'3T	54.1	28.9	17.0		1.9	5.0	11.0	24.1	12.1	15.3	13.6		42.0	40.0		16	.38
081-99	C1	70.1	26.1	3.8		2.1	3.9	8.4	42.9	12.8	15.7	10.4		57.3	48.1		3	.34
099-130	2C2	95.3	2.4	2.3		.8	1.1	6.5	84.1	2.8	2.1	.3		92.5	28.4		1	.30
130-155	3C3	49.9	37.6	12.5		3.1	5.8	9.0	21.5	10.5	16.0	21.6		39.4	37.3		10	.38
000-18	AP (A)																	

DEPTH CM	VOL. GT 2 PCT	GT 75 PCT	75-20	20-5	5-2	LT .074	20-2 PCT LT20	4A1D 1/3-BAR G/CC	4A1H OVEN DRY G/CC	4D1 COLE	4B1C 1/10 BAR PCT	4B1C 1/3-BAR PCT	4B2 15-BAR PCT	4C1 WRD CM/CM	6E1B LT 2 PCT	3A1A LT .002 PCT	8C1A 1/1 H2O	8C1E 1/2 CACL
	(PARTICLE SIZE ANALYSIS, MM, 3B, 3B1, 3B2)	(- - WEIGHT - -)	(- - PCT LT 75	- - -)				(BULK DENSITY	)		(- - - -WATER CONTENT	- - -)			CARBONATE		(- -PH - -)	
006-5	0	0	0	0	0	46	0	1.10B									6.4	6.0
000-13	1	0	0	1	1	42	2	1.30B					2.4				6.5	5.7
013-30	10	5	10	TR	TR	35	2	1.45	1.46	.002	14.0		2.5	.15			6.7	5.9
030-41	10	5	10	TR	TR	40	3	1.52	1.53	.002	11.2		1.9	.13			6.7	5.8
041-58	10	5	10	TR	TR	45	2	1.50	1.60	.020		20.3	7.8	.17	TR	0	7.3	6.5
058-81	10	5	10	5	TR	45	8	1.45	1.58	.026		19.2	6.4	.17	5	1	7.6	6.9
081-99	15	5	5	5	5	30	11	1.91	1.94	.005	12.8		1.3	.19	28	1	8.4	7.3
099-130		0	0	17	4	4	21						.7		6	1	8.3	7.1
130-155	20	5	5	10	5	45	15	2.05	2.10	.007	11.5		4.7	.11	29	3	8.3	7.6
000-20	TR	0	0	TR	TR	TR	TR	1.31	1.42	.028		25.9	5.2	.28				

DEPTH CM	6A1A ORGN CARB PCT	6B1A NITG PCT	C/N	6C2A EXT FE PCT	6S1A TOTL PCT	6N2E CA	6O2D MG	6P2A NA	6Q2A K	SUM EXTS	6H1A BACL TEA	6G1D KCL EXT	5A3A EXTB ACTY	5A6A NHAC	RATIO 8D1 NHAC TO CLAY	RATIO 8D3 CA TO MG	CA 5F SAT NHAC PCT	5C3 EXTB ACTY PCT	5C1 NHAC PCT
	(ORGANIC MATTER	)		IRON	PHOS	(- -EXTRACTABLE BASES 5B4A- -) MEQ / 100 G					ACTY	AL	(CAT EXCH)					(BASE SAT)	
006-5	2.80C			0.3		26.9	10.2	TR	0.4	37.5	9.4		46.9	33.7	5.80	2.6	80	80	111
000-13	1.27			0.5		4.2	1.9	TR	0.1	6.2	2.9		9.1	5.9	1.50	2.2	71	68	105
013-30	0.60			0.7		3.6	0.9	TR	0.1	4.6	2.8		7.4	4.6	0.73	4.0	78	62	100
030-41	0.27			0.7		2.5	0.5	TR	0.1	3.1	1.9		5.0	3.2	0.54	5.0	78	62	97
041-58	0.42			1.5		7.8D	2.1D	0.1	0.2	10.2				10.6	0.50				
058-81	0.48			1.3		7.8D	2.3D	0.1	0.2	10.4				9.5	0.56				
081-99	0.12			0.4		3.5D	0.50	TR	0.1	4.1				1.9	0.50				
099-130	0.11			0.4		1.6D	0.5D	TR	0.1	2.2				1.4	0.61				
130-155	0.09			0.6		6.0D	1.3D	0.1	0.1	7.5				4.1	0.33				
000-20	2.02																		

IDENTIFICATION OF THE SPODIC HORIZON BY LABORATORY CRITERIA. (E)

DEPTH	HORIZON	(PYROPHOSPHATE,PH10) 6C5A EXT FE PCT	6G5A EXT AL PCT	6A1B EXT C PCT	(CIT - DIT) 6C2A EXT FE PCT	6G7A EXT AL PCT	(PYROPHOSP) FE+AL / CLAY	AL+C / CLAY	PYRO FE+AL / C - D FE+AL	CEC -1/2 CLAY X THIC
013-30	BIRM	.24	.08		.7		.05			71

(A) COLLECTED 90 M SOUTH OF 42-2 FROM A FIELD OF TIMOTHY.
(B) ESTIMATED.
(C) ORGANIC CARBON IS 7 KG PER SQ M TO A DEPTH OF 1 METER (METHOD 6A).
(D) METHODS 6N4C FOR CA AND 6O4C FOR MG.
(E) BELTSVILLE SOIL SURVEY INVESTIGATIONS UNIT, USDA-SCS, BELTSVILLE, MD.

Soil classification: Typic Eutroboralf; fine-loamy,mixed.
Soil: Emmet taxadjunct*.
Soil No.: S68WI-42-2.
Location: Oconto County, Wisconsin; SE¼, SW¼, Sec. 20, T. 27 N., R. 20 E.; 120 feet north of road and 12 feet west of line fence.
Climate: Climate is continental. Mean annual temperature is about 43° F; mean annual precipitation ranges from 28 to 31 inches; and average frost-free season is 133 days.
Vegetation and land use: Native vegetation was mixed hardwood forest with sugar maple, beech, ash, aspen, and hemlock the principal species. A large part of this soil is cultivated with small grains, fruits, corn, and forages being the main crops.
Parent material: Highly calcareous gravelly loam to sandy loam glacial till.
Physiography: Gently sloping to steep side slopes of drumlins and glacial till plains.
Topography: Undulating ground moraine. Site is on a 3 percent convex slope with a west aspect.
Drainage: Well and moderately well drained.
Ground water: Deep.
Erosion: Slight.
Permeability: Moderate.
Described by: A. Klingelhoets, R. Fox, E. Link, Aug. 22, 1968.

(Colors are for moist soils unless otherwise noted)

01 1-1/2 to 0 cm (1/2 to 0 inch). Mat of partially decomposed hardwood leaves, twigs, and stems with some grasses.

A1 68L1098 0 to 5 cm (0 to 2 inches). Very dark gray (10YR 3/1) fine sandy loam; moderate fine crumb structure; friable; many of the sand grains have been stripped of their color coatings; many roots; neutral; abrupt wavy boundary.

A2 68L1099 5 to 13 cm (2 to 5 inches). Grayish brown (10YR 5/2) fine sandy loam; weak medium platy structure; friable; roots common; slightly acid; clear wavy boundary.

Bhir 68L1100 13 to 30 cm (5 to 12 inches). Dark brown (7.5YR 4/4) fine sandy loam; weak medium subangular blocky structure; friable; 5 percent of volume made up of stones 3/4 to 3 inches in diameter and 3 percent larger stones; roots common; slightly acid; gradual wavy boundary.

A'2 68L1101 30 to 41 cm (12 to 16 inches). Brown (7.5YR 5/2) sandy loam; moderate coarse platy structure; slightly hard and brittle when dry (weak fragipan); friable when moist; vesicular; 5 percent of volume comprised of stones 3/4 to 3 inches in diameter and 3 percent larger stones; roots common to few; slightly acid; abrupt wavy boundary.

B'2t 68L1102 41 to 58 cm (16 to 23 inches). Reddish brown (5YR 4/4) sandy clay loam; moderate medium subangular blocky structure; firm when moist; thin patchy clay films with dark reddish brown (5YR 3/3) colors; 5 percent of volume made up of stones 3/4 to 3 inches in diameter and 3 percent larger stones; roots common; slightly acid; clear wavy boundary.

B'3t 68L1103 58 to 81 cm (23 to 32 inches). Reddish brown (5YR 4/4), grading to (5YR 5/4) in lower part, light loam; weak to moderate medium subangular blocky structure; friable; 5 percent of volume is composed of rocks 3/4 to 3 inches in diameter and 3 percent larger stones; roots common; mildly alkaline; clear irregular boundary.

C1 68L1104 81 to 99 cm (32 to 39 inches). Reddish brown (5YR 5/4) sandy loam; weak medium fragmental blocky structure (basal till or weak fragipan?); friable when moist; 5 percent of volume made up of stones 3/4 to 3 inches in diameter and 3 percent larger stones; few roots; strong effervescence; abrupt wavy boundary.

IIC2 68L1105 99 to 130 cm (39 to 51 inches). Light brown and strong brown (7.5YR 6/4 and 5/6) sand; single grained; loose; weakly stratified; strong effervescence; abrupt wavy boundary.

IIIC3 68L1106 130 to 155 cm (51 to 61 inches). Brown (7.5YR 5/4) light loam; moderate medium fragmental blocky structure; slightly firm and brittle when dry; 5 percent of volume comprised of stones 3/4 to 3 inches in diameter and 3 percent larger stones; strong effervescence.

Remarks: Soil was dry in the solum and moist in the substratum when sampled. The glacial till has a high proportion of dolomite rocks and rock flower. The IIIC3 horizon becomes very compact and has some of the characteristics associated with basal till or fragipan. The IIC2 horizon is an inclusion in this profile. The original vegetation is identical to the present vegetative cover on this pedon.

Soil temperature: At 10 inches - 18.0° C.
20 inches - 17.5° C.
40 inches - 14.0° C.

A sample of the plow layer from a field 240 feet south of the road had the following characteristics:

Pedon S68WI-42-2 (1)

Ap 68L1107 0 to 18 cm (0 to 7 inches). Very dark grayish brown (10YR 3/2) fine sandy loam, light brownish gray (10YR 6/2) dry; weak very fine subangular blocky structure; friable; roots common; neutral; abrupt smooth boundary. Temperature at 10 inches - 17.0° C.

The face of this pit at which this profile was described and sampled also had some evidence of solifluction. Tongues of A'2 and B'2t occurred in the 2- to 3-foot depth and in some cases were truncated at the upper part.

*This pedon lacks a spodic horizon and is in a fine-loamy family; therefore, it is a taxadjunct to the Emmet series.

SOIL CLASSIFICATION-TYPIC GLOSSOBORALF
COARSE-SILTY, MIXED
SERIES - - - - - - -FENCE TAXADJUNCT

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE, NTSC
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

SOIL NO - - - - - - S72NI-21-6 COUNTY - - - FORREST

GENERAL METHODS- - -1A,1B1B,2A1,2B SAMPLE NOS. 72L850-72L859

DEPTH CM	HORIZON	PARTICLE SIZE ANALYSIS, LT 2MM, 3A1, 3A1A, 3A1B (PCT LT 2MM) SAND 2-.05	SILT .05-.002	CLAY LT .002	FINE CLAY LT .0002	VCOS 2-1	CORS 1-.5	MEDS .5-.25	FNES .25-.10	VFNS .10-.05	COSI .05-.02	FNSI .02-.002	VFSI .005-.002	SAND 2-.10	INTR II .2-.02	FINE CLAY TO CLAY PCT	RATIO NON-CO3-CLAY PCT	RATIO 8D1 15-BAR TO CLAY
000-2	A2	40.4	52.7	6.9	1.6	.4	2.4	5.6	16.2	15.8	27.0	25.7		24.6	51.3	23		.67
002-14	B21HIR	52.9	40.9	6.2	.8	.5	2.3	5.3	23.9	20.9	27.6	13.3		32.0	63.6	13		.71
014-36	B22IR	48.9	46.2	4.9	.5	.4	2.0	4.5	20.3	21.7	29.8	16.4		27.2	64.5	10		.84
036-54	A'2	33.5	57.2	9.3	1.7	.2	.7	1.2	8.0	23.4	37.9	19.3		10.1	67.4	18		.57
054-65	A&B'	38.7	52.3	9.0	2.2	TR	.2	.6	13.9	24.0	36.3	16.0		14.7	70.4	24		.61
065-75	B&A'	25.0	63.1	11.9	3.3	.1	.6	1.2	4.2	18.9	41.3	21.8		6.1	63.6	28		.49
075-119	B'21T	10.6	73.4	16.0	6.4	TR	.5	.6	.9	8.6	39.0	34.4		2.0	48.2	40		.48
119-149	B'22T	8.0	74.3	17.7	7.7	.1	.3	.3	.6	6.7	38.7	35.6		1.3	45.7	44		.49
149-179	B'3T	9.5	73.5	17.0	6.9	.1	.2	.3	.6	8.3	41.3	32.2		1.2	50.0	41		.51
179-210	C	9.7	73.5	16.8	7.2	TR	.2	.3	.6	8.6	42.1	31.4		1.1	51.1	43		.51

DEPTH CM	(PARTICLE SIZE ANALYSIS, MM, 3B, 3B1, 3B2) VOL. GT 2 PCT	GT 75 PCT	75-20 (PCT LT 75)	20-5	5-2	LT .074	20-2 PCT LT20	(BULK DENSITY) 4A1D 1/3-BAR G/CC	4A1H OVEN DRY G/CC	4D1 COLE	(WATER CONTENT) 4B1C 1/10 BAR PCT	4B1C 1/3-BAR PCT	4B2 15-BAR PCT	4C1 WRD CM/CM	CARBONATE 6E1B LT 2 PCT	3A1A LT .002 PCT	(PH) 8C1A 1/1 H2O	8C1B 1/2 CACL
000-2	TR	0	0	TR	TR	71	TR	1.0 A					4.6				5.8	5.3
002-14	TR	0	0	TR	TR	62	TR	1.26	1.30	.011	33.4	24.4	4.4	.26	.9B		5.3	4.7
014-36	TR	0	0	0	TR	67	TR	1.35	1.36	.003	25.1	18.3	4.1	.20	4.1B		5.3	4.6
036-54	TR	0	0	TR	TR	85	TR	1.4 A					5.3				5.1	4.3
054-65	TR	0	0	0	TR	79	TR	1.54	1.58	.009	25.1	21.1	5.5	.25	3.5B		5.1	4.3
065-75	TR	0	0	0	TR	90	TR	1.50	1.58	.017	24.2	21.2	5.8	.23	2.3B		5.0	4.2
075-119	TR	0	0	TR	TR	97	TR	1.53	1.58	.011	26.6	25.4	7.6	.28	7.6B		4.9	4.2
119-149	TR	0	0	TR	TR	98	TR	1.5 A					8.7				5.0	4.3
149-179	0	0	0	0	0	98	0	1.46	1.52	.014	29.2	28.1	8.6	.28	3.1B		5.1	4.5
179-210	TR	0	0	0	TR	98	TR	1.5 A					8.5				5.3	4.6

DEPTH CM	(ORGANIC MATTER) 6A1A ORGN CARB PCT	6B1A NITG PCT	C/N	IRON 6C2B EXT FE PCT	PHOS TOTL PCT	(EXTRACTABLE BASES 5B4A) 6N2E CA	6O2D MG	6P2B NA	6Q2B K	SUM EXTB (MEQ / 100 G)	ACTY 6H1A BACL TEA	AL 6G1E KCL EXT	(CAT EXCH) 5A3A EXTB ACTY	5A6A NHAC	RATIO 8D1 NHAC TO CLAY	RATIO 8D3 CA TO MG	CA 5F1 SAT NHAC PCT	(BASE SAT) 5C3 EXTB ACTY PCT	5C1 NHAC PCT
000-2	1.22C	.097	13	.8		6.6	.5	TR	.2	7.3	5.2		12.5	9.0	1.30	13.0	73	58	81
002-14	.87	.077	11	1.3		3.5	.4	TR	.1	4.0	10.7	.5	14.7	9.0	1.45	8.8	39	27	44
014-36	.67	.056	12	1.2		2.3	.3	TR	.1	2.7	10.2	.8	12.9	7.7	1.57	7.7	30	21	35
036-54	.16	.018	9	1.4		2.7	.7	TR	.2	3.6	7.0	1.2	10.6	7.6	.82	3.9	36	34	47
054-65	.16	.020	8	1.6		2.7	.8	.1	.2	3.8	7.3	1.2	11.1	7.5	.83	3.4	36	34	51
065-75	.11			1.2		3.1	1.1	.1	.2	4.5	7.1	1.6	11.6	9.0	.76	2.8	34	39	50
075-119	.12			1.3		4.3	1.7	.1	.2	6.3	7.9	1.5	14.2	10.8	.68	2.5	40	44	58
119-149	.09			1.4		5.7	2.3	.1	.3	8.4	7.5	.9	15.9	12.2	.69	2.5	47	53	69
149-179	.08			1.3		6.5	2.6	.1	.3	9.5	6.9	.6	16.4	12.8	.75	2.5	51	58	74
179-210	.08			1.2		7.2	2.8	.2	.3	10.5	4.9	.4	15.4	12.4	.74	2.6	58	68	85

DEPTH CM	(SATURATED PASTE) 8E1 REST OHM-CM	8C1B PH	8A H2O PCT	NA 5D2 ESP PCT	NA 5E SAR	SALT 8D5 TOTL SOLU PPM	GYP 6F1A PCT	(SATURATION EXTRACT 8A1) 8A1A EC MMHOS/CM	6N1B CA (MEQ / LITER)	6O1B MG	6P1B NA	6Q1B K	6I1A CO3	6J1A HCO3	6K1A CL	6L1A SO4	6M1A NO3	ATTERBERG 4F1 LQID LMIT PCT	4F2 PLST INDX
000-2																			
002-14																			
014-36																			
036-54																			
054-65																			
065-75																		25D	4D
075-119	10000	4.7	39.1					.11											
119-149																		32D	8D
149-179																			
179-210																		32D	7D

IDENTIFICATION OF THE SPODIC HORIZON BY LABORATORY CRITERIA.

DEPTH	HORIZON	(PYROPHOSPHATE,PH10) 6C5A EXT FE PCT	6G5A EXT AL PCT	6A1B EXT C PCT	(CIT - DIT) 6C2B EXT FE PCT	6G7A EXT AL PCT	(PYROPHOSP) FE+AL / CLAY	AL+C / CLAY	PYRO FE+AL / C - D FE+AL	CEC -1/2 CLAY X THIC
002-14	B21HIR	.4	.2		1.3	.2	.10		.40	71
014-36	B22IR	.3	.2		1.2	.2	.10		.36	116

(A) ESTIMATED.
(B) MICRO-PENETRATION RESISTANCE. A ROD 0.6 CM DIA IS SLOWLY PUSHED INTO BULK DENSITY CLOD, EQUILIBRATED AT 0.1-BAR, A DISTANCE OF 0.6 CM USING A POCKET PENETROMETER. UNITS ARE FORCE (KG) AND NOT ESTIMATES OF UNCONFINED COMPRESSIVE STRENGTH.
(C) ORGANIC CARBON IS 5 KG/M SQ TO A DEPTH OF 1 M (6A).
(D) BY USDA-SCS, SOIL MECHANICS LAB, LINCOLN, NE.

Soil classification: Typic Glossoboralf; coarse-silty, mixed.
Soil: Fence taxadjunct*.
Soil No. S72WI-21-6 (LSL Nos. 72L850-72L859).
Location: Forest County, Wisconsin; SW¼, NE¼, Sec. 8, T. 34 N., R. 14 E.; near county road W and Switzer Point Road.
Climate: Humid continental; mean annual temperature is about 41° F; mean annual precipitation is 30 inches; and frost-free season is about 130 days.
Vegetation and land use: Native vegetation was northern hardwoods. Cutover areas are in aspen. Small areas have been cleared and are used for general farming. Some wooded areas are used for livestock pasture.
Parent material: Silt and sand lacustrine deposits in old glacial lake plains.
Physiography: Nearly level to sloping glacial lake plains.
Topography: Site is on a 1 percent plane slope.
Drainage: Moderately well and well drained.
Ground water: Deep.
Erosion: Slight.
Permeability: Moderate.
Described by: Steve Payne and Robert Fox.
Sampled by: Robert H. Jordan and Robert L. Juve, September 19, 1972
(Colors are for moist soils unless stated otherwise)

O1 4 to 0 cm (1-1/2 to 0 inches). Dark reddish brown (5YR 2/2) organic matter; weak fine granular structure; many roots; a few sand grains; abrupt boundary.

A2 72L850 0 to 2 cm (0 to 3/4 inch). Brown (7.5YR 4/2) very fine sandy loam; weak medium platy structure; very friable; many roots; medium acid; abrupt boundary.

B21hir 72L851 2 to 14 cm (3/4 to 5-1/2 inches). Mixture of brown (7.5YR 4/2 and 4/4) very fine sandy loam; weak medium subangular blocky parting to fine granular structure; very friable; many roots; clear boundary.

B22ir 72L852 14 to 36 cm (5-1/2 to 14 inches). Brown (7.5YR 4/4) very fine sandy loam; weak fine subangular blocky structure; very friable; many roots; strongly acid; clear boundary.

A'2 72L853 36 to 54 cm (14 to 21 inches). Brown (7.5YR 5/4 and 4/4) very fine sandy loam; weak medium platy structure parting to very weak very fine subangular blocky structure; very friable; silt coatings on faces of peds; vesicular; few roots; strongly acid; abrupt boundary.

A&B' 72L854 54 to 65 cm (21 to 26 inches). Brown (7.5YR 5/4) silt loam with a few fine prominent mottles of yellowish red (5YR 5/8) and faint mottles of reddish brown (5YR 4/4); weak fine platy and subangular blocky structure; friable; vesicular; few roots; strongly acid; abrupt boundary.

B&A' 72L855 65 to 75 cm (26 to 30 inches). Reddish brown (5YR 5/4) and brown (10YR 5/3) silt loam with a few medium prominent mottles of yellowish red (5YR 4/8); weak medium subangular blocky structure; friable; few lenses of fine sand at the boundary of the A&B' and B&A' horizons; vesicular; few patchy clay films on Bt peds; few roots; strongly acid; clear boundary.

B'21t 72L856 75 to 119 cm (30 to 47 inches). Brown (7.5YR 4/4) silt loam with a few fine faint mottles of reddish brown (5YR 4/4) and specks of dark reddish brown (5YR 3/3); moderate medium subangular blocky structure with a macrostructure of coarse weak prismatic; firm; many thick patchy clay films; few roots; few iron concretions; very strongly acid, gradual boundary.

B'22t 72L857 119 to 149 cm (47 to 59 inches). Reddish brown (5YR 5/3) silt loam with common medium prominent mottles of yellowish red (5YR 4/6 and 5/6); weak medium subangular blocky structure; firm; thick patchy clay films common; strongly acid; clear boundary.

B'3t 72L858 149 to 179 cm (59 to 71 inches). Brown (7.5YR 5/4) silt loam with common medium distinct mottles of yellowish red (5YR 4/6) and a few dark specks and streaks of dark reddish brown (5YR 3/3 and 3/2); weak medium subangular blocky structure; firm; few discontinuous clay films; strongly acid; clear boundary.

C 72L859 179 to 210 cm (71 to 84 inches). Brown (7.5YR 5/4) silt and very fine sand with few medium distinct mottles of yellowish red (5YR 5/6); weak medium subangular blocky structure; friable; few small manganese concretions; strongly acid.

Remarks: These are moderately well and well drained soils and at the sampling site are nearly level. A sample of the B'21t horizon of this soil was sent to the University of Wisconsin for examination of thin section.

*This pedon lacks a spodic horizon; therefore, it is a taxadjunct to the Fence series.

SOIL CLASSIFICATION-TYPIC GLOSSOBORALF
FINE-LOAMY, MIXED
SERIES - - - - - - -FENWOOD

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE, MTSC
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

SOIL NO - - - - - - S70WIS-37-4 COUNTY - - - MARATHON

GENERAL METHODS- - -1A,1B1B,2A1,2B SAMPLE NOS. 70L894-70L900

DEPTH CM	HORIZON	PARTICLE SIZE ANALYSIS, LT 2MM, 3A1, 3A1A, 3A1B (PCT LT 2MM) SAND 2-.05	SILT .05-.002	CLAY LT .002	FINE CLAY LT .0002	VCOS 2-1	CORS 1-.5	MEDS .5-.25	FNES .25-.10	VFNS .10-.05	COSI .05-.02	FNSI .02-.002	VFSI .005-.002	FAML TEXT SAND 2-.1	INTR II .2-.02	FINE CLAY TO CLAY PCT	NON-CO3-CLAY PCT	RATIO 8D1 15-BAR TO CLAY
000-21	AP	22.9	65.9	11.2		3.0	4.4	3.7	5.8	6.0	31.7	34.2		16.9	40.6			.65
021-30	A2	47.0	44.7	8.3	3.6	6.4	11.5	7.8	11.4	9.9	22.0	22.7		37.1	37.8	43		.54
030-45	A&B	46.8	40.6	12.6	6.9	6.7	11.4	7.8	11.4	9.5	20.0	20.6		37.3	35.5	55		.44
045-62	B&A	41.2	39.6	19.2	11.3	3.8	9.9	7.1	10.9	9.5	19.0	20.6		31.7	34.4	59		.39
062-79	B21T	44.9	35.8	19.3	11.6	7.8	11.8	7.1	10.0	8.2	16.3	19.5		36.7	29.7	60		.38
079-110	2B22T	43.3	37.4	19.3	11.0	6.9	10.1	6.6	10.6	9.1	16.5	20.9		34.2	31.4	57		.42
000-21	AP (A)																	

DEPTH CM	(PARTICLE SIZE ANALYSIS, MM, 3B, 3B1, 3B2) VOL. GT 2 PCT	WEIGHT GT 75 PCT	75-20	20-5	5-2	LT .074 (PCT LT 75)	20-2 PCT LT20	(BULK DENSITY) 4A1D 1/3-BAR G/CC	4A1H OVEN DRY G/CC	4D1 COLE	(WATER CONTENT) 4B1C 1/10 BAR PCT	4B1C 1/3-BAR PCT	4B2 15-BAR PCT	4C1 WRD CM/CM	CARBONATE 6E1B LT 2 PCT	3A1A LT .002 PCT	(PH) 8C1A 1/1 H2O	8C1E 1/2 CACL
000-21	5	0	TR	2	4	77	6	1.30	1.36	.014	29.1	28.3	7.3	.26	3.1C		5.2	5.1
021-30	5	0	TR	4	5	54	9	1.61	1.63	.004	18.8	16.1	4.5	.18	5.6C		5.7	5.2
030-45	10	0	10	5	TR	50	6	1.50	1.61	.021	18.9	16.6	5.6	.15	4.0C		5.3	4.7
045-62	5	0	10	TR	TR	35	4	1.50B					7.4				4.4	3.9
062-79	15	0	15	5	TR	50	5	1.56	1.64	.014	21.6	19.4	7.3	.16	3.1C		4.4	3.7
079-110	20	0	30	TR	TR	10	12	1.70B					8.1				4.1	3.7
000-21	3	0	0	2	3		5						7.3				5.3	5.1

DEPTH CM	(ORGANIC MATTER) 6A1A ORGN CARB PCT	6B1A NITG PCT	C/N	IRON 6C2B EXT FE PCT	PHOS TOTL PCT	(EXTRACTABLE BASES 5B4A) 6N2E CA (MEQ / 100 G)	6O2D MG	6P2B NA	6Q2B K	SUM EXTB	ACTY 6H1A BACL TEA	AL 6G1E KCL EXT	(CAT EXCH) 5A3A EXTB ACTY	5A6A NHAC	RATIO 8D1 NHAC TO CLAY	RATIO 8D3 CA TO MG	CA 5F1 SAT NHAC PCT	(BASE SAT) 5C3 EXTB ACTY PCT	5C1 NHAC PCT
000-21	2.49D	.217	11	1.2		9.3	1.5	0.1	0.4	11.3	9.9	0.1	21.2	15.7	1.40	6.2	59	53	72
021-30	0.35	.034	10	1.4		4.7	0.9	0.1	0.2	5.9	5.5	0.1	11.4	9.1	1.10	5.2	52	52	65
030-45	0.23	.024	10	1.6		4.9	1.2	0.1	0.2	6.4	6.6	0.4	13.0	10.6	0.84	4.1	46	49	60
045-62	0.19	.018		1.9		4.4	1.2	0.1	0.2	5.9	10.8	1.7	16.7	12.7	0.66	3.7	35	35	46
062-79	0.18			1.9		3.3	1.3	0.1	0.2	4.9	10.6	2.2	15.5	12.1	0.63	2.5	27	32	40
079-110	0.11			2.0		4.0	1.6	0.1	0.2	5.9	12.7	2.4	18.6	14.6	0.76	2.5	27	32	40
000-21	2.33	.216	11																

DEPTH CM	(SATURATED PASTE) 8E1 REST OHM-CM	8C1B PH	8A H2O PCT	NA 5D2 ESP PCT	NA 5E SAR	SALT 8D5 TOTL SOLU PPM	GYP 6F1A PCT	(SATURATION EXTRACT 8A1) 8A1A EC MMHOS/CM	6N1B CA (MEQ / LITER)	6O1B MG	6P1B NA	6Q1B K	6I1A CO3	6J1A HCO3	6K1A CL	6L1A SO4	6M1A NO3	ATTERBERG 4F1 LQID LMIT PCT	4F2 PLST INDX
000-21																			
021-30																			
030-45																			
045-62																			
062-79																			
079-110	5200	4.2	28.7	1		80		0.54	2.4	1.1	0.6	0.1							
000-21																			

(A) COMPOSITE OF SEVERAL SURFACE SAMPLES.
(B) ESTIMATED.
(C) MICRO-PENETRATION RESISTANCE - A ROD 0.6 CM DIA IS SLOWLY PUSHED INTO BULK DENSITY CLOD, EQUILIBRATED AT 1/10- BAR, A DISTANCE OF 0.6 CM USING A POCKET PENETROMETER. UNITS ARE FORCE (KG) AND NOT ESTIMATES OF UNCONFINED COMPRESSIVE STRENGTH.
(D) ORGANIC CARBON IS 9 KG/M SQ TO A DEPTH OF 1 M (6A).

Soil classification: Typic Glossoboralfs; fine-loamy, mixed.
Soil: Fenwood.
Soil No.: S70WI-37-4.
Location: Marathon County, Wisconsin; NE¼, SE¼, Sec. 28, T. 29 N., R. 6 E.; 125 feet west of town road and 300 feet south of barn.
Climate: Humid-continental; mean annual temperature is about 43° F; mean annual precipitation is about 30 inches; and frost-free season is about 133 days.
Vegetation and land use: Natural vegetation was mixed hardwood forest. Much of this soil has been cleared and is used for general farming and pasture.
Parent material: Thin silty sediments over residuum from fine-grained granite and greenstone rocks.
Physiography: Gently sloping to moderately steep rock-controlled upland.
Topography: Site is on a southeast 3 percent plane slope in a cultivated field.
Drainage: Well drained.
Ground water: Deep
Erosion: Slight.
Permeability: Moderate.
Described by Paul H. Carroll

(Colors are for moist soils unless otherwise stated)

Ap 70L894 0 to 21 cm (0 to 8 inches). Very dark grayish brown (10YR 3/2) silt loam, light brownish gray (10YR 6/2) dry; weak fine and very fine subangular blocky structure; friable; many fine roots; very few (less than 1 percent) greenstone and fine-grained granitic fragments 2 to 75 mm in diameter; medium acid; abrupt smooth boundary.

A2 70L895 21 to 30 cm (8 to 12 inches). Grayish brown (10YR 5/2) and brown (10YR 5/3) very fine sandy loam; weak thin platy structure parting to weak fine subangular blocky structure; friable; common fine fibrous roots; 3 percent by volume of greenstone and fine-grained granite fragments 2 to 75 mm in diameter; medium acid; clear wavy boundary.

A&B 70L896 30 to 45 cm (12 to 18 inches). Brown (10YR 5/3) light loam (A2); weak thin platy structure; friable; occupies about 60 percent of the horizon and completely surrounds or intermingles with remnants of the Bt; dark yellowish brown (10YR 4/4) loam (B2t); weak fine subangular blocky structure; friable; common fine fibrous roots; few thin clay films on faces of peds and in pores; 5 percent by volume of greenstone and fine-grained granite rock fragments 20 to 75 mm in diameter (7 percent 2 to 75 mm); strongly acid; clear wavy boundary.

B&A 70L897 45 to 62 cm (18 to 24 inches). Dark brown (7.5YR 4/4) loam (Bt); moderate medium subangular blocky structure; firm; occupies about 70 percent of the horizon and consists of upward extensions of the underlying Bt horizons; many thin clay films on faces of peds and in tubular pores; tongues of brown (10YR 5/3-5/4) loam (A2); weak thin platy structure; friable; 5 percent by volume of greenstone and fine-grained granite rock fragments 20 to 75 mm in diameter (7 percent 2 to 75 mm); very strongly acid; clear wavy boundary.

B21t 70L898 62 to 79 cm (24 to 31 inches). Dark brown (7.5YR 4/4) loam; moderate medium angular and subangular blocky structure; very firm; few fine fibrous roots; many thin clay films on faces of peds and in tubular pores; 10 percent by volume of greenstone and fine-grained granite rock fragments 20 to 75 mm in diameter (14 percent 2 to 75 mm); very strongly acid; clear wavy boundary.

B22t 70L899 79 to 110 cm (31 to 43 inches). Dark brown (7.5YR 4/4) gravelly loam; moderate medium angular blocky structure; very firm; continuous thin clay films on faces of most peds and in tubular pores; 20 percent by volume of greenstone and fine-grained granite rock fragments 20 to 75 mm in diameter (30 percent 2 to 75 mm); grades below 43 inches (110 cm) to a concentration of angular and subangular rock fragments that makes further penetration unfeasible; strongly acid.

Gogebic taxadjunct — Bayfield County, Wisconsin

S49WI-4-3 — Beltsville Soil Survey Lab. Nos. 491011-491019

Depth cm	Horizon	M.E./100 Grams Soil						% B. SAT	pH	% O.C.	Size Classes %							
		Ca	Mg	K	Na	H[1]	S+[2]				Clay	III[3]	USDA Silt	VFS	FS	MS	CS	VCS
3.5-0	Oa	--	--	--	--	--	--	--	4.8	--	--	--	--	--	--	--	--	--
0-8	A21	2.9	1.4	0.2	<0.1	8.6	13.1	34	4.4	1.96	7.9	19.9	40.9	11.1	19.6	10.8	7.2	2.5
8-13	A22	3.9	1.4	0.2	<0.1	10.1	15.6	35	5.1	1.61	8.6	19.0	40.2	11.3	19.5	11.2	7.1	2.1
13-23	B21hir	3.6	1.4	0.2	<0.1	14.1	19.3	27	5.3	1.56	8.8	17.8	37.4	10.6	20.4	11.6	7.9	3.3
23-35	B22ir	2.0	1.4	0.2	<0.1	9.9	13.5	27	5.6	0.86	6.9	14.6	32.8	13.0	23.6	12.3	8.4	3.0
35-42	B23irx	1.5	1.3	0.1	<0.1	7.3	10.2	28	5.7	0.53	6.4	12.7	29.2	14.2	25.2	13.1	8.6	3.3
42-60	A'2x	1.1	1.0	0.1	<0.1	4.0	6.2	35	5.8	0.20	4.0	11.8	26.6	14.3	26.9	14.3	10.0	4.0
60-100	B'2tx	1.7	1.3	0.1	<0.1	2.7	5.8	53	5.4	0.10	5.6	12.2	28.1	14.8	26.5	13.4	8.4	3.2
100-130	C1	1.6	1.4	<0.1	<0.1	2.0	5.0	60	5.3	0.04	4.0	8.1	19.2	11.6	29.2	21.2	11.6	3.2

1 Acidity
2 CEC by sum of cations
3 International III - This is PSDA fine silt (.02-.002 mm).

Soil classification: Typic Fragiorthods; coarse-loamy, mixed, frigid.
Soil: Gogebic taxadjunct*.
SoilNo.: S49WI-4-3.
Location: Bayfield County, Wisconsin; SW¼ of Sec. 11, T. 44 N., R. 6 W.; 50 feet east of county highway D across the road from watershed elevation divide marker.
Climate: Average annual precipitation is 28 to 30 inches. Mean annual air termperature is about 37° to 43° F. Mean summer temperature is 60° to 67° F. Frost-free season is 90 to 105 days.
Vegetation and land use: Most of the soil has a mixed hardwood with scattered conifer forest cover. Hard maple, oak, birch, basswood, hemlock, white pine, and aspen are the principal tree species. Small areas have been cleared and are used for general farming.
Parent material: Fine sandy loam acid glacial till.
Physiography: Gently sloping to hilly upland.
Topography: Near the crest of a large ridge on a 3 to 4 percent slope.
Drainage: Moderately well to well drained.
Ground water: Deep.
Erosion: Slight.
Permeability: Moderate in upper part, moderately slow in the fragipan.

(Colors are for moist soil unless otherwise stated)

Ol Thin layer of maple, oak, and aspen leaves mixed with twigs and acorns.

Oa 491011 3.5 to 0 cm (1-1/2 to 0 inches). Black (10YR 2/1) organic mat, very dark grayish brown to very dark brown (10YR 3/2 to 2/2) dry; partially decomposed mat of organic matter bound together with many fine fine fibrous roots; many fragments of wood and charcoal; very strongly acid.

A21 491012 0 to 8 cm (0 to 3 inches). Reddish gray (5YR 5/2) loam, pinkish gray (5YR 6/2) dry; dark reddish gray (5YR 4/2) wet; coarse platy structure; friable; many fine fibrous roots; few pebbles; very strongly acid.

A22 491013 8 to 13 cm (3 to 5 inches). Dark reddish gray (5YR 4/2) loam, light reddish brown (5YR 6/3) dry, dark reddish brown (5YR 3/3) wet; weak fine subangular blocky structure parting to weak fine granular structure; friable; few pebbles; many roots; some humus accumulation; strongly acid.

B21hir 491014 13 to 23 cm (5 to 9 inches). Dark reddish brown (5YR 3/4) fine sandy loam; brown to light brown (7.5YR 5/4 to 6/4) dry; weak medium subangular blocky structure parting to medium granular structure; friable; common roots; strongly acid.

B22ir 491015 23 to 35 cm (9 to 14 inches). Reddish brown (5YR 4/4) fine sandy loam, light brown to light reddish brown (7.5YR 6/4 to 5YR 6/4) dry; moderate medium subangular blocky structure parting to weak fine granular structure; firm; common roots; largely woody with some fine fibrous but mainly large 1/8 to 1 inch in diameter; few pebbles and rocks; medium acid.

B23irx 491016 35 to 42 cm (14 to 17 inches). Reddish brown (5YR 4/4) fine sandy loam, light reddish brown (5YR 6/4) dry; compact in place breaking to thick angular plates or fragments; very firm; weak fragipan; few small roots; medium acid.

A'2x 491017 42 to 60 cm (17 to 24 inches). Reddish brown (5YR 4/4 and 5/4) fine sandy loam, light reddish brown (2.5YR 6/4) dry; cemented and compact in place breaking to thick angular fragments; very firm; moderately developed fragipan; medium acid.

B'2tx 491018 60 to 100 cm (24 to 40 inches). Reddish brown (2.5YR 4/4 & 5/4) fine sandy loam, light reddish brown (2.5YR 6/4) dry; compact in place parting to subangular fragments; firm; fragments often have thin coatings of lighter colored sand grains; few pebbles of micaceous schist and red sandstone; weak to moderately developed fragipan; strongly acid.

C1 491019 100 to 130 cm (40 to 52 inches). Reddish brown (2.5YR 4/4) fine sandy loam, light reddish brown (2.5YR 6/4) dry; compact in places but generally massive; friable; few pebbles mainly red sandstone and basalt; strongly acid.

C2 (not sampled) 130 to 158 cm (52 to 63 inches). Reddish brown (2.5YR 4/4) fine sandy loam with reddish brown (2.5YR 5/4) streaks; massive; very friable.

*This pedon lacks an argillic horizon; therefore, it is a taxadjunct to the Gogebic series.

Remarks: Pedon placement based on series classification because chemical data are incomplete.

SOIL CLASSIFICATION-ALFIC FRAGIORTHOD
COARSE-LOAMY, MIXED, FRIGID
SERIES - - - - - - -GOGEBIC TAXADJUNCT

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE, NTSC
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

SOIL NO - - - - - - S72WI-63-1 COUNTY - - - VILAS

GENERAL METHODS- - -1A,1B1B,2A1,2B SAMPLE NOS. 72L886-72L893

DEPTH CM	HORIZON	PARTICLE SIZE ANALYSIS, LT 2MM, 3A1, 3A1A, 3A1B (PCT LT 2MM) SAND 2-.05	SILT .05-.002	CLAY LT .002	FINE CLAY LT .0002	VCOS 2-1	CORS 1-.5	MEDS .5-.25	FNES .25-.10	VFNS .10-.05	COSI .05-.02	FNSI .02-.002	VFSI .005-.002	SAND 2-.10	INTR SI .2-.02	FINE CLAY TO CLAY PCT	NON-CO3-CLAY PCT	RATIO 8D1 15-BAR TO CLAY
000-6	A2	56.5	38.2	5.3	1.4	1.7	6.3	13.8	22.5	12.2	16.1	22.1		44.3	38.7	26		.74
006-20	B21HIR	60.2	32.9	6.9	.6	2.1	5.6	12.1	22.5	17.9	17.1	15.8		42.3	46.4	9		1.80
020-35	B22IR	62.7	31.0	6.3	.8	3.1	7.9	14.6	23.5	13.6	15.9	15.1		49.1	40.8	13		.90
035-57	B23IR	64.7	30.3	5.0	.7	3.1	7.6	15.0	24.6	14.4	16.4	13.9		50.3	42.5	14		.82
057-83	A'2X	67.8	28.3	3.9	.9	3.0	8.1	16.0	25.9	14.8	15.7	12.6		53.0	42.9	23		.56
083-98	A&BT'	65.8	30.0	4.2	.4	3.5	8.0	14.7	24.9	14.7	17.1	12.9		51.1	43.8	10		.38
098-127	B21't	66.2	28.9	4.9	.9	3.1	7.9	15.3	26.0	13.9	15.7	13.2		52.3	42.3	18		.39
127-162	B22't	52.3	34.5	13.2	4.4	2.1	5.8	11.5	20.2	12.7	18.1	16.4		39.6	40.7	33		.37

DEPTH CM	(PARTICLE SIZE ANALYSIS, MM, 3B, 3B1, 3B2) VOL. GT 2 PCT	WEIGHT GT 75 PCT	75-20	20-5	5-2	LT .074	20-2 PCT LT20	(BULK DENSITY) 4A1D 1/3-BAR G/CC	4A1H OVEN DRY G/CC	4D1 COLE	(WATER CONTENT) 4B1C 1/10 BAR PCT	4B1C 1/3-BAR PCT	4B2 15-BAR PCT	4C1 WRD CM/CM	(CARBONATE) 6E1B LT 2 PCT	3A1A LT .002 PCT	(PH) 8C1A 1/1 H2O	8C1B 1/2 CACL
000-6	5	TR	5	2	2	46	4						3.9				4.1	3.4
006-20	5	TR	5	8	6	41	15	.81	.93	.045	48.0	41.2	12.4	.21	.9A		4.6	4.0
020-35	10	TR	5	6	7	37	14						5.7				4.7	4.3
035-57	10	TR	5	8	6	35	15						4.1				4.8	4.3
057-83	20	5	10	9	6	30	17						2.2				4.9	4.5
083-98	20	5	10	7	5	33	13						1.6				5.1	4.5
098-127	20	5	10	7	5	33	13						1.9				5.4	4.8
127-162	15	5	10	5	5	44	11	1.88	1.88	.000	13.8	11.5	4.9	.11	4.3A		5.8	5.2

DEPTH CM	(ORGANIC MATTER) 6A1A ORGN CARB PCT	6B1A NITG PCT	C/N	IRON 6C2B EXT FE PCT	PHOS TOTL PCT	(EXTRACTABLE BASES 5B4A) 6N2E CA	6O2D MG	6P2B NA	6Q2B K	SUM EXTB	ACTY 6R1A BACL TRA	AL 6G1E KCL EXT	(CAT EXCH) 5A3A EXTB ACTY	5A6A NHAC	RATIO 8D1 NHAC TO CLAY	RATIO 8D3 CA TO MG	CA 5F1 SAT NHAC PCT	(BASE SAT) 5C3 EXTB ACTY PCT	5C1 NHAC PCT
						(MEQ / 100 G)													
000-6	1.65			1.0		1.0	.3	.1	.1	1.5	8.2	1.9	9.7	8.4	1.58	3.3	12	15	18
006-20	3.80			1.8		.4	.1	TR	.1	.6	36.5	5.1	37.1	22.7	3.29	4.0	2	2	3
020-35	1.10			1.0		.3	.1	TR	TR	.4	15.9	2.4	16.3	9.5	1.51	3.0	3	2	4
035-57	.79			1.0		.3	.1	TR	.1	.5	11.7	1.8	12.2	7.1	1.42	3.0	4	4	7
057-83	.27			1.0		.2	.1	TR	TR	.3	6.9	1.0	7.2	3.8	.97	2.0	5	4	8
083-98	.05			.9		1.3	.6	.1	TR	2.0	2.8	.4	4.8	3.8	.90	2.2	34	42	53
098-127	.18			1.0		1.9	.9	.1	.1	3.0	2.2	.1	5.2	3.9	.80	2.1	49	58	77
127-162	.16			1.3		4.4	2.4	.1	.1	7.0	2.5		9.5	7.8	.59	1.8	56	74	90

DEPTH CM	(SATURATED PASTE) 8E1 REST OHM-CM	8C1B PH	8A H2O PCT	NA 5D2 ESP PCT	NA 5E SAR	SALT 8D5 TOTL SOLU PPM	GYP 6F1A PCT	(SATURATION EXTRACT 8A1) 8A1A EC MMHOS/CM	6M1B CA	6O1B MG	6P1B NA	6Q1B K	6I1A CO3	6J1A HCO3	6K1A CL	6L1A SO4	6M1A NO3	ATTERBERG 4F1 LQID LMIT PCT	4F2 PLST INDX
									(MEQ / LITER)										
000-6																			
006-20																			
020-35	36000	4.7	33.3					.13											
035-57																			
057-83																			
083-98																			
098-127	15000	5.1	14.4					.27											
127-162																			

IDENTIFICATION OF THE SPODIC HORIZON BY LABORATORY CRITERIA.

DEPTH	HORIZON	(PYROPHOSPHATE,PH10) 6C5A EXT FE PCT	6G5A EXT AL PCT	6A1B EXT C PCT	(CIT - DIT) 6C2B EXT FE PCT	6G7A EXT AL PCT	(PYROPHOSP) FE+AL / CLAY	AL+C / CLAY	PYRO FE+AL / C - D FE+AL	CEC -1/2 CLAY X THIC
006-20	B21HIR	.8	.9		1.8	.9	.25		.63	270
020-35	B22IR	.2	.4		1.0	.4	.10		.43	95
035-57	B23IRX	.2	.3		1.0	.3	.10		.38	101

(A) MICRO-PENETRATION RESISTANCE. A ROD 0.6 CM DIA IS SLOWLY PUSHED INTO BULK DENSITY CLOD, EQUILIBRATED AT 0.1-BAR, A DISTANCE OF 0.6 CM USING A POCKET PENETROMETER. UNITS ARE FORCE (KG) AND NOT ESTIMATES OF UNCONFINED COMPRESSIVE STRENGTH.

Soil classification: Alfic Fragiorthod; coarse-loamy, mixed, frigid.
Soil: Gogebic taxadjunct*.
Soil No.: S72WI-63-1 (LSL Nos. 72L886-72L893).
Location: Vilas County, Wisconsin; SE¼, SE¼, Sec. 2, T. 43 N., R. 6 E.; near county road 13.
Climate: Humid continental; mean annual air temperature is about 41° F mean annual precipitation ranges from 28 to 32 inches; and frost-free season is about 90 to 180 days.
Vegetation and land use: Native vegetation was mixed northern hardwood and conifer forests. Most of this soil is in forest. Small areas have been cleared for general farming and some areas are used for livestock pasture.
Parent material: Acid fine sandy loam glacial till.
Physiography: Gently sloping to undulating and rolling glacial ground and recessional moraines.
Topography: Site is on a convex 3 percent slope in a forested area with many hummocks.
Drainage: Moderately well and well drained
Ground water: Deep.
Erosion: Slight.
Permeability: Moderately slow in the fragipan, and moderate in remainder of profile.
Described by: Steve Payne and Robert Fox
Sampled by: Robert H. Jordan and Robert L. Juve, September 19, 1972
(Colors are for moist soil unless otherwise stated)

O1 4 to 0 cm (1-1/2 to 0 inches). Dark colored decomposed leaves. Hummocky.

A2 72L886 0 to 6 cm (0 to 2 inches). Weak red (2.5YR 5/2) fine sandy loam; weak fine platy structure; very friable; few roots; few fine gravel; strongly acid; clear boundary.

B21hir 72L887 6 to 20 cm (2 to 8 inches). Dark reddish brown (2.5YR 3/4) fine sandy loam; moderate fine subangular blocky structure; very friable; many roots; strongly acid; clear boundary.

B22ir 72L888 20 to 35 cm (8 to 14 inches). Dark red (2.5YR 3/6) fine sandy loam; moderate medium subangular blocky structure; very friable; many roots; few fine gravel; strongly acid; clear boundary.

B23ir 72L889 35 to 57 cm (14 to 23 inches). Dark red (2.5YR 3/6) fine sandy loam; weak medium subangular blocky structure; firm, brittle, weakly cemented; few pores; few roots; strongly acid; clear boundary.

A'2x 72L890 57 to 83 cm (23 to 33 inches). Reddish brown (2.5YR 4/4) fine sandy loam; massive; firm, brittle, moderate cementation; vesicular; about 10 percent fine and medium gravel; strongly acid; clear boundary.

A&Bt' 72L891 83 to 98 cm (33 to 39 inches). Weak red (2.5YR 4/2) and reddish brown (2.5YR 4/4) fine sandy loam; weak medium subangular blocky structure; friable; few clay films on peds of Bt in this horizon; few pebbles; many fine pores; strongly acid; clear boundary.

B21't 72L892 98 to 127 cm (39 to 51 inches). Reddish brown (2.5YR 4/4) fine sandy loam; weak medium subangular blocky structure; friable; many thick continuous clay films; few fine gravel and 5 percent of coarse gravel; strongly acid; clear boundary.

B22't 72L893 127 to 162 cm (51 to 65 inches). Reddish brown (2.5YR 4/4) heavy fine sandy loam with a few coarse distinct mottles of pinkish gray (7.5YR 6/2); weak medium subangular blocky structure; friable; many thin clay films and clay bridges; a few fine gravel; medium acid.

Remarks: Stones make up about 5 percent of the soil mass throughout the profile. There is about 10 percent medium gravel below 57 cm. A sample of the B3t horizon was given to the University of Wisconsin for thin section inspection.

*This pedon is a taxadjunct to the Gogebic series because it lacks an A1 horizon and some of the colors are outside the series range.

SOIL CLASSIFICATION-TYPIC BOROSAPRIST
DYSIC
SERIES - - - - - - - GREENWOOD TAXADJUNCT

SOIL NO - - - - - - S74WI-67-2 COUNTY - - - LANGLADE

GENERAL METHODS- - -1A,1B1B,2A1,2B SAMPLE NOS. 74L841-74L849

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE, MTSC
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

DEPTH CM	HORIZON	SAND 2-.05	SILT .05-.002	CLAY LT .002	FINE CLAY LT .0002	VCOS 2-1	CORS 1-.5	MEDS .5-.25	FNES .25-.10	VFNS .10-.05	COSI .05-.02	FNSI .02-.002	VFSI .005-.002	SAND 2-.10	INTR II .2-.02	FINE CLAY TO CLAY PCT	NON-CO3-CLAY PCT	RATIO 8D1 15-BAR TO CLAY
		(- - PARTICLE SIZE ANALYSIS, LT 2MM, 3A1, 3A1A, 3A1B - - PCT LT 2MM - -)																
000-010	OI																	
010-016	OE1																	
016-050	OE2																	
050-090	OE3																	
090-135	OE4																	
135-155	OE5																	
155-200	OE6																	
200-260	OE7																	
260-300	OE8																	

DEPTH CM	VOL. GT 2 PCT	WEIGHT GT 75 PCT	75-20 PCT LT 75	20-5 PCT LT 75	5-2 PCT LT 75	LT .074	20-2 PCT LT20	BULK DENSITY 4A1D 1/3-BAR G/CC	4A1H OVEN DRY G/CC	4D1 COLE	WATER CONTENT 4B1C 1/10 BAR PCT	4B1C 1/3-BAR PCT	4B2A 15-BAR PCT	4C1 WRD CM/CM	CARBONATE 6E1B LT 2 PCT	3A1A LT .002 PCT	PH 8C1A 1/1 H2O	8C1E 1/2 CACL
000-010	0	0	0	0	0		0						112				3.5	2.9
010-016	0	0	0	0	0		0						126				3.5	2.8
016-050	0	0	0	0	0		0						110				3.6	2.9
050-090	0	0	0	0	0		0						127				3.6	2.9
090-135	0	0	0	0	0		0						122				3.6	2.9
135-155	0	0	0	0	0		0						114				3.7	2.9
155-200	0	0	0	0	0		0						79.6					
200-260	0	0	0	0	0		0											
260-300	0	0	0	0	0		0											

DEPTH CM	ORGANIC MATTER 6A1A ORGN CARB PCT	6B1A NITG PCT	C/N	IRON 6C2B EXT FE PCT	PHOS TOTL PCT	EXTRACTABLE BASES 5B4A 6N2E CA	6O2D MG	6P2B NA	6Q2B K	SUM EXTB	ACTY 6H1A BACL TEA	AL 6G1E KCL EXT	CAT EXCH 5A3A EXTB ACTY	5A6A NHAC	RATIO 8D1 NHAC TO CLAY	RATIO 8D3 CA TO MG	CA 5F1 SAT NHAC PCT	BASE SAT 5C3 EXTB ACTY PCT	5C1 NHAC PCT
						(- - MEQ / 100 G - -)													
000-010	54.6	1.59	34			8.3	3.3	.2	1.7	13.5	131		145	93.1		2.5	9	9	15
010-016	60.9	1.67	37			7.5	2.4	.2	1.0	11.1	119		130	102		3.1	7	9	11
016-050	49.7	2.09	24			4.1	1.5	.2	.3	6.1	165		171	102		2.7	4	4	6
050-090	53.9	1.64	33			5.2	1.4	.2	.0	6.8	161		168	86.6		3.7	6	4	8
090-135	51.4	1.46	35			6.2	1.6	.3	.0	8.1	171		179	90.2		3.9	7	5	9
135-155	55.2	1.39	40			6.5	1.8	.2	.0	8.5	147		156	90.5		3.6	7	5	9
155-200																			
200-260																			
260-300																			

DEPTH CM	SATURATED PASTE 8E1 REST OHM-CM	8C1E PH	8A H2O PCT	NA 5D2 ESP PCT	NA 5E SAR	SALT 8D5 TOTL SOLU PPM	GYP 6F1A PCT	SATURATION EXTRACT 8A1 8A1A EC MMHOS/CM	6N1B CA	6O1B MG	6P1B NA	6Q1B K	6I1A CO3	6J1A HCO3	6K1A CL	6L1A SO4	6M1A NO3	ATTERBERG 4F1 LQID LMIT PCT	4F2 PLST INDX
									(- - MEQ / LITER - -)										
000-010	11000	3.3	952			370		.12	.1	.1	.1	.3	0	1.8	.0	.2	.0		
010-016	7900	3.0	900			350		.15	.2	.1	.1	.2	0	1.5	.0	.9	.0		
016-050	12000	3.5	958			60		.09	.1	TR	TR	TR	0	1.2	.0	.5	.0		
050-090	15000	3.4	1080			70		.07	.1	TR	TR	TR	0	1.2	.0	.1	.0		
090-135	18000	3.5	1200					.06	TR	TR	TR	TR	0	.6	.0	.1	.0		
135-155	15000	3.3	1150					.06	TR	TR	TR	TR	0	.6	.5	.0	.0		
155-200																			
200-260																			
260-300																			

DEPTH CM	HISTOSOL CHARACTERIZATION 8F MINL CONT PCT	STATE OF DECOMPOSITION 8G (FIBER VOL) UNRB PCT	8G RUB PCT	8H PYROPHOSPHT SOLUBILITY (MUNS COLOR)	PH 8C1E .01M CACL	BULK DEN 4A3A FILD STAT G/CC	4A1I 1/3B REWT G/CC	COLE 4D1 RE-WET	SUBS RES-IDUE PCT	WATER CONTENT 4B4 FILD STAT PCT	4B1C 1/3B REWT PCT	4B2 15-BAR PCT	4C1 WRD CM/CM
000-010		88	44	10YR 7.5/4	3.0							99.0	
010-016		31	18	10YR 5/3	3.0							77.8	
016-050	6	26	11	10YR 6/3	3.1	.12			63	787		61.1	
050-090	4	32	14	10YR 6/4	3.1	.09			48	1090		38.7	
090-135	1	22	11	10YR 5/3	3.3	.07			39	1250		76.7	
135-155	1	54	28	10YR 7/3	3.4	, 7			39	1380		79.3	
155-200		58	31	10YR 6/3	3.4								
200-260		64	37	10YR 6/3	3.5								
260-300		47	29	10YR 6/3	3.6								

Soil classification: Typic Borosaprist, dysic.
Series: Greenwood taxadjunct.
Soil No.: S74WI-67-2.
Location: Langlade County, Wisconsin; SE¼, NE¼, Sec. 26, T. 33 N., R. 10 E.; 200 feet west of road. About 45.2° north latitude and about 89.0° west longitude.
Climate: Humid continental. Mean annual temperature is 42.2° F; mean July temperature is 68.5° F; mean January temperature is 13.8° F; mean annual precipitation is 29.86 inches with nearly two-thirds of this during the growing season; total annual snowfall is 48 inches; frost-free season is 138 days at Antigo but less on the organic soil areas.
Parent material: Organic soil material derived from mosses, grasses, reeds, and sedges overlying limnic material.
Physiography: Deep depression associated with a lake which has filled in with organic material; surrounding uplands is part of the Cary recessional moraine and consists of rolling gravelly loam soils. Elevation is about 1,600 feet.
Vegetation: Scattered white birch, black spruce, tamarack, and white pine, with an understory of Labrador-tea, leatherleaf, cranberry, blueberry, sphagnum moss and native bog forbs.
Size of area: About 60 acres.
Distance to adjacent mineral soil: About 160 feet to east, north, and south; west side is bordering on Summit Lake.
Depth to water table: 1 foot.
Microrelief: Low hummocks of 6 to 18 inches over the entire bog.
Subsidence: No evidence of subsidence.
Soil temperature: Measured soil temperature of 11.5° C at 50 cm.
Described and sampled by: G. Hudelson, A.J. Klingelhoets, G.B. Lee, Warren Lynn, W.E. McKinzie, R. Newbury, and S. Payne on Aug. 7, 1974. Samples were obtained from a pit dug with a spade to 45 inches and then with a posthole digger and peat sampler below 45 inches.

Mat of living sphagnum with many live roots of sphagnum, shrubs, and forbs, about 5 cm thick. (Not sampled.)

Oi 74L841 0 to 10 cm. Dark brown (10YR 3/3) broken face fibric material, very dark grayish brown (10YR 3/2) rubbed, and pale brown (10YR 6/3) pressed; fiber content 95 percent, 60 percent rubbed; primarily sphagnum fiber; matted structure; friable; less than 10 percent mineral material; many fine roots; pH 4.2 (Truog); abrupt wavy boundary.

Oe1 74L842 10 to 16 cm. Very dark brown (10YR 2/2) broken face hemic material, black (10YR 2/1) rubbed and pressed; fiber content 40 percent undisturbed, rubbed 18 percent; weak fine subangular blocky structure; very friable; mixture of sphagnum and herbaceous fibers; many fine fibrous roots; 20 to 25 percent mineral matter; pH 4.3 (Truog); clear wavy boundary.

Oe2 74L843 16 to 50 cm. Very dark brown (10YR 2/2) broken face, hemic material, black (10YR 2/1) rubbed, very dark brown (10YR 2/2) pressed; fiber content 60 percent, 20 percent rubbed; fibers primarily herbaceous; sedge fibers are yellowish brown (10YR 5/4, 5/6); weakly matted to weak fine subangular blocky structure; very friable; 20 percent mineral matter; few sedge and forb roots; pH 4.3 (Truog); gradual irregular boundary.

Oe3 74L844 50 to 90 cm. Very dark brown (7.5YR 2/2) broken face hemic material; very dark brown (10YR 2/2) rubbed and pressed; about 70 percent fibers undisturbed, rubbed 20 percent; primarily herbaceous fibers; less than 20 percent mineral material; weak fine subangular to matted structure; very friable; few sedge roots; pH 4.3 (Truog); gradual wavy boundary.

Oe4 74L845 90 to 135 cm. Dark brown (7.5YR 3/2) broken face hemic material, very dark brown (7.5YR 2/2) rubbed and pressed; about 50 percent fiber unrubbed and 20 percent rubbed; weak medium subangular blocky structure; very friable; less than 20 percent mineral material; few wood fragments from spruce and tamarack; pH 4.5 (Truog); gradual wavy boundary.

Oe5 74L846 135 to 155 cm. Dark brown (7.5YR 3/2) broken face hemic material, very dark brown (7.5YR 2/2) rubbed and pressed; 50 percent fibers and 20 percent rubbed; primarily herbaceous material; less than 20 percent mineral content; weakly matted; very friable; pH 4.5 (Truog); gradual wavy boundary.

Oe6 74L847 155 to 200 cm. Sampled separately but not differentiated from the horizon above.

Oe7 74L848 200 to 260 cm. Sampled separately but not differentiated from the Oe5 horizon description.

Oe8 74L849 260 to 300 cm. Sampled separately but not differentiated from the Oe5 horizon description.

Remarks: At a depth of 144 to 160 inches, the peat contained a high percent (40 percent) of sedimentary peat. This material had a fiber content of 30 percent unrubbed and 10 percent rubbed. It was very dark brown (7.5YR 2/2) in color; massive; very friable; pH 5.8 (Truog).

SOIL CLASSIFICATION-TYPIC BOROHEMIST
DYSIC
SERIES - - - - - - -GREENWOOD

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE, NTSC
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

SOIL NO - - - - - - - S74WI-85-1 COUNTY - - - ONEIDA

GENERAL METHODS- - -1A,1B1B,2A1,2B SAMPLE NOS. 74L891-74L899

DEPTH CM	HORIZON	PARTICLE SIZE ANALYSIS, LT 2MM, 3A1, 3A1A, 3A1B (PCT LT 2MM) SAND 2-.05	SILT .05-.002	CLAY LT .002	FINE CLAY LT .0002	VCOS 2-1	CORS 1-.5	MEDS .5-.25	FNES .25-.10	VFNS .10-.05	COSI .05-.02	FNSI .02-.002	VFSI .002-.002	SILT SAND 2-.10	INTR II .2-.02	FINE CLAY TO CLAY PCT	NON-CO3-CLAY PCT	RATIO 8D1 15-BAR TO CLAY
000-008	OI1																	
008-013	CI1																	
013-023	OE1																	
023-050	CE2																	
050-070	OE3																	
070-100	CE4																	
100-180	CE5																	
180-312	LCO																	
312-370	2CG																	

DEPTH CM	PARTICLE SIZE ANALYSIS, MM, 3B, 3B1, 3B2 VOL. GT 2 PCT	WEIGHT GT 75 PCT	75-20	20-5	5-2	LT .074 PCT LT 75	20-2 PCT LT20	BULK DENSITY 4A1D 1/3-BAR G/CC	4A1H OVEN DRY G/CC	4D1 COLE	WATER CONTENT 4B1C 1/10 BAR PCT	4B1C 1/3-BAR PCT	4B2A 15-BAR PCT	4C1 WRD CM/CM	CARBONATE 6E1B LT 2 PCT	3A1A LT .002 PCT	PH 8C1A 1/1 H2O	8C1E 1/2 CACL
000-008	0	0	0	0	0		0						107				3.6	2.8
008-013	0	0	0	0	0		0						169				3.6	2.9
013-023	0	0	0	0	0		0	.14	.34		620	563	129	.69			3.6	2.8
023-050	0	0	0	0	0		0	.12	.32		734	620	124	.73			3.7	2.9
050-070	0	0	0	0	0		0	.05	.16		1440	1340	122	.66			3.7	2.9
070-100	0	0	0	0	0		0	.04	.09		1950	1820	122	.73			3.8	3.1
100-180	0	0	0	0	0		0											
180-312	0	0	0	0	0		0											
312-370	0	0	0	0	0		0											

DEPTH CM	ORGANIC MATTER 6A1A ORGN CARB PCT	6B1A NITG PCT	C/N	IRON 6C2B EXT FE PCT	PHOS TOTL PCT	EXTRACTABLE BASES 5B4A (MEQ / 100) 6N2E CA	6O2D MG	6P2B NA	6Q2B K	SUM EXTB	ACTY 6H1A BACL TEA G	AL 6G1E KCL EXT	CAT EXCH 5A3A EXTB ACTY	5A6A NHAC	RATIO 8D1 NHAC TO CLAY	RATIO 8D3 CA TO MG	CA 5F1 SAT NHAC PCT	BASE SAT 5C3 EXTB ACTY PCT	5C1 NHAC PCT
000-008	53.3	1.26	42			8.5	6.1	.5	2.7	17.8	148		166	90.5		1.4	9	11	20
008-013	49.2	2.10	21			4.7	2.7	.3	.6	8.3	141		149	95.0		1.7	5	6	9
013-023	54.3	2.12	26			6.2	1.9	.2	.2	8.5	168		176	102		3.3	6	5	8
023-050	47.9	1.93	25			10.7	3.0	.8	.3	14.8				189		3.6	6		8
050-070	49.8	1.82	27			5.6	1.5	.3	.2	7.6	178		186	93.3		3.7	6	4	8
070-100	53.2	1.55	34			7.5	2.0	.4	.0	9.9	171		181	102		3.8	7	5	10
100-180																			
180-312																			
312-370																			

DEPTH CM	SATURATED PASTE 8E1 REST OHM-CM	8C1B PH	8A H2O PCT	NA 5D2 ESP PCT	NA 5E SAR	SALT 8D5 TOTL SOLU PPM	GYP 6F1A PCT	SATURATION EXTRACT 8A1 8A1A EC MMHOS/CM	6N1B CA	6O1B MG	6P1B NA	6Q1B K	6I1A CO3	6J1A HCO3	6K1A CL	6L1A SO4	6M1A NO3	ATTERBERG 4F1 LQID LMIT PCT	4F2 PLST INDX
								(MEQ / LITER)											
000-008	8600	3.3	180	1		90		.18	.1	.1	.1	.5	0	.9	.2	.0	.0		
008-013	6500	3.5	546			140		.19	.1	.1	.1	.1	0	.9	.0	.2	.0		
013-023	7500	3.2	785			250		.17	.3	.1	.1	TR	0	.6	.5	.0	.9		
023-050	12000	3.8	951			120		.10	.1	TR	.1	.0	0	.3	.0	.0	.0		
050-070	12000	3.4	979			60		.09	.1	TR	TR	.0	0	.6	.0	.0	.0		
070-100	15000	3.6	1110			70		.08	.1	TR	TR	.0	0	.3	.5	.0	.0		
100-180																			
180-312																			
312-370																			

DEPTH CM	HISTOSOL CHARACTERIZATION 8F MINL CONT PCT	STATE OF DECOMPOSITION 8G (FIBER VOL) UNRB PCT	RUB PCT	8H PYROPHOSPHT SOLUBILITY (MUNS COLOR)	PH 8C1E .01M CACL	BULK DEN 4A3A FILD STAT G/CC	4A1I 1/3B REWT G/CC	COLE 4D1 RE-WET	SUBS RES-IDUE PCT	WATER CONTENT 4B4 FILD STAT PCT	4B1C 1/3B REWT PCT	4B2 15-BAR PCT	4C1 WRD CM/CM
000-008		80	68	10 YR 6/4	3.3							101	
008-013		45	6	10 YR 5/4	3.3							68.4	
013-023	7	61	8	10 YR 5/3	3.0	.16	.21	.17	60	542	352	45.5	.64
023-050	6	55	10	10 YR 6/4	3.1	.14	.20	.17	73	649	337	64.8	.54
050-070	6	52	17	10 YR 7/4	3.2	.13	.11	.13	68	722	437	64.1	.41
070-100	2	53	23	7.5YR 6/4	3.4	.09	.05	.22	49	1060	1070	58.7	.51
100-180	4	50	22	10 YR 7/3	3.7	.08			43	963			
180-312	33	—	1		3.8	.09			34	1040			
312-370	99				3.7	.98				57			

Soil classification: Typic Borohemist; dysic.
Series: Greenwood.
Soil No.: S74WI-85-1.
Location: Oneida County, Wisconsin; SW¼, SW¼, Sec. 20, T. 35 N., R. 11 E.; 60 feet south of old highway in powerline right-of-way. About 45°30' N. latitude about 89°14' W. longitude.
Climate: Humid continental. Mean annual temperature is 41.6° F; mean July temperature is 68.4° F; mean January temperature is 12.8° F; mean annual precipitation is 30.78 inches with nearly two-thirds of the precipitation falling during the growing season; total amount of snow is 55.6 inches; the growing season averages 127 days, but less in organic areas (data from Rhinelander, WI, weather bureau substation.)
Parent material: Deposits of herbaceous material more than 51 inches thick.
Physiography: Large glacial depression in Cary drift.
Vegetation: Black spruce, tamarack, blueberry, Labrador-tea, and sphagnum moss.
Size of area: About 1,600 acres.
Distance to adjacent mineral soil: About 400 feet to the east.
Depth to water table: 75 cm.
Microrelief: Hummocky. Hummocks are 18 inches high.
Subsidence: None
Soil temperature: Measured soil temperature of 10.5° C. at 50 cm.
Described and sampled by: G.W. Hudelson, W.C.Lynn, W.E. McKinzie, G.B. Lee, R.L. Newbury, S.W. Payne, and A.J. Klingelhoets. Sampled from pit to 40 inches and peat sampler below 40 inches.

Not sampled: 5 to 0 cm. Mat of moss and roots;

Oi1 74L891 0 to 8 cm. 74L892 0 to 13 cm. Dark brown (7.5YR 3/2) broken face, rubbed, pale brown (10YR 6/3) pressed fibric material; about 95 percent fiber, about 50 percent rubbed; massive (matted); fibers primarily herbaceous; less than 10 percent mineral soil material; many roots; pH 4.5 (Truog); clear wavy boundary.

Oe1 74L893 13 to 23 cm. Dark brown (7.5YR 3/2) broken face, rubbed, or pressed hemic material; about 60 percent fibers, about 15-20 percent rubbed; weak medium subangular blocky structure; very friable; fibers primarily herbaceous; about 20 percent mineral soil material; common roots; pH 4.8 (Truog); clear wavy boundary.

Oe2 74L894 23 to 50 cm. Dark brown (7.5YR 3/2) broken face, rubbed, or pressed hemic material; about 50 percent fiber, about 15 to 20 percent rubbed; weak medium subangular blocky structure; fibers primarily herbaceous; about 25 percent mineral soil material; few roots; pH 4.5 (Truog); clear wavy boundary.

Oe3 74L895 50 to 70 cm. Dark brown (7.5YR 3/2) broken face, rubbed, or pressed hemic material; about 70 percent fiber, about 20 percent rubbed; massive (matted); very friable; fibers primarily herbaceous; about 20 percent mineral soil material; pH 4.5 (Truog); gradual wavy boundary.

Oe4 74L896 70 to 100 cm. Dark brown (7.5YR 3/2) broken face, rubbed, or pressed hemic material; about 60 percent fiber, about 15 to 20 percent rubbed; massive (matted); very friable; fibers primarily herbaceous; about 20 percent mineral soil material; pH 5.0 (Truog); gradual wavy boundary.

Oe5 74L897 100 to 180 cm. Dark brown (7.5YR 3/2) broken face, rubbed, or pressed hemic material; about 60 percent fiber, about 15 to 20 percent rubbed; massive (matted); very friable; fibers primarily herbaceous; about 15 percent mineral soil material; pH 5.8 (Truog); clear wavy boundary.

Lco 74L898 180 to 312 cm. Very dark gray (5Y 3/1), dark olive gray (5Y 3/2) coprogenous material; about 10 to 15 percent fibers, about 5 to 10 percent rubbed; massive; very friable; about 25 percent mineral soil material; pH 6.8 (Truog); clear wavy boundary.

IICg 74L899 312 to 370 cm. Gray (5Y 5/1) silt loam; massive; friable; pH 7.3 (Truog).

Remarks:
1. Oe1 contains thin layer with higher mineral content. This thin layer contains many charcoal fragments.
2. Oe1 through Oe5 contains many dark reddish brown (5YR 3/3 and 3/4) sedge fibers.
3. Oe5 contains layers of raw woody material at 113 cm. This layer is composed of stems and roots up to 3 inches in diameter.

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL Hibbing taxadjunct SOIL Nos. S64WI-2-1 LOCATION Ashland County, Wisconsin

SOIL SURVEY LABORATORY Lincoln, Nebraska LAB. Nos. 19829-19837 June, 1968

GENERAL METHODS: 1A, 1B1b, 2A1, 2B

Depth (In.)	Horizon	Size class and particle diameter (mm) 3A1 — Total: Sand (2-0.05) a	Total: Silt (0.05-0.002)	Total: Clay (< 0.002)	Sand: Very coarse (2-1)	Sand: Coarse (1-0.5)	Sand: Medium (0.5-0.25)	Sand: Fine (0.25-0.1)	Sand: Very fine (0.1-0.05)	Silt: 0.05-0.02	Silt: Int. III (0.02-0.002)	Int. II (0.2-0.02)	(2-0.1)	<0.074	0.005-0.002	Coarse fragments 2A2: 3B2 Vol. 19-2	3B1 Wt. 19-2
		Pct. of < 2 mm														<---Pct. of <19>	
0-2	A1	31.5	52.4	16.1	0.6	3.5	6.2	13.4	7.8	15.7	36.7	30.5	23.7	72.8	11.6		tr
2-5	A2	31.6	52.0	16.4	1.6	3.9	5.8	12.6	7.7	14.8	37.2	29.2	23.9	72.8	13.3		4
5-10	A&B	27.7	46.6	25.7	1.2	3.2	5.0	11.3	7.0	12.6	34.0	25.6	20.7	76.3	12.9	3	5
10-15	B21t	17.5	34.4	48.1	0.6	1.4	2.9	7.4	5.2	9.8	24.6	19.1	12.3	85.6	10.8		tr
15-23	B22t	17.1	34.6	48.3	0.4	1.5	2.8	7.1	5.3	10.0	24.6	19.2	11.8		10.1		tr
23-30	B3	16.0	35.6	48.4	0.7	1.3	2.6	6.6	4.8	8.9	26.7	17.4	11.2	86.8	10.8		tr
30-44	C1ca	12.6	34.8	52.6	0.5	1.4	2.0	4.9	3.8	7.7	27.1	14.2	8.8	89.6	11.8		tr
44-55	C2	17.4	34.2	48.4	0.8	1.7	3.2	7.3	4.4	7.6	26.6	16.0	13.0	85.0	11.7		tr
55-65	C3	17.7	36.2	46.1	0.7	1.6	3.1	7.5	4.8	8.6	27.6	17.4	12.9	85.0	11.9		tr

Depth (In.)	6A1a Organic carbon b Pct.	6B1a Nitrogen Pct.	C/N	Carbonate as CaCO3: 6E1b 6E2a <2mm Pct.	3A1a <0.002 mm Pct.	3A1a Non-Carbonate Clay Pct.	Bulk density: 4A1a Field-State g/cc	4A1d 1/3-Bar g/cc	4A1b Air-Dry g/cc	4D1 COLE	Water content: 4B4 Field-State Pct.	4B1c 1/3-Bar Pct.	4B2 15-Bar Pct.	4C1 1/3-to 15-Bar in./in.	3A1b Fine Clay <0.002 mm. Pct.	pH: 8C1b Sat. Paste		8C1a (1:1)
0-2	3.17	0.175	18			16	1.14	1.14	1.17	0.010	33.1	25.6	7.0	0.21				5.6
2-5	0.83	0.059	14			16		1.3c					5.0					5.2
5-10	0.50	0.042	12			26	1.84	1.82	1.83	0.003	13.5	13.7	7.2	0.12				5.3
10-15	0.36	0.045	8			48	1.59	1.47	1.77	0.064	21.0	24.7	14.5	0.15				5.1
15-23	0.10			-(s)		48	1.71	1.58	1.81	0.047	16.9	21.0	14.7	0.10	20.6			6.7
23-30	0.08			4	1	47	1.69	1.59	1.78	0.040	18.4	22.1	15.3	0.11				7.9
30-44	0.12			16	5	48	1.74	1.69	1.82	0.024	18.1	19.4	15.6	0.06		7.4		8.3
44-55	0.09			16	6	42	1.72	1.67	1.83	0.032	19.9	20.9	15.0	0.10				8.5
55-65	0.08			16	6	40	1.72	1.72	1.84	0.024	21.0	20.2	13.4	0.12				8.6

Depth (In.)	Extractable bases: 6N2a Ca	6O2a Mg	6P2a Na	5B1a 6Q2a K	Sum	6H1a Ext. Acidity	Cat. Exch. Cap.: 5A3a Sum Cations	5A1a NH_4OAc	6G1d KCl-Ext. Al	6C2a Ext. Iron as Fe Pct.		8E1 Resistivity ohms-cm.	8B1a Elec. Cond. mmhos/cm.	8B Water at Sat. Pct.	8D5 Est. Total Salt in Soil ppm.	8D3 Ca/Mg	Base saturation: 5C3 Sum Cations Pct.	5C1 NH_4OAc CEC Pct.
	meq/100 g																	
0-2	8.1	2.5	tr	0.3	10.9	8.3	19.2	13.5	0.1	0.6						3.2	57	81
2-5	2.5	1.1	tr	0.1	3.7	6.4	10.1	7.5	0.7	0.9						2.3	37	49
5-10	3.6	2.3	tr	0.2	6.1	8.5	14.6	10.0	1.0	1.1						1.6	42	61
10-15	10.4	7.8	0.1	0.5	18.8	7.5	26.3	22.0	1.1	1.4						1.3	71	85
15-23	14.1	9.8	0.1	0.4	24.4	4.0	28.4	23.9		1.3						1.4	86	102
23-30	14.1d	8.0e	0.2	0.4	22.7			20.4		1.3						1.8		
30-44	13.5d	6.5e	0.2	0.4	20.6			17.1		1.0		2,600	0.35	54.5	220	2.1		
44-55	10.5d	6.9e	0.2	0.4	18.0			14.3		1.0						1.5		
55-65	8.6d	7.5e	0.2	0.4	16.7			13.1		1.0						1.1		

Depth (In.)	Ratios to Clay 8D2: NH_4OAc CEC	Ext. Iron	15-Bar Water
0-2	0.84	0.04	0.44
2-5	0.47	0.05	0.31
5-10	0.38	0.04	0.28
10-15	0.46	0.03	0.30
15-23	0.50	0.03	0.30
23-30	0.43	0.03	0.33
30-44	0.36	0.02	0.33
44-55	0.34	0.02	0.36
55-65	0.33	0.03	0.34

a. Fe-Mn nodules comprise 50 to 60 percent of the very coarse sand above 23 inches. Carbonate comprises about 5 percent of the total sand below 23 inches.
b. 6 kg/m^2 to 60 inches (Method 6A).
c. Estimated.
d. KCl-TEA extraction (Method 6N4b).
e. KCl-TEA extraction (Method 6O4b).

Soil classification: Typic Glossoboralf; fine, mixed.
Soil: Hibbing taxadjunct*.
Soil No.: S64WI-2-1.
Location: Ashland County, Wisconsin; NE¼, NE¼, Sec. 6, T. 46 N., R. 4 W; 130 feet south of Highway 112 and 150 feet west of Highway 118.
Climate: Humid continental; mean annual temperature ranges from 38° to 44° F; mean annual precipitation ranges from 26 to 30 inches; and frost-free season is about 10 days.
Vegetation and land use: Native vegetation was mixed hardwood and pine forest with bracken fern, blueberry, hazelnut, rose, grasses, and weeds in the lower story vegetative cover and spruce, pine, elm, oak, and aspen in the upper story. Some large areas have been cleared and used for general farming.
Parent material: Calcareous clay glacial till.
Physiography: Gently sloping or undulating to hilly glacial till plain
Topography: Site is on a 2 percent convex slope with a west aspect.
Drainage: Moderately well and well drained.
Ground water: Deep.
Erosion: Slight
Permeability: Slow.
Described by: A.J. Klingelhoets, August 24, 1964.

(Colors are for moist soils unless otherwise stated)

A1 19829 0 to 5 cm (0 to 2 inches). Very dark grayish brown (10YR 3/2) silt loam; moderate medium granular structure; friable; many fine grass and tree roots; medium acid; clear wavy boundary. (A thin 1/4-inch mat of leaves, needles, and grass occurs on the surface at this site but was not sampled.)

A2 19830 5 to 13 cm (2 to 5 inches). Reddish gray (5YR 5/2) silt loam; moderate medium platy structure; friable; many fine roots; many earthworm holes and casts of A1; medium acid; clear wavy boundary.

A&B 19831 13 to 25 cm (5 to 10 inches). Reddish gray (5YR 5/2) silt loam A2; weak medium platy structure; friable; tonguing down into reddish and dark reddish brown (5YR 4/4 and 3/4) silty clay B2 having weak medium columnar structure which parts to moderate medium subangular blocks; very firm; isolated peds of B2 in the upper portion; few fine pebbles; many roots; some earthworm holes; medium acid; clear irregular boundary.

B21t 19832 25 to 38 cm (10 to 15 inches). Reddish brown (2.5YR 4/4) clay; moderate coarse prismatic structure parting to moderate medium angular and subangular blocks; very firm, plastic, sticky; coatings of reddish gray (5YR 5/2) uncoated silt on vertical faces of prisms; thin continuous clay films on faces of peds; few fine pebbles; many roots; medium acid; gradual wavy boundary.

B22t 19833 38 to 58 cm (15 to 23 inches). Reddish brown (2.5YR 4/4) clay; moderate coarse prismatic structure parting to moderate medium angular and subangular blocks; very firm, plastic, sticky; thin continuous clay films on faces of peds; roots common; few fine pebbles; slightly acid; gradual wavy boundary.

B3 19834 58 to 75 cm (23 to 30 inches). Reddish brown (2.5YR 4/4) clay; moderate coarse prismatic structure parting to moderate medium angular and subangular blocks; very firm, plastic, sticky; thin continuous clay films; few dark reddish brown (5YR 3/2) organic stains on vertical faces of prisms; few roots and fine pebbles; mildly alkaline; gradual wavy boundary.

C1ca 19835 75 to 100 cm (30 to 40 inches). Reddish brown (2.5YR 4/4) clay; moderate coarse prismatic structure parting to moderate medium subangular blocks; very firm, plastic, sticky; thick clay films and pinkish gray (5YR 7/2) lime coatings on pressure faces (slickensides); many pinkish gray (5YR 6/2 and 7/2) soft lime segregations less than 5 mm in diameter; few roots and fine pebbles; strong effervescence; clear wavy boundary.

C2 19836 100 to 138 cm (40 to 55 inches). Reddish brown (2.5YR 4/4) clay; moderate coarse prismatic structure parting to moderate medium blocks; very firm, plastic, sticky; thick clay films and pinkish gray (7.5YR 7/2) lime coatings on pressure faces (slickensides); few fine roots and pebbles; discontinuous thin (3/4-inch) loam lens occurs at top of this horizon; strong effervescence; clear irregular boundary.

C3 19837 138 to 163 cm (55 to 65 inches). Reddish brown (2.5YR 4/4) clay; moderate coarse prismatic structure parting to weak coarse subangular blocks; very firm, plastic, sticky; thick clay films and pinkish gray (7.5YR 6/2 and 7/2) lime coatings on pressure faces (slickensides); few roots to 60 inches; strong effervescence.

Remarks: Few stones and pebbles occur throughout the profile. Sand content of B and C horizons was estimated at 15 percent.

Soil temperatures:

Depth (inches)	Temperature
20	14° C.
30	14° C.
40	13° C.

*This pedon has lower base saturation in portions of the argillic horizon than that required for the Hibbing series.

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL Hibbing taxadjunct SOIL Nos. S64WI-4-1 LOCATION Bayfield County, Wisconsin

SOIL SURVEY LABORATORY Lincoln, Nebraska LAB. Nos. 19838-19846 June, 1968

GENERAL METHODS: 1A, 1B1b, 2A1, 2B

Depth (in.)	Horizon	Size class and particle diameter (mm) 3A1: Total: Sand (2-0.05) a	Total: Silt (0.05-0.002)	Total: Clay (< 0.002)	Sand: Very coarse (2-1)	Sand: Coarse (1-0.5)	Sand: Medium (0.5-0.25)	Sand: Fine (0.25-0.1)	Sand: Very fine (0.1-0.05)	Silt: (0.05-0.02)	Silt: Int. III (0.02-0.002)	Int. II (0.2-0.02)	(2-0.1)	<0.074	0.005-0.002	Coarse fragments 2A2: Vol. 19-2	3B1 Wt. 19-2
		Pct. of < 2 mm														<--Pct. of <19-->	
0-2	A1	23.1	59.3	17.6	0.5	2.8	4.8	9.7	5.3	15.5	43.8	25.5	17.8	79.8	14.8		1
2-4	A2	16.6	65.4	18.0	0.6	1.6	3.5	6.7	4.2	10.9	54.5	18.5	12.4	85.9	21.1		1
4-7	A&B	12.9	52.7	34.4	0.4	1.4	2.7	5.1	3.3	7.9	44.8	13.8	9.6	89.0	18.4		tr
7-13	B21t	15.3	35.6	49.1	0.7	1.5	3.0	6.2	3.9	6.6	29.0	13.7	11.4	86.9	14.2		tr
13-21	B22t	13.9	31.3	54.8	0.2	1.5	2.7	5.8	3.7	6.8	24.5	13.7	10.2		11.2		tr
21-27	B3	16.8	38.0	45.2	0.9	1.9	3.2	6.7	4.1	7.0	31.0	14.6	12.7	85.6	16.2		tr
27-37	C1ca	15.3	38.3	46.4	0.5	1.8	3.1	6.2	3.7	6.4	31.9	13.3	11.6	86.8	16.9		2
37-50	C2	14.8	37.5	47.7	1.1	1.7	2.8	5.7	3.5	6.3	31.2	12.9	11.3	87.2	16.9		2
50-60	C3	13.8	37.0	49.2	0.7	1.5	2.7	5.5	3.4	6.7	30.3	13.1	10.4	88.2	15.2		tr

Depth (in.)	6A1a Organic carbon Pct.	6B1a Nitrogen Pct.	C/N	Carbonate as CaCO3: 6E1b 6E2a <2mm Pct.	3A1a <0.002 mm Pct.	3A1a Non-Carbonate Clay Pct.	Bulk density: 4A1a Field-State g/cc	4A1d 1/3-Bar g/cc	4A1b Air-Dry g/cc	4D1 COLE	Water content: 4B4 Field-State Pct.	4B1c 1/3-Bar Pct.	4B2 15-Bar Pct.	4C1 1/3-to 15-Bar in./in.	pH	8C1a (1:1)
0-2	6.43	0.437	15			18							13.1			6.1
2-4	0.60	0.058	10			18	1.70	1.70	1.70	-	18.7	18.0	4.2	0.23		6.1
4-7	0.59					34	1.74	1.74	1.76	0.003	17.3	17.0	9.6	0.13		6.2
7-13	0.44			-(s)		49	1.59	1.61	1.78	0.036	21.7	19.8	14.4	0.09		6.2
13-21	0.30			tr(s)	-	55	1.61	1.52	1.74	0.047	20.2	23.2	16.0	0.11		7.0
21-27	0.08			12	3	42	1.74	1.69	1.82	0.024	16.9	18.7	14.0	0.08		8.2
27-37	0.07			15	4	42	1.74	1.67	1.83	0.032	18.5	20.1	14.1	0.10		8.3
37-50	0.08			17	6	42	1.81	1.76	1.86	0.017	17.6	18.7	15.5	0.06		8.3
50-60	0.08			16	6	43	1.74	1.69	1.84	0.028	19.9	21.2	16.0	0.09		8.5

Depth (in.)	Extractable bases 5B1a: 6N2a Ca	6O2a Mg	6P2a Na	6Q2a K	Sum	6H1a Ext. Acidity	Cat. Exch. Cap.: 5A3a Sum Cations	5A1a NH_4OAc	6G1d KCl-Ext. Al	6C2a Ext. Iron as Fe Pct.	8D3 Ca/Mg	Base saturation: 5C3 Sum Cations Pct.	5C1 NH_4OAc CEC Pct.
	meq/100 g												
0-2	17.0	4.9	0.1	0.4	22.4	9.3	31.7	22.5		0.6	3.5	71	100
2-4	4.3	2.0	0.1	0.1	6.5	4.3	10.8	7.6		0.8	2.2	60	86
4-7	7.4	3.9	0.1	0.2	11.6	6.1	17.7	13.3		1.3	1.9	66	87
7-13	12.5	6.9	0.2	0.4	20.0	6.8	26.8	21.3		1.4	1.8	75	94
13-21	15.8b	8.6c	0.2	0.5	25.1	3.6	28.7	25.6		1.4	1.8	87	98
21-27	13.6b	5.6c	0.2	0.3	19.7			17.1		1.3	2.4		
27-37	12.5b	5.6c	0.2	0.3	18.6			15.0		1.0	2.2		
37-50	10.8b	6.3c	0.2	0.3	17.6			13.6		1.1	1.7		
50-60	9.9b	7.2c	0.2	0.4	17.7			13.8		1.0	1.4		

Depth (in.)	Ratios to Clay 8D2: NH_4OAc CEC	Ext. Iron	15-Bar Water
0-2	1.25	0.03	0.73
2-4	0.42	0.04	0.23
4-7	0.39	0.04	0.28
7-13	0.43	0.03	0.29
13-21	0.47	0.03	0.29
21-27	0.41	0.03	0.33
27-37	0.36	0.02	0.34
37-50	0.32	0.03	0.37
50-60	0.32	0.02	0.37

a. Carbonate comprises about 5 percent of the sands below 21 inches.
b. KCl-TEA extraction (Method 6N4b).
c. KCl-TEA extraction (Method 6O4b).

Soil classification: Glossic Eutroboralf; fine, mixed.
Soil: Hibbing taxadjunct*.
Soil No.: S64WI-4-1.
Location: Bayfield County, Wisconsin; SW¼, Sec. 16, T. 47 N., R. 5 W.; 130 feet north and 120 feet east of section corner.
Climate: Humid continental; mean annual temperature ranges from 38° to 44° F; mean annual precipitation ranges from 26 to 30 inches; and frost-free season is about 109 days.
Vegetation and land use: Native vegetation was pine and spruce forests with bracken fern, wild strawberry, hazelnut, grasses, and weeds in lower story vegetative cover, and spruce, pine, aspen, birch, and cherry in upper story. Some areas have been cleared and are being used for general farming.
Parent material: Calcareous clay glacial till.
Physiography: Gently sloping in undulating to hilly glacial till plain.
Topography: Site is in a 1 percent east facing slope.
Drainage: Moderately well to well drained.
Ground water: Deep.
Erosion: Slight.
Permeability: Slow.
Described by: A.J. Klingelhoets, August 24, 1964.

(Colors are for moist soil unless otherwise noted)

A1 19838 0 to 5 cm (0 to 2 inches). Very dark gray (10YR 3/1) silt loam; moderate medium granular structure; friable; many fine grass and tree roots; slightly acid; clear wavy boundary.

A2 19839 5 to 10 cm (2 to 4 inches). Reddish gray (5YR 5/2) silt loam; weak to moderate medium platy structure; friable; many fine roots; many earthworm holes and casts of A1; slightly acid; clear irregular boundary.

A&B 19840 10 to 18 cm (4 to 7 inches). Dark reddish gray (5YR 4/2) silt loam A2; weak medium platy structure; friable; tonguing of A2 down into reddish brown (2.5YR 4/4) silty clay B2; B2 has moderate medium columnar structure that parts to moderate medium subangular blocks; very firm; isolated peds of B2 in the upper portion; few small pebbles; many roots; some earthworm holes; medium acid; gradual irregular boundary.

B21t 19841 18 to 33 cm (7 to 13 inches). Reddish brown (2.5YR 4/4) clay; moderate coarse prismatic structure parting to moderate medium angular blocks; very firm, plastic, sticky; thick coatings of dark reddish gray (5YR 4/2) clean silt coatings on the vertical faces of prisms; thin continuous clay films on faces of peds; few small pebbles; roots common; slightly to medium acid; gradual wavy boundary.

B22t 19842 33 to 53 cm (13 to 21 inches). Reddish brown (2.5YR 4/4) clay; moderate coarse prismatic structure parting to moderate medium angular blocks; very firm, plastic, sticky; thin continuous clay films; few dark reddish brown (5YR 3/2) organic stains along vertical cracks and root channels; few small pebbles; roots common; slightly to medium acid; gradual wavy boundary.

B3 19843 53 to 68 cm (21 to 27 inches). Reddish brown (2.5YR 4/4) clay; moderate coarse prismatic structure parting to moderate medium angular and subangular blocks; very firm, plastic, sticky; thin continuous clay films; few roots; few small pebbles; mildly alkaline; gradual wavy boundary.

C1ca 19844 68 to 93 cm (27 to 37 inches). Reddish brown (2.5YR 4/4) clay; moderate coarse prismatic structure parting to moderate medium subangular blocks; very firm, plastic, sticky; thick clay films and pinkish gray (7.5YR 6/2) and light gray (10YR 7/2) lime coatings on pressure faces (slickensides); many pinkish gray (5YR 6/2) soft lime segregations less than 5 mm in diameter; few small pebbles; strong effervescence; clear wavy boundary.

C2 19845 93 to 125 cm (37 to 50 inches). Reddish brown (2.5YR 4/4) clay; moderate coarse prismatic structure parting to weak coarse subangular blocks; very firm, plastic, sticky; thick clay films and pinkish gray (7.5YR 6/2) and light gray (10YR 7/2) lime coatings on pressure faces (slickensides); few small pebbles; strong effervescence; clear irregular boundary.

C3 19846 125 to 150 cm (50 to 60 inches). Reddish brown (2.5YR to 5YR 4/4) clay; moderate coarse prismatic structure parting to weak coarse subangular blocks; very firm, plastic, sticky; thick clay films and pinkish gray (7.5YR 6/2) and light gray (10YR 7/2) lime coatings on pressure faces (slickensides); few fine pebbles; strong effervescence; clear irregular boundary.

*This pedon is a taxadjunct to the Hibbing series because it has tongues of bleached material invading the top of the subsoil clay accumulation.

Remarks: Few stones and pebbles occur throughout the profile. Sand content of B and C horizons was estimated at 15 percent.

Soil temperatures:

Depth (inches)	Temperature
20	15° C.
20	14° C.
40	13° C.

SOIL CLASSIFICATION-TYPIC ARGIUDOLL
FINE-LOAMY, MIXED, MESIC
SERIES - - - - - - -HOCHHEIM

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE NRTSC
SOIL SURVEY INVESTIGATIONS UNIT
LINCOLN, NEBRASKA

SOIL NO - - - - - - S68WI-8-1 COUNTY - - - CALUMET

GENERAL METHODS- - -1A,1B1B,2A1,2B SAMPLE NOS. 68L1066-68L1072

DEPTH CM	HORIZON	PARTICLE SIZE ANALYSIS, LT 2MM, 3A1, 3A1A, 3A1B (PCT LT 2MM) SAND 2-.05	SILT .05-.002	CLAY LT .002	FINE CLAY LT .0002	VCOS 2-1	CORS 1-.5	MEDS .5-.25	FNES .25-.10	VFNS .10-.05	COSI .05-.02	FNSI .02-.002	VFSI .005-.002	FAML TEXT SAND 2-.1	INTR II .2-.02	FINE CLAY T3 CLAY	NON-CO3-CLAY PCT	RATIO 8D1 15-BAR TO CLAY PCT
000-20	AP	27.5	55.4	17.1	7.9	1.3	2.6	4.6	10.8	8.2	29.3	26.1		19.3	43.3	46	17	.43
020-36	B2T	26.5	49.7	23.8		.7	2.5	4.8	11.0	7.5	27.0	22.7		19.0	40.4		24	.40
036-51	B3T	53.5	32.6	13.9		2.3	4.5	7.3	25.8	13.6	18.7	13.9		39.9	48.3		14	.38
051-81	C1	58.8	33.4	7.8		4.0	5.1	7.8	26.4	15.5	19.9	13.5		43.3	52.1		8	.36
081-104	C2	59.7	32.6	7.7	2.6	8.0	9.3	8.3	21.3	12.8	17.3	15.3		46.9	42.9	34	8	.40
104-135	C3	49.4	41.8	8.8		4.0	5.7	5.9	19.8	14.0	22.6	19.2		35.4	49.0		9	.36
135-163	C4	50.8	38.9	10.3		8.8	7.3	5.4	17.0	12.3	19.4	19.5		38.5	42.3		10	.37

DEPTH CM	(PARTICLE SIZE ANALYSIS, MM, 3B, 3B1, 3B2) VOL. GT 2 PCT	GT 75 PCT	75-20	20-5	5-2	LT .074	20-2 PCT LT20	BULK DENSITY 4A1D 1/3-BAR G/CC	4A1H OVEN DRY G/CC	4D1 COLE	4B1C 1/10 BAR PCT	WATER CONTENT 4B1C 1/3-BAR PCT	4B2 15-BAR PCT	4C1 WRD CM/CM	CARBONATE 6E1B LT 2 PCT	3A1A LT .002 PCT	PH 8C1A 1/1 H2O	8C1E 1/2 CACL
000-20	5	0	5	TR	TR	75	2	1.57	1.67	.020		20.9	7.4	.20	3	0	7.4	6.9
020-36	5	0	5	TR	TR	75	1	1.52	1.65	.026		21.8	9.5	.18	2	0	7.7	7.1
036-51	15	10	10	5	5	45	8	1.60A					5.3		27	0	8.0	7.2
051-81	25	5	10	15	5	35	23	1.72	1.73	.002	10.4		2.8	.10	44	0	8.2	7.4
081-104	25	5	10	15	5	35	20	1.76	1.79	.004	13.3		3.1	.13	51	0	8.3	7.3
104-135	30	5	10	25	5	35	31	1.84	1.89	.006	12.8		3.2	.12	55	0	8.3	7.5
135-163	30	5	10	20	5	40	26	1.80A					3.8		60	0	8.4	7.5

DEPTH CM	(ORGANIC MATTER) 6A1A ORGN CARB PCT	6B1A NITG PCT	C/N	IRON 6C2A EXT FE PCT	PHOS 6S1A TOTL PCT	(EXTRACTABLE BASES 5B4A) 6N2E CA	6Q2D MG	6P2A NA	6Q2A K	SUM EXTB / 100 MEQ	ACTY 6H1A BACL TEA	AL 6G1D KCL EXT	(CAT EXCH) 5A3A EXTB ACTY	5A6A NHAC	RATIO 8D1 NHAC TO CLAY	RATIO 8D3 TO MG	CA 5F SAT NHAC PCT	(BASE SAT) 5C3 EXTB ACTY PCT	5C1 NHAC PCT
000-20	1.59B	.147	11	101		10.4C	4.4C	0.1	0.1	15.0				15.2	0.89	2.4			
020-36	0.54	.057	9	106		11.4C	5.6C	0.1	0.1	17.2				16.0	0.67	2.0			
036-51	0.31	.031	10	0.8		6.8C	2.7C	0.1	0.1	9.7				8.6	0.62	2.5			
051-81	0.19			0.5		3.6C	1.5C	0.1	TR	5.2				4.1	0.53	2.4			
081-104	0.13			0.4		2.7C	1.4C	0.1	TR	4.2				3.4	0.44	1.9			
104-135	0.09			0.3		2.4C	1.3C	0.1	TR	3.8				3.1	0.35	1.8			
135-163	0.06			0.2		2.2C	1.3C	0.1	TR	3.6				2.8	0.27	1.7			

DEPTH CM	(SATURATED PASTE) 8E1 REST OHM-CM	8C1B PH	8A H2O PCT	NA 5D2 ESP PCT	NA 5E SAR	SALT 8D5 TOTL SOLU PPM	GYP 6F1A PCT	(SATURATION EXTRACT 8A1) 8A1A EC MMHOS/CM	6N1B CA	6O1B MG	6P1A NA	6Q1A K	6I1A CO3	6J1A HCO3	6K1A CL	6L1A SO4	6M1A NO3	ATTERBERG 4F1 LQID LMIT PCT	4F2 PLST INDX
000-20																		30D	7
020-36																		31D	12
036-51																			
051-81																			
081-104	8300	7.9	28.5			70		0.39											
104-135																			
135-163																			

CLAY MINERALOGY (7A2C).
020-36 MI2 MV2 KK2 MT1.
COMMENTS - THE MONTMORILLONITE-VERMICULITE MIXTURE CONTAINS SOME INTERLAYER MATERIAL. BY INFERENCE, A CONSIDERABLE AMORPHOUS COMPONENT IS PRESENT. CLAY MINERALOGY IS MIXED.
RELATIVE AMOUNTS - (X-RAY) 5 = DOMINANT 4 = ABUNDANT 3 = MODERATE 2 = SMALL 1 = TRACE.
MINERAL CODE - MT = MONTMORILLONITE MI = MICA KK = KAOLINITE MV = MONTMORILLONITE-VERMICULITE.
(A) ESTIMATED.
(B) ORGANIC CARBON IS 8 KG PER SQ M TO A DEPTH OF 1 METER (METHOD 6A).
(C) METHODS 6N4C FOR CA AND 6O4C FOR MG.
(D) LL AND PI BY SOIL MECHANICS LAB, USDA-SCS, LINCOLN, NE.

Soil classification: Typic Argiudolls; fine-loamy, mixed, mesic.
Soil: Hochheim.
Soil No.: S68WI-8-1.
Location: Calumet County, Wisconsin; SW¼, SW¼, Sec. 11, T. 17 N., R. 20 E.; 90 feet east of lot line and 900 feet north of barn.
Climate: The climate is humid continental. Mean annual temperature is about 47° F; mean annual precipitation is approximately 30 inches; and frost-free season is about 135 days.
Vegetation and land use: Native vegetation was principally maple-basswood forest. Much of this soil is used for growing general farm crops.
Parent material: Highly calcareous light loam to sandy loam glacial till with very thin loess mantle.
Physiography: Gently sloping to steep sides of drumlins and glacial ground moraine.
Topography: Near the top of a large drumlin. Site is on a 10 percent convex slope with east aspect.
Drainage: Well drained.
Ground water: Deep.
Erosion: Slight to moderate.
Permeability: Moderate.
Described by: A. Klingelhoets, R. Fox, and E. Link, August 19, 1968.

(Colors are for moist conditions unless otherwise stated)

Ap 68L1066 0 to 20 cm (0 to 8 inches). Very dark grayish brown (10YR 3/2) gritty silt loam, grayish brown (10YR 5/2) dry; weak coarse plates parting to moderate very fine subangular blocks; friable; roots common; stones 3/4 to 3 inches in diameter constitute 3 percent of the volume; moderately alkaline; abrupt smooth boundary.

B2t 68L1067 20 to 36 cm (8 to 14 inches). Dark yellowish brown (10YR 4/4) light clay loam; moderate medium and fine subangular blocky structure; hard when dry, slightly plastic when wet; thick patchy clay films with dark brown (7.5YR 3/2) colors; roots common; 3 percent of the volume is composed of rocks 3/4 to 3 inches in diameter; moderately alkaline; clear wavy boundary.

B3t 68L1068 36 to 51 cm (14 to 20 inches). Dark yellowish brown (10YR 4/4) with inclusions of yellowish brown (10YR 5/4) loam; weak medium and moderate fine subangular blocky structure; firm when moist; few thin patchy clay films; many partly weathered dolomite rocks and pebbles; 6 percent of volume is composed of rocks 3/4 to 3 inches in diameter and 5 percent of rocks over 3 inches in diameter; roots common; moderately alkaline with areas that contain free carbonates; gradual irregular boundary.

C1 68L1069 51 to 81 cm (20 to 32 inches). Yellowish brown (10YR 5/4) light loam or sandy loam; weak medium fragmental blocks; friable; few roots; 6 percent of volume is composed of rocks 3/4 to 3 inches in diameter and 5 percent of rocks over 3 inches in diameter; 90 percent of the rocks are dolomite; strong effervescence; gradual wavy boundary.

C2 68L1070 81 to 104 cm (32 to 41 inches). Characteristics are the same as horizon above, except for the presence of a few fine flecks of secondary carbonates.

C3 68L1071 104 to 135 cm (41 to 53 inches). Light yellowish brown (10YR 5/4) light loam; weak medium fragmental blocks; friable; few fine faint mottles of yellowish brown and dark yellowish brown (10YR 5/6 and 4/4); 6 percent of volume is composed of rocks 3/4 to 3 inches in diameter and 5 percent of rocks over 3 inches in diameter; 90 percent of the rocks are dolomite; strong effervescence; gradual wavy boundary.

C4 68L1072 135 to 163 cm (53 to 64 inches). Pale brown (10YR 6/3) light loam; weak fine fragmental structure; friable; 6 percent of volume is composed of rocks 3/4 to 3 inches in diameter and 5 percent of rocks over 3 inches in diameter; 90 percent of rocks are dolomite; strong effervescence.

Remarks: Soil nearly dry in solum and moist in substratum when sampled. The glacial till appears to have a very high carbonate content. Approximately 80 percent of the pebbles and rocks in the till are dolomite.

Soil temperature: At 10 inches - 23° C.
20 inches - 21° C.
40 inches - 18.5° C.

SOIL CLASSIFICATION-TYPIC ARGIUDOLL
FINE-LOAMY, MIXED, MESIC
SERIES - - - - - - -HOCHHEIM

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE MRYSC
SOIL SURVEY INVESTIGATIONS UNIT
LINCOLN, NEBRASKA

SOIL NO - - - - - - S68WI-8-2 COUNTY - - - CALUMET

GENERAL METHODS- - -1A,1B1B,2A1,2B SAMPLE NOS. 68L1073-68L1079

DEPTH CM	HORIZON	PARTICLE SIZE ANALYSIS, LT 2MM, 3A1, 3A1A, 3A1B (PCT LT 2MM) SAND 2-.05	SILT .05-.002	CLAY LT .002	FINE CLAY LT .0002	SAND VCOS 2-1	CORS 1-.5	MEDS .5-.25	FNES .25-.10	VFNS .10-.05	COSI .05-.02	SILT FNSI .02-.002	VFSI .005-.002	FAML TEXT SAND 2-.1	INTR II .2-.02	FINE CLAY TO CLAY PCT	NON-CO3-CLAY PCT	RATIO 8D1 15-BAR TO CLAY
000-10	AP	38.0	44.6	17.4		3.9	6.1	6.2	13.8	8.0	17.5	27.1		30.0	33.0		17	.52
010-18	A3	38.2	44.0	17.8		4.8	6.9	6.1	12.7	7.7	17.4	26.6		30.5	32.1		18	.43
018-38	B2T	33.4	34.1	32.5		3.2	4.1	5.0	12.9	8.2	14.0	20.1		25.2	29.9		33	.34
038-56	B3T	46.6	34.8	18.6		3.6	4.7	5.8	19.2	13.3	18.6	16.2		33.3	43.6		19	.34
056-84	C1	47.4	38.0	14.6		5.5	5.9	6.2	17.7	12.1	19.4	18.6		35.3	42.0		15	.38
084-119	C2	45.3	40.4	14.3		4.0	4.5	5.7	18.0	13.1	19.8	20.6		32.2	43.8		12	.37
119-152	C3	46.2	39.4	14.4		5.3	5.4	5.9	17.2	12.4	19.0	20.4		33.8	41.7		9	.38

DEPTH CM	(PARTICLE SIZE ANALYSIS, MM, 3B, 3B1, 3B2) VOL. GT 2 PCT	GT 75 PCT	WEIGHT (PCT LT 75) 75-20	20-5	5-2	LT .074	20-2 LT20	BULK DENSITY 4A1D 1/3-BAR G/CC	4A1H OVEN DRY G/CC	4D1 COLE	WATER CONTENT 4B1C 1/10 BAR PCT	4B1C 1/3-BAR PCT	4B2 15-BAR PCT	4C1 WRD CM/CM	CARBONATE 6E1B LT 2 PCT	3A1A LT .002 PCT	PH 8C1A 1/1 H2O	8C1E 1/2 CAC.
000-10	2	0	0	2	1	64	3	1.21	1.35	.036		25.3	9.0	.19	1	0	7.3	6.8
010-18	TR	0	5	TR	TR	65	1	1.30A					7.6		TR	0	7.4	6.7
018-38	5	0	5	5	TR	65	5	1.50	1.68	.037		19.0	11.2	.11	11	0	7.6	7.1
038-56	20	5	10	10	5	45	17	1.60A					6.4		41	TR	8.0	7.2
056-84	30	15	10	10	10	40	21	1.77	1.83	.008		11.4	5.6	.07	50	TR	8.1	7.3
084-119	25	10	5	15	5	45	21	1.86	1.92	.008		11.1	5.3	.08	54	2	8.2	7.4
119-152	20	5	5	15	5	45	21	1.86	1.98	.017		10.9	5.5	.08	56	5	8.4	7.6

DEPTH CM	(ORGANIC MATTER) 6A1A ORGN CARB PCT	6B1A NITG PCT	C/N	IRON 6C2A EXT FE PCT	PHOS 6S1A TOTL PCT	(EXTRACTABLE BASES 5B4A) 6N2E CA (MEQ)	6Q2D MG	6P2A NA	6Q2A K	SUM EXTB / 100	ACTY 6H1A BACL TEA G	AL 6G1D KCL EXT	(CAT EXCH) 5A3A EXTB ACTY	5A6A NHAC	RATIO 8D1 NHAC TO CLAY	RATIO 8D3 CA TO MG	CA 5F SAT NHAC PCT	(BASE SAT) 5C3 EXTB ACTY PCT	5C1 NHAC PCT
000-10	3.10B			1.2		11.7C	4.4C	0.1	0.1	16.3				20.2	1.16	2.7			
010-18	1.32			1.2		10.1C	3.4C	0.1	0.1	13.7				14.7	0.83	3.0			
018-38	0.80			1.5		12.2C	5.3C	0.1	0.3	17.9				17.7	0.54	2.3			
038-56	0.43			0.6		6.6C	2.9C	0.1	0.2	9.8				8.8	0.47	2.3			
056-84	0.22			0.4		3.9C	2.1C	0.1	0.1	6.2				5.9	0.40	1.9			
084-119	0.16			0.4		3.5C	2.0C	0.1	0.1	5.7				5.0	0.35	1.8			
119-152	0.13			0.3		6.3C	1.7C	0.1	0.1	8.2				4.1	0.28	3.7			

(A) ESTIMATED.
(B) ORGANIC CARBON IS 10 KG PER SQ M TO A DEPTH OF 1 METER (METHOD 6A).
(C) METHODS 6N4C FOR CA AND 6Q4C FOR MG.

Soil classification: Typic Argiudolls; fine-loamy, mixed, mesic.
Soil: Hochheim.
Soil No.: S68WI-8-2.
Location: Calumet County, Wisconsin; NE¼, NW¼, Sec. 2, T. 17 N., R. 20 E.; 120 feet south of the road and 40 feet east of fence line.
Climate: The climate is humid continental. Mean annual temperature is about 47° F; mean annual precipitation is approximately 30 inches; and frost-free season is about 135 days.
Vegetation and land use: Native vegetation was primarily maple-basswood forest. Much of this soil is used for growing general farm crops.
Parent material: Highly calcareous light loam glacial till with a very thin loess mantle.
Physiography: Gently sloping to steep side slopes of drumlins and glacial ground moraine.
Topography: Near the top of a large drumlin. Site is on an 8 percent convex slope with a southwest aspect.
Drainage: Well drained.
Ground water: Deep.
Erosion: Slight.
Permeability: Moderate.
Described by: R. Fox and E. Link, Aug. 19, 1968

(Colors are for moist soil unless otherwise noted)

Ap 68L1073 0 to 10 cm (0 to 4 inches). Very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate fine granular structure; friable; roots common; moderately alkaline; abrupt smooth boundary.

A3 68L1074 10 to 18 cm (4 to 7 inches). Dark brown (10YR 3/3) silt loam, dark grayish brown (10YR 4/2) dry; moderate fine granular structure; friable; evidence of an A2 exists in pockets near the lower boundary with dark grayish brown (10YR 4/2) colors and moderate medium platy structure; roots common; about 1 percent of volume composed of gravel 3/4 to 3 inches in diameter; moderately alkaline; clear wavy boundary.

B2t 68L1075 18 to 38 cm (7 to 15 inches). Dark brown (7.5YR 4/4) clay loam, reddish brown (5YR 4/3) dry; moderate fine subangular blocky structure; slightly plastic when wet and hard when dry; thick patchy clay films with dark brown (7.5YR 4/2) colors; roots common; approximately 3 percent of volume composed of gravel, 3/4 to 3 inches in diameter; moderately alkaline; gradual wavy boundary.

B3t 68L1076 38 to 56 cm (15 to 22 inches). Dark brown (7.5YR 4/4) loam, dark brown (7.5YR 4/2) crushed; weak fine subangular blocky structure; friable; roots common; few thin patchy clay films; approximately 8 percent of volume composed of stones 3/4 to 3 inches in diameter and 5 percent of stones over 3 inches in diameter; moderately alkaline with free carbonates in the lower part; gradual irregular boundary.

C1 68L1077 56 to 84 cm (22 to 33 inches). Brown (7.5YR 5/4) loam; weak fine fragmental blocks; friable; few roots; 5 percent of volume composed of stones 3/4 to 3 inches in diameter and 10 percent of stones over 3 inches in diameter; 80 percent of stones are dolomite; strong effervescence; gradual wavy boundary.

C2 68L1078 84 to 119 cm (33 to 47 inches). Characteristics are the same as for horizon above except for some evidence of weak coarse platy structure along with the fragmental blocks and 3 percent of volume being composed of stones 3/4 to 3 inches in diameter and 6 percent of stones over 3 inches in diameter.

C3 68L1079 119 to 152 cm (47 to 60 inches). Yellowish brown (10YR 5/4) light loam; weak coarse plates parting to weak fine fragmental blocks; friable; few scattered roots; 3 percent of volume composed of stones 3/4 to 3 inches in diameter and 4 percent of volume of stones over 3 inches in diameter; strong effervescence.

Remarks: Soil nearly dry in solum but moist in substratum when sampled. The glacial till appears to have a very high carbonate content. Most of the pebbles and stones are of dolomite (estimated 80 percent). Evidence of an A2 horizon occurs in scattered areas but this is destroyed after a few cultivations.

Soil temperature: At 10 inches - 19° C.
20 inches - 17.5° C.
40 inches - 16.5° C.

SOIL CLASSIFICATION-TYPIC MEDISAPRIST
EUIC, MESIC
SERIES - - - - - - -HOUGHTON

SOIL NO - - - - - - S74WI-25-1 COUNTY - - - DANE

GENERAL METHODS- - -1A,1B1B,2A1,2B SAMPLE NOS. 74L1479-74L1482

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NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

DEPTH CM	HORIZON	(PARTICLE SIZE ANALYSIS, LT 2MM, 3A1, 3A1A, 3A1B) SAND 2-.05	SILT .05-.002	CLAY LT .002	FINE CLAY LT .0002	(SAND) VCOS 2-1	CORS 1-.5	MEDS .5-.25	FNES .25-.10	VFNS .10-.05	(SILT) COSI .05-.02	FNSI .02-.002	VFSI .005-.002	SAND 2-.10	INTR II .2-.02	FINE CLAY TO CLAY PCT	NON-CO3-CLAY PCT	RATIO 8D1 15-BAR TO CLAY
		(- - - PCT LT 2MM - - -)																
000-25	OAP1																	
033-43	OA3																	
043-109	OA4																	
109-152	OA5	5.7	66.1	28.2		TR	TR	.5	2.4	2.8	24.2	41.9		2.9				3.29

DEPTH CM	(PARTICLE SIZE ANALYSIS, MM, 3B, 3B1, 3B2) VOL. GT 2 PCT	(WEIGHT) GT 75 PCT	75-20	20-5	5-2	LT .074	20-2 PCT LT20	(BULK DENSITY) 4A1D 1/3-BAR G/CC	4A1H OVEN DRY G/CC	4D1 COLE	(WATER CONTENT) 4B1C 1/10 BAR PCT	4B1C 1/3-BAR PCT	4B2A 15-BAR PCT	4C1 WRD CM/CM	CARBONATE 6E1B LT 2 PCT	3A1A LT .002 PCT	(PH) 8C1A 1/1 H2O	8C1E 1/2 CACL
			(- - - PCT LT 75 - - -)															
000-25	TR	0	0	0	TR		TR	.18	.71		564	459	81	.68			6.7	6.3
033-43	TR	0	0	0	TR		TR	.21	.78		472	388	113	.58			6.4	6.2
043-109	TR	0	0	0	TR		TR	.19	.66		527	388	122	.51			6.3	6.0
109-152	0	0	0	0	0	96	0						102				6.0	5.8

DEPTH CM	(ORGANIC MATTER) 6A1A ORGN CARB PCT	6B1A NITG PCT	C/N	IRON 6C2B EXT FE PCT	PHOS TOTL PCT	(EXTRACTABLE BASES 5B4A) 6N2E CA	6O2D MG	6P2B NA	6Q2B K	SUM EXTB	ACTY 6H1A BACL TEA	AL 6G1E KCL EXT	(CAT EXCH) 5A3A EXTB ACTY	5A6A NHAC	RATIO 8D1 NHAC TO CLAY	RATIO 8D3 CA TO MG	CA 5F1 SAT NHAC PCT	(BASE SAT) 5C3 EXTB ACTY PCT	5C1 NHAC PCT
						(- - - MEQ / 100 G - - -)													
000-25	29.0	2.94	10			118	39.1	.5	2.2	160	23.4		183	139		3.0	85	87	115
033-43	42.1	3.29	13			120	43.8	.4	.4	165	47.4		212	147		2.7	82	78	112
043-109	41.7	3.67	11			131	48.5	.5	.5	181	50.0		231	162		2.7	81	78	111
109-152	43.2	2.96	15			102	38.8	.4	.3	142	65.8		207	121		2.6	84	68	117

DEPTH CM	(SATURATED PASTE) 8E1 REST OHM-CM	8C1B PH	8A H2O PCT	NA 5D2 ESP PCT	NA 5E SAR	SALT 8D5 TOTL SOLU PPM	GYP 6F1A PCT	(SATURATION EXTRACT 8A1) 8A1A EC MMHOS/CM	6N1B CA	6O1B MG	6P1B NA	6Q1B K	6I1A CO3	6J1A HCO3	6K1A CL	6L1A SO4	6M1A NO3	ATTERBERG 4F1 LQID LMIT PCT	4F2 PLST INDX
									(- - - MEQ / LITER - - -)										
000-25	510	6.5	315			9200		3.45	24.5	18.3	.8	1.9	0	.9	6.7	24.9	15.4		
033-43	1300	6.0	826			6400		1.16	6.3	5.4	.3	.1	0	.6	1.0	5.2	4.5		
043-109	1300	6.0	841			7200		1.19	6.9	5.9	.3	.2	0	.3	1.0	6.3	4.1		
109-152	950	5.4	587			7600		1.67	11.2	8.9	.2	TR	0	.3	.2	16.8	2.5		

DEPTH CM	(HISTOSOL CHARACTERIZATION) 8F MINL CONT PCT	(STATE OF DECOMPOSITION) 8G (FIBER VOL) UNRB PCT	RUB PCT	8H PYROPHOSPHT SOLUBILITY (MUNS COLOR)	PH 8C1E .01M CACL	(BULK DEN) 4A3A FILD STAT G/CC	4A1I 1/3B REWT G/CC	COLE 4D1 RE-WET	SUBS RES-IDUE PCT	(WATER CONTENT) 4B4 FILD STAT PCT	4B1C 1/3B REWT PCT	4B2 15-BAR PCT	4C1 WRD CM/CM
000-25	44	15	1	10 YR 2/2	6.8	.34	.32	.21	71	181	229	77	.49
033-43	16	30	4	7.5YR 4/2	6.0	.18	.32	.15	84	450	229	108	.39
043-109	16	30	8	7.5YR 4/2	6.0	.18	.32	.19	84	462	220	114	.34
109-152	30	48	4	10 YR 6.5/3	5.7	.15			58	523		93	

Soil classification: Typic Mediaaprists; euic, mesic.
Series: Houghton.
Pedon No.: S74WI-25-1.
Location: Dane County, Wisconsin; SE¼, NW¼, NE¼, Sec. 6, T. 8 N., R. 12 E.; 430 feet north (along drainage ditch) from center of road (at culvert) and 234 feet east from drainage ditch. About 43°12' N. latitude and 89°10' W. longitude.
Climate: Humid continental. Mean annual temperature is 46.6° F; mean July temperature is 73.0° F; mean January temperature is 19.1° F; mean annual precipitation is 30.05 inches with nearly two-thirds of the precipitation falling during the growing season; total amount of snow is 39.3 inches; the growing season averages 175 days, but less in organic areas (data from Madison, WI weather bureau station).
Parent material: Deposits of herbaceous organic material more than 51 inches thick.
Physiography: Old glacial lake basin.
Vegetation: Peppermint
Size of area: About 1,000 acres.
Distance to adjacent mineral soil: About 250 feet to west.
Depth to water table: 122 cm.
Microrelief: None
Subsidence: Estimated to be moderate.
Described and sampled by: G.W. Hudelson and C.L. Glocker. Sampled from pit to 56 inches. Auger investigations to 100 inches.

Oap1 74L1479 0 to 25 cm. Black (N 2/0) broken face, rubbed, and pressed sapric material; about 5-10 percent fiber, less than 5 percent rubbed; weak fine granular structure; friable; fibers primarily herbaceous; about 10-15 percent mineral soil material; few roots; pH 7.3 (LaMotte); abrupt smooth boundary.

Oap2 not sampled 25 to 33 cm. Very dark gray (10YR 3/1) broken face and rubbed, black (10YR 2/1) pressed sapric material; about 10 percent or less fiber, less than 5 percent rubbed; weak fine granular structure with some areas of weak fine subangular blocky structure; friable; fibers primarily herbaceous; about 10-15 percent mineral soil material; pH 7.3 (LaMotte); abrupt smooth boundary.

Oa3 74L1480 33 to 43 cm. Very dark brown (10YR 2/2) broken face, rubbed, and pressed sapric material; 82 percent fiber, 6 percent rubbed; weak thin platy structure; very friable; fibers primarily herbaceous; about 10-15 percent mineral soil material; pH 6.8 (LaMotte); clear wavy boundary.

Oa4 74L1481 43 to 109 cm. Very dark brown (10YR 2/2), black (10YR 2/1) rubbed, very dark brown (10YR 2/2) pressed sapric material; 84 percent fiber, 4 percent rubbed; massive; very friable; fibers primarily herbaceous; about 15-20 percent mineral soil material; pH 6.8 (LaMotte); clear wavy boundary.

Oa5 74L1482 109 to 152 cm. Dark yellowish brown (10YR 3/4), very dark grayish brown (10YR 3/2) rubbed, dark brown (10YR 3/3) pressed sapric material; 68 percent fiber, 4 percent rubbed; massive; very friable; fibers primarily herbaceous; about 10-15 percent mineral soil material; pH 7.0 (LaMotte).

Remarks:

1. At 76 cm and 97 cm are horizontal shear planes. They are 1/8 to 1/4 inch thick and appear to be mineral.

2. This pedon has high unrubbed fiber content, but rubbed fiber content is quite low.

3. 43 to 109 cm is a rather thick layer, but material is similar. This layer was sampled from 56 to 96 cm.

4. This Houghton and the pedon sampled in Jefferson County plus other pedons examined have a quite high unrubbed fiber content. None were as low (unrubbed) as described in the official series description typifying pedon (Mich.). None were highly decomposed.

5. Dane County, Wisconsin, has 27,000 acres of Houghton soils.

6. Sodium Pyrophosphate color test produced the following colors:

   Oap1 - 10YR 3/2
   Oap2 - not sampled
   Oa3 - 10YR 4/3
   Oa4 - 10YR 5/3
   Oa5 - 10YR 7/3

7. Organic material from 152 to 253 cm is similar. A few woody fragments were noted at 190-202 cm.

SOIL CLASSIFICATION-TYPIC HEDISAPRIST
EUIC, HESIC
SERIES - - - - - - -HOUGHTON

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LINCOLN, NEBRASKA

SOIL NO - - - - - - S74WI-55-2 COUNTY - - - JEFFERSON

GENERAL METHODS- - -1A,1B1B,2A1,2B SAMPLE NOS. 74L1483-74L1488

DEPTH CM	HORIZON	PARTICLE SIZE ANALYSIS, LT 2MM, 3A1, 3A1A, 3A1B (PCT LT 2MM) SAND 2-.05	SILT .05-.002	CLAY LT .002	FINE CLAY LT .0002	VCOS 2-1	CORS 1-.5	MEDS .5-.25	FNES .25-.10	VFNS .10-.05	COSI .05-.02	FNSI .02-.002	VFSI .005-.002	SAND 2-.10	INTR II .2-.02	FINE CLAY TO CLAY PCT	NON-CO3-CLAY PCT	RATIO 8D1 15-BAR TO CLAY
000-28	0AP	3.5	71.2	25.3		.1	.1	.2	.8	2.3	23.7	47.5		1.2				3.81
028-62	0A2																	
062-84	0A3																	
084-109	0A4																	
109-127	0A5																	
127-183	0A6																	

DEPTH CM	(PARTICLE SIZE ANALYSIS, MM, 3B, 3B1, 3B2) VOL. GT 2 PCT	WEIGHT GT 75 PCT	75-20	20-5	5-2	LT .074	20-2 PCT LT20	(BULK DENSITY) 4A1D 1/3-BAR G/CC	4A1H OVEN DRY G/CC	4D1 COLE	(WATER CONTENT) 4B1C 1/10 BAR PCT	4B1C 1/3-BAR PCT	4B2A 15-BAR PCT	4C1 WRD CM/CM	CARBONATE 6E1B LT 2 PCT	3A1A LT .002 PCT	(PH) 8C1A 1/1 H2O	8C1E 1/2 CACL
000-28	TR	0	0	0	TR	98	TR						103				5.7	5.5
028-62	0	0	0	0	0		0	.21	.89		459	371	112	.54			5.7	5.4
062-84	0	0	0	0	0		0	.17	.61		573	447	111	.57			5.7	5.4
084-109	0	0	0	0	0		0	.16	.50		571	418	110	.49			5.6	5.4
109-127	TR	0	0	0	TR		TR	.20	.96		551	398	113	.57			5.2	5.1
127-183	TR	0	0	0	TR		TR	.20	1.11		576	435	105	.66			4.9	4.8

DEPTH CM	(ORGANIC MATTER) 6A1A ORGN CARB PCT	6E1A NITG PCT	C/N	IRON 6C2B EXT FE PCT	PHOS TOTL PCT	(EXTRACTABLE BASES 5B4A) 6N2E CA	6O2D MG	6P2B NA	6Q2B K	SUM EXTB	ACTY 6H1A BACL TEA	AL 6G1E KCL EXT	(CAT EXCH) 5A3A EXTB ACTY	5A6A NHAC	RATIO 8D1 NHAC TO CLAY	RATIO 8D3 CA TO MG	CA 5F1 SAT NHAC PCT	(BASE SAT) 5C3 EXTB ACTY PCT	5C1 NHAC PCT
CM						MEQ / 100 G													
000-28	36.5	3.60	10			110	27.4	.1	1.1	139	72.8		211	149		4.0	74	66	93
028-62	39.0	3.08	13			119	36.5	.2	.5	156	97.4		254	163		3.3	73	62	96
062-84	45.8	2.83	16			121	38.5	.3	.5	160	89.3		250	155		3.1	78	64	103
084-109	45.7	2.61	18			83.8	26.6	.3	.3	111	77.8		189	118		3.2	71	59	94
109-127	31.2	3.27	10			56.0	18.9	.3	.3	75.5	99.6		175	83.8		3.0	67	43	90
127-183	24.0	2.95	8			61.2	29.4	.3	.3	91.2	178		269	75.1		2.1	81	34	121

DEPTH CM	(SATURATED PASTE) 8E1 REST OHM-CM	8C1B PH	8A H2O PCT	NA 5D2 ESP PCT	NA 5E SAR	SALT 8D5 TOTL SOLN PPM	GYP 6F1A PCT	(SATURATION EXTRACT 8A1) 8A1A EC MMHOS/CM	6N1B CA	6O1B MG	6P1B NA	6Q1B K	6I1A CO3	6J1A HCO3	6K1A CL	6L1A SO4	6M1A NO3	ATTERBERG 4F1 LQID LMIT PCT	4F2 PLST INDX
								MEQ / LITER											
000-28	1000	5.2	410			4300		1.59	9.7	5.8	.1	.7	0	.3	.2	2.0	12.7		
028-62	1200	5.3	708			6100		1.25	7.8	5.3	.1	.2	0	.3	.0	3.9	8.1		
062-84	1900	5.3	960			5200		.76	4.9	3.3	.1	.1	0	.9	.2	4.2	2.4		
084-109	1700	5.2	968			5900		.88	5.5	3.8	.1	.1	0	.9	.0	5.4	2.3		
109-127	570	3.9	862			24000		3.13	28.5	15.1	.2	.1	0	.0	.5	44.2	1.6		
127-183	250	2.3	809			30000		6.17		33.8	.2	.1	0	.0	2.5	102	.4		

DEPTH CM	8F MINL CONT PCT	(STATE OF DECOMPOSITION) 8G (FIBER VOL) UNRB PCT	RUB PCT	8H PYROPHOSPHT SOLUBILITY (HUNS COLOR)	PH 8C1E .01M CACL	(BULK DEN) 4A3A FILD STAT G/CC	4A1I 1/3B RENT G/CC	COLE 4D1 RE-WET	SUBS RES-IDUE PCT	(WATER CONTENT) 4B4 FILD STAT PCT	4B1C 1/3B RENT PCT	4B2 15-BAR PCT	4C1 WRD CM/CM
000-28	24	25	3	7.5YR 3/2	5.3	.32			90	218		96	
028-62	18	29	3	7.5YR 3/2	5.3	.20	.40	.24	91	417	169	93	.30
062-84	12	28	2	10 YR 5.5/3	5.6	.14	.29	.19	68	556	239	98	.41
084-109	20	32	7	10 YR 5.5/3	5.5	.14	.29	.22	62	562	233	89	.42
109-127	26	20	4	10 YR 6/4	4.9	.14	.43	.29	58	562	148	99	.21
127-183	37	10	1	10 YR 7/4	4.5	.14	.29	.13	49	577	276	86	.55

Soil classification: Typic Medisaprists; euic, mesic.
Series: Houghton.
Pedon No.: S74WI-55-2.
Location: Jefferson County, Wisconsin; NW¼, SW¼, sec. 27, T. 7 N., R. 16 E., 576 feet north from center of road opposite farmhouse. About 43°07' N latitude and 88°37' W longitude.
Climate: Humid continental. Mean annual temperature is 47.8° F; mean July temperature is 73.1° F; mean January temperature is 21.3° F; mean annual precipitation is 30.98 inches with nearly two-thirds of the precipitation falling during the growing season; total amount of snowfall is 41.9 inches; the growing season averages 159 days, but less in organic areas (data from Watertown, WI weather bureau substation).
Parent material: Deposits of herbaceous organic material more than 51 inches thick.
Physiography: Depressional area between drumlins.
Vegetation: Bluegrass sod (cut and sold as sod).
Size of area: About 2,000-3,000 acres interfingering between drumlins.
Distance to adjacent mineral soil: About 572 feet to south.
Depth to water table: 109 cm.
Microrelief: None
Subsidence: Estimated to be moderate.
Described and sampled by: G.W. Hudelson and C.L. Glocker. Sampled from pit to 72 inches.

Oap 74L1483 0 to 28 cm. Black (N 2/0), black (10YR 2/1) rubbed and pressed sapric material; 60 percent fiber, less than 2 percent rubbed; weak fine granular structure; very friable; fibers primarily herbaceous; about 10 percent mineral soil material; pH 6.0 (LaMotte); abrupt smooth boundary.

Oa2 74L1484 28 to 62 cm. Very dark brown (10YR 2/2), black (10YR 2/1) rubbed, very dark brown (10YR 2/2) pressed sapric material; 88 percent fiber, less than 2 percent rubbed; weak coarse prismatic structure parting to weak medium subangular blocky structure; very friable; fibers primarily herbaceous; about 10-15 percent mineral soil material; pH 6.2 (LaMotte); clear smooth boundary.

Oa3 74L1485 62 to 84 cm. Very dark brown (10YR 2/2), black (10YR 2/1) rubbed, very dark brown (10YR 2/2) pressed sapric material; 68 percent fiber, 4 percent rubbed; weak thin platy structure with some areas of massive (matted); very friable; fibers primarily herbaceous; about 10-15 percent mineral soil material; pH 6.2 (LaMotte); abrupt smooth boundary.

Oa4 74L1486 84 to 109 cm. Black (10YR 2/1) broken face, rubbed, and pressed sapric material; 72 percent fiber, 4 percent rubbed; massive (matted); very friable; fibers primarily herbaceous; about 10-15 percent mineral soil material; pH 6.4 (LaMotte); gradual wavy boundary.

Oa5 74L1487 109 to 127 cm. Very dark grayish brown (10YR 3/2), very dark grayish brown (10YR 3/2), very dark gray (10YR 3/1) rubbed and pressed sapric material; about 25-30 percent fiber, less than 5 percent rubbed; massive with a few areas of weak thin platy structure; very friable; fibers primarily herbaceous; about 15 percent mineral soil material; pH 6.8 (LaMotte); gradual wavy boundary.

Oa6 74L1488 127 to 183 cm. Very dark gray (10YR 3/1) broken face, rubbed, and pressed sapric material; about 15-20 percent fiber, less than 5 percent rubbed; weak thin platy structure; very friable; fibers primarily herbaceous; about 15 percent mineral soil material; pH 6.8 (LaMotte).

Remarks:

1. 127-183 cm - sedge roots and leaves (easily identifiable).
2. 109-127 cm sedge roots, leaves, seeds, 1 wood fragment (easily identifiable).
3. 0-28 cm - some weak medium angular blocky structure (compaction by machinery).
4. 28-62 cm - sedge roots, leaves, and seeds are evident on broken face. Some tendency towards prismatic structure.
5. 62-84 cm - sedge roots evident on broken faces.
6. Water moves into pit down through vertical cracks. Some places in field have polygonal cracks at surface.
7. 109 cm is a soak line (wet); color change in material also.
8. Sand underlies organic material at 183 cm.
9. High percent of fibers (unrubbed) in this profile.
10. Sodium Pyrophosphate color test produced colors of: Oap-10YR 3/3; Oa2 - 10YR 3/3; Oa3 - 10YR 7/3; Oa4 - 10YR 7/3; Oa5 - 10YR 8/1; Oa6 - 10YR 8/1.

SOIL CLASSIFICATION-TYPIC EUTROBORALF
COARSE-LOAMY, MIXED
SERIES - - - - - - - -IRON RIVER TAXADJUNCT

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LINCOLN, NEBRASKA

SOIL NO - - - - - - S72WI-21-9 COUNTY - - - FOREST

GENERAL METHODS- - -1A,1B1B,2A1,2B SAMPLE NOS. 72L878-72L885

DEPTH CM	HORIZON	PARTICLE SIZE ANALYSIS, LT 2MM, 3A1, 3A1A, 3A1B (PCT LT 2MM) SAND 2-.05	SILT .05-.002	CLAY LT .002	FINE CLAY LT .0002	SAND VCOS 2-1	CORS 1-.5	MEDS .5-.25	FNES .25-.10	VFNS .10-.05	SILT COSI .05-.02	FNSI .02-.002	VFSI .005-.002	SAND 2-.10	INTR II .2-.02	FINE CLAY TO CLAY PCT	NON-CO3-CLAY PCT	RATIO 8D1 15-BAR TO CLAY
000-12	A2	57.4	37.8	4.8	1.5	3.8	10.7	16.3	18.6	8.0	16.1	21.7		49.4	32.5	31		.77
012-21	B21HIR	56.9	33.6	9.5	.9	3.5	9.8	15.2	19.6	8.8	14.2	19.4		48.1	32.0	9		.86
021-52	B22IR	62.1	32.0	5.9	.1	3.8	11.4	17.1	20.7	9.1	14.3	17.7		53.0	32.9	2		.97
052-64	B23IR	79.2	17.6	3.2	.3	6.3	15.1	21.5	25.7	10.6	8.9	8.7		68.6	31.0	9		.78
064-82	B24IRX	81.0	16.5	2.5	.2	5.7	15.2	23.0	26.6	10.5	8.2	8.3		70.5	30.6	8		.68
082-140	A&BX	79.2	17.6	3.2	.1	7.2	16.2	22.4	24.2	9.2	8.1	9.5		70.0	27.9	3		.47
140-200	B2T	74.2	15.7	10.1	3.0	6.3	16.3	21.0	21.7	8.9	6.8	8.9		65.3	24.8	30		.38
200-225	B3T	75.3	14.0	10.7	3.5	5.9	17.8	22.3	21.2	8.1	6.2	7.8		67.2	23.1	33		.34

DEPTH CM	(PARTICLE SIZE ANALYSIS, MM, 3B, 3B1, 3B2) VOL. GT 2 PCT	GT 75 PCT	WEIGHT 75-20 (PCT LT 75)	20-5	5-2	LT .074	20-2 PCT LT20	BULK DENSITY 4A1D 1/3-BAR G/CC	4A1H OVEN DRY G/CC	4D1 COLE	WATER CONTENT 4B1C 1/10 BAR PCT	4B1C 1/3-BAR PCT	4B2 15-BAR PCT	4C1 WRD CM/CM	CARBONATE 6E1B LT 2 PCT	3A1A LT .002 PCT	PH 8C1A 1/1 H2O	8C1E 1/2 CACL
000-12	10	TR	5	7	4	40	12	1.0 A					3.7				4.7	4.2
012-21	10	TR	5	7	5	40	13	1.2 A					8.2				4.6	4.0
021-52	10	TR	5	9	6	34	16	1.20	1.26	.015	34.5	25.6	5.7	.22	1.8B		4.8	4.2
052-64	30	5	20	11	6	17	23	1.6 A					2.5				4.8	4.4
064-82	35	5	25	7	7	15	19	1.9 A					1.7				4.8	4.5
082-140	35	5	25	9	7	15	21	1.91	1.93	.003	8.8	7.3	1.5	.08	3.8B		6.0	4.7
140-200	35	5	25	8	7	18	20	1.9 A					3.8				6.0	5.2
200-225	35	5	25	8	7	17	20	1.9 A					3.6				6.1	5.4

DEPTH CM	(ORGANIC MATTER) 6A1A ORGN CARB PCT	6E1A NITG PCT	C/N	IRON 6C2B EXT FE PCT	PHOS TOTL PCT	(EXTRACTABLE BASES 5B4A) 6M2E CA (MEQ/100 G)	6O2D MG	6P2B NA	6Q2B K	SUM EXTB	ACTY 6H1A BACL TEA	AL 6G1E KCL EXT	(CAT EXCH) 5A3A EXTB ACTY	5A6A NHAC	RATIO 8D1 NHAC TO CLAY	RATIO 8D3 CA TO MG	CA 5F1 SAT NHAC PCT	(BASE SAT) 5C3 EXTB ACTY PCT	5C1 NHAC PCT
000-12	.99	.081	12	.5		2.3	.7	.0	.1	3.1	5.2	.4	8.3	7.1	1.48	3.3	32	37	44
012-21	1.84	.122	15	1.5		1.2	.4	TR	.1	1.7	22.6	3.5	24.3	15.3	1.61	3.0	8	7	11
021-52	1.59	.083	19	1.1		.6	.1	.1	.1	.9	16.7	2.2	17.6	10.2	1.73	6.0	6	5	9
052-64	.34	.019	18	.6		.2	TR	TR	TR	.2	5.8	.8	6.0	3.8	1.19		5	3	5
064-82	.16			.5		.1	.0	.1	TR	.2	4.3	.6	4.5	3.1	1.24		3	4	6
082-140	.09			.5		.6	.2	.1	.1	1.0	2.1		3.1	2.6	.81	3.0	23	32	38
140-200	.04			.7		3.6	1.6	.1	.1	5.4	1.6		7.0	5.8	.57	2.3	62	77	93
200-225	.04			.9		2.8	1.5	.1	.1	4.5	1.6		6.1	4.9	.46	1.9	57	74	92

DEPTH CM	(SATURATED PASTE) 8E1 REST OHM-CM	8C1B PH	8A H2O PCT	NA 5D2 ESP PCT	NA 5E SAR	SALT 8D5 TOTL SOLU PPM	GYP 6F1A PCT	(SATURATION EXTRACT 8A1) 8A1A EC MMHOS/CM	6N1B CA (MEQ/LITER)	6O1B MG	6P1B NA	6Q1B K	6I1A CO3	6J1A HCO3	6K1A CL	6L1A SO4	6M1A NO3	ATTERBERG 4F1 LQID LMIT PCT	4F2 PLST INDX
000-12																			
012-21																			
021-52																			
052-64																			
064-82																			
082-140	36000	5.0	13.8					.20											
140-200																			
200-225																			

IDENTIFICATION OF THE SPODIC HORIZON BY LABORATORY CRITERIA.

DEPTH	HORIZON	(PYROPHOSPHATE, PH10) 6C5A EXT FE PCT	6G5A EXT AL PCT	6A1B EXT C PCT	(CIT - DIT) 6C2B EXT FE PCT	6G7A EXT AL PCT	(PYROPHOSP) FE+AL / CLAY	AL+C / CLAY	PYRO FE+AL / C - D FE+AL	CEC -1/2 CLAY Y THIC
012-21	B21HIR	.8	.4		1.5	.4	.13		.63	95
021-52	B22IR	.4	.4		1.1	.4	.14		.53	225
052-64	B23IR	.1	.2		.6	.2	.09		.38	26
064-82	B24IRX	.1	.1		.5	.1	.08		.33	33

(A) ESTIMATED.
(B) MICRO-PENETRATION RESISTANCE. A ROD 0.6 CM DIA IS SLOWLY PUSHED INTO BULK DENSITY CLOD, EQUILIBRATED AT 0.1-BAR, A DISTANCE OF 0.6 CM USING A POCKET PENETROMETER. UNITS ARE FORCE (KG) AND NOT ESTIMATES OF UNCONFINED COMPRESSIVE STRENGTH.

Soil classification: Typic Eutroboralf; coarse-loamy, mixed.
Soil: Iron River taxadjunct*.
Soil No.: S72 WI-21-9 (LSL Nos. 72L878-72L885).
Location: Forest County, Wisconsin; SW¼, NW¼, Sec. 32, T. 38 N., R. 12 E.
Climate: Humid continental; mean annual temperature is about 37° to 43° F; average annual precipitation is about 30 inches; and frost-free season is 90 to 120 days.
Vegetation and land use: Natural vegetation was mixed northern hardwoods and conifers. Most of this soil is in second growth hardwoods and aspen. Some areas have been cleared and are used for general farming. Some wooded areas are pastured.
Parent material: Acid sandy loam glacial till.
Physiography: Gently sloping to steep glacial ground and recessional moraines.
Topography: Site is on a plane 2 percent slope in a hardwood-conifer forest.
Drainage: Moderately well and well drained.
Ground water: Deep.
Erosion: Slight.
Permeability: Moderate except for the fragipan which is moderately slow.
Described by: Steve Payne and Robert Fox.
Sampled by: Robert H. Jordan and Robert L. Juve, September 20, 1972.
(Colors are for moist soils unless otherwise stated)

O1 Partially decomposed leaves and new leaves from the forest cover.

O2 6 to 0 cm (2 to 0 inches). Very dark brown (10YR 2/2) decomposed leaves; weak fine granular structure; very friable.

A2 72L878 0 to 12 cm (0 to 5 inches). Dark reddish brown (5YR 4/2) fine sandy loam; weak fine granular structure; very friable; few fine gravel; roots common; very strongly acid; abrupt boundary.

B21hir 72L879 12 to 21 cm (5 to 8 inches). Dark reddish brown (2.5YR 3/4) fine sandy loam; weak medium subangular blocky structure; very friable; few roots; strongly acid; clear boundary.

B22ir 72L880 21 to 52 cm (8 to 21 inches). Dark red (2.5YR 3/6) fine sandy loam; moderate medium subangular blocky structure; very friable; few roots; very strongly acid; clear boundary.

B23ir 72L881 52 to 64 cm (21 to 25 inches). Reddish brown (5YR 4/4) sandy loam; moderate medium subangular blocky structure; friable; a few brittle peds; about 20 percent by volume of medium and coarse gravel and about 10 percent of fine gravel and 5 percent cobblestones; very strongly acid; abrupt boundary.

B24irx 72L882 64 to 82 cm (25 to 33 inches). Brown (7.5YR 4/4) loamy sand; weak medium subangular blocky structure; firm; a few peds of brittle firm sandy loam which are more firm than the A&B horizon below; about 20 percent of medium and coarse gravel and 10 percent of fine gravel, and about 5 percent cobblestones; strongly acid; clear boundary.

A&Bx 72L883 82 to 140 cm (33 to 56 inches). Brown (7.5YR 5/4) loamy sand and reddish brown (5YR 4/3) sandy loam; the loamy sand is structureless and loose, and the sandy loam has a weak medium subangular blocky structure; the sandy loam is brittle and weakly cemented; about 20 percent medium and coarse gravel and 10 percent fine gravel, about 5 percent cobblestones; medium acid; abrupt boundary.

B2t 72L884 140 to 200 cm (56 to 80 inches). Reddish brown (2.5YR 4/4) sandy loam; moderate medium subangular blocky structure; friable; many clay films and clay bridges; about 20 percent medium and fine gravel and 5 percent cobblestones; slightly brittle and weakly cemented; medium acid; clear boundary.

B3t 72L885 200 to 225 cm (80 to 90 inches). Reddish brown (2.5YR 4/4) sandy loam; weak medium subangular blocky structure; friable; a few clay films and some clay bridging; slightly acid; clear boundary.

C 225 to 250 cm (90 to 100 inches). Reddish brown (5YR 4/3) sandy loam; massive; friable; about 20 percent gravel.

Remarks: Sola is thicker than typical and appears to have been developed in coarser till overlying Gogebic till starting at 140 cm.

*This pedon lacks a well expressed fragipan with spodic characteristics; therefore, it is a taxadjunct to the Iron River series.

Kalkaska variant **Bayfield County, Wisconsin**

S49WI-4-1

Beltsville Soil Survey Lab. Nos. 49997-491003

Depth cm	Horizon	M.E./100 Grams Soil						% B. SAT	pH	% O.C.	Size Classes %							
		Ca	Mg	K	Na	H[1]	S+[2]				Clay	III[3]	USDA Silt	VFS	FS	MS	CS	VCS
2.5-0	O1	—	—	—	—	—	—	—	4.4	—	—	—	—	—	—	—	—	—
0-20	A2	0.7	0.2	0.1	<0.1	2.2	3.2	31	4.8	0.51	2.4	10.5	20.5	9.1	33.4	23.0	10.2	1.4
20-33	B21hir	0.6	0.3	0.2	0.1	12.2	13.4	9	5.1	0.97	6.0	8.6	18.0	10.0	35.2	21.5	8.1	1.2
33-68	B22irx	0.5	0.1	0.1	<0.1	4.1	4.8	14	5.7	0.33	3.8	3.6	9.5	13.7	41.1	21.6	8.7	1.6
68-103	B3x	0.2	0.1	0.1	<0.1	2.1	2.5	16	5.6	0.15	2.0	2.6	6.6	12.0	38.2	22.6	14.1	4.5
103-133	IIC1x	0.3	0.1	0.1	<0.1	1.7	2.2	23	5.8	0.13	2.5	4.4	9.3	11.8	39.4	21.8	12.0	3.2
133-160	IIC2x	1.0	0.3	0.2	<0.1	1.3	2.8	54	6.0	0.08	4.5	11.1	20.0	13.7	34.0	17.2	8.5	2.1

1 Acidity
2 CEC by sum of cations
3 International III - This is PSDA fine silt (.02-.002 mm).

Soil classification: Typic Fragiorthod; sandy, mixed, frigid.
Soil: Kalkaska variant.
Soil No.: S49WI-4-1.
Location: Bayfield County, Wis.; NW¼, Sec. 2, T. 48 N., R. 7 W.; about 1/4 mile south of junction of earth road and road to Lewanee lookout tower.
Climate: Humid continental; mean annual air temperature is about 39° to 45° F; average annual precipitation is 28 to 32 inches; frost-free season is 90 to 105 days.
Vegetation and land use: Largely in second growth timber of mixed deciduous and coniferous trees such as aspen, white birch, jack pine, and maple. Some cleared areas are used for pasture and forage production.
Parent material: Sandy acid glacial outwash over acid sandy loam till.
Physiography: Sloping to hilly upland.
Topography: On east-facing side slope of a ridge; gradient is 4 percent.
Drainage: Somewhat excessive to well drained.
Ground water: Deep.
Erosion: Slight.
Permeability: Rapid in solum; moderate in substratum.
Described by: J. K. Ableiter, I.J. Nygard, R.J. Muckenhirn, and V.J. Kilmer.

(Colors are for moist soil unless otherwise stated)

01 49997 2.5 to 0 cm (1 to 0 inches). Very dark brown (10YR 2/2) crushed, peaty organic matter, poorly decomposed; very friable; many fibrous roots, gray sand grains, bits of twigs, bark, leaves, and wood fragments; fungal mycelium and some gray particles present; constitutes a definite fairly strong mat on the surface.

A2 49998 0 to 20 cm (0 to 8 inches). Reddish gray (5YR 5/2) sand, pinkish gray (5YR 7/2) dry; weakly coherent subangular blocky structure parting to weak small granules; very friable; many roots; abrupt irregular boundary; strongly acid.

B21hir 49999 20 to 33 cm (8 to 13 inches). Dark reddish brown to reddish brown (5YR 3/4 to 4/4) loamy sand, light reddish brown to light brown (5YR 6/4 to 7.5YR 6/4) dry; cemented ortstein in places which are angular, hard and difficult to fracture or crush; orterde is more yellowish brown, weakly cemented and crushes easily; roots penetrate this horizon vertically but are more extensive at top and bottom where they are horizontally extended; ortstein fragments are dark reddish brown on exterior and lighter brown on interior; irregular boundary with tongues extending into horizon below; medium acid.

B22irx 491000 33 to 68 cm (13 to 27 inches). Reddish brown (5YR 4/4) loamy sand, light reddish brown (5YR 6/4) dry; slightly cemented in place parting to subangular blocks which crush easily; few roots; roots are concentrated where the material is looser; irregular boundary with tongues extending into lower horizon; medium acid.

B3x 491001 68 to 103 cm (27 to 41 inches). Reddish brown (2.5YR 5/4) loamy sand, reddish brown to light reddish brown (5YR 5/4 to 6/4) dry; cemented in place parting to irregular fragments when disturbed; hard when dry, firm when moist; rounded pebbles of sandstone, basalt, gneiss, and granite; medium acid.

IIC1x 491002 103 to 133 cm (41 to 53 inches). Reddish brown (5YR 4/4) sandy loam, light reddish brown (5YR 6/4) dry; moderately cemented in place parting to fragments which crush with moderate resistance; very hard when dry, firm when moist; medium acid.

IIC2x 491003 133 to 160 cm (53 to 64 inches). Reddish brown (5YR 4/3) fine sandy loam, light reddish brown (5YR 6/3) dry; weakly cemented in place parting to irregular fragments when disturbed; hard when dry, firm when moist; about 60 percent of the pebbles present are hard sandstone, with basalt, granite, and slate rocks making up the remainder; medium acid.

Note: This soil differs from Kalkaska in having a diagnostic fragipan development in the solum.

Pedon placement based on series classification because chemical data are incomplete.

Kalkaska — **Bayfield County, Wisconsin**

S49WI-4-2 — Beltsville Soil Survey Lab. Nos. 491004-491010

Depth cm	Horizon	M.E./100 Grams Soil						% B. SAT	pH	% O.C.	Size Classes %							
		Ca	Mg	K	Na	H[1]	S+[2]				Clay	III[3]	USDA Silt	VFS	FS	MS	CS	VCS
2.5-0	O2	--	--	--	--	--	--	--	5.8	--	--	--	--	--	--	--	--	--
0-17	A2	0.6	0.1	0.1	<0.1	1.3	2.1	38	4.8	0.44	1.9	4.5	6.8	2.6	27.6	29.8	26.3	5.0
17-40	B2hir	0.4	0.2	0.1	0.1	9.1	9.9	8	5.9	0.81	5.9	3.2	4.4	3.2	36.7	27.9	16.3	5.6
40-53	B3ir	0.3	<0.1	0.1	0.1	3.9	4.4	11	5.4	0.35	2.6	1.0	0.9	2.1	43.2	31.5	15.6	4.1
53-85	B3	0.1	<0.1	<0.1	<0.1	1.4	1.5	7	6.0	0.14	1.5	0.0	0.6	5.0	60.6	24.5	6.4	1.4
85-128	C1	0.2	<0.1	<0.1	0.1	1.3	1.6	19	6.0	0.13	1.6	0.0	0.1	3.9	46.3	21.8	19.8	6.5
128-160	C2	0.2	0.1	<0.1	0.1	1.0	1.4	28	5.8	0.07	1.7	0.7	6.9	13.2	36.5	32.2	8.3	1.2

1 Acidity
2 CEC by sum of cations
3 International III - This is PSDA fine silt (.02-.002 mm).

Soil classification: Typic Haplorthod: sandy, mixed, frigid.
Soil: Kalkaska.
Soil No.: S49WI-4-2.
Location: Bayfield County, Wisconsin; NW¼, NE¼ of Sec. 13, T. 50 N., R. 8 W.; 100 feet east of northwest to southeast side road and 0.3 mile northeast of Port Wing.
Climate: Average annual precipitation is 28 to 32 inches. Mean annual air temperature is about 39° to 45° F. Frost-free season is 90 to 105 days.
Vegetation and land use: Largely in second growth timber of mixed deciduous and coniferous trees such as aspen, white birch, jack pine, oak, and maple. Ground cover consists of grasses, forbs, ferns, blueberry, and mosses. Some cleared areas are used for pasture and forage production.
Parent material: Sandy acid glacial outwash.
Physiography: Nearly level to steep uplands.
Topography: On north-facing side slope of high ridge.
Drainage: Somewhat excessive to well drained.
Ground water: Deep.
Erosion: Slight.
Permeability: Rapid.
Described by: J. K. Ableiter, I.J. Nygard, R.J. Muckenhirn, and V.J. Kilmer

(Colors are for moist soil unless otherwise stated)

O1 Consists of 1/4 inch of birch, oak, and forb leaves.

O2 491004 2-1/2 to 0 cm (1 to 0 inches) Dark gray to very dark brown and black (10YR 4/1, 2/2 and 2/1) peaty organic matter with some sand grains; forms a strong mat which can be cut loose and handled in patches or strips; contains fine roots, mycelia, bits of charcoal and twigs; grades into a very thin (1/4 inch) A1.

A2 491005 0 to 17 cm (0 to 7 inches). Pinkish gray (5YR 6/2) loamy sand, pinkish gray (5YR 7/2) dry, and dark reddish gray (5YR 4/2) wet; very weakly coherent; very friable; numerous roots up to 1/2 inch in diameter; some mixing and gradation in patches or pockets with the B2hir horizon below; strongly acid; irregular boundary.

B2hir 491006 17 to 40 cm (7 to 16 inches). Yellowish red to reddish brown (5YR 4/6 to 4/4) loamy sand, light brown to reddish brown (7.5YR 6/4 to 5YR 5/4) dry; weakly coherent (weak medium subangular blocky structure); very friable; spheres or zones of darker brown cemented ortstein about 2 to 6 inches in diameter occur and extend downward into the horizon below; these appear to be old root channels; common roots, mostly woody, 1/8 to 1/4 inch in diameter; few sandstone, granite and basalt pebbles; strongly acid.

B3ir 491007 40 to 53 cm (16 to 21 inches). Yellowish red (5YR 4/6) loamy sand, reddish brown (5YR 5/4) dry; weakly coherent with little tendency toward structure; very friable; many roots, generally woody and 1/8 to 1/4 inch in diameter; cylinders or tongues of cemented ortstein extend into this horizon from the B2hir horizon; a large rock, 18 inches in diameter extends through this horizon and into the one above; medium acid.

B3 491008 53 to 85 cm (21 to 34 inches). Yellowish red to reddish brown (5YR 4/6 to 4/4) sand, light reddish brown (5YR 6/4) dry; weakly coherent to single grained; very friable to loose; few roots, mostly vertical and woody; medium acid.

C1 491009 85 to 128 cm (34 to 51 inches). Yellowish red (5YR 4/6) sand; slightly coherent to single grained; very friable to loose; horizon has finer sand at upper limit and medium sand in lower part; few pebbles, about 1/2 inch in diameter, about 1/3 sandstone, 1/3 basalt, and remainder granite, quartzite and other rocks; few roots; slightly acid.

C2 491010 128 to 160 cm (51 to 64 inches). Reddish brown (5YR 5/4) sand, pink (5YR 7/4) dry; single grained; loose; medium acid.

Note: Inspection of sides of pit showed evidence of stratification in the C horizons.

Pedon placement based on series classification because chemical data are incomplete.

SOIL CLASSIFICATION-AQUIC GLOSSOBORALF
FINE-LOAMY, MIXED
SERIES - - - - - - -KERT

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE, MTSC
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

SOIL NO - - - - - - S70WIS-71-5 COUNTY - - - WOOD

GENERAL METHODS- - -1B1B,2A1,2B SAMPLE NOS. T0L952-T0L959

DEPTH CM	HORIZON	PARTICLE SIZE ANALYSIS, LT 2MM, 3A1, 3A1A, 3A1B (PCT LT 2MM) SAND 2-.05	SILT .05-.002	CLAY LT .002	FINE CLAY LT .0002	VCOS 2-1	CORS 1-.5	MEDS .5-.25	FNES .25-.10	VFNS .10-.05	COSI .05-.02	FNSI .02-.002	VFSI .005-.002	FAML TEXT SAND 2-.1	INTR II .2-.02	FINE CLAY TO CLAY PCT	NON-CO3-CLAY PCT	RATIO 8D1 15-BAR TO CLAY
000-14	AP	39.9	48.1	12.0	4.1	1.1	2.0	3.8	24.7	8.3	22.0	26.1	4.6	31.6	46.3	34		.48
014-35	A2	29.3	52.9	17.8	7.0	.7	1.7	3.2	17.2	6.5	23.9	29.0	5.6	22.8	40.8	39		.41
035-55	2A&B	77.6	16.1	6.3	2.4	2.5	4.8	7.3	46.7	16.3	6.4	9.7	3.4	61.3	55.1	38		.40
055-83	2B&A	47.7	28.7	23.6	12.6	4.6	4.9	3.7	16.9	17.6	10.0	18.7	7.4	30.1	40.1	53		.42
083-100	2C1	76.6	13.0	10.4		4.1	5.1	4.3	26.5	36.6	5.0	8.0	3.8	40.0	63.1			.43
100-132	2C2	21.2	38.8	40.0		2.4	2.3	1.3	5.0	10.2	10.7	28.1	10.5	11.0	24.6			.39
132-172	2C3	48.5	27.5	24.0		3.7	6.1	4.2	17.1	17.4	8.2	19.3	8.7	31.1	38.2			.39
000-14	2AP (A)																	

DEPTH CM	PARTICLE SIZE ANALYSIS, MM, 3B, 3B1, 3B2 (WEIGHT PCT) VOL. GT 2 PCT	GT 75 PCT	75-20	20-5	5-2	LT .074	20-2 PCT LT20	4A1D 1/3-BAR G/CC	4A1H OVEN DRY G/CC	4D1 COLE	BULK DENSITY 4B1C 1/10 BAR PCT	4B1C 1/3-BAR PCT	WATER CONTENT 4B2 15-BAR PCT	4C1 WRD CM/CM	CARBONATE 6E1B LT 2 PCT	3A1A LT .002 PCT	PH 8C1A 1/1 H2O	8C1E 1/2 CACL
000-14	TR	0	TR	TR	1	62	1	1.47	1.53	.014	22.6	20.2	5.8	.22			7.1	7.0
014-35	0	0	0	0	0	74	0	1.69	1.70	.002	19.4	17.7	7.3	.18	5.48		5.4	4.9
035-55	0	0	0	0	0	27	0						2.5				4.6	4.1
055-83	TR	0	0	0	TR	59	TR						9.8				4.1	3.6
083-100	0	0	0	0	0	35	0						4.5				4.4	3.8
100-132	0	0	0	0	0	85	0						15.5				4.2	3.8
132-172	0	0	0	0	0	60	0						9.3				4.3	3.9
000-14	TR	0	TR	TR	TR		TR						6.1				7.0	7.0

DEPTH CM	ORGANIC MATTER 6A1A ORGN CARB PCT	6B1A NITG PCT	C/N	IRON 6C2B EXT FE PCT	PHOS TOTL PCT	EXTRACTABLE BASES 5B4A (MEQ / 100 G) 6N2E CA	6O2D MG	6P2B NA	6Q2B K	SUM EXTB	ACTY 6H1A BACL TEA	AL 6G1E KCL EXT	CAT EXCH 5A3A EXTB ACTY	5A6A NHAC	RATIO 8D1 NHAC TO CLAY	RATIO 8D3 CA TO MG	CA 5F1 SAT NHAC PCT	BASE SAT 5C3 EXTB ACTY PCT	5C1 NHAC PCT
000-14	1.32	.099	13	0.7		12.6	0.5	0.2	0.2	13.5	2.8		16.3	10.0	0.83	25.0	126	83	135
014-35	0.33	.036	9	0.9		6.2	0.8	0.2	0.2	7.4	5.9	0.6	13.3	10.1	0.57	7.8	61	56	73
035-55	0.08	.010		0.2		0.8	0.3	0.1	0.1	1.3	2.2	0.7	3.5	2.6	0.41	2.7	31	37	50
055-83	0.07	.022		0.5		1.3	1.1	0.1	0.4	2.9	8.3	3.4	11.2	8.9	0.38	1.2	15	26	33
083-100	0.03			0.1		0.7	0.7	0.1	0.2	1.7	3.5	1.6	5.2	3.9	0.38	1.0	18	33	44
100-132	0.03			1.5		1.9	3.0	TR	0.6	5.5	9.3	3.5	14.8	12.4	0.31	0.6	15	37	44
132-172	0.03			0.3		1.5	2.4	0.2	0.5	4.6	4.4	1.3	9.0	7.4	0.31	0.6	20	51	62
000-14	1.53																		

DEPTH CM	SATURATED PASTE 8E1 REST OHM-CM	8C1B PH	8A H2O PCT	NA 5D2 ESP PCT	NA 5E SAR	SALT 8D5 TOTL SOLU PPM	GYP 6F1A PCT	SATURATION EXTRACT 8A1 (MEQ / LITER) 8A1A EC MMHOS/CM	6N1B CA	6O1B MG	6P1B NA	6Q1B K	6I1A CO3	6J1A HCO3	6K1A CL	6L1A SO4	6M1A NO3	ATTERBERG 4F1 LQID LMIT PCT	4F2 PLST INDX
000-14																			
014-35																			
035-55																			
055-83																			
083-100	9900	4.2	28.7	3		40		0.34	0.7	0.8	0.3	0.5							
100-132																			
132-172																			
000-14																			

(A) COMPOSITE OF SEVERAL SURFACE SAMPLES.
(B) MICRO-PENETRATION RESISTANCE - A ROD 0.6 CM DIA IS SLOWLY PUSHED INTO BULK DENSITY CLOD, EQUILIBRATED AT 1/10- BAR, A DISTANCE OF 0.6 CM USING A POCKET PENETROMETER. UNITS ARE FORCE (KG) AND NOT ESTIMATES OF UNCONFINED COMPRESSIVE STRENGTH.

Soil classification: Aquic Glossoboralfs; fine-loamy, mixed.
Soil: Kert.
Soil No.: S70WI-71-5.
Location: Wood County, Wisconsin; SW¼, SE¼, Sec. 19, T. 24 N., R. 3 E.; 500 feet east and 300 feet north of field corner.
Climate: Humid continental; mean annual temperature is about 43° F mean annual precipitation is about 30 inches; and frost-free season is about 133 days.
Vegetation and land use: Original vegetation was mixed northern hardwoods with some coniferous trees. Most areas of this soil are in second-growth woodlots. Cleared areas are used for general farming.
Parent material: Thin silty sediments over stratified residuum from sandstone and shale.
Physiography: Rock-controlled upland on gently sloping or nearly level relief.
Topography: Site is on a 1 to 2 percent plane slope.
Drainage: Somewhat poorly drained.
Ground water: Deep - perched water table exists at a depth of 2 feet or less in this soil for some periods most years.
Erosion: Slight.
Permeability: Moderate to slow.
Described by: Paul H. Carroll

(Colors are for moist conditions unless designated otherwise)

Ap 70L952 0 to 14 cm (0 to 5 inches). Very dark grayish brown (10YR 3/2) silt loam, light brownish gray (10YR 6/2) dry; weak fine subangular blocky structure; friable; many fine fibrous roots; neutral; abrupt smooth boundary.

A2 70L953 14 to 35 cm (5 to 14 inches). Brown (10YR 5/3) silt loam with many fine prominent mottles of yellowish brown (10YR 5/6-5/8); weak fine platy structure; friable; common fine fibrous roots; strongly acid; clear wavy boundary.

IIA&B 70L954 35 to 55 cm (14 to 22 inches). Pale brown (10YR 6/3) loamy fine sand (A2) with many fine prominent mottles of yellowish brown (10YR 5/6-5/8); very weak fine subangular blocky structure; very friable; brown (10YR 5/3) sandy loam remnants of Bt are scattered through the horizon and occupy about 30 percent of the soil volume; few thin clay films are on faces of peds and in some pores or bridge sand grains in the Bt portion of the horizon; strongly acid; abrupt wavy boundary.

IIB&A 70L955 55 to 83 cm (22 to 33 inches). Reddish brown (2.5YR 4/4) sandy clay loam (Bt) with many fine prominent mottles of strong brown (7.5YR 5/6) and brown (7.5YR 5/2); strong coarse platy structure parting to moderate fine angular blocky structure; very firm; continuous thick clay films of very dark gray (10YR 3/1) and dark gray (10YR 4/1) along horizontal cleavage planes and thin on faces of angular blocky peds; brown (10YR 5/3) tongues of fine sandy loam (A2) penetrate the horizon from above and occupy approximately 35 percent of the soil volume; many fine prominent mottles of strong brown (7.5YR 5/6-5/8); weak fine subangular blocky structure; firm; strongly acid; clear wavy boundary.

IIC1 70L956 83 to 100 cm (33 to 40 inches. Olive yellow (2.5Y 6/6) and pale green (5G 7/2) loam; weak fine angular blocky structure; firm; few thin clay films on vertical faces of peds; thin (approximately 1/2 inch) layers of pale brown (10YR 6/3) and light yellowish brown (10YR 6/4) hard platy sandstone at intervals of approximately 2 inches; very strongly acid; abrupt smooth boundary.

IIC2 70L957 100 to 132 cm (40 to 52 inches). Dark reddish brown (2.5YR 3/4) silt loam; weak fine angular blocky structure; firm; few thin clay films on vertical faces of peds; few thin pinkish gray (7.5YR 7/2) silt coats on faces of peds; very strongly acid; abrupt smooth boundary.

IIC3 70L958 132 to 172 cm (52 to 68 inches). Olive (5Y 5/3,5/4) and pale green (5G 7/2) clay loam; weak fine angular blocky structure; firm; few thin clay films on vertical faces of peds; thin (approximately 1/2 inch) layers of pale brown (10YR 6/3) hard platy sandstone at intervals of approximately 4 inches; strongly acid.

Additional notes: At 150 cm depth, the soil temperature is 12.5° C.

SOIL CLASSIFICATION-TYPIC BOROSAPRIST
EUIC
SERIES - - - - - - -LUPTON

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE, MTSC
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

SOIL NO - - - - - - S74WI-67-3 COUNTY - - - LANGLADE

GENERAL METHODS- - -1A,1B1B,2A1,2B SAMPLE NOS. 74L850-74L856

DEPTH CM	HORIZON	PARTICLE SIZE ANALYSIS, LT 2MM, 3A1, 3A1A, 3A1B: SAND 2-.05	SILT .05-.002	CLAY LT .002	FINE CLAY LT .0002	SAND VCOS 2-1	SAND CORS 1-.5	SAND MEDS .5-.25	SAND FNES .25-.10	SAND VFNS .10-.05	SILT COSI .05-.02	SILT FNSI .02-.002	SILT VFSI .005-.002	SAND 2-.10	INTR II .2-.02	FINE CLAY TO CLAY PCT	NON-CO3-CLAY PCT	RATIO 8D1 15-BAR TO CLAY
		PCT LT 2MM																
000-005	CA1																	
005-015	OA2																	
015-050	CA3																	
050-096	CA4																	
096-175	OA5																	
175-195	LC0																	
195+	2CG	16.5	64.1	19.4		1.4	3.0	3.6	3.8	4.7	31.9	32.2		11.8				5.07

DEPTH CM	PARTICLE SIZE ANALYSIS, MM, 3B, 3B1, 3B2: VOL. GT 2 PCT	WEIGHT GT 75 PCT	75-20	20-5	5-2	LT .074	BULK DENSITY 4A1D 1/3-BAR G/CC	4A1H OVEN DRY G/CC	4D1 COLE	WATER CONTENT 4B1C 1/10 BAR PCT	4B1C 1/3-BAR PCT	4B2A 15-BAR PCT	4C1 WRD CM/CM	CARBONATE 6E1B LT 2 PCT	3A1A LT .002 PCT	PH 8C1A 1/1 H2O	8C1E 1/2 CACL
		PCT LT 75				20-2 LT20 PCT											
000-005	TR	0	0	0	TR	TR						79.6				4.7	4.3
005-015	0	0	0	0	0	0	.08	.17		1230	951	104	.90			5.6	5.4
015-050	0	0	0	0	0	0	.12	.27		775	665	102	.81			5.7	5.4
050-096	0	0	0	0	0	0	.12	.25		819	684	101	.86			6.0	5.7
096-175	0	0	0	0	0	0						98.4				6.1	5.8
175-195	0	0	0	0	0	0											
195+	TR	0	0	0	TR	TR											

DEPTH CM	ORGANIC MATTER 6A1A ORGN CARB PCT	6B1A NITG PCT	C/N	IRON 6C2B EXT FE PCT	PHOS TCTL PCT	EXTRACTABLE BASES 5B4A: 6N2E CA MEQ/100 G	6O2D MG	6P2B NA	6Q2B K	SUM EXTB	ACTY 6H1A BACL TEA	AL 6G1E KCL EXT	CAT EXCH 5A3A EXTB ACTY	5A6A NHAC	RATIO 8D1 NHAC TO CLAY	RATIO 8D3 CA TO MG	CA 5F1 SAT NHAC PCT	BASE SAT 5C3 EXTB ACTY PCT	5C1 NHAC PCT
000-005	46.0	1.53	30			48.8	10.3	.2	2.6	61.9	94.9		157	103		4.7	47	39	60
005-015	49.1	1.62	30			149	48.7	.3	.6	199	57.2		256	192		3.1	78	78	103
015-050	51.3	1.76	29			173	45.6	.2	.1	219	61.2		280	200		3.8	87	78	109
050-096	48.9	1.74	28			190	51.6	.2	.1	242	60.0		302	213		3.7	89	80	114
096-175	46.1	1.78	26			185	51.0	.2	.1	236	46.8		283	201		3.6	92	83	118
175-195																			
195+																			

DEPTH CM	SATURATED PASTE 8E1 REST OHM-CM	8C1B PH	8A H2O PCT	NA 5D2 ESP PCT	NA 5E SAR	SALT 8D5 TOTL SOLU PPM	GYP 6F1A PCT	SATURATION EXTRACT 8A1: 8A1A EC MMHOS/CM	6N1B CA MEQ/LITER	6O1B MG	6P1B NA	6Q1B K	6I1A CO3	6J1A HCO3	6K1A CL	6L1A SO4	6M1A NO3	ATTERBERG 4F1 LQID LMIT PCT	4F2 PLST INDX
000-005	3100	4.7	582			1400		.57	1.9	.8	.1	1.0	0	2.1	.0	.9	1.6		
005-015	6500	5.4	1030			1200		.14	1.0	.6	.1	.1	0	1.2	.0	.0	.0		
015-050	3600	5.7	737			1500		.31	1.9	1.1	.1	TR	0	1.2	.0	1.1	.0		
050-096	1300	5.8	691			6500		1.18	8.7	5.7	.1	.1	0	.6	.0	15.3	.0		
096-175	1400	6.3	700			4900		.95	6.6	4.2	.1	.1	0	.3	.0	12.2	.0		
175-195																			
195+																			

DEPTH CM	HISTOSOL CHARACTERIZATION: 8F MINL CONT PCT	STATE OF DECOMPOSITION 8G (FIBER UNRB PCT)	8G (FIBER VOL) RUB PCT	8H PYROPHOSPHT SOLUBILITY (MUNS COLOR)	PH 8C1E .01M CACL	BULK DEN 4A3A FILD STAT G/CC	4A1I 1/3B REWT G/CC	COLE 4D1 RE-WET	SUBS RES-IDUE PCT	WATER CONTENT 4B4 FILD STAT PCT	4B1C 1/3B REWT PCT	4B2 15-BAR PCT	4C1 WRD CM/CM
000-005	26	56	30A	10YR 6/3	5.2	.13			35	499		87.2	
005-015	16	30	12	10YR 5/3	5.6	.12	.09	.24	40	674	775	104	.60
015-050	16	36	10	10YR 5/3	5.5	.15	.14	.24	70	595	488	98.0	.55
050-096	20	30	3	10YR 4/2	5.6	.17	.15	.19	76	494	530	90.5	.66
096-175	24	32	8	10YR 3/2	5.9	.15			63	542		83.9	
175-195													
195+													

(A) INCLUDES LIVE ROOTS (20 PCT).

Soil classification: Typic Boroasapriat; euic.
Series: Lupton.
Pedon No.: S74WI-67-3.
Location: Langlade County, Wisconsin; NW¼, SW¼, NE¼, Sec. 18, T. 32 N., R. 11 E.; 250 feet east of Hwy B; 1,000 feet north of section center. About 45.2° north latitude and about 89.0° west longitude.

Climate: Humid continental. Mean annual temperature is 42.2° F; mean July temperature is 68.5° F; mean January temperature is 13.8° F; mean annual precipitation is 29.86 inches with nearly two-thirds of this during the growing season; total amount of snowfall is 48 inches; frost-free season is 138 days at Antigo but less on organic soil areas.
Parent material: Organic soil material derived primarily from woody plants mixed with sedge, grass, and reed remains.
Physiography: Moderately deep depression between a large, nearly level, outwash plain to the south and a major rolling recessional moraine to the north. Bog area is nearly level. Elevation is about 1,560 feet.
Vegetation: Overstory of white cedar, balsam fir, black ash with scattered soft maple, American elm and tamarack. Lower story of grasses, forbs, sedges, and reeds.
Size of area: 160 to 200 acres.
Distance to adjacent mineral soil: About 600 feet.
Depth to water table: About 1 foot or 30 cm.
Microrelief: Few low small hummocks less than 12 inches high.
Subsidence: Slight; road ditch provides some drainage to area and some subsidence has taken place.
Soil temperature: Measured soil temperature of 13.0° C. at 50 cm.
Described and sampled by: G. Hudelson, Warren Lynn, W.E. McKinzie, and S. Payne on Aug. 8, 1974. Samples were obtained from a pit dug with a spade and posthole digger.

Oa1 74L850 0 to 5 cm. Black (5YR 2/1) broken face, rubbed, or pressed sapric material; weak medium subangular blocky structure; very friable; fiber content 25 percent undisturbed, 8 percent rubbed; fibers primarily from grasses and sedges; mineral content about 10 percent; many fine and few coarse roots; pH 6.5 (Truog); clear smooth boundary.

Oa2 74L851 5 to 15 cm. Black (5YR 2/1) broken face, rubbed or pressed sapric material; weak medium and coarse subangular blocky structure; very friable; fiber content 20 percent undisturbed, less than 5 percent rubbed; fibers dominantly from grasses and sedges, with a few conifer needles; mineral content about 10 percent; few coarse roots; pH 6.5 (Truog); abrupt smooth boundary.

Oa3 74L852 15 to 50 cm. Black (5YR 2/1) broken face, rubbed or pressed sapric material; weak coarse platy structure with a few weak medium subangular blocks; very friable; fiber content 15 percent undisturbed and less than 5 percent rubbed; fibers are dominantly woody with some herbaceous; estimated 15 percent wood fragments with dark reddish brown (5YR 3/4) color; mineral content about 15 percent; few coarse roots; pH 6.5 (Truog); clear smooth boundary.

Oa4 74L853 50 to 96 cm. Black (5YR 2/1) broken face, rubbed, or pressed sapric material; weak coarse platy structure with a few thin plates; very friable; fiber content about 25 percent undisturbed and 8 percent rubbed; fibers are dominantly woody with some herbaceous; about 35 percent wood fragments with reddish brown and dark reddish brown (5YR 4/4 and 3/4) colors; mineral content about 10 percent; pH 6.5 (Truog); clear smooth boundary.

Oa5 74L854 96 to 175 cm. Dark reddish brown (5YR 2/2) broken face sapric material; black (5YR 2/1) rubbed and dark reddish brown (5YR 2/2) pressed; weak coarse platy structure; very friable; about 20 percent fibers undisturbed, 5 percent rubbed; fibers dominantly woody with some herbaceous; about 10 percent wood fragments with reddish brown (5YR 4/4) color; 10 percent mineral matter; pH 7.2 (Truog); gradual wavy boundary.

Lco 74L855 175 to 195 cm. Dark reddish brown (5YR 3/2) broken face, rubbed, or pressed limnic material; massive; very friable; pH 7.2 (Truog); abrupt smooth boundary.

IICg 74L856 195 cm plus. Dark gray (5Y 4/1) silt loam; massive; friable.

SOIL CLASSIFICATION—TYPIC BOROSPRIST
EUIC
SERIES - - - - - - -LUPTCN

SOIL NO - - - - - - - S74WI-83-1 COUNTY - - - OCONTO

GENERAL METHODS- - -1A,1B1B,2A1,2B SAMPLE NOS. 74L864-74L871

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE, MTSC
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

DEPTH CM	HORIZON	SAND 2-.05	SILT .05-.002	CLAY LT .002	FINE CLAY LT .0002	VCOS 2-1	CORS 1-.5	MEDS .5-.25	FNES .25-.10	VFNS .10-.05	COSI .05-.02	FNSI .02-.002	VFSI .005-.002	SAND 2-.10	INTR II .2-.02	FINE CLAY TO CLAY PCT	NON-CO3-CLAY PCT	8D1 15-BAR TO CLAY
		(- - - PARTICLE SIZE ANALYSIS, LT 2MM, 3A1, 3A1A, 3A1B - - -) PCT LT 2MM																RATIO
CCC-020	OA1																	
020-038	CA2																	
038-046	OE																	
046-070	CA3																	
C70-117	CA4																	
117-150	OA5																	
150-215	CE2																	
215-358	2C																	

DEPTH CM	VOL. GT 2 PCT	GT 75 PCT	75-20	20-5	5-2	LT .074	20-2 PCT LT20	4A1D 1/3-BAR G/CC	4A1H OVEN DRY G/CC	4D1 COLE	4B1C 1/10 BAR PCT	4B1C 1/3-BAR PCT	4B2A 15-BAR PCT	4C1 WRD CM/CM	6E1B LT 2 PCT	3A1A LT .002 PCT	8C1A 1/1 H2O	8C1E 1/2 CACL
	(PARTICLE SIZE ANALYSIS, MM, 3B, 3B1, 3B2)	(- - WEIGHT - -)	(- - PCT LT 75 - -)					(BULK DENSITY)			(- - WATER CONTENT - -)				CARBONATE		(- -PH - -)	
C00-020	TR	C	0	TR	TR		TR	.29	.54		309	249	68.8	.70			6.5	6.0
020-038	TR	C	0	TR	TR		TR	.33	.76		283	211	58.3	.74			6.5	6.1
C38-046	TR	C	0	TR	C		TR						82.6				6.1	5.7
046-070	0	C	0	0	TR		TR	.25	.44		380	320	81.1	.75			6.0	6.0
C70-117	0	C	0	0	0		0											
117-150	0	0	0	0	C		0											
150-215	C	C	0	0	0		0											
215-358	0	0	0	0	0		0											

DEPTH CM	6A1A ORGN CARB PCT	6B1A NITG PCT	C/N	6C2B EXT FE PCT	PHOS TCTL PCT	6N2E CA	6O2D MG	6P2B NA	6Q2B K	SUM EXTB	6H1A BACL TEA	6G1E AL KCL EXT	5A3A EXTB ACTY	5A6A NHAC	8D1 RATIO NHAC TO CLAY	8D3 RATIO CA TO MG	5F1 CA SAT NHAC PCT	5C3 EXTB ACTY PCT	5C1 NHAC PCT
	(ORGANIC MATTER)			IRON	PHOS	(- -EXTRACTABLE BASES 5B4A- -) MEQ / 100 G					ACTY	AL	(CAT EXCH)					(BASE SAT)	
000-02C	36.1	1.73	21			100	25.4	.2	.3	126	18.1		144	107		3.9	93	87	118
020-038	34.8	1.88	18			118	27.2	.2	.1	146	23.9		169	116		4.3	102	86	125
038-046	46.6	2.26	21			147	26.4	.4	.3	174	46.6		221	164		5.6	90	79	106
046-070	45.5	1.58	29			176	29.0	.4	.1	206	61.7		267	199		6.1	88	77	103
070-117																			
117-150																			
15C-215																			
215-358																			

DEPTH CM	8E1 REST OHM-CM	8C1B PH	8A H2O PCT	NA 5D2 ESP PCT	NA 5E SAR	SALT 8D5 TOTL SCLU PPM	GYP 6F1A PCT	8A1A EC MMHCS/CM	6N1B CA	6O1B MG	6P1B NA	6Q1B K	6I1A CO3	6J1A HCO3	6K1A CL	6L1A SO4	6M1A NO3	ATTERBERG 4F1 LQID LMIT PCT	4F2 PLST INDX
	(SATURATED PASTE)							(- - SATURATION EXTRACT 8A1 - -)	MEQ / LITER										
C00-02C	2600	7.0	491			16C0		.41	3.1	1.8	.1	.1	0	1.8	.5	2.2	1.6		
020-038	2500	7.1	615			2300		.56	3.8	2.0	.1	TR	0	1.5	.5	4.1	1.1		
038-046	2300	6.5	614			2700		.65	4.5	2.1	.3	TR	0	.6	.2	5.8	.0		
046-070	2500	6.1	510			1900		.53	3.8	1.6	.3	.0	0	.3	.5	4.8	.0		
070-117																			
117-150																			
150-215																			
215-358	750	5.7	238			5400		3.41	22.9	11.4	.4	.6	0	1.2	.2	5.4	30.0		

DEPTH CM	8F MINL CONT PCT	8G (FIBER VOL) UNRB PCT	8G RUB PCT	8H PYROPHOSPHT SOLUBILITY (MUNS CCLOR)	PH 8C1E .01M CACL	4A3A FILD STAT G/CC	4A1I 1/3B REWT G/CC	COLE 4D1 RE-WET	SUBS RES-IDUE PCT	4B4 FILD STAT PCT	4B1C 1/3B REWT PCT	4B2 15-BAR PCT	4C1 WRD CM/CM
	(- - HISTOSOL CHARACTERIZATION - -) (STATE OF DECOMPOSITION)					(BULK DEN)				(- -WATER CONTENT- -)			
000-020	45	37	8	7.5YR 3/2	6.9	.20			41	296		62.3	
020-038	44	28	4	7.5YR 4/2	7.1	.21			44	364		73.2	
038-046		57	11	10YR 3/2	6.1							83.7	
046-07C	24	16	3	10YR 3/1	5.6	.18	.27	.18	76	399	242	75.6	.45
070-117		16	4	10YR 3/2	6.1								
117-150		38	12	10YR 5/3	5.9								
150-215		48	11	10YR 6.5/3	5.9								
215-358		56	16	10YR 7/2.5	5.8								

Soil classification: Typic Borosaprist; euic.
Series: Lupton.
Pedon No.: S74WI-83-1.
Location: Oconto County, Wisconsin; NE¼, NW¼, Sec. 14, T. 29 N., R. 21 E.; 200 feet east of NW forty line and 80 feet south of center of road. About 45.0 deg. north latitude and about 88.1 deg. west longitude.
Climate: Humid continental. Mean annual temperature is 44.9° F; mean July temperature is 70.9° F; mean January temperature is 18.6° F; mean annual precipitation is 27.05 inches with nearly two-thirds of this during the growing season; total amount of snowfall is 39.8 inches; frost-free season is 133 days at Marinette but less on organic soil areas. (Data from Oconto, WI., weather bureau substation.)
Parent material: Organic soil material derived primarily from woody plants with some herbaceous plant remains.
Physiography: Moderately deep depression in a large, gently undulating lake plain. Bog area is nearly level. Elevation is about 900 feet.
Vegetation: Overstory of white cedar, black ash, willow, white birch, and tag alder with an understory of sedges, grasses, and forbs.
Size of area: About 2,000 acres.
Distance to adjacent mineral soil: 1,450 feet to west.
Depth to water table: 50 cm.
Microrelief: Many low hummocks 12 to 18 inches in height.
Subsidence: Slight; area has not been drained.
Soil temperature: Measured soil temperature of 58° F at 20 inches.
Described and sampled by: G. Hudelson, Warren Lynn, W.E. McKinzie, H. Lorenz, G.B. Lee, and A.J. Klingelhoets on Aug. 5, 1974. Samples were obtained from a pit down to 46 inches and with a peat sampler to a depth of 144 inches.

Oa1 74L864 0 to 20 cm. Black (10YR 2/1) broken face, rubbed, or pressed sapric material; weak fine subangular blocky structure; very friable; about 10 percent fibers undisturbed, less than 2 percent rubbed; fibers dominantly woody with some herbaceous; 20 percent mineral content; many fine and large roots; pH 7.5 (Truog); clear smooth boundary.

Oa2 74L865 20 to 38 cm. Black (10YR 2/1) broken face, rubbed, or pressed sapric material; weak coarse prismatic structure parting to weak medium subangular blocky structure; very friable; about 5 percent fibers undisturbed, less than 2 percent rubbed; fibers dominantly woody; about 20 percent mineral content; few roots; pH 7.5 (Truog); clear smooth boundary.

Oe 74L866 38 to 46 cm. Black (7.5YR 2/1) broken face hemic material; black (10YR 2/1) rubbed and very dark brown (10YR 2/2) pressed; weak coarse platy to matted structure; friable; about 55 percent fiber undisturbed, 15 to 20 percent rubbed; fibers primarily from herbaceous material; about 15 percent mineral content; few sedge roots; pH 7.0 (Truog); abrupt smooth boundary.

Oa3 74L867 46 to 70 cm. Black (10YR 2/1) broken face sapric material; very dark brown (10YR 2/2) rubbed or pressed; weak medium subangular blocky structure parting to weak medium granular structure; very friable; about 10 percent fiber undisturbed, less than 5 percent rubbed, about 50 percent woody and remainder herbaceous; about 20 percent mineral content; wood fragments common, 5 percent of the mass dark reddish brown (5YR 3/3) in color; few sedge roots; pH 7.0 (Truog); gradual wavy boundary.

Oa4 74L868 70 to 117 cm. Black (10YR 2/1) broken face, rubbed, or pressed sapric material; weak very coarse platy parting to weak medium subangular blocky structure; very friable; about 25 percent fiber undisturbed, less than 5 percent rubbed; fibers mixed woody and herbaceous; about 20 percent mineral content; 5 percent wood fragments with dark reddish brown (5YR 3/3) color; few sedge roots; pH 7.0 (Truog); gradual wavy boundary.

Oa5 74L869 117 to 150 cm. Black (10YR 2/1) broken face, rubbed, or pressed sapric material; massive; very friable; about 50 percent fibers undisturbed, less than 15 percent rubbed; fibers primarily from herbaceous material; about 20 percent mineral content; pH 7.0 (Truog); gradual smooth boundary.

Oe2 74L870 150 to 215 cm. Very dark grayish brown (10YR 3/2) broken face hemic material; very dark brown (10YR 2/2) rubbed, and very dark grayish brown (10YR 3/2) pressed; weakly matted; very friable; about 60 percent fibers undisturbed, 15 to 20 percent rubbed; fibers dominantly from herbaceous material; about 10 percent mineral content; pH 7.0 (Truog); abrupt smooth boundary.

IIC 74L871 215 to 358 cm. Grayish brown (2.5Y 5/2) coarse silts and fine sands; stratified; friable; violent effervescence. Sampled only to 240 cm depth.

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL Magnor taxadjunct SOIL Nos. 869WI-54-2 LOCATION Rusk County, Wisconsin

SOIL SURVEY LABORATORY Beltsville, Maryland LAB. Nos. 69B255 - 69B261

Depth (cm)	Horizon	1B1b Total Sand (2-0.05)	Total Silt (0.05-0.002)	Total Clay (< 0.002)	Sand: Very coarse (2-1)	Sand: Coarse (1-0.5)	Sand: Medium (0.5-0.25)	Sand: Fine (0.25-0.1)	Sand: Very fine (0.1-0.05)	Silt: (0.05-0.02)	Silt: Int. III (0.02-0.002)	Int. II (0.2-0.02)	(2-0.1)	<.074 mm	3B2 Cm	Coarse fragments 3B1: 2A2 > 2	2-19	19-76
		Size class and particle diameter (mm) 3A1																
		Pct. of < 2 mm												Pct.		Pct.	Pct. of < 76mm	
0-20	Ap	17.4	71.3	11.3	1.2	3.3	3.5	3.7	5.7	35.9	35.4	43.4	11.7	87.3	0.98	4	3	1
20-34	A2	15.3	73.3	11.4	0.5	2.0	3.0	3.2	6.7	40.9	32.4	49.2	8.6	90.7	1.00	tr.	tr.	tr.
34-46	IIA&B	52.7	34.0	13.3	3.5	12.2	14.7	14.3	8.2	18.8	15.2	33.9	44.5	52.5	0.90	15	6	9
46-62	IIB&A	64.3	22.8	12.9	5.4	13.9	16.7	18.5	9.8	12.1	10.7	31.2	54.5	41.3	0.93	10	9	1
62-84	IIB2t	67.0	19.8	13.2	4.8	12.4	16.0	22.1	11.8	9.9	9.9	33.5	55.2	39.5	0.90	15	13	2
84-109	IIB3t	69.1	19.8	11.1	5.6	13.2	17.3	22.2	10.9	10.4	9.4	32.7	58.2	36.7	0.82	25	17	8
109-150	IIC	72.2	20.1	7.7	6.4	15.3	18.1	22.1	10.3	10.0	10.1	31.5	61.9	33.2	0.84	21	14	7

Depth (cm)	6A1a Organic carbon	Na Pyro. ext 6C5a Fe	6G5a Al	C-D Al	Carbonate as $CaCO_3$	Ext. iron as Fe	Plasticity Index	Bulk density 4A1e ⅓ bar	4A1h Oven dry	4D1 COLE	Water content	4B1c ⅓ bar	4B2 15 bar	8E1 Resistivity ohms-cm 60°F	4C1 WRD	pH (1:2) $CaCl_2$	8C1c (1:1) KCl	8C1a (1:1) H_2O
	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.		g/cc	g/cc		Pct.	Pct.	Pct.		in/in			
0-20	1.80			0.1		1.0		1.32	1.39	0.02		28.4	6.8		0.28	5.1	4.2	5.6
20-34	0.25			0.1		0.9		1.60	1.64	0.01		19.3	5.2		0.23	4.2	3.4	5.0
34-46	0.13	0.1	tr.	0.1		1.0		1.67	1.69	0.00		17.0	5.8		0.19	4.3	3.5	4.9
46-62	0.13			0.1		0.9		1.75	1.84	0.02		12.7	5.5		0.13	4.4	3.5	4.9
62-84	-	tr.	tr.	tr.		0.7	N.P.	1.76	1.84	0.02		10.8	5.1		0.10	4.7	3.6	5.2
84-109	0.12	0.3	0.3	tr.		0.7		1.76	1.85	0.02		9.9	4.3	10000	0.10	5.3	4.0	6.1
109-150	-			tr.		0.5		1.83	1.87	0.01		7.6	3.2	15000	0.08	5.5	4.3	6.3

Depth (cm)	Extractable bases 5B4a: 6N2e Ca	6O2d Mg	6P2b Na	6Q2b K	Sum	6H2a Ext. acidity	CEC: 5A3a Sum cations	5A6a NH_4OAc	6G1e Ext. Al		Fine clay <.0002 mm	Ratios to clay 8D1: CEC sum	Ext. iron	15-bar water	8D3 Ca/Mg		Base saturation: 5C3 Sum cations	5C1 NH_4OAc
	meq/100 g.										Pct.						Pct	Pct.
0-20	4.4	0.6	tr.	tr.	5.0	9.9	14.9	10.9			3.7	1.32	0.09	0.60			34	46
20-34	1.9	1.3	tr.	tr.	3.3	8.4	11.7	8.2	1.9		3.2	1.03	0.08	0.46			28	40
34-46	2.0	1.9	tr.	tr.	3.9	6.9	10.8	8.2	1.6		5.0	0.81	0.08	0.44			36	48
46-62	1.9	2.8	tr.	tr.	4.7	6.2	10.9	9.0	0.9		4.6	0.84	0.07	0.43			43	52
62-84	4.0	0.8	tr.	tr.	4.8	3.7	8.5	8.0	0.4		6.1	0.64	0.05	0.39			56	60
84-109	2.7	3.3	tr.	tr.	6.0	1.9	7.9	7.6			5.3	0.71	0.06	0.39			76	79
109-150	3.4	3.4	tr.	tr.	6.8	1.5	8.3	7.6			2.5	1.08	0.06	0.42			82	89

Depth (cm)	Clay fraction analysis 7A1: < 0.002 mm 7A2 X-ray a/b/	7A3 DTA b/ Pct.	Sand fraction analysis 7A1: 0.2-0.02 mm 7B1 Petrographic b/ Pct.	TW
0-20	MV5,KK2,QZ1	KK10	QZ77,FE< 1,TM< 1,FD18,EP2,MS1,HN1,VR< 1,BT< 1	22
20-34				
34-46				
46-62	MV5,KK2,MI1,QZ1	KK10	QZ65,FE6,ZR< 1,SP< 1,FD17,HN5,MS3,EP1,TA1,VR1,BT< 1,EN< 1,GN< 1	28
62-84				
84-109				
109-150	MV5,MI2,CL1,KK1,QZ1,FD1	KK5	QZ79,FE2,SP< 1,FD12,HN3,MS1,EP1,VR1,TA< 1,BT< 1	18

a/Relative amounts (X-ray): 5 = dominant, 4 = abundant, 3 = moderate, 2 = small, 1 = trace.
b/Mineral code: MV = montmorillonite-vermiculite, KK = kaolinite, QZ = quartz, FE = iron oxides, TM = tourmaline, FD = feldspar, EP = epidote, MS = muscovite, HN = hornblende, VR = vermiculite, BT = biotite, MI = mica, ZR = zircon, SP = sphene, TA = talc, EN = enstatite, GN = garnet, CL = chlorite.

Soil classification: Dystric Eutrochrept; coarse-loamy, mixed, frigid.
Soil: Magnor taxadjunct*.
Soil No.: S69WI-54-2.
Location: Rusk County, Wisconsin; SW¼, SE¼, Sec. 33, T. 36 N., R. 6 W.; 50 feet east and 100 feet north of intersection of fence line with the road.
Climate: Humid continental; mean average temperature ranges from 41° to 45° F; mean annual precipitation is 30 inches and frost-free season is about 125 days.
Vegetation and land use: Native vegetation was mixed northern hardwoods with some pine. Principal species were oak, ash, elm, maple, aspen and white pine. About 50 percent of this soil is used for cropland and livestock pasture. Corn, oats, and forages are the principal crops.
Parent material: Thin loess cap over acid sandy loam glacial till.
Physiography: Nearly level to sloping glacial till plain.
Topography: Nearly level site with 1 percent slope.
Drainage: Somewhat poorly drained.
Ground water: Seasonally less than 3 feet from surface.
Erosion: Slight.
Permeability: Moderately slow.
Described by: Paul H. Carroll

(Colors are for moist soil unless otherwise stated)

Ap 69B255 0 to 20 cm (0 to 8 inches). Very dark grayish brown and dark grayish brown (10YR 3/2 & 4/2) silt loam, gray (10YR 6/1) dry; weak fine subangular blocky structure; friable; many roots; medium acid; abrupt smooth boundary.

A2 69B256 20 to 34 cm (8 to 14 inches). Variegated brown and yellowish brown (10YR 5/3, 5/6, 5/8) silt loam marginal to silt; weak fine platy structure; friable; many roots; strongly acid; clear wavy boundary.

IIA&B 69B257 34 to 46 cm (14 to 18 inches). Dark grayish brown (10YR 4/2) sandy loam A2 material occupies about 60 percent of the horizon body and surrounds isolated remnants or upward extensions of reddish brown (5YR 4/4) sandy loam or loam with slightly higher clay content and with common medium distinct mottles of yellowish red (5YR 4/6-4/8); weak coarse platy structure in the A2 material and weak medium subangular blocky structure in the B2t material; friable; common roots; very strongly acid; clear wavy boundary.

IIB&A 69B258 46 to 62 cm (18 to 23 inches). Reddish brown (5YR 4/4) sandy loam with common medium prominent yellowish red (5YR 4/8) mottles and dark reddish gray (5YR 4/2) tongues of sandy loam with slightly lower clay content; A2 tongues with common medium distinct reddish brown (5YR 5/4) mottles occupy about 30 percent of the horizon body; moderate medium subangular blocky structure in the B2t portion of the horizon and weak thick platy structure in the A2 portion; friable in the A2 portion and firm with slightly fragic consistence in the B2t portion; thin patchy clay films on horizontal faces of peds and in pores and accumulated as small pockets or horizontal streaks at the base of the tongues. Contains 8 to 10 percent gravel and cobblestones; common roots; strongly acid; clear irregular boundary.

IIB2t 69B259 62 to 84 cm (23 to 33 inches). Dark reddish brown (5YR 3/4) sandy loam with thin interfingers and occasional tongues (2 to 6 cm thick) of loamy sand extending halfway through this horizon; moderate thick platy structure parts under pressure to weak medium subangular blocky structure; firm with slightly fragic consistence; few thin clay films continuous or nearly so on horizontal faces of peds and common on vertical faces of peds; reddish brown (5YR 4/4) sand coats on some faces of peds along vertical cleavage planes in upper part of horizon; contains 8 to 10 percent gravel and cobblestones; few roots; medium acid; gradual wavy boundary.

IIB3t 69B260 84 to 109 cm (33 to 43 inches). Dark reddish brown (5YR 3/4) sandy loam; weak thick platy structure parting to somewhat weaker medium subangular blocky structure; friable; thin patchy clay films on plate surfaces; contains 8 to 10 percent gravel and cobblestones; few roots; slightly acid; gradual wavy boundary.

IIC 69B261 109 to 150 cm (43 to 60 inches). Reddish brown (5YR 4/4) sandy loam; weak thick platy structure; friable; contains 8 to 10 percent cobblestones and gravel; slightly acid; gradual wavy boundary.

*This pedon lacks an argillic horizon; therefore, it is a taxadjunct to the Magnor series.

SOIL Magnor taxadjunct SOIL Nos. S69WI-54-3 LOCATION Rusk County, Wisconsin

SOIL SURVEY LABORATORY Beltsville, Maryland LAB. Nos. 69B262 - 69B269

Depth (cm)	Horizon	1B1b Total Sand (2-0.05)	Total Silt (0.05-0.002)	Total Clay (< 0.002)	Sand Very coarse (2-1)	Sand Coarse (1-0.5)	Sand Medium (0.5-0.25)	Sand Fine (0.25-0.1)	Sand Very fine (0.1-0.05)	Silt 0.05-0.02	Silt Int. III (0.02-0.002)	Int. II (0.2-0.02)	(2-0.1)	<.074 mm	3B2 Cm	Coarse fragments 3B1 2A2 > 2	2-19	19-76
		Pct. of < 2 mm												Pct.		Pct.	Pct. of < 76mm	
0-19	Ap	23.0	62.8	14.2	1.2	5.7	6.8	5.2	4.1	22.5	39.3	46.2	18.9	80.2	0.99	2	2	tr.
19-34	A2	32.9	55.3	11.8	1.8	7.5	9.6	8.1	5.9	30.0	25.3	39.5	27.0	71.6	0.99	1	1	tr.
34-46	A&B	38.5	53.3	8.2	1.6	8.5	11.9	10.5	6.0	42.7	10.6	53.6	32.5	65.7	0.97	5	3	2
46-62	IIB&A	62.6	25.9	11.5	3.0	12.5	19.3	19.3	8.5	14.8	11.1	32.4	54.1	42.4	0.95	7	4	3
62-83	IIB2tx	72.7	18.4	8.9	5.6	15.2	18.9	22.9	10.1	10.4	8.0	31.9	62.6	32.8	0.90	14	10	4
83-106	IIB3	69.2	20.8	10.0	5.4	12.6	16.8	22.5	11.9	00.0	20.8	20.4	57.3	37.3	0.86	19	15	4
106-124	IIC1														0.85	20	16	4
124-150	IIC2	65.6	25.1	9.3	5.1	11.0	15.3	22.3	11.9	15.2	9.9	39.0	53.7	41.0	0.76	32	14	18

Depth (cm)	6A1a Organic carbon	Na Pyro. ext. 6C5a Fe	6G5a Al	C-D Al	Carbonate as $CaCO_3$	Ext. iron as Fe	Plasticity Index	Bulk density 4A1e ⅓ bar	4A1h Oven dry	4D1 COLE	Water content	4B1c ⅓ bar	4B2 15 bar	8E1 Resistivity ohms-cm 60°F	4C1 WRD	pH (1:2) $CaCl_2$	8C1c (1:1) KCl	8C1a (1:1) H_2O
	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.		g/cc	g/cc		Pct.	Pct.	Pct.		in/in			
0-19	0.64			0.2		1.1		1.30	1.39	0.02		29.1	8.5		0.27	4.5	4.0	5.2
19-34	0.25	0.1	0.2	0.1		1.0		1.60	1.65	0.01		19.3	5.6		0.22	4.3	3.7	4.9
34-46	0.24	tr.	0.1	0.1		1.1		1.58	1.65	0.02		19.3	6.9		0.20	4.2	3.5	4.8
46-62	0.25			0.1		1.0		1.72	1.77	0.01		13.3	5.0		0.14	4.3	3.6	4.9
62-83	0.38	tr.	tr.	tr.		0.8	N.P.	1.82	1.81	0.00		9.2	4.1		0.09	4.5	3.6	5.1
83-106	0.25			tr.		0.7		1.82	1.85	0.00		9.7	4.1	15000	0.10	4.6	3.8	5.2
106-124	0.25	0.4	0.3	tr.		0.6		1.81	1.90	0.02		8.8	3.7	10000	0.09	5.0	4.0	5.6
124-150	0.12	0.2	0.2	tr.		0.6		1.81	1.88	0.01		9.7	3.5	10000	0.11	5.2	4.1	5.8

Depth (cm)	Extractable bases 5B4a 6N2e Ca	6O2d Mg	6P2b Na	6Q2b K	Sum	6H2e Ext. acidity	CEC 5A3a Sum cations	5A6a NH_4OAc	6G1e Ext. Al		Fine clay <.0002 mm	Ratios to clay 6D1 CEC sum	Ext. iron	15-bar water	8D3 Ca/Mg		Base saturation 5C3 Sum cations	5C1 NH_4OAc
	meq/100 g										Pct.						Pct.	Pct.
0-19	2.6	2.6	tr.	tr.	5.2	15.8	21.0	13.8	1.1		5.1	1.48	0.08	0.60			25	38
19-34	1.8	0.6	tr.	tr.	2.4	8.6	11.0	7.8	2.7		2.9	0.93	0.08	0.47			22	31
34-46	2.6	1.3	tr.	tr.	3.9	9.1	13.0	9.7	2.7		2.0	1.58	0.13	0.84			30	40
46-62	2.0	1.2	tr.	tr.	3.2	6.9	10.1	7.2	1.7		3.7	0.88	0.09	0.43			32	44
62-83	2.7	1.2	tr.	tr.	3.9	4.9	8.8	7.0	0.7		3.0	0.99	0.09	0.46			44	56
83-106	2.8	1.3	tr.	tr.	4.1	3.8	7.9	6.1	0.4		3.5	0.79	0.07	0.41			52	67
106-124	3.3	1.4	tr.	tr.	4.7	1.9	6.6	5.9									71	80
124-150	3.5	1.4	tr.	tr.	4.9	1.7	6.6	5.9			2.8	0.71	0.06	0.38			74	83

Depth (cm)	Clay fraction analysis 7A1 < 0.002 mm 7A2 X-ray a/b/	7A3 DTA b/ Pct.	Sand fraction analysis 7A1 0.2-0.02 mm 7B1 Petrographic b/ Pct.	TW
0-19 19-34 34-46	MV5,KK2,MI1,QZ1	KK15	QZ75,FE1,PO<1,FD18,HN2,MS1,EP1,VR1,TA<1	24
46-62 62-83 83-106	MV3,KK2,MI1,QZ1,FD1	KK15	QZ69,FE1,SP<1,FD19,VR6,EP2,HN1,BT1,GN<1,TA<1	29
106-124 124-150	MV5,KK2,MI2,CL1,QZ1,FD1	KK15	QZ78,FE3,SP<1,FD15,HN1,MS1,EP1,TA<1,BT<1,GN<1	18

a/Relative amounts (X-ray): 5 = dominant, 4 = abundant, 3 = moderate, 2 = small, 1 = trace.
b/Mineral code: MV = montmorillonite-vermiculite, KK = kaolinite, MI = mica, QZ = quartz, FE = iron oxides, PO = plant opal, FD = feldspar, HN = hornblende, MS = muscovite, EP = epidote, VR = vermiculite, TA = talc, SP = sphene, EP = epidote, BT = biotite, GN = garnet, CL = chlorite.

Soil classification: Typic Glossoboralf; coarse-loamy, mixed.
Soil: Magnor taxadjunct*.
Soil No.: S69WI-54-3.
Location: Rusk County, Wisconsin; NW¼, SW¼, Sec. 4, T. 35 N., R. 6 W; 100 feet east and 150 feet north of intersection of fence line and road.
Climate: Humid continental; mean average temperature ranges from 41° to 45° F. Mean annual precipitation is 30 inches and frost-free season is about 125 days.
Vegetation and land use: Native vegetation was mixed northern hardwood forest with some pine. Principal species were oak, ash, elm, maple, aspen, and white pine. About 50 percent of this soil is used for cropland and livestock pasture. Corn, small grain, and forages are the principal crops.
Parent material: Thin loess mantle over acid sandy loam glacial till.
Physiography: Nearly level to sloping glacial till plain.
Topography: Site is in a slight depression on gently sloping relief.
Drainage: Somewhat poorly drained.
Ground water: Seasonally less than 3 feet from surface.
Erosion: Slight.
Permeability: Moderately slow.
Described by: Paul H. Carroll.

(Colors are for moist soil conditions unless otherwise noted)

Ap 69B262 0 to 19 cm (0 to 7 inches). Very dark grayish brown (10YR 3/2) silt loam, light gray (10YR 6/1) dry; weak fine subangular blocky structure; friable; many roots; strongly acid; clear smooth boundary.

A2 69B263 19 to 34 cm (7 to 13 inches). Brown (10YR 5/3) silt loam with many fine prominent mottles of strong brown (7.5YR 5/6-5/8); weak thin platy structure; friable; many roots; strongly acid; clear wavy boundary.

A&B 69B264 34 to 46 cm (13 to 18 inches). Variegated pinkish gray (7.5YR 6/2) to strong brown (7.5YR 5/8) silt loam; interfingers and tongues, 3 to 6 cm wide and with colors of pinkish gray (7.5YR 6/2-7/2), extend from the A2 horizon above into the argillic horizon below to occupy approximately 55 percent of the horizon body; weak medium platy structure in the A2 material and weak medium subangular blocky structure in the B2t material; friable; clay content in the B2t material is slightly higher than that in the tongues of A2; many roots; very strongly acid; clear wavy boundary.

IIB&A 69B265 46 to 62 cm (18 to 24 inches). Variegated brown (7.5YR 5/2) through strong brown (7.5YR 5/8) loam; interfingers and tongues of A2 material, brown (7.5YR 5/2) in color and 3 to 6 cm wide, extend deeply into this horizon and occupy about 25 percent of the horizon body; weak thin platy structure in the A2 material and weak medium subangular blocky structure in the B2t portion; friable; slightly higher clay content in the B2t than in the A2 portion of the horizon; common roots; strongly acid; clear wavy boundary.

IIB2tx 69B266 62 to 83 cm (24 to 32 inches). Dark reddish brown (5YR 3/4) sandy loam with few dark-colored manganese spots and occasional loamy sand tongues of reddish brown (5YR 5/4) that continue downward from the lower-chroma tongues above; moderate medium subangular blocky structure that displays weakly-expressed coarse platiness throughout; firm with fragic consistence; clay films are thin and continuous or nearly so on horizontal faces of peds and thin and patchy on vertical faces; small clay pockets or thick clay coatings on faces of peds are observed at the lower end of the tongues that terminate in this horizon; contains 10 to 12 percent gravel and cobblestones; common roots; strongly acid; clear wavy boundary.

IIB3 69B267 83 to 106 cm (32 to 42 inches). Reddish brown (5YR 4/4) and dark reddish brown (5YR 3/4) sandy loam; weak medium subangular blocky structure with weakly-expressed coarse platiness throughout; firm with fragic consistence; contains occasional thin clay films on ped faces and thin (1 to 2 cm) horizontal streaks of reddish gray (5YR 5/2) and pinkish gray (5YR 6/2) sandy clay loam that may represent illuviated material from the A2 tongues above; contains 10 to 12 percent gravel and cobblestones; few roots; medium acid; clear wavy boundary.

IIC1 69B268 106 to 124 cm (42 to 49 inches). Dark reddish brown (5YR 3/4) sandy loam; weak coarse platy structure; firm with fragic consistence; medium acid; contains 10 to 12 percent gravel and cobblestones; clear wavy boundary.

IIC2 69B269 124 to 150 cm (49 to 60 inches). Dark reddish brown (5YR 3/4) sandy loam; weak coarse platy structure; friable; contains 10 to 12 percent gravel and cobblestones; medium acid.

*This pedon is in a coarse-loamy family; therefore, it is a taxadjunct to the Magnor series.

SOIL CLASSIFICATION-TYPIC GLOSSOBORALF
COARSE-LOAMY, MIXED
SERIES - - - - - - - -MARATHON

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE, MTSC
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

SOIL NO - - - - - - S70WIS-37-3 COUNTY - - - MARATHON

GENERAL METHODS- - -1A,1B1B,2A1,2B SAMPLE NOS. 70L883-70L892

DEPTH CM	HORIZON	SAND 2-.05	SILT .05-.002	CLAY LT .002	FINE CLAY LT .0002	VCOS 2-1	CORS 1-.5	MEDS .5-.25	FNES .25-.10	VFNS .10-.05	COSI .05-.02	FNSI .02-.002	VFSI .005-.002	FAML TEXT SAND 2-.1	INTR II .2-.02	FINE CLAY TO CLAY	NON-CO3-CLAY	RATIO 8D1 15-BAR TO CLAY
		PARTICLE SIZE ANALYSIS, LT 2MM, 3A1, 3A1A, 3A1B (PCT LT 2MM)																
		SAND									SILT							
		PCT														PCT	PCT	
000-17	AP	25.9	64.2	9.9		2.6	3.4	7.8	8.3	3.8	29.1	35.1		22.1	35.9			.67
017-25	A2	21.2	69.4	9.4	2.0	1.3	2.5	6.1	7.3	4.0	31.9	37.5		17.2	38.3	21		.54
025-46	A&B	19.7	70.1	10.2	1.8	.7	2.1	5.8	6.9	4.2	31.7	38.4		15.5	38.2	18		.47
046-73	B&A	25.4	63.5	11.1	2.6	1.3	3.1	7.4	8.8	4.8	30.5	33.0		20.6	38.1	23		.48
073-96	2B2T	74.2	11.9	13.9	9.0	24.8	17.8	8.2	15.1	8.3	6.3	5.6		65.9	22.7	65		.53
096-144	2B3T	80.2	10.9	8.9	5.5	25.6	21.1	9.7	16.0	7.8	5.7	5.2		72.4	21.7	62		.65
144-184	2C1	84.8	10.5	4.7	2.8	24.6	24.4	10.5	17.0	8.3	6.1	4.4		76.5	23.0	60		.77
184-234	2C2	81.3	12.9	5.8		14.6	21.6	12.4	21.2	11.5	7.2	5.7		69.8	30.2			.78
234-279	2C3	88.0	7.9	4.1	1.9	36.0	25.2	9.4	12.3	5.1	3.5	4.4		82.9	14.5	46		.68
000-17	AP (A)																	

DEPTH CM	VOL. GT 2 PCT	WEIGHT GT 75 PCT	75-20 PCT	20-5 PCT	5-2 PCT	LT 75	LT .074 PCT LT20	4A1D BULK DENSITY 1/3-BAR G/CC	4A1H OVEN DRY G/CC	4D1 COLE	4B1C WATER CONTENT 1/10 BAR PCT	4B1C 1/3-BAR PCT	4B2 15-BAR PCT	4C1 WRD CM/CM	6E1B CARBONATE LT 2 PCT	3A1A LT .002 PCT	8C1A PH 1/1 H2O	8C1E 1/2 CACL
000-17	1	0	0	TR	3	75	3	1.31	1.37	.015	27.8	25.7	6.6	.25	3.98		4.8	4.4
017-25	TR	0	0	TR	1	81	1	1.50	1.53	.007	23.1	20.9	5.1	.23	3.0B		5.0	4.2
025-46	TR	0	0	TR	1	83	1	1.55	1.60	.011	23.5	20.5	4.8	.24	2.5B		4.8	3.9
046-73	1	0	0	TR	2	77	2	1.59	1.64	.010	22.3	19.6	5.3	.23	3.0B		4.7	3.9
073-96	34	0	0	17	31	16	48	1.46	1.52	.009	21.2	19.1	7.3	.11			4.7	4.0
096-144	34	0	0	12	36	12	48	1.46	1.57	.016	19.1	16.6	5.8	.10			4.8	4.1
144-184	41	0	0	19	38	9	57	1.44	1.55	.014	18.4	18.4	3.6	.13			5.1	4.3
184-234	44	0	0	24	36	10	60						4.5				4.9	4.1
234-279	37	0	0	16	35	7	51						2.8				5.1	4.4
000-17	1	0	0	TR	2		2						6.3				4.8	4.3

DEPTH CM	6A1A ORGN CARB PCT	6B1A NITG PCT	C/N	6C2B IRON EXT FE PCT	PHOS TOTL PCT	6N2E EXTRACTABLE BASES CA (MEQ / 100 G-)	6O2D MG	6P2B NA	6Q2B K	SUM EXTB	5B4A ACTY TEA	6H1A BACL	6G1E AL KCL EXT	5A3A CAT EXCH EXTB ACTY	5A6A NHAC	8D1 RATIO NHAC TO CLAY	8D3 RATIO CA TO MG	5F1 CA SAT NHAC PCT	5C3 BASE SAT EXTB ACTY PCT	5C1 NHAC PCT
000-17	2.25C	.166	14	1.1		4.3	0.6	0.1	0.2	5.2	12.8		0.9	18.0	11.4	1.15	7.2	38	29	46
017-25	0.79	.060	13	1.1		1.6	0.2	0.1	0.1	2.0	10.5		2.3	12.5	8.8	0.94	8.0	18	16	23
025-46	0.35	.030	12	1.1		0.9	0.2	0.1	0.1	1.3	9.3		3.6	10.6	8.0	0.78	4.5	11	12	16
046-73	0.19	.019		1.1		1.0	0.4	0.1	0.2	1.7	8.8		3.9	10.5	8.2	0.74	2.5	12	16	21
073-96	0.04			1.8		2.4	1.6	0.1	0.3	4.4	6.8		2.4	11.2	10.5	0.76	1.5	23	39	42
096-144	0.04			1.9		2.5	1.4	0.1	0.2	4.2	6.1		1.6	10.3	7.6	0.85	1.8	33	41	55
144-184	0.03			1.5		2.4	1.2	0.1	0.2	3.9	4.1		0.8	8.0	6.9	1.47	2.0	35	49	57
184-234	0.03			1.4		2.8	1.4	0.1	0.2	4.5	4.1		1.1	8.6	7.6	1.31	2.0	37	52	59
234-279	0.02			1.4		2.4	1.0	0.1	0.1	3.6	3.6		0.5	7.2	5.5	1.34	2.4	44	50	65
000-17	2.14	.159	13																	

DEPTH CM	8E1 SATURATED PASTE REST OHM-CM	8C1B PH	8A H2O PCT	5D2 NA ESP PCT	5E NA SAR	8D5 SALT TOTL SOLU PPM	6F1A GYP PCT	8A1A SATURATION EXTRACT EC MMHOS/CM	6N1B CA (MEQ / LITER)	6O1B MG	6P1B NA	6Q1B K	6I1A CO3	6J1A HCO3	6K1A CL	6L1A SO4	6M1A NO3	4F1 ATTERBERG LQID LMIT PCT	4F2 PLST INDX
000-17																		32D	4
017-25																			
025-46	31000	4.7	27.0	1	1	20		.14	.5	.2	.4	0.1							
046-73																			
073-96																		23D	
096-144	15800	4.7	21.9	1	1	20		0.14	0.4	0.3	0.3	0.1							
144-184																			
184-234																			
234-279																			
000-17																			

(A) COMPOSITE OF SEVERAL SURFACE SAMPLES.
(1) MICRO-PENETRATION RESISTANCE -A ROD 0.6 CM DIA IS SLOWLY PUSHED INTO BULK DENSITY CLOD, EQUILIBRATED AT 1/10-BAR, A DISTANCE OF 0.6 CM USING A POCKET PENETROMETER. UNITS ARE FORCE (KG) ANDNOT ESTIMATES OF UNCONFINED COMPRESSIVE STRENTH.
(C) ORGANIC CARBON IS 8 KG/M SQ TO A DEPTH OF 1 M (6A).
(D) DETERMINED BY SOIL MECHANICS LAB - SCS, LINCOLN, NE.

Soil classification: Typic Glossoboralf; coarse-loamy, mixed.
Soil: Marathon.
Soil No.: S7OWI-37-3.
Location: Marathon County, Wisconsin; NE¼, SE¼, Sec. 34, T. 28 N., R 6 E.; 150 feet west and 210 feet south of intersection of Thornapple and County Highway O.
Climate: Humid continental; mean annual temperature is about 43° F.; mean annual precipitation is about 30 inches; and frost-free season is about 133 days.
Vegetation and land use: Original vegetation was mixed hardwood and pine forests. Large areas of this soil are used for general farming. Principal crops are corn, small grain, and forages.
Parent material: Aeolian silt loam and very fine sandy loam over disintegrated and weathered granite.
Physiography: Rock-controlled uplands.
Topography: Site is on an east-facing convex slope of 5 percent.
Drainage: Well drained.
Ground water: Deep.
Erosion: None to slight accumulation.
Permeability: Moderate.
Described by Paul H. Carroll.

(Colors are for moist soils unless otherwise stated)

Ap 70L883 0 to 17 cm (0 to 7 inches). Dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; moderate fine subangular blocky structure; friable; many fine fibrous roots; 1 to 2 percent by volume of fine gravel from disintegrated granitic bedrock; neutral; abrupt smooth boundary.

A2 70L884 17 to 25 cm (7 to 10 inches). Brown (10YR 5/3) silt loam marginal to silt; weak fine platy structure; friable; common fine fibrous roots; 1 to 2 percent by volume of fine gravel from disintegrated granitic bedrock; medium acid; abrupt smooth boundary. (See Remarks)

A&B 70L885 25 to 46 cm (10 to 18 inches). Brown (10YR 5/3) silt loam marginal to silt (A2); weak thin platy structure; very friable; occupies about 80 percent of the horizon and completely surrounds or tongues into remnants of underlying Bt; brown (7.5YR 5/4) and dark brown (7.5YR 4/4) silt loam (Bt); weak fine subangular blocky structure; friable; common fine fibrous roots; few thin clay films on faces of peds in Bt remnants and in some pores; 1 to 2 percent by volume of fine gravel from disintegrated granitic bedrock; very strongly acid; clear wavy boundary. (See Remarks)

B&A 70L886 46 to 73 cm (18 to 29 inches). Dark yellowish brown (10YR 4/4) and dark brown (7.5YR 4/4) silt loam (Bt); moderate medium subangular blocky structure; friable; occupies about 60 percent of the horizon and consists of upward extensions of the underlying Bt horizons; common thin clay films on faces of peds and in tubular pores; tongues of brown (10YR 5/3) silt loam marginal to silt (A2); weak thin platy structure; very friable; few fine fibrous roots; 1 to 2 percent by volume of fine gravel from disintegrated granitic bedrock; very strongly acid; clear wavy boundary. (See Remarks)

IIB2t 70L887 73 to 96 cm (29 to 38 inches). Dark brown (7.5YR 4/4) and brown (7.5YR 5/2-5/3) very gravelly sandy loam; weak medium subangular blocky structure; firm; many thin dark brown (7.5YR 3/2) clay films on faces of pebbles and as bridging of sand grains; 70 to 80 percent by volume of fine angular and subangular gravel from disintegrated granitic bedrock; very strongly acid; clear wavy boundary.

IIB3t 70L888 96 to 144 cm (38 to 57 inches). Dark brown (7.5YR 4/4), strong brown (7.5YR 5/6-5/8) and yellowish red (5YR 5/6-5/8) very gravelly sandy loam; weak coarse subangular blocky structure; firm; common thin dark brown (7.5YR 3/2) clay films on faces of pebbles and as bridging of sand grains; 80 percent by volume of fine angular and subangular gravel from disintegrated granitic bedrock; strongly acid; gradual wavy boundary.

IIC1 70L889 144 to 184 cm (57 to 72 inches). Strong brown (7.5YR 5/6-5/8) loamy fine angular and subangular gravel from disintegrated granitic bedrock; weak coarse subangular blocky structure; firm; common thin dark brown (7.5YR 3/2) clay films on faces of angular and subangular pebbles at upper boundary, becoming fewer with depth; strongly acid; gradual wavy boundary.

IIC2 70L890 184 to 234 cm (72 to 92 inches). Strong brown (7.5YR 5/6-5/8) fine angular and subangular gravel from disintegrated granitic bedrock; massive; slightly acid; gradual wavy boundary.

IIC3 70L891 234 to 279 cm (92 to 109 inches). Strong brown (7.5YR 5/6-5/8) fine angular and subangular gravel from disintegrated granitic bedrock; massive; less evidence of iron release than in the horizon above; very slightly acid.

Remarks: It is assumed that dry colors for A2 material are 7/3 (value/chroma) or higher.

SOIL CLASSIFICATION-TERRIC BOROSAPRIST
SANDY OR SANDY-SKELETAL, MIXED, EUIC
SERIES - - - - - - - -MARKEY

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE, MTSC
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

SOIL NO - - - - - - - S74WI-83-2 COUNTY - - - OCONTO

GENERAL METHODS- - -1A,1B1B,2A1,2B SAMPLE NOS. 74L872-74L877

DEPTH CM	HORIZON	SAND 2-.05	SILT .05-.002	CLAY LT .002	FINE CLAY LT .0002	VCOS 2-1	CORS 1-.5	MEDS .5-.25	FNES .25-.10	VFNS .10-.05	COSI .05-.02	FNSI .02-.002	VFSI .005-.002	SAND 2-.10	INTR II .2-.02	FINE CLAY TO CLAY PCT	NON-CO3-CLAY PCT	RATIO 8D1 15-BAR TO CLAY
		(- - - PARTICLE SIZE ANALYSIS, LT 2MM, 3A1, 3A1A, 3A1B - - -) PCT LT 2MM																
000-018	OAP																	
018-036	OA2																	
036-050	OA3																	
050-084	OA4																	
084-100	OA5																	
100-150	2C	91.1	7.3	1.6		.5	7.5	27.4	42.8	12.9	6.0	1.3		78.2				

DEPTH CM	VOL. GT 2 PCT	WEIGHT GT 75 PCT	75-20 PCT LT 75	20-5 PCT LT 75	5-2 PCT LT 75	LT .074 PCT LT 75	20-2 PCT LT20	4A1D 1/3-BAR G/CC	4A1H OVEN DRY G/CC	4D1 COLE	4B1C 1/10 BAR PCT	4B1C 1/3-BAR PCT	4B2A 15-BAR PCT	4C1 WRD CM/CM	CARBONATE 6E1B LT 2 PCT	CARBONATE 3A1A LT .002 PCT	PH 8C1A 1/1 H2O	PH 8C1E 1/2 CACL
000-018	TR	0	0	TR	TR		TR						77.2				5.9	5.7
018-036	C	0	0	0	0		0	.30	.76		261	246	91.7	.51			5.9	5.7
036-050	0	0	0	0	0		0	.28	.78		312	287	81.0	.65			5.9	5.6
050-084	TR	0	0	0	TR		TR	.25	.66		347	321	85.5	.65			5.9	5.5
084-100	0	0	0	0	0		0	.25	.77		370	339	72.7	.74			5.7	5.1
100-150	1	C	0	1	1		2						1.1				6.3	6.3

DEPTH CM	6A1A ORGN CARB PCT	6B1A NITG PCT	C/N	IRON 6C2B EXT FE PCT	PHOS TOTL PCT	6N2E CA	6O2D MG	6P2B NA	6Q2B K	SUM EXTB	ACTY 6H1A BACL TEA	AL 6G1E KCL EXT	CAT EXCH 5A3A EXTB ACTY	CAT EXCH 5A6A NHAC	RATIO 8D1 NHAC TO CLAY	RATIO 8D3 CA TO MG	CA 5F1 SAT NHAC PCT	BASE SAT 5C3 EXTB ACTY PCT	BASE SAT 5C1 NHAC PCT
						(- EXTRACTABLE BASES 5B4A - MEQ / 100 G -)													
000-018	41.9	2.55	16			125	26.4	.2	.7	152	42.7		195	140		4.7	89	78	109
018-036	39.1	2.26	17			126	26.6	.2	.3	153	49.9		203	146		4.7	86	75	105
036-050	37.6	1.95	19			128	30.1	.3	.1	159	63.9		222	145		4.3	88	71	109
050-084	37.7	2.02	19			104	24.7	.3	.1	129	54.7		184	115		4.2	90	70	112
084-100	25.1	1.84	14			31.0	8.3	.2	TR	39.5	40.8		80.3	37.7		3.7	82	49	105
100-150	.19	.009					2.7	TR	TR		1.1					1.4		85	

DEPTH CM	SATURATED PASTE 8E1 REST OHM-CM	SATURATED PASTE 8C1B PH	SATURATED PASTE 8A H2O PCT	NA 5D2 ESP PCT	NA 5E SAR	SALT 8D5 TOTL SOLU PPM	GYP 6F1A PCT	8A1A EC MMHOS/CM	6N1B CA	6O1B MG	6P1B NA	6Q1B K	6I1A CO3	6J1A HCO3	6K1A CL	6L1A SO4	6M1A NO3	ATTERBERG 4F1 LQID LMIT PCT	ATTERBERG 4F2 PLST INDX
									(- SATURATION EXTRACT 8A1 - MEQ / LITER -)										
000-018	750	5.7	238			5400		3.41	22.9	11.4	.4	.6	0	1.2	.2	5.4	30.0		
018-036	1300	5.8	281			2700		1.45	9.8	4.9	.3	.1	0	1.2	.2	3.4	12.0		
036-050	1700	6.0	444			2400		.82	5.3	2.9	.3	.0	0	.9	.2	4.3	3.6		
050-084	1600	5.8	467			3300		.95	6.9	4.0	.3	.0	0	.6	.5	8.9	1.9		
084-100	620	4.4	384			11000		2.99	28.0	17.0	.4	TR	0	.9	.2	47.0	.0		
100-150	2400	6.9	24.0			490		2.35	17.7	13.9	.3	TR	0	.9	.5	32.6	.0		

DEPTH CM	8F MINL CCNT PCT	8G (FIBER VOL) UNRB PCT	8G (FIBER VOL) RUB PCT	8H PYROPHOSPHT SOLUBILITY (MUNS COLOR)	PH 8C1E .01M CACL	BULK DEN 4A3A FILD STAT G/CC	BULK DEN 4A1I 1/3B REWT G/CC	COLE 4D1 RE-WET	SUBS RES-IDUE PCT	WATER CONTENT 4B4 FILD STAT PCT	WATER CONTENT 4B1C 1/3B REWT PCT	WATER CONTENT 4B2 15-BAR PCT	WATER CONTENT 4C1 WRD CM/CM
	(- HISTOSOL CHARACTERIZATION -) (STATE OF DECOMPOSITION)												
000-018	29	23A	3	7.5YR 2/2	5.8	.29			76	179		77.5	
018-036	30	12	3	10YR 2/2	5.9	.32	.34	.31	84	203	196	73.1	.42
036-050	19	30	1	10YR 4/2	5.9	.20	.41	.24	90	393	173	65.2	.44
050-084	28	29A	1	7.5YR 4/2	5.3	.21	.34	.25	84	385	222	67.7	.53
084-100	30	10	1	7.5YR 3/2		.18	.36	.29	70	456	211	53.3	.57
100-150												.9	

(A) CONTAINS SAPRIC MATERIAL.

Soil classification: Terric Borosaprists; sandy or sandy-skeletal, mixed, euic.
Series: Markey.
Pedon No.: S74WI-83-2.
Location: Oconto County, Wisconsin; NW¼, SW¼, Sec. 26, T. 29 N., R. 20 E.; 300 feet east of U.S. Highway 141 and 75 feet north of drainage ditch. About 45.0° north latitude and about 88.0° west longitude.
Climate: Humid continental. Mean annual temperature is 44.9° F mean July temperature is 70.9° F mean January temperature is 18.6° F.; mean annual precipitation is 27.05 inches with nearly two-thirds of the precipitation falling during the growing season; total amount of snowfall is 39.8 inches; the growing season averages 133 days, but less in organic soil areas. (Data from Oconto, weather bureau substation.)
Parent material: Deposits of herbaceous organic material 16 to 50 inches thick over sandy mineral deposits.
Physiography: Level glacial depression along a major drainageway.
Vegetation: Area sampled was in potatoes. Native vegetation was white cedar.
Size of area: About 200 acres.
Distance to adjacent mineral soil: About 200 feet to the west is a sand island.
Depth to water table: 76 cm.
Microrelief: None.
Subsidence: Estimated as moderate.
Soil temperature: Measured soil temperature at 15.5° C at 50 cm.; 13.7° C at 70 cm.
Described and sampled by: G.W. Hudelson, W.C. Lynn, W.E. McKinzie, H.E. Lorenz, G.B. Lee, and A.J. Klingelhoets on August 6, 1974. Samples were obtained from a pit.

Oap 74L872 0 to 18 cm. Black (7.5YR 2/1) broken face, rubbed or pressed sapric material; about 5 percent fibers undisturbed, less than 1 percent rubbed; weak medium and fine subangular blocky structure parting to weak fine granular structure; very friable; fibers primarily herbaceous, about 20 percent mineral soil material; common fine roots; pH 8.0 (Truog); abrupt smooth boundary.

Oa2 74L873 18 to 36 cm. Black (7.5YR 2/1) broken face, rubbed, or pressed, sapric material; about 10 percent fibers undisturbed, less than 5 percent rubbed; weak fine subangular blocky structure; very friable; fibers primarily herbaceous; about 25 percent mineral soil material; common fine roots; pH 7.5 (Truog); clear smooth boundary.

Oa3 74L874 36 to 50 cm. Black (7.5YR 3/1), black (10YR 2/1) rubbed or pressed, sapric material; about 25 percent fibers, less 5-10 percent rubbed; weak moderate subangular blocky structure; fibers are primarily herbaceous, about 10 percent cedar wood fragments; about 25 percent mineral soil material; few fine roots; pH 7.5 (Truog); clear smooth boundary.

Oa4 74L875 50 to 84 cm. Very dark brown (7.5YR 3/2), black (7.5YR 2/1) rubbed or pressed sapric material; about 20 percent fibers, less than 5 percent rubbed; weak coarse platy structure; fibers primarily herbaceous with thin, less than 1/4 inch thick, medium and fine sand lenses; about 20 percent mineral soil material; few fine roots; pH 7.5 (Truog); clear smooth boundary.

Oa5 74L876 84 to 100 cm. Dark brown (7.5YR 4/2), very dark brown (7.5YR 3/2) rubbed or pressed sapric material; about 30 percent fibers, less than 5 percent rubbed; weak coarse platy structure; fibers primarily herbaceous but lower 3 cm is limnic material; about 15 percent mineral soil material; pH 7.0 (Truog); abrupt wavy boundary.

IIC 74L877 100 to 150 cm. Grayish brown (2.5Y 5/2) sand; single grained; loose; strong effervescence.

SOIL CLASSIFICATION-TERRIC BORDSAPRIST
FERRIHUMIC, EUIC
SERIES - - - - - - -MARKEY, BOG IRON VARIANT

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE, NTSC
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

SOIL NO - - - - - - S74WI-83-4 COUNTY - - - OCONTO

GENERAL METHODS- - -1A,1B1B,2A1,2B SAMPLE NOS. 74L884-74L890

DEPTH CM	HORIZON	PARTICLE SIZE ANALYSIS, LT 2MM, 3A1, 3A1A, 3A1B (PCT LT 2MM) SAND 2-.05	SILT .05-.002	CLAY LT .002	FINE CLAY LT .0002	VCOS 2-1	CORS 1-.5	MEDS .5-.25	FNES .25-.10	VFNS .10-.05	COSI .05-.02	FNSI .02-.002	VFSI .005-.002	SAND 2-.10	INTR II .2-.02	FINE CLAY TO CLAY PCT	NON-CO3-CLAY PCT	RATIO 8D1 15-BAR TO CLAY
000-023	CAP																	
023-043	CA2																	
043-058	CCN1	41.8	49.1	9.1		.6	7.4	11.0	12.9	9.9	17.8	31.3		31.9				
058-086	CA3																	
086-089	CCN2	50.8	47.8	1.4		1.4	12.1	12.1	15.1	10.1	9.1	38.7		40.7				
089-104	CA4																	
104-152	2C	96.7	2.2	1.1		.1	13.0	36.9	35.0	11.7	2.2	TR		85.0				

DEPTH CM	PARTICLE SIZE ANALYSIS, MM, 3B, 3B1, 3B2 VOL. GT 2 PCT	WEIGHT GT 75 PCT	75-20	20-5	5-2 (PCT LT 75)	LT .074	20-2 PCT LT20	BULK DENSITY 4A1D 1/3-BAR G/CC	4A1H OVEN DRY G/CC	4D1 COLE	WATER CONTENT 4B1C 1/10 BAR PCT	4B1C 1/3-BAR PCT	4B2A 15-BAR PCT	4C1 WRD CM/CM	CARBONATE 6E1B LT 2 PCT	3A1A LT .002 PCT	PH 8C1A 1/1 H2O	8C1E 1/2 CACL
000-023	TR	0	0	0	TR		TR	.49	.77		146	138	53.3	.46			5.0	4.6
023-043	0	0	0	0	0		0	.24	.55		383	324	81.4	.60			5.0	4.6
043-058	0	0	0	0	0		0	.59	.65		131	126	42.4	.53			6.5	6.1
058-086	0	0	0	0	0		0	.20	.66		437	421	88.7	.70			5.9	5.6
086-089	0	0	0	0	0		0						47.3				7.4	7.3
089-104	0	0	0	0	0		0	.16	.56		560	534	66.7	.79			6.1	5.1
104-152	TR	0	0	TR	TR		TR						1.0				6.3	5.9

DEPTH CM	ORGANIC MATTER 6A1A ORGN CARB PCT	6B1A NITG PCT	C/N	IRON 6C2B EXT FE PCT	PHOS TOTL PCT	EXTRACTABLE BASES 5B4A (MEQ / 100) 6N2E CA	6O2D MG	6P2B NA	6Q2B K	SUM EXTB	ACTY 6H1A BACL TEA G	AL 6G1E KCL EXT	CAT EXCH 5A3A EXTB ACTY	5A6A NHAC	RATIO 8D1 NHAC TO CLAY	RATIO 8D3 CA TO MG	CA 5F1 SAT NHAC PCT	BASE SAT 5C3 EXTB ACTY PCT	5C1 NHAC PCT
000-023	34.2	2.14	16			40.6	12.9	.1	1.5	55.1	82.1		137	90.9		3.1	45	40	61
023-043	41.9	2.76	15			40.3	12.3	.1	.9	53.6	110.0		164	100		3.3	40	33	54
043-058	7.84	.512	15				2.4	.1	.4		22.0								
058-086	40.4	2.72	15			91.2	12.7	.4	1.2	106	66.1		172	104		7.2	88	61	101
086-089	10.6	.549	19				.6	.2	.5		18.7								
089-104	32.5	1.68	19			45.7	11.2	.5	.8	58.2	84.0		142	79.6		4.1	5	4	73
104-152																			

DEPTH CM	SATURATED PASTE 8E1 REST OHM-CM	8C1B PH	8A H2O PCT	NA ESP PCT	NA SAR	SALT 8D5 TOTL SOLU PPM	GYP 6F1A PCT	SATURATION EXTRACT 8A1 8A1A EC MMHOS/CM	6N1B CA	6O1B MG	6P1B NA	6Q1B K	6I1A CO3	6J1A HCO3	6K1A CL	6L1A SO4	6M1A NO3	ATTERBERG 4F1 LQID LMIT PCT	4F2 PLST INDX
000-023	1400	4.8	219			2400		1.86	8.6	6.8	.1	1.9	0	.6	.5	.6	14.6		
023-043	2100	4.5	380			2100		.94	4.5	3.2	.1	.7	0	.0	.2	.5	5.7		
043-058	3400	7.4	149			610		.74	5.2	.2	.2	.8	0	1.8	.5	1.5	3.7		
058-086	2600	5.6	669			2000		.51	2.9	.9	.2	.6	0	.3	.5	.8	1.5		
086-089	2200	7.4	214			890		.94	5.8	TR	.2	.5	0	4.0	1.0	.6	2.0		
089-104	3000	4.9	664			1800		.49	2.3	1.2	.3	.5	0	.6	1.0	1.2	.9		
104-152																			

DEPTH CM	HISTOSOL CHARACTERIZATION (STATE OF DECOMPOSITION) 8F MINL CONT PCT	8G (FIBER VOL) UNRB PCT	8G (FIBER VOL) RUB PCT	8H PYROPHOSPHT SOLUBILITY (MUNS COLOR)	PH 8C1E .01M CACL	(BULK DEN) 4A3A FILD STAT G/CC	4A1I 1/3B RENT G/CC	COLE 4D1 RE-WET	SUBS RES-IDUE PCT	WATER CONTENT 4B4 FILD STAT PCT	4B1C 1/3B RENT PCT	4B2 15-BAR PCT	4C1 WRD CM/CM
000-023	47	16	4	7.5YR 3/2	5.0	.45	.54	.13	88	132	115	51.6	.34
023-043	18	22	3	7.5YR 3/2	4.9	.21	.31	.21	96	294	199	60.4	.43
043-058	81	5	1		7.4	.51	.62	.02		111	120	34.6	.53
058-086	20	36	2	7.5YR 4/2	6.1	.20	.29	.32	89	419	250	71.5	.52
086-089		20	1		7.5							32.8	
089-104	35	32	8	7.5YR 4/2	5.0	.17	.26	.29	61	415	284	47.6	.62
104-152												.8	

Soil classification: Terric Borosaprist; ferrihumic, euic.
Series: Markey, bog iron variant.
Pedon No.: S74WI-83-4.
Location: Oconto County, Wisconsin; SW¼, SE¼, Sec. 4, T. 30 N., R. 18 E., 250 feet east (opposite machine shed) of farm lane. About 45.1° north latitude and about 88.2° west longitude.
Climate: Humid continental. Mean annual temperature is 43.4° F; mean July temperature is 69.6° F mean January temperature is 15.6° F; mean annual precipitation is 27.94 inches with nearly two-thirds of the precipitation falling during the growing season; total amount of snowfall is 47.9 inches; the growing season averages 119 days, but less in the organic areas (data from Crivitz High Fall, WI weather bureau substation).
Parent material: Deposits of herbaceous organic material 16 to 50 inches thick over sandy mineral deposits. Organic material contains limonite layer.
Physiography: Large glacial lake basin with many scattered sand "islands."
Vegetation: Area sampled was in potatoes and Cris variety of spring wheat.
Size of area: About 500 acres.
Distance to adjacent mineral soil: 300 feet to west.
Depth to water table: 120 cm.
Microrelief: None.
Subsidence: Estimated as moderate.
Soil Temperature: Measured soil temperature was 14.0° C at 60 cm and 10.0° C at 110 cm.
Described and sampled by: G.W. Hudelson, W.C. Lynn, W.E. McKinzie, H.E. Lorenz, G.B.Lee, and A.J. Klingelhoets on August 6, 1974. Samples were obtained from pit.

Oap 74L884 0 to 23 cm. Black (10YR 2/1) broken face, rubbed, pressed sapric material; about 10 percennt fiber, less than 5 percent rubbed; weak coarse subangular blocky structure and weak fine granular structure; very friable; fibers primarily herbaceous; about 20 percent mineral soil material; many roots; pH 5.5 (Truog); abrupt smooth boundary.

Oa2 74L885 23 to 43 cm. Black (10YR 2/1) broken face, rubbed, or pressed sapric material; about 15 percent fiber, less than 5 percent rubbed; weak coarse prismatic structure parting to weak medium subangular blocky structure; friable; fibers primarily herbaceous; about 25 percent mineral soil material; common roots; pH 7.0 (Truog); abrupt wavy boundary.

Ccn1 74L886 43 to 58 cm. Strong brown (7.5YR 5/6 & 5/8) limonite; massive; firm; few roots; moderately alkaline, violent effervescence; abrupt wavy boundary.

Oa3 74L887 58 to 86 cm. Black (10YR 2/1) broken face and rubbed, very dark brown (10YR 2/2) pressed sapric material; about 40 percent fiber, less than 5 percent rubbed; massive; very friable; fibers primarily herbaceous; about 20 percent mineral soil material;pH 6.0 (Truog); clear smooth boundary.

Ccn2 74L888 86 to 89 cm. Dark yellowish brown (7.5YR 4/4) limonite; massive; firm; moderately alkaline, violent effervescence; abrupt wavy boundary.

Oa4 74L889 89 to 104 cm. Dark brown (7.5YR 3/2), black (7.5YR 2/1) rubbed or pressed sapric material; about 40 percent fiber, about 5-10 percent rubbed; massive; very friable; fibers primarily herbaceous; about 20 percent mineral soil material; pH 6.5 (Truog); clear wavy boundary.

IIC 74L890 104 to 152 cm. Dark grayish brown (10YR 4/2) sand; single grained; loose; pH 7.5 (Truog).

Remarks:
1. Oa2 & Oa3 - old sedge root channels have coats of yellowish red (5YR 4/6).

2. Ocn1 - includes some small peds (1 to 3 cms) of cemented iron concretions.

3. Oa4 - contains a few soft and hard lime concretions and segregations just above sand layer. Few thin lenses of sand less than 1 cm thick are in lower part.

SOIL CLASSIFICATION-AQUIC GLOSSOBORALF
FINE -LOAMY, MIXED
SERIES - - - - - - - -HILLADORE TAXADJUNCT

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE, MTSC
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

SOIL NO - - - - - - - S70WIS-37-2 COUNTY - - - MARATHON

GENERAL METHODS- - -1A,1B1B,2A1,2B SAMPLE NOS. 70L870-70L882

DEPTH	HORIZON	(- - - PARTICLE SIZE ANALYSIS, LT 2MM, 3A1, 3A1A, 3A1B - - -																)RATIO
					FINE	(- - - - - - SAND				- - - - - -)	(- - -SILT-	- - -)		FAML	INTR	FINE	NON-	8D1
		SAND 2- .05	SILT .05- .002	CLAY LT .002	CLAY LT .0002	VCOS 2- 1	CORS 1- .5	MEDS .5- .25	FNES .25- .10	VFNS .10- .05	COSI .05 .02	FNSI .02 .002	VFSI .005- .002	TEXT SAND 2-.1	II .2- .02	CLAY TO CLAY	CO3- CLAY	15- BAR TO
CM		(- - - - - - - - - -								PCT LT 2MM - - -					- -)	PCT	PCT	CLAY
000-15	AP1	11.0	77.3	11.7	4.1	.6	1.3	1.6	2.2	5.3	37.6	39.7		5.7	44.0	35		.63
015-25	AP2	10.0	78.2	11.8	3.6	.3	1.2	1.6	2.3	4.6	38.4	39.8		5.4	44.1	31		.60
025-35	A2	11.2	72.9	15.9	4.9	.1	.7	1.3	2.0	7.1	40.2	32.7		4.1	48.2	31		.44
035-50	A&B	10.9	68.8	20.3	8.6	.1	.7	1.3	1.7	7.1	40.2	28.6		3.8	48.1	42		.42
050-67	B&A	19.6	60.9	19.5	8.4	.6	2.2	3.2	4.4	9.2	37.4	23.5		10.4	48.5	43		.42
067-90	1&2B21T	47.9	36.4	15.7		3.8	7.0	10.9	14.6	11.6	22.8	13.6		36.3	40.8			.42
090-123	2B22T	52.7	29.5	17.8	13.0	2.7	7.1	12.7	20.1	10.1	16.2	13.3		42.6	35.3	73		.41
123-162	2B3T	57.4	24.5	18.1	12.0	5.9	10.5	12.6	19.4	9.0	11.5	13.0		48.4	29.4	66		.46
162-196	2C1	73.3	19.1	7.6	4.6	13.5	18.0	13.2	19.9	8.7	9.4	9.7		64.6	27.2	61		.78
196-237	2C2	75.9	19.1	5.0		15.3	19.1	10.4	20.1	11.0	10.3	8.8		64.9	31.9			1.06
237-287	2C3	82.7	14.4	2.9		15.6	25.6	11.6	20.0	9.9	8.6	5.8		72.8	28.7			1.10
287-370	2C4	80.8	15.1	4.1		18.9	24.3	10.6	18.0	9.0	7.9	7.2		71.8	25.9			1.00
000-25	AP (A)																	

DEPTH	(PARTICLE SIZE ANALYSIS, MM, 3B, 3B1, 3B2)							(BULK DENSITY		)	(- - - -WATER CONTENT- - - -)					CARBONATE		(- -PH - -)	
	VOL.	(- - - - - - WEIGHT					- - - -)	4A1D	4A1H	4D1	4B1C	4B1C	4B2	4C1		6E13	3A1A	8C1A	8C1E
	GT 2	GT 75	75-20	20-5	5-2	LT .074	20-2 PCT	1/3- BAR	OVEN DRY	COLE	1/10 BAR	1/3- BAR	15- BAR	WRD CM/		LT 2	LT .002	1/1 H2O	1/2 CACL
CM	PCT	PCT	(- - - PCT LT 75			- - -)	LT20	G/CC	G/CC		PCT	PCT	PCT	CM		PCT	PCT.		
000-15	TR	0	TR	TR	TR	93	TR	1.37	1.40	.007	30.2	28.0	7.4	.28	3.6C			4.8	4.5
015-25	TR	0	0	TR	TR	94	TR	1.34	1.40	.015	31.4	29.8	7.1	.31	3.6C			4.9	4.5
025-35	TR	0	0	0	TR	95	TR	1.50	1.56	.014	26.1	23.2	7.0	.25	3.0C			4.8	4.2
035-50	TR	0	0	TR	TR	95	TR	1.49	1.57	.018	26.2	23.4	8.5	.23	2.5C			4.6	4.1
050-67	TR	0	0	TR	TR	88	TR	1.50	1.62	.027	24.0	21.3	8.2	.20	2.6C			4.6	4.1
067-90	2	0	0	2	1	60	3	1.70B					6.6					4.5	4.0
090-123	1	0	TR	1	1	52	2	1.78	1.90	.023	16.7	14.8	7.3	.14	2.6C			4.9	4.3
123-162	2	0	TR	1	2	45	3	1.76	1.87	.019	18.5	16.9	8.3	.14	3.0C			5.2	4.4
162-196	TR	0	0	TR	1	31	1	1.80B					5.9					5.4	4.7
196-237	8	0	0	TR	11	26	11	1.80B					5.3					5.5	4.7
237-287	21	0	0	TR	29	15	29	1.73	1.97	.033	17.2	14.7	3.2	.15				6.2	5.2
287-370	21	0	0	2	28	17	30	1.70B					4.1					5.5	4.9
000-25	TR	0	TR	0	TR		TR						10.7					4.6	4.3

DEPTH	(ORGANIC MATTER	)		IRON	PHOS	(- -EXTRACTABLE BASES 5B4A- -)					ACTY	AL	(CAT EXCH)		RATIO	RATIO	CA	(BASE SAT)	
	6A1A	6B1A	C/N	6C2B		6N2E	6O2D	6P2B	6Q2B		6H1A	6G1E	5A3A	5A6A	8D1	8D3	5F1	5C3	5C1
	ORGN CARB	NITG		EXT FE	TOTL	CA	MG	NA	K	SUM EXTB	BACL TEA	KCL EXT	EXTB ACTY	NHAC	NHAC TO	CA TO	SAT NHAC	EXTB ACTY	NHAC
CM	PCT	PCT		PCT	PCT	(- - - - - - - -				-MEQ / 100	G- - - - - -			- -)	CLAY	MG	PCT	PCT	PCT
000-15	1.88D	.173	11	0.9		5.7	0.9	0.3	0.2	7.1	12.2	0.4	19.3	14.1	1.21	6.3	40	37	50
015-25	1.61	.156	10	1.0		5.7	0.9	0.2	0.1	6.9	8.0	0.4	14.9	13.8	1.17	6.3	41	46	50
025-35	0.31	.037	8	1.1		5.8	1.2	0.2	0.2	7.4	8.3	1.1	15.7	11.6	0.73	4.8	50	47	64
035-50	0.20	.027		1.3		6.4	1.7	0.2	0.3	8.6	9.8	2.0	18.4	14.1	0.69	3.8	45	47	61
050-67	0.15	.021		1.2		6.1	1.9	0.1	0.3	8.4	8.8	1.9	17.2	13.3	0.68	3.2	46	49	63
067-90	0.07			1.1		5.8	2.0	0.2	0.3	8.3	6.4	1.1	14.7	12.1	0.77	2.9	48	56	69
090-123	0.07			1.3		7.3	2.6	0.1	0.2	10.2	6.1	0.9	16.3	12.4	0.70	2.8	59	63	82
123-162	0.07			1.3		10.7	3.4	0.3	0.2	14.6	6.5	0.7	21.1	15.9	0.88	3.1	67	69	92
162-196	0.03			0.9		8.5	2.3	0.3	0.2	11.3	4.2	0.5	15.5	13.6	1.79	3.7	63	73	83
196-237	0.03			0.7		8.7	2.3	0.3	0.2	11.5	3.5		15.0	13.3	2.66	3.8	65	77	86
237-287	0.02			0.7		5.3	1.6	0.2	0.2	7.3	1.4		8.7	7.3	2.52	3.3	73	84	100
287-370	0.03			0.7		6.2	1.9	0.2	0.2	8.5	1.5		10.0	9.3	2.27	3.3	67	85	91
000-25	1.69	.161	10																

DEPTH	(SATURATED PASTE)			NA	NA	SALT	GYP	(- - - - - - - - - - SATURATION EXTRACT 8A1-									- - -)	ATTERBERG	
	8E1	8C1B	8A	5D2	5E	8D5	6F1A	8A1A	6N1B	6O1B	6P1B	6Q1B	6I1A	6J1A	6K1A	6L1A	6M1A	4F1	4F2
	REST OHM-	PH	H2O	ESP	SAR	TOTL SOLU		EC MMHOS/	CA	MG	NA	K	CO3	HCO3	CL	SO4	NO3	LQID LMIT	PLST INDX
CM	CM		PCT	PCT		PPM	PCT	CM	(- - - - - - - - -			MEQ / LITER					- - - -)	PCT	
000-15																		33E	5
015-25																			
025-35																			
035-50	4400	4.5	37.3	1		70		0.39	1.8	0.5	0.5	0.2						29E	6
050-67																			
067-90																			
090-123	7200	4.7	26.3	1	1	20		.14	0.4	0.2	0.5	0.1						24E	8
123-162																			
162-196																			
196-237																			
237-287																			
287-370																			
000-25																			

(A) COMPOSITE OF SEVERAL SURFACE SAMPLES.
(B) ESTIMATED.
(C) MICRO-PENETRATION RESISTANCE - A ROD 0.6 CM DIA IS SLOWLY PUSHED INTO BULK DENSITY CLOD, EQUILIBRATED AT 1/10- BAR, A DISTANCE OF 0.6 CM USING A POCKET PENETROMETER. UNITS ARE FORCE (KG) AND NOT ESTIMATES OF UNCONFINED COMPRESSIVE STRENGTH.
(D) ORGANIC CARBON IS 8 KG/M SQ TO A DEPTH OF 1 M (6A).
(E) DETERMINED BY SOIL MECHANICS LAB - SCS, LINCOLN, NE.

Soil classification: Aquic Glossoboralf; fine-loamy, mixed.
Soil: Milladore taxadjunct*.
Soil No.: S70WI-37-2.
Location: Marathon County, Wisconsin; SW¼, SW¼, Sec. 24, T. 26 N., R. 4 E., 130 feet east of fence, directly north of elm trees.
Climate: Humid continental; mean annual temperature is about 43° F; mean annual precipitation is about 30 inches; and frost-free season is about 133 days.
Vegetation and land use: Original vegetation was mixed northern hardwoods and pine forest. Many areas have been cleared and are being used for cropland or pasture.
Parent material: Loess over residuum from highly micaceous gneissic rocks.
Physiography: Nearly level to gently sloping areas in rock-controlled uplands.
Topography: Site is in a 1 percent plane slope in an idle field.
Drainage: Somewhat poorly drained.
Ground water: Deep - a perched water table occurs within 2 feet of the surface for short periods during wet seasons.
Erosion: Slight.
Permeability: Moderate.
Described by: Paul H. Carroll.

(Colors are for moist soils unless designated otherwise)

Ap1 70L870 0 to 15 cm (0 to 6 inches). Dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak very fine subangular blocky structure; friable; many fine fibrous roots; strongly acid; abrupt smooth boundary.

Ap2 70L871 15 to 25 cm (6 to 10 inches). Dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak medium platy structure parting to weak very fine subangular blocky structure; friable; many fine fibrous roots; strongly acid; abrupt smooth boundary.

A2 70L872 25 to 35 cm (10 to 14 inches). Brown (10YR 5/3) silt loam with common fine prominent mottles of strong brown (7.5YR 5/6-5/8) and yellowish brown (10YR 5/6-5/8); weak thin platy structure; friable; common fine fibrous roots; strongly acid; clear wavy boundary. (See Remarks)

A&B 70L873 35 to 50 cm (14 to 20 inches). Dark yellowish brown (10YR 4/4) silt loam (Bt) with many fine and medium distinct and prominent mottles of strong brown (7.5YR 5/6-5/8) and few fine distinct mottles of grayish brown (10YR 5/2); weak fine subangular blocky structure; friable; thick brown (10YR 5/3) tongues of light silt loam penetrate this horizon from the A2 above and occupy approximately 70 percent of the horizon; very friable; few fine roots; few thin clay films on faces of peds and in tubular pores of the Bt portion of the horizon; strongly acid; clear wavy boundary. (See Remarks)

B&A 70L874 50 to 67 cm (20 to 26 inches). Yellowish brown (10YR 5/6) heavy silt loam (Bt) with many fine distinct and prominent mottles of strong brown (7.5YR 5/6-5/8) and light brownish gray (2.5Y 6/2); moderate fine and medium subangular blocky structure; friable; tongues of grayish brown (10YR 5/2) silt loam penetrate this horizon from above and occupy approximately 40 percent of the horizon; common thin clay films are on surfaces of peds and in tubular pores of the Bt portion; very strongly acid; clear wavy boundary. (See Remarks)

IIB21t 70L875 67 to 90 cm (26 to 35 inches). Dark brown (7.5YR 4/4) gravelly loam with common medium distinct and prominent mottles of strong brown (7.5YR 5/6-5/8); moderate medium subangular blocky structure; firm; common thin clay films on faces of peds and in continuous tubular pores and as clay bridging of sand grains; patchy thin coatings of uncoated silt and very fine sand on faces of some peds near upper boundary; horizon has gravel accumulation consisting of 15 percent by volume of fine subangular rock fragments 20 to 75 mm in daimeter, approximately the same amount between 2 and 75 mm diameter; very strongly acid; clear wavy boundary.

IIB22t 70L876 90 to 123 cm (35 to 48 inches). Dark brown (7.5YR 4/4) and dark yellowish brown (10YR 4/4) light sandy clay loam with few medium distinct mottles of strong brown (7.5YR 5/6); moderate medium and coarse angular blocky structure; firm; common thin clay films on faces of peds and in tubular pores and clay bridging of sand grains; 1 to 2 percent by volume of rock fragments 20 to 75 mm diameter, 5 to 10 percent fragments 2 to 75 mm in diameter; very strongly acid; gradual wavy boundary.

IIB3t 70L877 123 to 162 cm (48 to 64 inches). Brown (7.5YR 5/4) and strong brown (7.5YR 5/6-5/8) light sandy clay loam; weak coarse angular blocky structure; firm; clay bridging of sand grains; 1 to 2 percent by volume of rock fragments 20 to 75 mm in diameter, 10 to 15 percent fragments, 2 to 75 mm in diameter; medium acid; gradual wavy boundary.

IIC1 70L878 162 to 196 cm (64 to 78 inches). Variegated dark brown (7.5YR 4/4), reddish brown (5YR 4/4) and olive (5Y 5/4) gravelly sandy loam or loam; weak coarse angular and subangular blocky structure; friable; 5 percent by volume of fragments 20 to 75 mm in diameter, about 20 percent 2 to 75 mm in diameter; medium acid; clear irregular boundary.

IIC2 70L879 196 to 237 cm (78 to 94 inches). Variegated olive gray (5Y 4/2), dark olive gray (5Y 3/2) and yellowish brown (10YR 5/4, 5/6, 5/8) disintegrated gneissic bedrock consisting of fragments mostly 2 to 7 mm in diameter; massive; friable; slightly acid; diffuse smooth boundary.

*This pedon is in a fine-loamy family; therefore, it is a taxadjunct to the Milladore series.

Remarks: It is assumed that dry colors for A2 material are 7/3 (value/chroma) or higher.

SOIL CLASSIFICATION-AQUIC GLOSSOBORALF
COARSE-LOAMY, MIXED
SERIES - - - - - - -MONICO TAXADJUNCT

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE, NTSC
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

SOIL NO - - - - - - S72NI-21-5 COUNTY - - - FOREST

GENERAL METHODS- - -1A,1B1B,2A1,2B SAMPLE NOS. 72L843-72L849

DEPTH CM	HORIZON	PARTICLE SIZE ANALYSIS, LT 2MM, 3A1, 3A1A, 3A1B (PCT LT 2MM) SAND 2-.05	SILT .05-.002	CLAY LT .002	FINE CLAY LT .0002	VCOS 2-1	CORS 1-.5	MEDS .5-.25	FNES .25-.10	VFNS .10-.05	COSI .05-.02	FNSI .02-.002	VFSI .005-.002	SAND 2-.10	INTR II .2-.02	FINE CLAY TO CLAY PCT	NON-CO3-CLAY PCT	RATIO 8D1 15-BAR TO CLAY
000-6	A1	55.4	32.1	12.5	5.4	1.8	7.9	14.4	21.8	9.5	14.7	17.4		45.9	34.9	83		1.00
006-25	A2	56.8	35.7	7.5	3.5	2.0	8.6	15.7	21.6	8.9	16.2	19.5		47.9	35.4	47		.48
025-48	B2HIR	64.0	27.0	9.0	2.7	1.9	8.9	16.7	25.4	11.1	14.7	12.3		52.9	38.2	30		.59
048-65	A'2	68.2	26.4	5.4	1.6	2.1	10.0	21.2	25.6	9.3	14.7	11.7		58.9	34.6	30		.44
065-85	B'21	78.8	15.8	5.4	1.6	2.0	10.6	23.4	31.6	11.2	10.1	5.7		67.6	35.5	30		.37
085-120	B'22T	52.4	37.8	9.8	2.1	1.3	7.3	15.8	17.8	10.2	21.7	16.1		42.2	39.1	21		.41
120-170	C	78.9	15.0	6.1	1.4	4.4	14.6	23.1	26.8	10.0	7.6	7.4		68.9	29.0	23		.31

DEPTH CM	(PARTICLE SIZE ANALYSIS, MM, 3B, 3B1, 3B2) VOL. GT 2 PCT	GT 75 PCT	WEIGHT 75-20 (PCT LT 75)	20-5	5-2	LT .074	20-2 LT20	BULK DENSITY 4A1D 1/3-BAR G/CC	4A1H OVEN DRY G/CC	4D1 COLE	WATER CONTENT 4B1C 1/10 BAR PCT	4B1C 1/3-BAR PCT	4B2 15-BAR PCT	4C1 WRD CM/CM	CARBONATE 6E1B LT 2 PCT	3A1A LT .002 PCT	PH 8C1A 1/1 H2O	8C1E 1/2 CACL
000-6	2	0	TR	1	2	48	3	.9 A					12.5				4.4	4.1
006-25	1	0	TR	1	1	47	2	1.1 A					3.6				4.6	3.9
025-48	2	0	TR	1	2	41	3	1.3 A					5.3				4.3	4.2
048-65	2	0	TR	1	2	36	3	1.65	1.68	.006	16.5	13.9	2.4	.04	2.3B		5.1	4.3
065-85	5	0	5	4	3	24	7	1.7 A					2.0				5.3	4.5
085-120	5	0	5	1	2	50	3	1.71	1.75	.008	15.9	13.0	4.0	.15	4.4B		5.1	4.1
120-170	15	TR	5	9	6	21	17	1.77	1.84	.012	12.3	8.8	1.9	.11	1.4B		5.3	4.4

DEPTH CM	(ORGANIC MATTER) 6A1A ORGN CARB PCT	6B1A NITG PCT	C/N	IRON 6C2B EXT FE PCT	PHOS TOTL PCT	(EXTRACTABLE BASES 5B4A) 6N2E CA	6O2D MG	6P2B NA	6Q2B K	SUM EXTB (MEQ / 100 G)	ACTY 6H1A BACL TEA	AL 6G1E KCL EXT	(CAT EXCH) 5A3A EXTB ACTY	5A6A NHAC	RATIO 8D1 NHAC TO CLAY	RATIO 8D3 CA TO MG	CA 5F1 SAT NHAC PCT	(BASE SAT) 5C3 EXTB ACTY PCT	5C1 NHAC PCT
000-6	12.60	.450	28	1.1		4.6	.9	.1	.3	5.9	19.8	1.1	25.7	19.8	1.58	5.1	23	23	30
006-25	.95	.082	12	.7		1.0	.2	.1	.1	1.4	8.3	2.0	9.7	6.7	.89	5.0	15	14	21
025-48	.95	.071	13	1.3		.5	.1	.1	.1	.8	15.5	2.5	16.3	9.2	1.02	5.0	5	5	9
048-65	.12			.9		.5	.2	.1	.1	.9	6.1	1.7	7.0	4.8	.89	2.5	10	13	19
065-85	.08			.8		.7	.4	TR	.1	1.2	4.0	1.1	5.2	3.9	.72	1.8	18	23	31
085-120	.08			1.0		2.1	1.1	.1	.1	3.4	5.9	1.6	9.3	7.3	.74	1.9	29	37	47
120-170	.01			.6		.9	.4	TR	.1	1.4	2.2	.3	3.6	2.6	.43	2.3	35	39	54

DEPTH CM	(SATURATED PASTE) 8E1 REST OHM-CM	8C1B PH	8A H2O PCT	NA 5D2 ESP PCT	NA 5E SAR	SALT 8D5 TOTL SOLU PPM	GYP 6F1A PCT	(SATURATION EXTRACT 8A1) 8A1A EC MMHOS/CM	6N1B CA (MEQ / LITER)	6O1B MG	6P1B NA	6Q1B K	6I1A CO3	6J1A HCO3	6K1A CL	6L1A SO4	6M1A NO3	ATTERBERG 4F1 LQID LMIT PCT	4F2 PLST INDX
000-6																			
006-25																			
025-48																			
048-65																			
065-85																			
085-120	14000	4.8	23.9					.12											
120-170																			

IDENTIFICATION OF THE SPODIC HORIZON BY LABORATORY CRITERIA.

DEPTH CM	HORIZON	(PYROPHOSPHATE,PH10) 6C5A EXT FE PCT	6G5A EXT AL PCT	6A1B EXT C PCT	(CIT - DIT) 6C2B EXT FE PCT	6G7A EXT AL PCT	(PYROPHOSP) FE+AL / CLAY	AL+C / CLAY	PYRO FE+AL / C - D FE+AL	CEC -1/2 CLAY X THIC
025-48	B2HIR	.6	.3		1.3	.3	.10		.56	108
048-65	A'2	.1	.1		.9	.1	.04		.20	36

(A) ESTIMATED.
(B) MICRO-PENETRATION RESISTANCE. A ROD 0.6 CM DIA IS SLOWLY PUSHED INTO BULK DENSITY CLOD, EQUILIBRATED AT 0.1-BAR, A DISTANCE OF 0.6 CM USING A POCKET PENETROMETER. UNITS ARE FORCE (KG) AND NOT ESTIMATES OF UNCONFINED COMPRESSIVE STRENGTH.

Soil classification: Aquic Glossoboralf; coarse-loamy, mixed.
Soil: Monico taxadjunct*.
Soil No.: S72WI- 21-5 (LSL Nos. 72L843-72L849).
Location: Forest County, Wisconsin; SW¼, NW¼, Sec. 32, T. 38 N., R. 12 E.; near State Highway 32, Argonne Experimental Forest.
Climate: Humid continental; mean annual temperature is about 41° to 45° F; mean annual precipitation is about 30 inches; and frost-free season is about 130 days.
Vegetation and land use: Natural vegetation was northern hardwoods. Most of this soil is in forest. A few small areas are cleared and used for general farming. Some wooded areas are pastured.
Parent material: Sandy loam glacial till.
Physiography: Nearly level to gently sloping areas on glacial ground moraines.
Topography: Site is on 1 percent plane slope.
Drainage: Somewhat poorly drained.
Ground water: A perched water table exists within 20 inches of the surface for short periods during wet seasons.
Erosion: Slight.
Permeability: Moderately slow.
Described by: Robert Fox and Steve Payne.

(Colors are for moist soil unless otherwise stated)

A1 72L843 0 to 6 cm (0 to 2.5 inches). Black (5YR 2/1) sandy loam; weak fine granular structure; very friable; many roots; strongly acid; abrupt boundary.

A2 72L844 6 to 25 cm (2.5 to 10 inches). Reddish gray (5YR 5/2) sandy loam; weak fine platy structure; friable; few roots; strongly acid; abrupt boundary.

B2hir 72L845 25 to 48 cm (10 to 19 inches). Dark reddish brown (5YR 3/4) sandy loam; weak fine subangular blocky structure; very friable; many fine and medium roots; strongly acid; clear boundary.

A'2 72L846 48 to 65 cm (19 to 26 inches). Reddish gray (5YR 5/2) sandy loam; weak fine subangular blocky structure parting to weak thin platy structure; friable, brittle; few fine pores; few roots; strongly acid; clear boundary.

B'21 72L847 65 to 85 cm (26 to 34 inches). Reddish brown (5YR 4/3) loamy sand with common medium prominent mottles of yellowish red (5YR 5/6) and reddish brown (5YR 5/4); weak fine subangular blocky structure; friable, brittle; about 5 percent fine gravel; strongly acid; clear boundary.

B'22t 72L848 85 to 120 cm (34 to 48 inches). Yellowish red (5YR 4/6) sandy loam with many medium and large prominent and distinct mottles of grayish brown (10YR 5/2) and yellowish red (5YR 5/6); weak fine platy structure; friable; about 5 percent fine gravel; strongly acid; clear boundary.

C 72L849 120 to 170 cm (48 to 68 inches). Reddish brown (5YR 4/3) sandy loam; massive; very friable, brittle, weakly cemented; about 5 percent fine gravel and about 10 percent medium gravel; strongly acid.

Remarks: The surface is covered by a thin layer, about 2 cm thick, of partially decomposed leaves and twigs from the timber growing in the area. The microrelief is hummocky with considerable tree throw in the vicinity of the sample. There are a few stones on the surface and some boulders up to 3 feet in diameter.

*This pedon has an argillic horizon; therefore it is a taxadjunct to the Monico series.

Omega Douglas County, Wisconsin

S49WI-16-1 Beltsville Soil Survey Lab. Nos. 49982-49989

Depth cm	Horizon	M.E./100 Grams Soil						% B. SAT	pH	% O.C.	Size Classes %							
		Ca	Mg	K	Na	H[1]	S+[2]				Clay	III[3]	USDA Silt	VFS	FS	MS	CS	VCS
0-5	A1	4.9	0.9	0.2	0.1	15.0	21.1	29	4.7	4.44	3.1	4.5	8.7	2.6	29.0	31.4	20.0	5.2
5-10	A3	1.0	0.3	0.1	<0.1	5.0	6.4	22	5.2	0.95	4.2	5.8	10.5	3.5	32.1	30.3	16.9	2.5
10-28	B21ir	—	—	—	—	—	—	—	5.4	0.37	4.4	4.8	8.3	2.8	31.4	30.8	18.3	4.0
28-50	B22ir	0.6	0.2	0.1	<0.1	2.1	3.0	30	5.3	0.12	4.3	3.1	6.4	3.2	36.2	30.7	15.5	3.7
50-65	B3	—	—	—	—	—	—	—	5.6	0.12	3.2	0.2	1.4	1.8	32.0	33.0	24.2	4.4
65-88	C1	—	—	—	—	—	—	—	5.8	0.07	1.8	0.0	0.0	2.2	21.8	48.5	23.0	2.7
88-100	C2	0.1	<0.1	<0.1	<0.1	1.0	1.1	9	6.2	0.07	1.2	0.0	0.0	0.3	16.5	42.5	35.1	4.4
100-123	C3	—	—	—	—	—	—	—	6.2	0.05	1.0	0.0	0.0	1.0	20.8	40.9	32.5	3.8

1 Acidity
2 CEC by sum of cations
3 International III - This is PSDA fine silt (.02-.002 mm).

Soil classification: Typic Udipsamment; mixed, frigid.
Soil: Omega.
Soil No.: S49WI-16-1.
Location: Douglas County, Wisconsin; SW¼, SE¼, Sec. 24, T. 45 N., R. 11 W.; 60 feet north of County Hwy. A, 6-1/2 miles west of Bayfield County line.
Climate: Continental; mean annual temperature ranges from 36° to 44° F; mean annual precipitation ranges from 26 to 30 inches; frost-free season is 90 to 105 days.
Vegetation and land use: Most of this soil is forested with jack pine and oak being the dominant species. A few areas have been cleared and are used for general farming or special crops such as potatoes.
Parent material: Sandy acid glacial outwash.
Physiography: Nearly level to hilly upland.
Topography: Nearly level plain with low ridges and swales. Gradient is 1 to 2 percent.
Drainage: Excessively drained.
Ground water: Deep.
Erosion: Slight.
Permeability: Rapid.
Described by: J. K. Ableiter, I.J. Nyard, R.J. Muckenhirn, and V.J. Kilmer.

(Colors are for moist conditions unless otherwise noted)

A1 49982 0 to 5 cm (0 to 2 inches). Very dark brown (10YR 2/2) loamy sand, with many light gray (10YR 7/2) sand grains; weak fine granular structure; very friable; salt-and-pepper mixture of light and dark-colored sand grains are indicative of a mixture of A1 and A2 material; charcoal fragments up to 1/4 inch in diameter, bits of organic matter and wood present; many roots, along with fungi mycelia; very strongly acid.

A3 49983 5 to 10 cm (2 to 4 inches). Reddish brown (5YR 4/4) loamy sand, with grayish patches, light brown (7.5YR 6/4) dry; weak coarse granular structure; very friable; many roots, mostly fine; strongly acid.

B21ir 49984 10 to 28 cm (4 to 11 inches). Reddish brown (5YR 4/4) loamy sand, light reddish brown (5YR 6/4) dry; weak medium granular structure; very friable; common roots; strongly acid.

B22ir 49985 28 to 50 cm (11 to 20 inches). Yellowish red (5YR 4/6) sand, reddish brown to reddish yellow (5YR 5/4 to 6/6) dry; weak coarse granular structure; very friable; few roots; few basalt, sandstone, granite, and quartzite pebbles; strongly acid.

B3 49986 50 to 65 cm (20 to 26 inches). Yellowish red (5YR 5/6) sand, reddish yellow (5YR 6/6) dry; single grained; loose; few pebbles of quartzite, sandstone and basalt; medium acid.

C1 49987 65 to 88 cm (26 to 35 inches). Yellowish red (5YR 5/6) sand, light reddish brown (5YR 6/4) dry; weakly coherent to single grained; loose; few pebbles of basalt, sandstone, quartzite, granite, and other minerals; medium acid.

C2 49988 88 to 100 cm (35 to 40 inches). Brown (7.5YR 5/4) sand, light brown (7.5YR 6/4) dry; single grained; loose; numerous dark-colored grains; pebbles of basalt, quartz, and granite present; medium acid.

C3 49989 100 to 123 cm (40 to 49 inches). Brown to light brown (7.5YR 5/4 to 6/4) sand, light brown to pink (7.5YR 6/4 to 7/4) dry; single grained; loose; numerous dark-colored sand grains; few rounded pebbles of granite, quartzite, or basalt; medium acid.

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL Ontonagon SOIL Nos. S64WI-16-1 LOCATION Douglas County, Wisconsin

SOIL SURVEY LABORATORY Lincoln, Nebraska LAB. Nos. 19847-19854 June, 1968

GENERAL METHODS: 1A, 1B1b, 2A1, 2B

Depth (in.)	Horizon	Size class and particle diameter (mm) 3A1 — Total: Sand (2-0.05) a	Total: Silt (0.05-0.002)	Total: Clay (< 0.002)	Sand: Very coarse (2-1)	Sand: Coarse (1-0.5)	Sand: Medium (0.5-0.25)	Sand: Fine (0.25-0.1)	Sand: Very fine (0.1-0.05)	Silt: 0.05-0.02	Silt: Int. III (0.02-0.002)	Int. II (0.2-0.02)	(2-0.1)	<0.074	0.005-0.002	Coarse fragments 2A2 Vol. 19-2	3B1 Wt. 19-2	
		Pct. of < 2 mm														<-Pct. of <19->		
0-5	Ap	9.3	37.3	53.4b	0.3	1.0	1.6	3.7	2.7	6.0	31.3	10.8	6.6	92.3	15.4		tr	
5-9	B&A	5.0	18.2	76.8b	0.2	0.5	0.8	2.0	1.5	3.0	15.2	5.7	3.5	95.9	8.3		tr	
9-13	B2t	5.0	25.1	69.9	0.1	0.4	0.9	1.8	1.8	3.2	21.9	6.0	3.2		14.9		tr	
13-19	B3	4.9	24.9	70.2	0.5	0.6	0.7	1.7	1.4	2.1	22.8	4.4	3.5	95.9	14.9		tr	
19-26	C1ca	4.3	22.6	73.1	0.1	0.5	0.8	1.7	1.2	1.9	20.7	4.1	3.1	96.4	13.9		tr	
26-39	C2ca	2.9	22.2	74.9	0.1	0.4	0.5	1.1	0.8	0.9	21.3	2.3	2.1	97.5	15.8		tr	
39-54	C3	5.3	21.8	72.9	0.3	0.7	1.1	1.9	1.3	2.3	19.5	4.6	4.0	95.4	12.7		tr	
54-65	C4	5.4	22.7	71.9	0.2	0.6	1.1	2.0	1.5	2.9	19.8	5.5	3.9	95.4			tr	

Depth (in.)	6A1a Organic carbon c Pct.	6B1a Nitrogen Pct.	C/N	Carbonate as $CaCO_3$: 6E1b <2mm Pct.	3A1a <0.002 mm Pct.	3A1a Non-Carbonate Clay Pct.	Bulk density: 4A1a Field-State g/cc	4A1d 1/3-Bar g/cc	4A1b Air-Dry g/cc	4D1 COLE	Water content: 4B4 Field-State Pct.	4B1c 1/3-Bar Pct.	4B2 15-Bar Pct.	4C1 1/3-to 15-Bar in./in.		pH: 8C1b Sat. Paste		8C1a (1:1)
0-5	3.01	0.217	14			53	1.27	1.22	1.31	0.024	25.0	26.2	16.2	0.12				5.6
5-9	0.98	0.089	11	tr(s)	-	77		1.3d					20.0					6.6
9-13	0.33	0.044	8	3	tr	70	1.36	1.36	1.70	0.078	31.8	29.5	20.0	0.13				7.9
13-19	0.14			16	8	62	1.41	1.41	1.62	0.047	28.7	26.6	19.1	0.11				7.3
19-26	0.12			20	12	61	1.42	1.42	1.64	0.047	29.7	27.9	20.5	0.11				8.4
26-39	0.12			19	11	64	1.35	1.39	1.70	0.068	37.0	33.0	21.7	0.16				8.5
39-54	0.13			12	8	65	1.44	1.44	1.68	0.052	30.6	29.5	22.8	0.10		7.8		8.6
54-65	0.14			14	8	66	1.36	1.35	1.66	0.073	36.2	33.8	22.6	0.15				8.5

Depth (in.)	Extractable bases: 6N4b Ca	6O4b Mg	6P2a Na	5B1a 6Q2a K	Sum	6H1a Ext. Acidity	Cat. Exch. Cap.: 5A3a Sum Cations	5A1a NH_4OAc	6G1d KCl-Ext. Al	6C2a Ext. Iron as Fe Pct.		8E1 Resistivity ohms-cm.	8B1a Elec. Cond. mmhos/cm.	8B Water at Sat. Pct.	8D5 Est. Total Salt in Soil ppm.	8D3 Ca/Mg	Base saturation: 5C3 Sum Cations Pct.	5C1 NH_4OAc CEC Pct.
	meq/100 g																	
0-5	10.9e	10.8f	0.1	0.6	22.4	12.9	35.3	26.1		1.5						1.0	63	86
5-9	12.4	19.6	0.3	0.7	33.0	6.7	39.7	32.0		1.7						0.6	83	103
9-13	13.7	19.0	0.3	0.6	33.6			29.3		1.6						0.7		
13-19	12.3	14.4	0.3	0.5	27.5			23.7		1.3						0.9		
19-26	10.9	13.4	0.4	0.5	25.2			20.5		1.2						0.8		
26-39	9.9	13.6	0.4	0.7	24.6			19.2		1.1						0.7		
39-54	9.0	14.0	0.5	0.8	24.3			18.6		1.4		2,600	0.38	74.6	240	0.6		
54-65	8.8	14.3	0.5	0.8	24.4			18.8		1.4						0.6		

Depth (in.)	Ratios to Clay 8D2: NH_4OAc CEC	Ext. Iron	15-Bar Water		
0-5	0.49	0.03	0.31		
5-9	0.42	0.02	0.26		
9-13	0.42	0.02	0.28		
13-19	0.38	0.02	0.31		
19-26	0.34	0.02	0.34		
26-39	0.30	0.01	0.34		
39-54	0.29	0.02	0.35		
54-65	0.28	0.02	0.34		

a. Carbonate comprises about 5 percent of the sand below 9 inches.
b. Verified by sample replication.
c. 8 kg/m^2 to 60 inches (Method 6A).
d. Estimated.
e. NH_4OAc extraction (Method 6N2a).
f. NH_4OAc extraction (Method 6O2a).

Soil classification: Glossic Eutroboralfs; very-fine, mixed.
Soil: Ontonagon.
Soil No.: S64WI-16-1.
Location: Douglas County, Wisconsin; NW¼, NW¼, Sec. 17, T. 48 N., R. 13 W.; 120 feet south of Highway Z by a pine tree in an abandoned field.
Climate: Humid continental; mean annual temperature is about 41° F; mean annual precipitation ranges from 26 to 30 inches; and frost-free season is about 109 days.
Vegetation and land use: Native vegetation was mixed spruce-pine forest. A small portion is being used for general farming. Some cutover areas are in second-growth aspen.
Parent material: Calcareous clay glacial lake deposits.
Physiography: Gently sloping to undulating glacial lake plains.
Topography: Site is on a 1 percent east-facing convex slope in an abandoned field.
Drainage: Moderate to well-drained.
Ground water: Deep
Erosion: Slight.
Permeability: Slow.
Described by: A.J.Klingelhoets, August 25, 1964.

(Colors are for moist soils unless otherwise stated)

Ap 19847 0 to 13 cm (0 to 5 inches). Dark reddish brown, dark reddish gray, and reddish brown (5YR 3/2, 4/2, and 4/4) silty clay; moderate fine and medium subangular blocky structure; firm; much earthworm activity and mixing; roots common; slightly acid; abrupt smooth boundary.

B&A 19848 13 to 23 cm (5 to 9 inches). Reddish brown (5YR 4/4) clay; medium columnar structure parting to moderate fine angular blocks; very firm, plastic, sticky; tongues of reddish gray (5YR 5/2) silty clay A2 with weak medium platy structure extend through this horizon and constitute about 20 percent of the horizon body; isolated peds of B2 are in the upper part; clay films are thin and patchy on peds of B2; roots common; slightly acid; clear irregular boundary.

B2t 19849 23 to 33 cm (9 to 13 inches). Reddish brown (2.5YR 4/4) clay; moderate to strong very fine angular blocky structure; very firm, plastic, sticky; clay films thin but continuous; few hard lime concretions less than 3 mm in diameter; roots common; mildly alkaline; clear wavy boundary.

B3 19850 33 to 48 cm (13 to 19 inches). Reddish brown (2.5YR 4/4) clay; weak coarse prismatic structure parting to moderate to strong very fine angular blocks; very firm, plastic, sticky; clay films are thin but continuous; few hard lime concretions less than 3 mm in diameter; roots common; mildly alkaline; clear wavy boundary.

C1ca 19851 48 to 65 cm (19 to 26 inches). Reddish brown (2.5YR 4/4 and 5/4) clay; moderate coarse prismatic structure parting to moderate fine angular blocks; very firm, plastic, sticky; many light brownish and pinkish-gray (10YR and 7.5YR 6/2) soft lime segregations less than 5 mm in diameter; few hard lime concretions less than 3 mm in diameter; clay films are thick and continuous on pressure faces (slickensides); few roots; strong effervescence; gradual irregular boundary.

C2ca 19852 65 to 98 cm (26 to 39 inches). Reddish brown (2.5YR 4/4 and 5/4) clay; moderate coarse prismatic structure parting to moderate medium angular blocks; very firm, plastic, sticky; many light brownish and pinkish-gray (10YR and 7.5YR 6/2) soft lime segregations less than 5 mm in diameter; few hard lime concretions less than 3 mm in diameter; clay films are thick and continuous on pressure faces (slickensides); few roots; strong effervescence; clear wavy boundary.

C3 19853 98 to 135 cm (39 to 54 inches). Reddish brown (2.5YR 4/4 and 5/4) clay; weak coarse prismatic structure parting to moderate medium angular blocks; very firm, plastic, sticky; very prominent slickensides with thick clay films; strong effervescence; gradual wavy boundary.

C4 19854 135 to 163 cm (54 to 65 inches). Reddish brown (2.5YR 4/4 and 5/4) clay; weak coarse prismatic structure parting to coarse angular blocks; very firm, plastic, sticky; very prominent slickensides with thick clay films; strong effervescence.

Remarks: Sand content in profile is estimated at less than 5 percent. Clay content was estimated to be greater than 60 percent in the B and C horizons.

Soil temperature:

Depth (inches)	Temperature
20	14° C.
30	14° C.
40	14° C.

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL Ontonagon SOIL Nos. S64WI-16-3 LOCATION Douglas County, Wisconsin

SOIL SURVEY LABORATORY Lincoln, Nebraska LAB. Nos. 19855-19862 June, 1968

GENERAL METHODS: 1A, 1B1b, 2A1, 2B

Depth (in.)	Horizon	Size class and particle diameter (mm) 3A1 — Total: Sand (2-0.05) a	Total: Silt (0.05-0.002)	Total: Clay (< 0.002)	Sand: Very coarse (2-1)	Sand: Coarse (1-0.5)	Sand: Medium (0.5-0.25)	Sand: Fine (0.25-0.1)	Sand: Very fine (0.1-0.05)	Silt: 0.05-0.02	Silt: Int. III (0.02-0.002)	Int. II (0.2-0.02)	(2-0.1)	<0.074	0.005-0.002	Coarse fragments 2A2 Vol. 19-2	3B1 Wt. 19-2	
		Pct. of < 2 mm														← Pct. of <19 →		
0-6	Ap	3.1	60.8	36.1	tr	0.4	0.5	0.9	1.3	14.9	45.9	16.7	1.8		14.9		-	
6-9	B&A	1.7	39.0	59.3	-	0.1	0.2	0.5	0.9	10.1	28.9	11.3	0.8	99.0	9.2		-	
9-16	B2t	0.7	31.6	67.7	tr	tr	0.1	0.2	0.4	4.0	27.6	4.5	0.3		11.9		-	
16-21	B3	0.8	41.1	58.1	-	0.1	0.1	0.4	0.2	2.3	38.8	2.8	0.6	99.3	17.1		-	
21-32	C1ca	1.1	27.8	71.1	0.2	0.2	0.2	0.3	0.2	0.4	27.4	0.8	0.9	99.0	17.9		tr	
32-39	C2ca	1.9	20.0	78.1	0.1	0.2	0.3	0.7	0.6	0.9	19.1	1.9	1.3	98.4	10.5		tr	
39-52	C3	3.2	17.9	78.9	0.2	0.3	0.6	1.3	0.8	2.4	15.5	3.9	2.4	97.2	8.3		tr	
52-65	C4	2.4	20.5	77.1	0.1	0.3	0.4	1.0	0.6	1.7	18.8	2.9	1.8	97.9	10.6		tr	

Depth (in.)	6A1a Organic carbon b Pct.	6B1a Nitrogen Pct.	C/N	Carbonate as $CaCO_3$: 6E1b 6E2a <2mm Pct.	3A1a <0.002 mm Pct.	3A1a Non-Carbonate Clay Pct.	Bulk density: 4A1a Field-State g/cc	4A1d 1/3-Bar g/cc	4A1b Air-Dry g/cc	4D1 COLE	Water content: 4B4 Field-State Pct.	4B1c 1/3-Bar Pct.	4B2 15-Bar Pct.	4C1 1/3-to 15-Bar in./in.	3A1b Fine Clay <0.002 mm. Pct.	pH		8C1a (1:1)
0-6	3.59	0.237	15			36	1.19	1.21	1.28	0.017	32.3	28.2	13.9	0.17	12.6			6.7
6-9	0.62	0.071	9	-(s)		59	1.36	1.39	1.71	0.073	28.5	25.8	17.2	0.12				6.4
9-16	0.39			tr(s)		68	1.41	1.38	1.70	0.073	27.6	27.4	19.2	0.12	18.0			7.5
16-21	0.19			4	tr	58	1.42	1.37	1.65	0.064	27.7	28.7	18.6	0.14				8.1
21-32	0.17			17	7	64	1.48	1.39	1.64	0.056	26.6	29.8	21.6	0.11				8.4
32-39	0.15			17	10	68	1.40	1.34	1.61	0.064	31.9	33.2	22.7	0.14				8.5
39-52	0.18			13	8	71	1.35	1.31	1.60	0.068	36.3	35.8	24.1	0.15				8.5
52-65	0.19			8	3	74	1.32	1.33	1.63	0.068	37.9	35.6	25.0	0.14				8.4

Depth (in.)	Extractable bases 6N4b Ca	6O4b Mg	6P2a Na	5B1a 6Q2a K	Sum	6H1a Ext. Acidity	Cat. Exch. Cap. 5A3a Sum Cations	5A1a NH_4OAc	KCl-Ext. Al	6C2a Ext. Iron as Fe Pct.				8D3 Ca/Mg		Base saturation 5C3 Sum Cations Pct.	5C1 NH_4OAc CEC Pct.
	meq/100 g																
0-6	18.2c	5.8d	0.1	0.5	24.6	6.8	31.4	22.3		1.2				3.1		78	110
6-9	12.7c	17.5d	0.2	0.6	31.0	6.9	37.9	28.7		1.8				0.7		82	108
9-16	12.2	19.2	0.3	0.6	32.3			29.5		2.1				0.6			
16-21	13.0	17.1	0.4	0.5	31.0			26.5		1.8				0.8			
21-32	12.3	17.1	0.5	0.5	30.4			25.3		1.5				0.7			
32-39	10.2	17.7	0.6	0.6	29.1			23.7		1.4				0.6			
39-52	8.9	17.0	0.6	0.7	27.2			22.6		1.5				0.5			
52-65	8.3	18.3	0.7	0.9	28.2			24.2		1.6				0.5			

Depth (in.)	Ratios to Clay 8D2: NH_4OAc CEC	Ext. Iron	15-Bar Water
0-6	0.62	0.03	0.39
6-9	0.49	0.03	0.29
9-16	0.43	0.03	0.28
16-21	0.46	0.03	0.32
21-32	0.40	0.02	0.34
32-39	0.35	0.02	0.33
39-52	0.32	0.02	0.34
52-65	0.33	0.02	0.34

a. Fe-Mn nodules comprise about 50 percent of the sand above 32 inches. Carbonate comprises about 5 percent of the sand below 16 inches.
b. 11 kg/m^2 to 60 inches (Method 6A).
c. NH_4OAc extraction (Method 6N2a).
d. NH_4OAc extraction (Method 6O2a).

Soil classification: Glossic Eutroboralfs; very-fine, mixed.
Soil: Ontonagon.
Soil No.: S64WI-16-3.
Location: Douglas County, Wisconsin, NW¼, NE¼, Sec. 25, T. 48 N., R. 14 W.; 400 feet east and 150 feet south of junction of county roads A and C.
Climate: Humid continental; mean annual temperature is about 41° F; mean annual precipitation ranges from 26 to 30 inches; and frost-free season is about 109 days.
Vegetation and land use: Native vegetation was mixed spruce-pine forest. A small part of this soil is being used for general livestock farming. Some cutover areas are in second growth aspen forests.
Parent material: Calcareous clay glacial lake deposits.
Physiography: Gently sloping to undulating glacial lake plain.
Topography: Site is on a 1 percent south-facing convex slope of gently undulating area.
Drainage: Moderately well to well drained.
Ground water: Deep.
Erosion: Slight.
Permeability: Slow.
Described by: A.J. Klingelhoets, August 25, 1964.

(Colors are for moist soils unless otherwise stated)

Ap 19855 0 to 15 cm (0 to 6 inches). Dark reddish gray, very dark gray, and dark reddish brown (5YR 4/2, 3/1, and 3/2) heavy silty clay loam; moderate fine subangular blocky structure; firm; some earthworm mixing; roots common; neutral; abrupt smooth boundary.

B&A 19856 15 to 23 cm (6 to 9 inches). Reddish brown (2.5YR 4/4) clay; weak medium columnar structure parting to moderate fine angular blocks; very firm, plastic, sticky; tongues of reddish gray (5YR 5/2) silty clay A2 with weak medium platy structure extend through this horizon and constitute about 20 percent of the horizon body; isolated peds of B2 are in the upper portion of this horizon; clay films are thin and patchy on peds of B2; roots common; slightly acid; clear wavy boundary.

B2t 19857 23 to 40 cm (9 to 16 inches). Reddish brown (2.5YR 4/4) clay; weak coarse prismatic structure parting to moderate to strong very fine angular blocks; very firm, plastic, sticky; clay films thin and continuous; few hard lime concretions less than 2 mm in diameter; roots common; mildly alkaline; clear wavy boundary.

B3 19858 40 to 53 cm (16 to 21 inches). Reddish brown (2.5YR 4/4) clay; weak coarse prismatic structure parting to moderate to strong fine angular blocks; very firm, plastic, sticky; thin continuous clay films; few hard lime concretions less than 2 mm in diameter; roots common; mildly alkaline; clear wavy boundary.

C1ca 19859 53 to 80 cm (21 to 32 inches). Reddish brown (2.5YR to 5YR 4/4) clay; moderate coarse prismatic structure parting to moderate fine angular blocks; very firm, plastic, sticky; many light reddish brown (5YR 6/4) soft lime segregations less than 15 mm in diameter; few hard lime concretions less than 2 mm in diameter; clay films are thick and continuous on pressure faces (slickensides); few roots; strong effervescence; gradual irregular boundary.

C2ca 19860 80 to 98 cm (32 to 39 inches). Reddish brown (2.5YR to 5YR 4/4) clay; moderate coarse prismatic structure parting to moderate fine angular blocks; very firm, plastic, sticky; many light reddish brown (5YR 6/4) soft lime segregations less than 15 mm in diameter; few hard lime concretions less than 2 mm in diameter; clay films are thick and continuous on pressure faces (slickensides); strong effervescence; clear irregular boundary.

C3 19861 98 to 130 cm (39 to 52 inches). Reddish brown (2.5YR to 5YR 4/4) clay; weak coarse prismatic structure parting to moderate medium angular blocks; very firm, plastic, sticky; very prominent slickensides with thick clay films; strong effervescence; gradual wavy boundary.

C4 19862 130 to 163 cm (52 to 65 inches). Reddish brown (2.5YR to 5YR 4/4) clay; weak medium coarse angular blocky structure; very firm, plastic, sticky; very prominent slickensides with thick clay films; strong effervescence.

Remarks: Sand content in profile is estimated at less than 5 percent. Clay content was estimated to be greater than 60 percent in B and C horizons.

Depth (inches)	Temperature
20	14° C.
30	14° C.
40	13° C.

SOIL CLASSIFICATION-TYPIC GLOSSOBORALF
COARSE-LOAMY, MIXED
SERIES - - - - - - -PADUS TAXADJUNCT

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE, NTSC
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

SOIL NO - - - - - - S72NI-21-8 COUNTY - - - FOREST

GENERAL METHODS- - -1A,1B1B,2A1,2B SAMPLE NOS. 72L869-72L877

DEPTH CM	HORIZON	PARTICLE SIZE ANALYSIS, LT 2MM, 3A1, 3A1A, 3A1B (PCT LT 2MM) SAND 2-.05	SILT .05-.002	CLAY LT .002	FINE CLAY LT .0002	VCOS 2-1	CORS 1-.5	MEDS .5-.25	FNES .25-.10	VFNS .10-.05	COSI .05-.02	FNSI .02-.002	VFSI .005-.002	SAND 2-.10	INTR II .2-.02	FINE CLAY TO CLAY PCT	NON-CO3-CLAY PCT	RATIO 8D1 15-BAR TO CLAY
000-6	A1	21.6	63.9	14.5	6.9	.8	4.5	7.6	5.6	3.1	31.3	32.6		18.5	36.1	48		2.63
006-13	A2	38.1	55.7	6.2	1.5	1.6	7.7	14.5	9.6	4.7	27.1	28.6		33.4	34.5	24		.61
013-24	B21HIR	38.1	53.4	8.5	1.3	1.1	7.3	14.2	10.2	5.3	26.8	26.6		32.8	35.0	15		.79
024-36	B22IR	48.1	46.5	5.4	1.0	2.2	9.4	18.4	12.6	5.5	25.2	21.3		42.6	34.3	19		.76
036-50	2A'2	49.0	46.6	4.4	.5	2.0	9.4	18.6	13.1	5.9	25.2	21.4		43.1	34.8	11		.75
050-72	2A&B'	54.9	37.6	7.5	1.3	1.4	8.9	21.2	16.7	6.7	22.1	15.5		48.2	33.7	17		.55
072-91	2B2T	66.0	26.8	7.2	1.9	1.9	11.7	26.3	19.8	6.3	15.8	11.0		59.7	27.6	26		.47
091-175	2C1	95.1	3.5	1.4	.5	8.1	24.2	35.3	25.1	2.4	2.7	.8		92.7	12.1			
175-220	2C2	98.8	.9	.3		1.8	19.5	52.3	24.5	.7	.8	.1		98.1	6.0			

DEPTH CM	(PARTICLE SIZE ANALYSIS, 8H, 3B, 3B1, 3B2) VOL. GT 2 PCT	GT 75 PCT	75-20	20-5	5-2	LT .074	20-2 PCT LT20	(BULK DENSITY) 4A1D 1/3-BAR G/CC	4A1H OVEN DRY G/CC	4D1 COLE	(WATER CONTENT) 4B1C 1/10 BAR PCT	4B1C 1/3-BAR PCT	4B2 15-BAR PCT	4C1 WRD CM/CM	CARBONATE 6E1B LT 2 PCT	3A1A LT .002 PCT	(PH) 8C1A 1/1 H2O	8C1E 1/2 CACL
000-6	TR	0	TR	TR	TR	81	TR	.9 A					38.1				4.8	4.5
006-13	5	0	TR	5	1	62	6	1.0 A					3.8				4.6	4.0
013-24	5	0	TR	3	2	63	5	1.1 A					6.7				4.7	4.1
024-36	5	0	TR	5	3	52	8	1.2 A					4.1				4.8	4.2
036-50	5	0	TR	4	3	51	7	1.44	1.48	.009	23.8	20.8	3.3	.24	1.1B		4.8	4.3
050-72	5	0	TR	4	4	46	8	1.78	1.81	.005	13.9	11.8	4.1	.13	4.1B		4.9	4.3
072-91	5	0	5	3	2	35	5	1.87	1.93	.010	12.3	10.5	3.4	.13	4.1B		4.9	4.2
091-175	55	5	25	25	10	2	46	1.9 A					1.6				5.2	4.6
175-220	5	0	TR	2	2	1	4						.5				5.6	4.9

DEPTH CM	(ORGANIC MATTER) 6A1A ORGN CARB PCT	6B1A NITG PCT	C/N	IRON 6C2B EXT FE PCT	PHOS TOTL PCT	(EXTRACTABLE BASES 5B4A-) 6H2E CA	6G2D MG	6P2B NA	6Q2B K	SUM EXTB	ACTY 6H1A BACL TEA G-	AL 6G1B KCL EXT	(CAT EXCH) 5A3A EXTB ACTY	5A6A NHAC	RATIO 8D1 NHAC TO CLAY	RATIO 8D3 CA TO MG	CA 5F1 SAT NHAC PCT	(BASE SAT) 5C3 EXTB ACTY PCT	5C1 NHAC PCT
						(MEQ / 100													
000-6	8.94			.6		26.4	3.4	.1	.9	30.8	38.0	.0	68.8	58.2	4.01	7.8	45	45	53
006-13	1.26			.7		2.4	.4	.1	.1	3.0	7.3	.8	10.3	8.7	1.40	6.0	28	29	34
013-24	1.70			1.5		1.4	.3	.1	.1	1.9	18.8	3.0	20.7	13.5	1.59	4.7	10	9	14
024-36	.54			.9		.7	.1	.1	TR	.9	12.0	2.3	12.9	8.7	1.61	7.0	8	7	10
036-50	.59			.7		.4	.1	TR	TR	.5	9.0	1.8	9.5	6.3	1.43	4.0	6	5	8
050-72	.20			.7		1.5	.5	TR	.1	2.1	6.6	2.4	8.7	7.0	.93	3.0	21	24	30
072-91	.11			.8		1.8	.8	TR	.1	2.7	4.7	1.3	7.4	6.1	.85	2.3	30	36	44
091-175																			
175-220																			

DEPTH CM	(SATURATED PASTE) 8E1 BEST OHM- CM	8C1B PH	8A H2O PCT	NA 5D2 ESP PCT	NA 5E SAR	SALT 8D5 TOTL SOLU PPM	GYP 6F1A PCT	(SATURATION EXTRACT 8A1-) 8A1A EC MMHOS/CM	6N1B CA	6O1B MG	6P1B NA	6Q1B K	6I1A CO3	6J1A HCO3	6K1A CL	6L1A SO4	6M1A NO3	ATTERBERG 4F1 LQID LMIT PCT	4F2 PLST INDX
								(MEQ / LITER)											
000-6																			
006-13																			
013-24																			
024-36	34000	4.9	28.1					.21											
036-50																			
050-72																			
072-91																			
091-175	34000	5.2	21.0					.15											
175-220																			

IDENTIFICATION OF THE SPODIC HORIZON BY LABORATORY CRITERIA.

DEPTH CM	HORIZON	(PYROPHOSPHATE, PH10) 6C5A EXT FE PCT	6G5A EXT AL PCT	6A1E EXT C PCT	(CIT - DIT) 6C2B EXT FE PCT	6G7A EXT AL PCT	(PYROPHOSP) FE+AL / CLAY	AL+C / CLAY	PYRO FE+AL / C - D FE+AL	CEC -1/2 CLAY X THIC
013-24	B21HIR	.7	.4		1.5	.4	.13		.58	102
024-36	B22IR	.3	.2		.9	.3	.09		.42	72

(A) ESTIMATED.
(B) MICRO-PENETRATION RESISTANCE. A ROD 0.6 CM DIA IS SLOWLY PUSHED INTO BULK DENSITY CLOD, EQUILIBRATED AT 0.1-BAR, A DISTANCE OF 0.6 CM USING A POCKET PENETROMETER. UNITS ARE FORCE (KG) AND NOT ESTIMATES OF UNCONFINED COMPRESSIVE STRENGTH.

Soil classification: Typic Glossoboralf; coarse-loamy, mixed.
Soil: Padus taxadjunct*.
Soil No.: S72WI-21-8 (LSL Nos. 72L869-72L877).
Location: Forest County, Wisconsin; SW¼, NW¼, Sec. 23, T. 38 N., R. 12 E.
Climate: Humid continental; mean annual temperature ranges from 40° to 45° F; mean annual precipitation ranges from 28 to 34 inches; frost-free season is 130 to 135 days.
Vegetation and land use: Native vegetation was mixed northern hardwoods and conifers. Cutover areas are presently in aspen. About 30 percent of this soil is cleared and used for general farming. Some wooded areas are pastured.
Parent material: Thin silt (probably loess) over sand and gravel outwash.
Physiography: Nearly level to steep glacial outwash plains, stream terraces, and pitted outwash.
Topography: Site is on a 2 percent plane slope in a wooded area.
Drainage: Moderate and well drained.
Ground water: Deep.
Erosion: Slight
Permeability: Moderate in sola, rapid in substratum.
Described by: Steve Payne and Robert Fox.
Sampled by: Robert H. Jordan and Robert L. Juve, September 21, 1972
(Colors are for moist soils unless otherwise stated)

O1 2 to 0 cm (1 to 0 inches). Partially decomposed leaves from the forest cover and about 1 cm of fully decomposed organic matter.

A1 72L869 0 to 6 cm (0 to 2 inches). Dark reddish brown (5YR 2/2) silt loam with a high sand content; weak fine granular structure; friable; about 5 percent fine gravel; many fine roots; high organic matter content; strongly acid; abrupt boundary.

A2 72L870 6 to 13 cm (2 to 5 inches). Brown (7.5YR 5/2) silt loam; weak fine subangular blocky structure parting to weak fine platy structure; friable; about 5 percent of fine gravel; roots common; very strongly acid; abrupt boundary.

B21hir 72L871 13 to 24 cm (5 to 9 inches). Brown (7.5YR 4/4) silt loam with high sand content; weak fine subangular blocky structure; very friable; fine roots common; very strongly acid; clear boundary.

B22ir 72L872 24 to 36 cm (9 to 14 inches). Brown (7.5YR 5/4) sandy loam with high silt content; weak fine subangular blocky structure; very friable; roots common; very strongly acid; abrupt boundary.

IIA'2 72L873 36 to 50 cm (14 to 20 inches). Brown (7.5YR 4/2) sandy loam; moderate medium subangular blocky structure; slightly brittle, friable; vesicular; very strongly acid; clear boundary.

IIA&B' 72L874 50 to 72 cm (20 to 29 inches). Brown (7.5YR 4/2) sandy loam, the crushed color is brown (7.5YR 4/4); weak medium subangular blocky structure; peds part to weak platy structure; some peds are brittle and weakly cemented; silt coatings on the peds and streaks of lighter color; clay films are common on the peds of the B horizon; strongly acid; abrupt boundary.

IIB2t 72L875 72 to 91 cm (29 to 36 inches). Reddish brown (5YR 4/3) heavy sandy loam; moderate medium subangular blocky structure; friable; clay films are common; about 5 percent medium and coarse gravel and about 5 percent fine gravel; a few coatings of silt and fine sand on the peds; many clay bridges; very strongly acid; abrupt wavy boundary.

IIC1 72L876 91 to 175 cm (36 to 70 inches). Strong brown (7.5YR 5/6) sand and gravel; single grained; loose; about 45 percent of medium and coarse gravel and 15 percent of fine gravel in the main body of the C1 horizon; just below the B2t horizon there is a layer about 15 cm thick of sand with about 10 percent gravel; there are also thin layers of brittle loam about 2 cm thick; about 5 percent of the horizon is cobblestones; medium acid; abrupt wavy boundary.

IIC2 72L877 175 to 220 cm (70 to 88 inches). Brown (7.5YR 5/4) medium and coarse sand; single grained; loose; about 80 percent of the sand is medium; about 5 percent of the horizon is fine gravel.

Remarks: A sample of this soil, IIB2t horizon, was sent to the University of Wisconsin for examination of the thin section.

*This pedon lacks a spodic horizon; therefore, it is a taxadjunct to the Padus series.

SOIL CLASSIFICATION-TERRIC MEDISAPRIST
LOAMY, MIXED, EUIC, MESIC
SERIES - - - - - - -PALMS

SOIL NO - - - - - - S74WI-55-3 COUNTY - - - JEFFERSON

GENERAL METHODS- - -1A,1B1B,2A1,2B SAMPLE NOS. 74L1489-74L1493

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE, MTSC
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

DEPTH CM	HORIZON	PARTICLE SIZE ANALYSIS, LT 2MM, 3A1, 3A1A, 3A1B: SAND 2-.05 PCT	SILT .05-.002 PCT	CLAY LT .002 PCT	FINE CLAY LT .0002 PCT	SAND VCOS 2-1 PCT	SAND CORS 1-.5 PCT	SAND MEDS .5-.25 PCT	SAND FNES .25-.10 PCT	SAND VFNS .10-.05 PCT	SILT COSI .05-.02 PCT	SILT FNSI .02-.005 PCT	SILT VFSI .005-.002 PCT	SAND SAND 2-.10 PCT	INTR II .2-.02 PCT	FINE CLAY TO CLAY PCT	RATIO NON-CO3-CLAY PCT	RATIO 8D1 15-BAR TO CLAY
000-23	0AP																	
023-58	0A2																	
058-79	0A3																	
079-89	2C1G	5.7	66.1	28.2		TR	TR	.5	2.4	2.8	24.3	41.8		2.9				.60
089-152	2C2	3.6	71.1	25.3		.1	.1	.2	.9	2.3	23.6	47.5		1.3				.87

DEPTH CM	PARTICLE SIZE ANALYSIS, MM, 3B, 3B1, 3B2: VOL. GT 2 PCT	WEIGHT GT 75 PCT	75-20 PCT	20-5 PCT	5-2 PCT	LT .074 PCT	20-2 PCT LT20	BULK DENSITY: 4A1D 1/3-BAR G/CC	4A1H OVEN DRY G/CC	4D1 COLE	WATER CONTENT: 4B1C 1/10 BAR PCT	4B1C 1/3-BAR PCT	4B2A 15-BAR PCT	4C1 HRD CM/CM	CARBONATE: 6E1B LT 2 PCT	3A1A LT .002 PCT	PH: 8C1A 1/1 H2O	8C1E 1/2 CACL
000-23	0	0	0	0	0		0						87				6.1	5.6
023-58	0	0	0	0	0		0	.20	1.01		446	338	117	.54			6.1	5.8
058-79	0	0	0	0	0		0	.40	.93		206	174	69	.42			6.4	5.9
079-89	0	0	0	0	0		0	1.35	1.71	.08	37	35	20	.20			6.0	5.3
089-152	0	0	0	0	0		0	.68	1.35	.26	110	98	28	.48			6.7	5.2

DEPTH CM	ORGANIC MATTER: 6A1A ORGN CARB PCT	6B1A NITG PCT	C/N	IRON 6C2B EXT FE PCT	PHOS TOTL PCT	EXTRACTABLE BASES 5B4A: 6H2E CA	6G2D MG	6P2B NA	6Q2B K	SUM EXTB MEQ / 100 G	ACTY 6N1A BACL TEA	AL 6G1E KCL EXT	(CAT EXCH) 5A3A EXTB ACTY	5A6A NHAC	RATIO 8D1 NHAC TO CLAY	RATIO 8D3 CA TO MG	CA 5F1 SAT NHAC PCT	(BASE SAT) 5C3 EXTB ACTY PCT	5C1 NHAC PCT
000-23	32.9	2.85	12			116	29.3	.2	.4	146	43.4		189	145		4.0	80	77	101
023-58	31.5	3.38	9			137	45.5	.3	.3	183	63.7		247	170		3.0	81	74	108
058-79	30.3	2.08	15			101	37.4	.2	.2	139	36.3		175	138		2.7	73	79	101
079-89	3.27	.210	16			25.5	13.0	.2	.2	38.9	6.1		45.0	36.8		2.0	69	86	106
089-152	6.84	.468	15			27.4	14.3	.2	.2	42.1	8.1		50.2	38.8		1.9	71	84	109

DEPTH CM	(SATURATED PASTE): 8E1 REST OHM-CM	8C1B PH	8A H2O PCT	NA 5D2 ESP PCT	NA 5E SAR	SALT 8D5 TOTL SOLU PPM	GYP 6F1A PCT	SATURATION EXTRACT 8A1: 8A1A EC MMHOS/CM	6N1B CA	6O1B MG	6P1B NA	6Q1B K	6I1A CO3	6J1A HCO3	6K1A CL	6L1A SO4	6M1A NO3	ATTERBERG: 4F1 LQID LMIT PCT	4F2 PLST INDX
									MEQ / LITER										
000-23	870	5.8	301			4600		2.33	14.7	9.1	.2	.1	0	.3	.0	5.4	19.8		
023-58	840	5.6	785			11000		1.98	12.5	9.7	.2	.1	0	1.2	.2	5.5	14.2		
058-79	1400	6.0	332			2800		1.19	6.7	6.1	.2	.1	0	.6	.0	5.8	6.7		
079-89	2300	6.5	85.5	1		230		.40	2.1	1.9	.2	TR	0	.6	.0	3.4	.0		
089-152	2200	6.6	161	1		530		.51	2.6	2.4	.1	TR	0	.6	.2	3.9	1.0		

DEPTH CM	HISTOSOL CHARACTERIZATION: (STATE OF DECOMPOSITION) 8F MINL CONT PCT	8G (FIBER VOL) UNRB PCT	8G (FIBER VOL) RUB PCT	8H PYROPHOSPHT SOLUBILITY (RUBS COLOR)		PH 8C1E .01M CACL	(BULK DEN) 4A3A FILD STAT G/CC	4A1I 1/3B REWT G/CC	COLE 4D1 RE-WET	SUBS RES-IDUE PCT	(WATER CONTENT) 4B4 FILD STAT PCT	4B1C 1/3B REWT PCT	4B2 15-BAR PCT	4C1 HRD CM/CM
000-23	31	18	2	10 YR	2/2	5.7	.28			72	216		82	
023-58	15	32	4	7.5YR	4/4	5.9	.20	.40	.26	94	272	166	113	.21
058-79	44	14	1	10 YR	2/2	6.0	.25	.55	.40	78	289	110	61	.27
079-89								1.44	.53			32	17	.22
089-152								.97	.13			55	22	.32

Soil classification: Terric Medisapriats; loamy, mixed, euic, mesic.
Series: Palms.
Pedon: S74WI-55-3.
Location: Jefferson County, Wisconsin; SE¼, NW¼, Sec. 33, T. 8 N., R. 15 E.; 462 feet north from center of road (approx. opposite barn at farmstead) and 129 feet east from north-south drainage ditch. About 43°12' N. latitude and 88°43' W. longitude.
Climate: Humid continental. Mean annual temperature is 47.8° F; mean July temperature is 73.1° F; mean January temperature is 21.3° F; mean annual precipitation is 30.98 inches with nearly two-thirds of the precipitation falling during the growing season; total amount of snowfall is 41.9 inches; the growing season averages 159 days, but less in organic areas (data from Watertown, WI, weather bureau substation).
Parent material: Deposits of herbaceous organic material 16 to 50 inches thick over loamy mineral deposits.
Physiography: Large depressional area between drumlins.
Vegetation: Corn
Size of area: About 50 acres.
Distance to adjacent mineral soil: About 450 feet to south.
Depth to water table: 58 cm.
Microrelief: None
Subsidence: Estimated to be moderate.
Described and sampled by: G.W. Hudelson and C.L. Glocker. Sampled from pit to 47 inches. Auger investigation to 60 inches.

Oap 74L1489 0 to 23 cm. Black (10YR 2/1) broken face, rubbed, and pressed sapric material; less than 5 percent fiber, less than 5 percent rubbed; weak thin platy parting to weak fine granular structure; very friable; fibers primarily herbaceous; about 15-20 percent mineral soil material; common roots; pH 6.6 (LaMotte); abrupt smooth boundary.

Oa2 74L1490 23 to 58 cm. Very dark brown (10YR 2/2), black (10YR 2/1) rubbed, very dark brown (10YR 2/2) pressed sapric material; about 30-40 percent fiber; less than 5 percent rubbed; weak thin platy structure and areas that are massive (matted); very friable; fibers primarily herbaceous; about 10-15 percent mineral soil material; few roots; pH 6.8 (LaMotte); clear wavy boundary.

Oa3 74L1491 58 to 79 cm. Black (N 2/0) broken face, rubbed, and pressed sapric material; about 10 percent fiber, less than 5 percent rubbed; weak medium prismatic parting to weak fine subangular blocky structure; very friable; fibers primarily herbaceous; about 20-25 percent mineral soil material; few roots; pH 6.8 (LaMotte); abrupt wavy boundary.

IIClg 74L1492 79 to 89 cm. Dark gray (10YR 4/1) silt loam; weak medium prismatic structure parting to weak medium subangular blocky structure; friable; few thin black (10YR 2/1) coatings on vertical faces of peds; pH 6.8 (LaMotte); abrupt wavy boundary.

IIC2 74L1493 89 to 152 cm. Dark grayish brown (10YR 4/2) silt loam; massive; friable; pH 7.0 (LaMotte).

Remarks

1. Oa2 has some areas of black (10YR 2/1) broken face.

2. Oa3 has a thin layer about 1-1½ inches thick of very dark grayish brown (10YR 3/2) sapric material.

3. A 1- to 2-inch transition zone exists above mineral contact.

SOIL CLASSIFICATION-AQUIC EUTROBORALF
FINE-LOAMY, MIXED
SERIES - - - - - - -RIETBROCK TAXADJUNCT

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE, MTSC
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

SOIL NO - - - - - - S70WIS-37-5 COUNTY - - - MARATHON

GENERAL METHODS- - -1A,1B1B,2A1,2B SAMPLE NOS. 70L902-70L911

DEPTH CM	HORIZON	PARTICLE SIZE ANALYSIS, LT 2MM, 3A1, 3A1A, 3A1B (PCT LT 2MM) SAND 2-.05	SILT .05-.002	CLAY LT .002	FINE CLAY LT .0002	VCOS 2-1	CORS 1-.5	MEDS .5-.25	FNES .25-.10	VFNS .10-.05	COSI .05-.02	FNSI .02-.002	VFSI .005-.002	FAML TEXT SAND 2-.1	INTR II .2-.02	FINE CLAY TO CLAY	NON-CO3-CLAY PCT	RATIO 8D1 15-BAR TO CLAY
000-13	AP1	26.0	64.9	9.1	3.4	1.8	7.0	9.9	3.8	3.5	32.5	32.4		22.5	37.0	37		.67
013-22	AP2	23.9	66.0	10.1	3.8	1.6	6.1	9.0	3.6	3.6	33.8	32.2		20.3	38.4	38		.55
022-33	A2	32.1	56.2	11.7	4.9	2.0	7.5	12.2	5.5	4.9	33.0	23.2		27.2	39.5	42		.50
033-45	2B&A	27.2	47.8	25.0	14.7	2.8	5.5	7.4	5.1	6.4	26.6	21.2		20.8	34.8	59		.44
045-67	2B21T	24.1	45.6	30.3	18.1	3.7	4.4	3.5	4.9	7.6	24.4	21.2		16.5	34.4	60		.44
067-96	2B22T	34.9	39.4	25.7	15.2	4.5	7.0	6.2	9.8	7.4	19.6	19.8		27.5	31.7	59		.44
096-128	2B3T	42.0	37.3	20.7	11.7	5.3	8.7	8.4	11.8	7.8	18.2	19.1		34.2	31.7	57		.46
128-162	2C1	51.2	32.6	16.2	8.5	8.4	11.2	10.7	13.2	7.7	17.7	14.9		43.5	31.4	52		.48
162-192	2C2	61.4	18.9	19.7		17.7	15.5	10.2	11.6	6.4	7.3	11.6		55.0	19.0			.52
192-222	3C3	55.9	14.1	30.0		15.3	14.4	7.1	11.5	7.6	6.6	7.5		48.3	20.4			.44

DEPTH CM	(PARTICLE SIZE ANALYSIS, MM, 3B, 3B1, 3B2) VOL. GT 2 PCT	WEIGHT GT 75 PCT	75-20	20-5	5-2	LT .074 (PCT LT 75)	BULK DENSITY 6A1D 1/3-BAR LT20	6A1H OVEN DRY G/CC	6D1 COLE	6B1C 1/10 BAR	6B1C 1/3-BAR	WATER CONTENT 6B2 15-BAR PCT	6C1 WRD CM/CM	CARBONATE 6E1B LT 2 PCT	3A1A LT .002 PCT	PH 8C1A 1/1 H2O	8C1E 1/2 CACL
000-13	10	0	TR	10	5	65	16	1.35	1.41	.013	27.3	25.1	6.1	.23	2.8B		6.0	5.6
013-22	10	0	TR	8	8	66	16	1.40A					5.6				6.2	5.7
022-33	20	0	TR	14	15	51	29	1.68	1.72	.006	20.4	17.3	5.9	.15	4.9B		6.1	5.5
033-45	15	0	20	5	TR	20	15	1.50A					10.9				5.8	5.2
045-67	55	0	35	23	10	27	50	1.47	1.76	.026	30.1	28.1	13.3	.10	3.6B		5.4	4.8
067-96	40	0	22	23	11	31	43	1.55	1.90	.040	25.7	23.6	11.4	.11	1.9B		5.7	5.0
096-128	40	0	38	8	4	32	19	1.65	1.82	.020	22.3	20.4	9.6	.11	2.5B		5.7	5.2
128-162	45	0	39	9	7	24	26	1.73	1.85	.012	19.9	18.1	7.7	.10	1.9B		5.7	5.3
162-192	50	0	42	10	9	16	34						10.3				5.5	5.1
192-222	55	0	49	18	9	12	51	1.11	1.47	.040	34.9	34.1	13.2	.10			5.3	4.9

DEPTH CM	(ORGANIC MATTER) 6A1A ORGN CARB PCT	6B1A NITG PCT	C/N	IRON 6C2B EXT FE PCT	PHOS TOTL PCT	(EXTRACTABLE BASES 5B4A) 6N2E CA	6O2D MG	6P2B NA	6Q2B K	SUM EXTB (MEQ / 100 G)	ACTY 6H1A BACL TEA	AL 6G1E KCL EXT	(CAT EXCH) 5A3A EXTB ACTY	5A6A NHAC	RATIO 8D1 NHAC TO CLAY	RATIO 8D3 CA TO MG	CA 5F1 SAT NHAC PCT	(BASE SAT) 5C3 EXTB ACTY PCT	5C1 NHAC PCT
000-13	1.77C	.140	13	1.1		7.8	1.3	0.1	0.2	9.4	8.0		17.4	10.5	1.15	6.0	74	54	90
013-22	1.00	.077	13	1.1		7.3	1.2	0.2	0.1	8.8	4.3		13.1	9.7	0.96	6.1	75	67	91
022-33	0.20	.027		1.4		6.2	2.0	0.2	0.2	8.6	4.0		12.6	9.4	0.80	3.1	66	68	91
033-45	0.15	.023		1.7		10.6	6.1	0.2	0.3	17.2	6.4		23.6	18.2	0.73	1.7	58	73	95
045-67	0.10	.017		2.1		10.7	8.0	0.2	0.4	19.3	6.1	0.4	25.4	20.1	0.66	1.3	53	76	96
067-96	0.03			2.0		11.2	7.4	0.3	0.3	19.2	5.9		25.1	19.7	0.77	1.5	57	76	97
096-128	0.03			1.9		9.1	6.7	0.2	0.2	16.2	4.3		20.5	17.4	0.84	1.4	52	79	93
128-162	0.02			1.7		8.9	5.6	0.3	0.2	15.0	4.2		19.2	15.5	0.96	1.6	57	78	97
162-192	0.03			3.4		8.7	5.5	0.3	0.3	14.8	6.4		21.2	16.8	0.85	1.6	52	70	88
192-222	0.15			3.0		9.9	6.8	0.3	0.4	17.4	8.1		25.5	18.3	0.61	1.5	54	68	95

DEPTH CM	(SATURATED PASTE) 8E1 REST OHM-CM	8C1B PH	8A H2O PCT	NA 5D2 ESP PCT	NA 5E SAR	SALT 8D5 TOTL SOLU PPM	GYP PCT	(SATURATION EXTRACT 8A1) 6F1A	8A1A EC MMHOS/CM	6N1B CA	6O1B MG	6P1B NA	6Q1B K	6I1A CO3	6J1A HCO3	6K1A CL	6L1A SO4	6M1A NO3	ATTERBERG 4F1 LQID LMIT PCT	4F2 PLST INDX
000-13																			32D	5
013-22																				
022-33																				
033-45																				
045-67																				
067-96																			31D	14
096-128	2200	5.3	28.6	1	1	110			0.67	2.4	2.2	1.2	TR							
128-162																				
162-192																				
192-222																			43D	20

(A) ESTIMATED.
(B) MICRO-PENETRATION RESISTANCE - A ROD 0.6 CM DIA IS SLOWLY PUSHED INTO BULK DENSITY CLOD, EQUILIBRATED AT 1/10- BAR, A DISTANCE OF 0.6 CM USING A POCKET PENETROMETER. UNITS ARE FORCE (KG) AND NOT ESTIMATES OF UNCONFINED COMPRESSIVE STRENGTH.
(C) ORGANIC CARBON IS 5 KG/M SQ TO A DEPTH OF 1 M (6A).
(D) DETERMINED BY SOIL MECHANICS LAB - SCS, LINCOLN, NE.

Soil classification: Aquic Eutroboralf; fine-loamy, mixed.
Soil: Rietbrock taxadjunct*.
Soil No.: S70WI-37-5.
Location: Marathon County, Wisconsin; NE¼, SE¼, NE¼, SE¼, Sec. 34, T. 30 N., R. 6 E.; in exact center of NE quarter.
Climate: Humid continental; mean annual temperature is about 43° F; mean annual precipitation is about 30 inches; and frost-free season is about 133 days.
Vegetation and land use: Native vegetation was mixed deciduous and coniferous forests. Many areas have been maintained in woodlots or used for pasture. Small areas have been cleared for general farming.
Parent material: Thin silty sediments over residuum from greenstone and fine-grained granite rocks.
Physiography: Nearly level to gently sloping rock-controlled uplands.
Topography: Site is on a 3 percent plane slope in a grass pasture.
Drainage: Somewhat poorly drained
Ground water: Deep; a perched water table exists for short periods within 2 feet of the surface during wet seasons.
Erosion: Slight to none.
Permeability: Moderate
Described by: Paul H. Carroll

(Colors are for moist soils unless otherwise stated)

Ap1 70L902 0 to 13 cm (0 to 5 inches). Dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak fine subangular blocky structure; friable; many fine fibrous roots; trace of greenstone and fine-grained granite rock fragments 2 to 75 mm in diameter; medium acid; abrupt smooth boundary.

Ap2 70L903 13 to 22 cm (5 to 9 inches). Dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; many fine prominent mottles of yellowish brown (10YR 5/6-5/8); weak fine subangular blocky strucutre; friable; many fine fibrous roots; trace of greenstone and fine-grained granite rock fragments 2 to 75 mm in diameter; medium acid; abrupt smooth boundary.

A2 70L904 22 to 33 cm (9 to 13 inches). Brown (10YR 5/3) silt loam with many fine prominent mottles of yellowish brown (10YR 5/6-5/8); weak thin platy structure; friable; common fine fibrous roots; trace of greenstone and fine-grained granite rock fragments 2 to 75 mm in diameter; medium acid; clear wavy boundary.

IIB&A 70L905 33 to 45 cm (13 to 18 inches). Dark yellowish brown (10YR 4/4) heavy loam (Bt) with many fine distinct and prominent mottles of yellowish brown (10YR 5/6-5/8), strong brown (7.5YR 5/6-5/8), and grayish brown (10YR 5/2); moderate medium subangular blocky structure; firm; occupies about 70 percent of the horizon and consists of upward extensions of the underlying B2t horizon; few fine fibrous roots; few thin clay films on faces of peds and in continuous pores; tongues of light brownish gray (10YR 6/2) very fine sandy loam (A2) surrounds the upward extensions of B2t; weak thin platy structure; friable; 15 percent by volume of greenstone and fine-grained granite rock fragments 20 to 75 mm in diameter (20 percent 2 to 75 mm); medium acid; clear wavy boundary.

IIB21t 70L906 45 to 67 cm (18 to 26 inches). Dark brown (7.5YR 4/4) gravelly clay loam with many fine and medium distinct and prominent mottles of strong brown (7.5YR 5/8) and grayish brown (10YR 5/2); moderate fine and medium angular blocky structure; very firm; few fine fibrous roots; continuous clay films of dark brown (10YR 3/3) on faces of most peds and in tubular pores; thin patchy bleached silt coats along primary vertical cleavage planes; 20 percent by volume of greenstone and fine-grained granite rock fragments 20 to 75 mm in diameter (25 percent 2 to 75 mm); medium acid; gradual wavy boundary.

IIB22t 70L907 67 to 96 cm (26 to 38 inches). Dark brown (7.5YR 4/4) gravelly clay loam with common fine distinct and prominent mottles of strong brown (7.5YR 5/6-5/8) and many fine black (10YR 2/1) manganese spots; moderate fine and medium angular blocky structure; very firm; many thin clay films on faces of peds and in tubular pores; 15 percent by volume of greenstone and fine-grained granite rock fragments 20 to 75 mm in diameter (20 percent 2 to 75 mm); medium acid; gradual wavy boundary.

IIB3t 70L908 96 to 128 cm (38 to 50 inches). Dark brown (7.5YR 4/4) loam with common fine distinct and prominent mottles of strong brown (7.5YR 5/6-5/8)and common fine black (10YR 2/1) manganese spots; weak and moderate medium angular blocky structure; firm; many clay films on faces of peds and in tubular pores; 10 percent by volume of greenstone and fine-grained granite rock fragments 20 to 75 mm in diameter (14 percent 2 to 75 mm); medium acid; gradual wavy boundary.

IIC1 70L909 128 to 162 cm (50 to 64 inches). Dark brown (7.5YR 4/4) sandy loam with common fine prominent black (10YR 2/1) manganese spots; weak fine angular blocky structure; firm; few thin clay films on faces of peds and continuous in tubular pores; 5 percent by volume of greenstone and fine-grained granite rock fragments 20 to 75 mm in diameter (7 percent 2 to 75 mm); medium acid; gradual wavy boundary.

IIC2 70L910 162 to 192 cm (64 to 78 inches). Strong brown (7.5YR 4/4) sandy loam; weak fine and medium angular blocky structure; firm; common thin clay films on faces of peds and in tubular pores; 5 to 10 percent by volume of greenstone and fine-grained granite rock fragments 20 to 75 mm in diameter (7 to 12 percent 2 to 75 mm); medium acid; gradual wavy boundary.

IIIC3 70L911 192 to 22 cm (78 to 87 inches). Dark brown (7.5YR 4/2) gravelly sandy clay loam; weak medium and coarse angular blocky structure; firm; many thin locally derived clay films on faces of peds and in pores; clay films result from in place weathering (hydration) of biotite mica (aluminum silicate) books, giving rise to many isolated books of thin clay films; 10 percent by volume of greenstone and fine-grained granite rock fragments 20 to 75 mm in diameter (30 percent by volume of fragments coarser than 2 mm); medium acid.

*This pedon is a taxadjunct to the Rietbrock series because the base saturation is higher than is typical for that series.

SOIL CLASSIFICATION-GLOSSIC EUTRCBCRALF
COARSE-LOAMY, MIXED
SERIES - - - - - - -RCSHCLT TAXACJUNCT

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE, MTSC
NATIONAL SCIL SURVEY LABORATORY
LINCOLN, NEBRASKA

SOIL NO - - - - - - - S75WI-95-6 CCUNTY - - - PCLK

GENERAL METHCDS- - -1A,1B1B,2A1,2B SAMPLE NOS. 760210-760217

DEPTH CM	HCRIZON	SAND 2-.05	SILT .05-.002	CLAY LT .002	FINE CLAY LT .0002	VCCS 2-1	CCRS 1-.5	MEDS .5-.25	FNES .25-.10	VFNS .10-.05	COSI .05-.02	FNSI .02-.002	VFSI .005-.002	SAND 2-.10	INTR II .2-.02	FINE CLAY TO CLAY PCT	NCN-CO3-CLAY PCT	RATIO 8D1 15-BAR TO CLAY
		(- - PARTICLE SIZE ANALYSIS, LT 2MM, 3A1, 3A1A, 3A1B - -) PCT LT 2MM																
000-018	AP	53.7	41.9	4.4	1.2	5.9	18.5	16.6	7.8	4.9	24.3	17.6		48.8	31.2	27		.95
018-036	A2	56.5	39.9	3.6	1.0	7.1	18.1	17.6	8.8	4.9	22.2	17.7		51.6	29.4	28		.58
036-048	A&B	49.0	42.6	8.4	3.8	4.6	14.7	15.1	7.4	7.2	26.0	16.6		41.8	35.4	45		.48
048-066	B&A	54.5	32.1	13.4	7.1	4.8	15.0	16.3	9.5	8.9	19.1	13.0		45.6	31.0	53		.43
066-081	B2T	73.0	19.3	7.7	2.8	7.9	23.7	24.4	13.0	4.0	10.6	8.7		69.0	18.2	36		.47
081-094	2B3	76.5	17.1	6.4	2.8	10.3	22.4	26.3	14.4	3.1	9.2	7.9		73.4	16.0	44		.48
094-122	2C1	96.9	2.5	.6	.3	15.7	41.9	29.5	8.9	.9	1.0	1.5		96.0	4.3	50		
122-152	2C2	95.7	2.4	1.9	1.5	11.1	34.8	34.7	13.8	1.3	1.9	.5		94.4	6.8	79		

DEPTH CM	VCL. GT 2 PCT	GT 75 PCT	75-20	20-5	5-2	LT .074	20-2 PCT LT20	4A1D 1/3-BAR G/CC	4A1H OVEN DRY G/CC	4D1 COLE	4B1C 1/10 BAR PCT	4B1C 1/3-BAR PCT	4B2 15-BAR PCT	4C1 WRD CM/CM	CARBONATE 6E1B LT 2 PCT	3A1A LT .002 PCT	PH 8C1A 1/1 H2O	PH 8C1E 1/2 CACL
	(PARTICLE SIZE ANALYSIS, MM, 3B, 3B1, 3B2) (- - WEIGHT - -)		(- - - PCT LT 75 - - -)					(BULK DENSITY)			(- - - -WATER CONTENT- - - -)							
000-018	5	0	0	5	3	47	8	1.56	1.60	.008		18.2	4.2	.21			5.2	4.8
018-036	5	0	TR	6	3	43	9	1.77	1.79	.004		10.8	2.1	.15			5.4	5.0
036-048	5	0	TR	3	3	54	5	1.7 A					4.0				5.5	5.0
048-066	5	0	TR	3	4	49	7	1.76	1.80	.007		10.9	5.8	.09			5.2	4.6
066-081	5	0	TR	4	4	27	8	1.74	1.81	.013		11.2	3.6	.13			5.3	4.7
081-094	15	0	TR	14	7	20	21	1.60B			10.5C		3.1	.12			5.4	4.8
094-122	10	0	TR	7	7	3	14	1.59B			2.1C		1.0	.02			5.5	4.8
122-152	5	0	TR	6	6	4	12	1.6 A					1.1	.02			5.7	5.1

DEPTH CM	ORGANIC MATTER 6A1A ORGN CARB PCT	6B1A NITG PCT	C/N	IRCN 6C2B EXT FE PCT	PHOS TOTL PCT	6N2E CA	6O2D MG	6P2B NA	6Q2B K	SUM EXTB	ACTY 6H1A BACL TEA	AL 6G1E KCL EXT	CAT EXCH 5A3A EXTB ACTY	CAT EXCH 5A6A NHAC	RATIO 8D1 NHAC TO CLAY	RATIO 8D3 CA TO MG	CA 5F1 SAT NHAC PCT	BASE SAT 5C3 EXTB ACTY PCT	BASE SAT 5C1 NHAC PCT
						(- -EXTRACTABLE BASES 5B4A- -) (- - -MEQ / 100 G- - -)													
000-018	1.16	.101	11			3.5	.6	.0	.1	4.2	5.9	TR	10.1	7.3	1.66	5.8	48	42	58
018-036	.20	.025	8			2.4	.5	.0	TR	2.9	3.1	.1	6.0	4.1	1.14	4.8	59	48	71
036-048	.16	.019	8			4.4	1.3	TR	.1	5.8	3.5	.1	9.3	7.4	.88	3.4	59	62	78
048-066	.18					5.6	2.0	TR	.2	7.8	5.0	.5	12.8	10.2	.76	2.8	55	61	76
066-081	.10					3.7	1.3	TR	.1	5.1	3.1	.3	8.2	6.4	.83	2.8	58	62	80
081-094	.10					3.3	1.1	TR	.1	4.5	2.8	.2	7.3	5.4	.84	3.0	61	62	83
094-122	.03					1.4	.5	TR	TR	1.9	1.3	TR	3.2	2.3	3.83	2.8	61	59	83
122-152	.00					1.4	.6	TR	TR	2.0	.9		2.9	2.1	1.11	2.3	67	69	95

DEPTH CM	SATURATED PASTE 8E1 REST OHM-CM	8C1B PH	8A H2O PCT	NA 5D2 ESP PCT	NA 5E SAR	SALT 8D5 TOTL SCLU PPM	GYP 6F1A PCT	8A1A EC MMHOS/CM	6N1B CA	6O1B MG	6P1B NA	6Q1B K	6I1A CO3	6J1A HCO3	6K1A CL	6L1A SO4	6M1A NO3	ATTERBERG 4F1 LQID LMIT PCT	4F2 PLST INDX
								(- - SATURATION EXTRACT 8A1- -)	(- - MEQ / LITER - -)										
000-018																			
018-036																			
036-048																			
048-066																			
066-081																		170	30
081-094																			
094-122	51000	5.5	16.9					.06								.2			
122-152																			

CLAY MINERALOGY (7A2C)
36-48 MT3 KK2 VR1 MI1 QZ1
66-81 MT4 KK3 MI1 VR1 QZ1
94-122 MV3 KK2 MI1 QZ1
RELATIVE AMOUNTS: (X-RAY) 5 = DOMINANT 4 = ABUNDANT 3 = MODERATE 2 = SMALL 1 = TRACE.
MINERAL CODE: MT = MONTMORILLONITE MI = MICA KK = KAOLINITE VR = VERMICULITE QZ = QUARTZ
MV = MCNTMCRILLONITE-VERMICULITE

SAND MINERALCGY (7B1) PLACEMENT: MIXEC.
036-48 FNES - RE86 QZ75 FE11 FD11 MS2 HN1.
066-81 FNES - RE82 QZ73 FE9 FD14 MS3 HN1.
094-122 FNES - RE88 QZ78 FE9 SP1 FD9 MS2 PR1 CL.
RELATIVE AMOUNTS: AS PERCENT
MINERAL CODE: CL = CHLCRITE FD = FELDSPARS HN = HORNBLENDE MS = MUSCOVITE PR = PYROXENE QZ = QUARTZ
RE = RESISTANT MINERALS FE = IRCN MINERALS SP = SPHENE

(A) ESTIMATED
(B) CORE SAMPLE METHOD 4A3A
(C) SIEVEC SAMPLE, METHCC 4B1A
(D) LIQUID LIMIT AND PLASTIC INDEX BY USDA-SCS, SOIL MECHANICS LAB, LINCOLN, NE.

Soil classification: Glossic Eutroboralf; coarse-loamy, mixed.
Soil: Rosholt taxadjunct*.
Soil No.:S75WI-95-6.
Location: Polk County, Wisconsin; SE¼, SW¼, Sec. 29, T. 34 N., R. 15 W.; 250 feet north of Highway No. 8 by field entrance. About 45°25' N. latitude and 92°15' W. longitude.
Climate: Humid continental; mean annual temperature is 43° F; mean July temperature is 71° F; mean January temperature is 11.8° F; mean annual precipitation is 27.5 inches with about two-thirds of this occurring during the growing season; mean annual snowfall is 41.2 inches; the growing season averages 127 days. (Data from Amery, WI., weather bureau substation.)
Vegetation and use: Native vegetation was mixed northern hardwood and conifer forests. Most large areas have been cleared and are being used for general farming. This site is presently in alfalfa hay.
Parent material: Loamy outwash 20 to 40 inches thick and stratified sand and gravel.
Physiography: Nearly level to sloping outwash plains, stream terraces and morainic areas in glaciated region.
Topography: Nearly level outwash plain; sample site is on a small rise with a 2 percent convex slope.
Drainage: Well drained.
Ground water: Deep; over 5 feet.
Erosion: Slight.
Permeability: Moderate in solum and rapid in substratum.
Described by: A. J. Klingelhoets and G. B. Lee, July 1975.

(Colors are for moist soil unless otherwise stated)

Ap 760210 0 to 18 cm (0 to 7 inches). Dark grayish brown (10YR 4/2) loam; moderate fine subangular blocky structure parting to moderate medium granular; friable; many roots; estimated 3 percent by volume of coarse fragments over 2 mm in diameter; slightly acid; abrupt smooth boundary.

A2 760211 18 to 36 cm (7 to 14 inches). Brown (10YR 5/3) light loam; moderate medium platy structure; friable; estimated 3 percent by volume coarse fragments over 2 mm in diameter; many roots; slightly acid; clear wavy boundary.

A&B 760212 36 to 48 cm (14 to 19 inches). Brown (10YR 5/3) light loam (A2); weak coarse platy structure; friable; occupies about 55 percent of horizon as tongues 10 to 30 mm thick extending into or completely surrounding isolated remnants of dark yellowish brown (10YR 4/4) loam (B2t); moderate medium subangular blocky structure; firm; a few thin patchy clay films on faces of peds (B2t); estimated 5 percent by volume coarse fragments greater than 2 mm in diameter; many roots; medium acid; gradual wavy boundary.

B&A 760213 48 to 66 cm (19 to 26 inches). Dark brown (7.5YR 4/4) heavy loam (B2t); moderate medium subangular blocky structure; firm; occupies about 70 percent of the horizon; thin patchy clay films on most faces of peds (B2t); tongues of brown (10YR 5/3) loam (A2) extend to bottom of horizon; weak coarse platy structure; friable; estimated 5 percent by volume coarse fragments greater than 2 mm in diameter; many roots; medium acid; clear wavy boundary.

B2t 760214 66 to 81 cm (26 to 32 inches). Dark brown (7.5YR 4/4) light loam; weak and moderate subangular blocky structure; friable; few thin patchy clay films mostly on vertical faces of peds; many roots; medium acid; clear wavy boundary.

IIB3 760215 81 to 94 cm (32 to 37 inches). Dark brown and dark yellowish brown (7.5YR 4/4 and 10YR 4/4) loamy coarse sand; weak medium subangular blocky structure; estimated 12 percent by volume coarse fragments greater than 2 mm in diameter; many roots; medium acid; clear wavy boundary.

IIC1 760216 94 to 122 cm (37 to 48 inches). Dark brown (7.5YR 4/4) coarse sand and fine gravel; single grained; loose; stratified; estimated 8 percent by volume coarse fragments greater than 2 mm in diameter; few roots; medium acid; abrupt smooth boundary.

IIC2 760217 122 to 152 cm (48 to 60 inches). Brown and strong brown (7.5YR 5/4 and 5/6) coarse sand and fine gravel; single grained; loose; stratified; estimated 8 percent by volume coarse fragments greater than 2 mm in diameter; slightly acid.

Additional notes:
1. Much of the Onamia with little or no silt influence may be close to the coarse-loamy family.
2. pH's in field determined by Truog kit.

*This pedon has higher base saturation in the argillic horizon than that allowed for the Rosholt series.

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL Sarona taxadjunct SOIL Nos. S69WI-65-1 LOCATION Washburn County, Wisconsin

SOIL SURVEY LABORATORY Beltsville, Maryland LAB. Nos. 69B277 - 69B284

Depth (cm)	Horizon	1B1b Total Sand (2-0.05)	Total Silt (0.05-0.002)	Total Clay (< 0.002)	Sand: Very coarse (2-1)	Sand: Coarse (1-0.5)	Sand: Medium (0.5-0.25)	Sand: Fine (0.25-0.1)	Sand: Very fine (0.1-0.05)	Silt: 0.05-0.02	Silt: Int. III (0.02-0.002)	Silt: Int. II (0.2-0.02)	Silt: (2-0.1)	<.074 mm Pct.	3B2 Cm	Coarse fragments 3B1: 2A2 > 2 Pct.	2-19	19-76
		Pct. of < 2 mm															Pct. of < 76mm	
5-0	01	NOT SAMPLED																
0-3	A1	NOT SAMPLED																
3-21	A2	65.3	25.7	9.0	6.5	16.5	17.1	17.9	7.4	11.4	14.3	27.1	57.9	38.7		5	5	0
21-48	Bhir	67.3	26.5	6.2	4.6	13.4	18.4	20.8	10.1	12.7	13.8	33.1	57.2	38.0	0.85	23	14	9
48-69	Bir	67.1	24.0	8.9	4.5	12.5	18.0	21.5	10.7	12.3	11.7	33.9	56.4	39.0	0.84	24	18	6
69-81	A&B	83.4	12.9	3.7	8.4	22.3	24.7	21.1	7.0	6.8	6.1	23.1	76.4	20.3	0.85	22	13	9
81-112	B&A	69.3	26.2	4.5	8.2	18.0	20.9	12.3	10.0	18.8	7.4	29.5	59.3	36.2	0.83	23	17	6
112-137	B2t	75.5	18.1	6.4	4.9	15.1	21.0	23.7	10.8	10.3	7.8	32.8	64.7	30.3	0.87	18	16	2
137-160	B3t	78.6	15.6	5.8	6.1	15.4	22.5	24.7	9.9	8.6	7.0	30.5	68.7	26.5	0.82	24	17	7
160-175+	C	74.3	19.2	6.5	4.8	15.2	21.2	23.1	10.0	11.2	8.0	32.2	64.3	31.2	0.85	20	16	4

Depth (cm)	6A1a Organic carbon Pct.	Na Pyro. ext. 6C5a Fe Pct.	6G5a Al Pct.	C-D Al Pct.	Carbonate as $CaCO_3$ Pct.	Ext. iron as Fe Pct.	Bulk density: Plasticity Index	4A1e ⅓ bar g/cc	4A1h Oven dry g/cc	4D1 COLE	Water content Pct.	4B1c ⅓ bar Pct.	4B2 15 bar Pct.	8E1 Resistivity ohms-cm 60°F	4C1 WRD in/in	pH (1:2) $CaCl_2$	8C1c (1:1) KCl	8C1a (1:1) H_2O
3-21	6.45			0.1		0.6												
21-48	0.75	0.2	0.2	0.1		0.7	N.P.	1.57	1.64	0.02		9.0	3.1		0.09	4.4	4.0	5.1
48-69	0.50	0.2	0.2	0.2		0.8		1.58	1.57	0.00		9.2	4.3		0.08	4.8	4.3	5.5
69-81	-	0.1	tr.	0.1		0.6		1.72	1.71	0.00		6.0	1.9		0.07	4.9	4.3	5.5
81-112	-			0.1		0.5		1.81	1.85	0.01		10.3	1.8		0.15	4.9	4.3	5.6
112-137	-			tr.		0.6		1.77	1.83	0.01		9.7	2.2	15000	0.13	5.0	4.2	5.7
137-160	-			tr.		0.6		1.80	1.85	0.01		9.9	2.4	15000	0.14	5.0	4.2	5.7
160-175+	0.12			tr.		0.8		1.85	1.88	0.00		9.2	2.7	15000	0.12	4.9	4.1	5.5

Depth (cm)	Extractable bases 6N2e Ca	6O2d Mg	6P2b Na	5B4a 6Q2b K	Sum	6H2a Ext. acidity	CEC: 5A3a Sum cations	5A6a NH_4OAc	6G1e Ext. Al		Fine clay <.0002 mm Pct.	Ratios to clay: CEC sum	Ext. iron	8D1 15-bar water	8D3 Ca/Mg		Base saturation: 5C3 Sum cations Pct.	5C1 NH_4OAc Pct.
	meq/100 g																	
3-21	7.3	0.9	tr.	tr.	8.2	13.9	22.1	15.8			2.9	2.46	0.07				37	52
21-48	0.9	0.2	tr.	tr.	1.1	8.8	9.9	5.3	1.2		1.8	1.60	0.11	0.50			11	21
48-69	1.3	0.4	tr.	tr.	1.7	10.5	12.2	6.1			1.6	1.37	0.09	0.48			14	28
69-81	1.2	0.2	tr.	tr.	1.4	3.8	5.2	2.6			0.8	1.40	0.16	0.51			27	54
81-112	1.4	0.3	tr.	tr.	1.7	3.0	4.7	2.6			0.7	1.04	0.11	0.40			36	65
112-137	2.0	0.6	tr.	tr.	2.6	1.9	4.5	3.4			1.3	0.70	0.09	0.34			58	76
137-160	2.0	0.6	tr.	tr.	2.6	2.6	5.2	3.7			1.9	0.90	0.10	0.41			50	70
160-175+	2.5	0.6	tr.	tr.	3.1	3.0	6.1	4.3			2.1	0.94	0.12	0.42			51	72

Depth (cm)	Clay fraction analysis 7A1: < 0.002 mm 7A2 X-ray a/b/	7A3 DTA b/ Pct.	Sand fraction analysis 7A1: 0.2-0.02 mm 7B1 Petrographic b/ Pct.	TW
3-21 21-48 48-69	VR5,KK3,CL1,MI1,QZ1,FD1	KK20	QZ72,FE2,SP<1,FD20,MS2,HN1,EP1,TA1,AU<1,GN<1	25
69-81 81-112 112-137	VR3,KK3,CL2,MI2,QZ1,FD1	KK20	QZ81,FE2,ZR<1,FD14,HN1,EP1,MS<1,GN<1,TA<1,VR<1	16
137-160 160-175+	VR3,KK3,MI2,MT1,QZ1,FD1	KK20	QZ78,FE6,SP1,ZR<1,FD10,EP3,HN1,MS<1,AU<1,GN<1,VR<1,TA<1	14

a/Relative amounts (X-ray): 5 = dominant, 4 = abundant, 3 = moderate, 2 = small, 1 = trace.
b/Mineral code: VR = vermiculite, KK = kaolinite, CL = chlorite, MI = mica, QZ = quartz, FE = iron oxides, SP = sphene, FD = feldspar, MS = muscovite, HN = hornblende, EP = epidote, TA = talc, AU = augite, GN = garnet, ZR = zircon, MT = montmorillonite.

Soil classification: Typic Dystrochrept; coarse-loamy, mixed frigid.
Soil: Sarona taxadjunct*.
Soil No.: S69WI-65-1.
Location: Washburn County, Wisconsin; SE¼, NE¼, NE¼, Sec. 9, T. 37 N., R. 10 W.; 200 yards southwest of junction of road with the lake.
Climate: Humid continental; mean annual temperature is about 45° F; mean annual precipitation is about 30 inches and average frost-free season is 135 days.
Vegetation and land use: Native vegetation was mixed northern hardwood forest. About 50 percent of this soil is used for livestock pasture and crop production. Principal crops are corn, small grains, and forages.
Parent material: Acid loamy sand glacial till.
Physiography: Sloping to hilly glacial ground and end moraines.
Topography: Site is on a convex 5 percent slope near the top of a hill.
Drainage: Well drained.
Ground water: Deep.
Erosion: Slight.
Permeability: Moderate.
Described by: Paul H. Carroll

(Colors are for moist soil unless otherwise stated)

01 (not sampled) 5 to 0 cm (2 to 0 inches). Very dark brown (10YR 2/2) and very dark grayish brown (10YR 3/2) leaf mat; strongly acid; abrupt smooth boundary.

A1 (not sampled) 0 to 3 cm (0 to 1 inch). Very dark brown (10YR 2/2) loam or sandy loam with many white sand grains that impart a salt-and-pepper appearance to the horizon; weak fine granular structure; very friable; common roots; strongly acid; abrupt smooth boundary.

A2 69B277 3 to 21 cm (1 to 8 inches). Brown (7.5YR 4/2) and dark reddish gray (5YR 4/2) loam or sandy loam; weak fine subangular blocky structure; very friable; common roots; strongly acid; gradual wavy boundary.

Bhir 69B278 21 to 48 cm (8 to 19 inches). Dark brown (7.5YR 4/4) and reddish brown (5YR 4/4) loam or sandy loam; weak fine subangular blocky structure; very friable; common roots; strongly acid; gradual wavy boundary.

Bir 69B279 48 to 69 cm (19 to 27 inches). Dark brown (7.5YR 4/4) sandy loam; weak fine and medium subangular blocky structure; friable; common roots; strongly acid; clear wavy boundary.

A&B 69B280 69 to 81 cm (27 to 32 inches). Dark reddish gray (5YR 4/2) loamy sand and reddish brown (5YR 4/3) light sandy loam; A2 material occupies 60 to 80 percent of the horizon and surrounds isolated remnants or upward extensions of sandy loam B2t horizon; weak thin platy structure in the A2 material and weak medium subangular blocky structure in the B2t material; very friable and friable, with the B2t material being slightly fragic; slightly higher clay content in the B2t than in the A2 portions of the horizon; contains 8 to 10 percent mostly gravel with some cobblestones; common roots; strongly acid; clear wavy boundary.

B&A 69B281 81 to 112 cm (32 to 44 inches). Dark reddish brown (5YR 3/4) sandy loam upward extensions of the B2t horizon occupy approximately 60 to 70 percent of the horizon, with tongues of the dark reddish gray (5YR 4/2) and reddish brown (5YR 4/3) loamy sand A2 material penetrating the B2t from the horizon above; weak fine and medium subangular blocky structure in the B2t portion of the horizon and very weak thin platy structure in the A2 portion; firm and friable; occasional clay films on faces of peds in the B2t portion; contains 8 to 10 percent by volume of gravel and cobblestones; few roots; medium acid; clear irregular boundary.

B2t 69B282 112 to 137 cm (44 to 54 inches). Dark reddish brown (5YR 3/4) sandy loam; weak and moderate medium subangular blocky structure with weakly expressed coarse platiness; firm; clay films are thin and patchy on faces of peds; occasional tongues of A2 material penetrate this horizon; few roots; slightly acid; clear wavy boundary.

B3t 69B283 137 to 160 cm (54 to 63 inches). Dark reddish brown (5YR 3/4) and reddish brown (5YR 4/4) loamy sand; weak coarse subangular blocky structure with weakly expressed coarse platiness; friable; to firm; few thin clay films on faces of peds; slightly acid; gradual wavy boundary.

C 69B284 160 to 175 cm (63 to 69 inches). Reddish brown (5YR 4/4) loamy sand or sandy loam; weak thick platy structure to massive; friable; slightly acid.

*This pedon lacks both spodic and argillic horizons; therefore it is a taxadjunct to the Sarona series.

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL: Sarona taxadjunct SOIL Nos. S69WI-65-2 LOCATION: Washburn County, Wisconsin

SOIL SURVEY LABORATORY: Beltsville, Maryland LAB. Nos. 69B285 - 69B292

Depth (cm)	Horizon	1B1b Total Sand (2-0.05)	Total Silt (0.05-0.002)	Total Clay (< 0.002)	Sand: Very coarse (2-1)	Sand: Coarse (1-0.5)	Sand: Medium (0.5-0.25)	Sand: Fine (0.25-0.1)	Sand: Very fine (0.1-0.05)	Silt: 0.05-0.02	Silt: Int. III (0.02-0.002)	Int. II (0.2-0.02)	(2-0.1)	<.074 mm	3B2 Cm	Coarse fragments 3B1: 2A2 ≥ 2	2-19	19-76
		Size class and particle diameter (mm) 3A1 — Pct. of < 2 mm												Pct.		Pct.	Pct. of < 76mm	
5-0	O1	NOT SAMPLED																
0-5	A21	NOT SAMPLED																
5-13	A22	68.9	26.0	5.1	4.8	14.6	20.2	20.4	8.9	14.2	11.8	32.5	60.0	36.3	0.96	7	7	0
13-41	Bhir	71.6	23.6	4.8	6.1	16.1	20.5	20.2	8.7	13.2	10.4	31.1	62.9	33.6	0.83	25	18	7
41-64	Bir	74.7	20.7	4.6	4.3	15.4	21.6	23.3	10.1	10.1	10.6	31.4	64.6	30.8	0.86	19	16	3
64-87	A&B	78.7	17.5	3.8	4.6	14.7	22.5	26.4	10.5	8.5	9.0	31.8	68.2	26.8	0.90	14	12	2
87-127	B&A	80.1	15.8	4.1	5.4	16.6	23.8	24.8	9.5	8.0	7.8	29.3	70.6	25.0	0.78	29	14	15
127-152	B2t	79.2	15.1	5.7	5.2	16.3	22.8	25.0	9.9	7.8	7.3	29.5	69.3	26.0	0.86	19	11	8
152-182	B3t	76.8	15.2	8.0	6.0	16.6	22.0	23.3	8.9	7.8	7.4	27.9	67.9	27.9	0.85	20	15	5
182-203	C	77.6	14.3	8.1	5.1	17.1	23.7	23.4	8.3	6.8	7.5	26.1	69.3	26.7	0.89	15	12	3

Depth (cm)	6A1a Organic carbon	Na Pyro ext. 6C5a Fe	6G5a Al	C-D Al	Carbonate as $CaCO_3$	Ext. iron as Fe	Plasticity Index	Bulk density 4A1e ⅓ bar	4A1h Oven dry	4D1 COLE	Water content: Pct.	4B1c ⅓ bar	4B2 15 bar	8E1 Resistivity ohms-cm 60°F	4C1 WRD	pH (1:2) $CaCl_2$	8C1c (1:1) KCl	8C1a (1:1) H_2O
	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.		g/cc	g/cc		Pct.	Pct.	Pct.		in/in			
5-13	1.01			0.1		0.8		1.59	1.56	0.00		11.4	3.2		0.13	4.3	3.9	5.0
13-41	0.50	0.2	0.2	0.2		0.6	N.P.	1.59	1.62	0.01		9.8	2.6		0.11	4.7	4.3	5.4
41-64	0.12	0.1	0.1	0.1		0.6		1.78	1.75	0.00		7.0	2.0		0.09	4.9	4.4	5.8
64-87	0.12			tr.		0.6		1.85	1.85	0.00		6.1	1.7		0.08	5.1	4.3	5.8
87-127	0.12	tr.	tr.	tr.		0.6		1.79	1.84	0.01		8.3	1.8		0.12	5.0	4.2	5.7
127-152	-			tr.		0.6		1.77	1.80	0.00		7.2	2.3	20000	0.09	5.1	4.1	5.8
152-182	-			tr.		0.8		1.83	1.90	0.01		9.0	3.0	15000	0.11	5.0	4.1	5.8
182-203	-			tr.		0.8		1.86	1.92	0.01		7.9	3.0	20000	0.09	5.2	4.1	5.8

Depth (cm)	Extractable bases 5B4a: 6N2e Ca	6O2d Mg	6P2b Na	6Q2b K	Sum	6H2a Ext. acidity	CEC: 5A3a Sum cations	5A6a NH_4OAc	6G1e Ext. Al	Fine clay <.0002 mm Pct.	Ratios to clay: CEC sum	Ext. iron	8D1 15-bar water	8D3 Ca/Mg	Base saturation: 5C3 Sum cations Pct.	5C1 NH_4OAc Pct.
	meq/100 g															
5-13	0.7	0.2	tr.	tr.	0.9	9.6	10.5	5.9	1.7	1.8	2.06	0.16	0.63		8	15
13-41	0.9	0.2	tr.	tr.	1.1	6.8	7.9	4.3		0.8	1.64	0.13	0.54		14	26
41-64	0.9	0.2	tr.	tr.	1.1	7.9	9.0	2.6		0.7	1.96	0.13	0.43		12	42
64-87	1.2	0.3	tr.	tr.	1.5	2.6	4.1	3.0		1.1	1.08	0.16	0.45		36	50
87-127	1.4	0.4	tr.	tr.	1.8	2.1	3.9	2.8		0.8	0.95	0.15	0.44		46	64
127-152	1.9	0.5	tr.	tr.	2.4	2.1	4.5	3.9		1.2	0.79	0.11	0.40		53	62
152-182	2.5	0.9	tr.	tr.	3.4	2.8	6.2	5.3		2.6	0.78	0.10	0.38		55	64
182-203	2.3	0.9	tr.	tr.	3.2	2.3	5.5	4.9		1.9	0.68	0.10	0.37		58	65

Depth (cm)	Clay fraction analysis 7A1: < 0.002 mm, 7A2 X-ray a/b/	7A3 DTA b/ Pct.	Sand fraction analysis 7A1: 0.2-0.02 mm, 7B1 Petrographic b/ Pct.	TW
5-13 13-41 41-64	VR4,KK2,QZ2,FD2,MI1	KK15	QZ72,FE6,ZR<1,FD16,EP3,HN1,MS<1,GN<1,VR<1,TA<1	20
64-87 87-127	VR3,MI1,KK1,QZ1,FD1	KK5	QZ68,FE4,ZR<1,FD22,EP3,TA1,HN1,VR<1	27
127-152	MV3,MI1,KK1,QZ1	KK5	QZ75,FE3,SP<1,FD17,HN1,EP1,TA1,GN<1,BT<1,VR<1,MS<1	20
152-182 182-203	MV3,CL1,MI1,KK1,QZ1,FD1	KK5	QZ72,FE2,SP<1,FD22,HN1,EP1,VR1,EN<1,TA<1,MS<1	25

a/Relative amounts (X-ray): 5 = dominant, 4 = abundant, 3 = moderate, 2 = small, 1 = trace.
b/Mineral code: VR = vermiculite, KK = kaolinite, QZ = quartz, FE = iron oxides, ZR = zircon, FD = feldspar, EP = epidote, HN = hornblende, MS = muscovite, GN = garnet, TA = talc, MI = mica, MV = montmorillonite-vermiculite, SP = sphene, BT = biotite, CL = chlorite, EN = enstatite.

Soil classification: Typic Dystrochrept; coarse-loamy, mixed, frigid.
Soil: Sarona taxadjunct*.
Soil No.: S69WI-65-2.
Location: Washburn County, Wisconsin; NE¼, SE¼, Sec. 32, T. 38 N., R. 10 W.; 150 yards south and 50 yards west of right-angle turn in road.
Climate: Humid continental; mean annual temperature is about 45° F; mean annual precipitation is about 30 inches; and average frost-free season is 135 days.
Vegetation and land use: Native vegetation was mixed hardwood forest. About 50 percent of this soil is cultivated or used for livestock pasture. Principal crops are corn, small grain, and forage.
Parent material: Acid loamy sand glacial till.
Physiography: Sloping to hilly glacial ground and end moraines.
Topography: Site is on a 6 percent convex slope near the top of a hill.
Drainage: Well drained.
Ground water: Deep.
Erosion: Slight.
Permeability: Moderate.
Described by: Paul H. Carroll.

(Colors are for moist soils unless otherwise stated)

O1 (Not sampled) 5 to 0 cm (2 to 0 inch). Very dark brown (10YR 2/2) mat of partially decayed leaves.

A21 (Not sampled) 0 to 5 cm (0 to 2 inches). Brown (7.5YR 4/2) loamy sand; very weak granular structure that becomes single grained at the upper boundary; very friable, becoming loose at the upper boundary; strongly acid; abrupt smooth boundary.

A22 69B285 5 to 13 cm (2 to 5 inches). Brown (7.5YR 4/2) and 5/3) sandy loam; weak fine subangular blocky structure; very friable; common roots; strongly acid; clear smooth boundary.

Bhir 69B286 13 to 41 cm (5 to 16 inches). Reddish brown (5YR 4/4) and dark brown (7.5YR 4/4) sandy loam; weak fine subangular blocky structure; very friable; common roots; medium acid; clear wavy boundary.

Bir 69B287 41 to 64 cm (16 to 25 inches). Dark brown (7.5YR 4/4) sandy loam; weak fine subangular blocky structure; friable; common roots; medium acid; clear wavy boundary.

A&B 69B288 64 to 87 cm (25 to 34 inches). Dark brown (7.5YR 4/4) and brown (7.5YR 5/4) eluviated loamy (A2 material) occupies 60 to 75 percent of this horizon and surrounds isolated remnants or upward extensions of reddish brown (5YR 4/4) and dark reddish brown (5YR 3/4) sandy loam argillic horizons; weak thin platy structure in the A2 material and weak medium subangular blocky structure in the B2t material; very friable and friable with the B2t material being slightly fragic; contains 10 to 12 percent by volume of gravel and cobblestones; few roots; medium acid; clear wavy boundary.

B&A 69B289 87 to 127 cm (34 to 50 inches). Reddish brown (5YR 4/4) and dark reddish brown (5YR 3/4) sandy loam upward extensions of B2t material occupy approximately 60 to 70 percent of the horizon body, with tongues of brown (7.5YR 4/4) loamy sand A2 material penetrating the B2t from the horizon above; weak and moderate medium subangular blocky structure in the B2t material and weak medium platy structure in the A2 material; friable and firm; occasional clay films on faces of peds in the B2t material; contains 10 to 12 percent by volume of gravel and cobblestones; few roots; medium acid; clear irregular boundary.

B2t 69B290 127 to 152 cm (50 to 60 inches). Dark reddish brown (5YR 3/4) sandy loam; weak and moderate medium and coarse subangular blocky structure with weakly-expressed coarse platiness; firm; thin continuous clay films on many faces of peds, patchy on others; few tongues of dark brown (7.5YR 4/4) light sandy loam penetrate this horizon and occupy 2 to 7 percent of the horizon body; contains 10 to 12 percent by volume of gravel and cobblestones; medium acid; gradual wavy boundary.

B3t 69B291 152 to 182 cm (60 to 72 inches). Reddish brown (5YR 4/4) and dark reddish brown (5YR 3/4) loamy sand; weak coarse subangular blocky structure to nearly massive with weakly-expressed coarse platiness throughout; friable; few clay films on faces of peds and clay bridging of sand grains; contains 10 to 12 percent by volume of cobblestones and gravel; medium acid.

C 69B292 182 to 203 cm (72 to 80 inches). Reddish brown (5YR 4/4) loamy sand; weak coarse subangular blocky structure to massive with weakly-expressed coarse platiness throughout; friable; contains 10 to 12 percent by volume of gravel and cobblestones; medium acid.

*This pedon lacks both spodic and argillic horizons; therefore, it is a taxadjunct to the Sarona series.

SOIL CLASSIFICATION-TYPIC BCROSAPRIST
EUIC
SERIES - - - - - - - -SEELYEVILLE

U. S. DEPARTMENT CF AGRICULTURE
SOIL CONSERVATION SERVICE, MTSC
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

SOIL NC - - - - - - - S74NI-83-3 CCUNTY - - - OCCNTO

GENERAL METHODS- - -1A,1B1B,2A1,2B SAMPLE NOS. 74L878-74L883

DEPTH CM	HORIZON	SANC 2- .05	SILT .05- .002	CLAY LT .002	FINE CLAY LT .0002	VCOS 2- 1	CORS 1- .5	MEDS .5- .25	FNES .25- .10	VFNS .10- .05	COSI .05 .02	FNSI .02 .005-	VFSI .005- .002	SAND 2- .10	INTR II .2- .02	FINE CLAY TO CLAY	NON- CO3- CLAY PCT	RATIO 8D1 15- BAR TO CLAY
		PARTICLE SIZE ANALYSIS, LT 2MM, 3A1, 3A1A, 3A1B																
		SAND									SILT							
		PCT LT 2MM															PCT	
000-015	OAP																	
015-038	OA2																	
038-082	OA3																	
082-096	CA4																	
C96-147	OA5																	
147-167	2C	97.6	1.5	.9		.1	10.3	46.0	37.4	3.8	1.5	TR		93.8				

DEPTH CM	VCL. GT 2 PCT	GT 75 PCT	75-20	20-5	5-2	LT .C74 PCT LT 75	20-2 LT20	4A1D 1/3- BAR G/CC	4A1H OVEN DRY G/CC	4D1 COLE	4B1C 1/10 BAR PCT	4B1C 1/3- BAR PCT	4B2A 15- BAR PCT	4C1 WRD CM/CM	6E1B LT 2 PCT	3A1A LT .002 PCT	8C1A 1/1 H2O	8C1E 1/2 CACL
	PARTICLE SIZE ANALYSIS, MM, 3B, 3B1, 3B2							BULK DENSITY			WATER CONTENT				CARBONATE		PH	
	WEIGHT																	
000-015	TR	C	0	0	TR		TR						50.0				5.2	4.6
C15-038	TR	C	0	0	TR		TR	.47	.74		151	145	57.3	.44			5.1	4.6
038-082	0	C	0	0	C		0	.24	.62		336	328	85.3	.60			4.4	4.0
C82-C96	0	C	0	0	C		0	.23	.71		384	372	93.7	.67			4.4	4.0
096-147	0	C	0	0	0		0	.17	.56		553	514	101	.77			4.6	4.2
147-167	TR	C	0	C	TR		TR						1.4				4.8	4.7

DEPTH CM	6A1A ORGN CARB PCT	6B1A NITG PCT	C/N	6C2B EXT FE PCT	PHCS TOTL PCT	6N2E CA	6O2D MG	6P2B NA	6Q2B K	SUM EXTB / 100	6H1A BACL TEA	AL 6G1E KCL EXT	9A3A EXTB ACTY	5A6A NHAC	8D1 NHAC TO CLAY	8D3 CA TO MG	5F1 SAT NHAC PCT	5C3 EXTB ACTY PCT	5C1 NHAC PCT
	ORGANIC MATTER			IRCN	PHCS	EXTRACTABLE BASES 5B4A					ACTY	AL	CAT EXCH		RATIO	RATIO	CA	BASE SAT	
						MEQ													
000-015	34.1	2.34	15			40.1	13.2	.2	2.5	56.0	83.4		139	85.9		3.0	47	40	65
015-038	34.4	2.38	14			41.5	14.2	.1	1.4	57.2	91.4		149	93.0		2.9	45	38	62
038-082	32.5	2.91	11			35.3	11.9	.2	.9	48.3	132		180	104		3.0	34	27	46
082-C96	38.2	2.88	13			39.4	12.8	.3	1.0	53.5	142		196	109		3.1	36	27	49
096-147	43.8	2.82	16			35.8	12.3	.4	.9	49.4	143		192	109		2.9	33	26	45
147-167																			

DEPTH CM	8E1 REST OHM- CM	8C1B PH	8A H2C PCT	NA 5D2 ESP PCT	NA 5E SAR	SALT 8D5 TOTL SCLU PPM	GYP 6F1A PCT	8A1A EC MMHOS/ CM	6N1B CA	6O1B MG	6P1B NA	6Q1B K	6I1A CO3	6J1A HCO3	6K1A CL	6L1A SO4	6M1A NO3	4F1 LQID LMIT PCT	4F2 PLST INDX
	SATURATED PASTE							SATURATION EXTRACT 8A1										ATTERBERG	
								MEQ / LITER											
CCC-015	1CC0	4.7	192			3600		2.91	13.7	11.0	.3	4.1	0	.0	2.2	4.0	24.3		
015-038	1400	4.8	222			2600		1.90	9.0	7.3	.2	1.6	0	.0	1.5	3.1	12.7		
038-082	1400	4.2	493			4500		1.53	7.9	5.6	.2	.7	0	.3	2.2	5.1	7.7		
082-096	1700	4.2	628			4100		1.03	5.4	3.8	.2	.7	0	.3	1.5	2.6	5.0		
096-147	2800	4.4	851			27C0		.57	2.4	1.8	.2	.5	0	.6	1.0	2.8	.0		
147-167																			

DEPTH CM	8F MINL CCNT PCT	8G (FIBER UNRB PCT	VOL) RUB PCT	8H PYROPHOSPHT SCLUBILITY (MUNS CCLOR)	PH 8C1E .01M CACL	(BULK CEN) 4A3A FILD STAT G/CC	4A1I 1/3B REWT G/CC	COLE 4D1 RE- WET	SUBS RES- IDUE PCT	4B4 FILD STAT PCT	4B1C 1/3B REWT PCT	4B2 15- BAR PCT	4C1 WRD CM/CM
	(STATE CF DECCMPOSITION)					HISTOSOL CHARACTERIZATION				WATER CONTENT			
000-015	46		1	10YR 3/2	4.9	.39			78	124		49.7	
015-038	35	10	5	10YR 2/2	4.6	.42	.51	.13	100	128	120	48.2	.37
C38-082	27	18	1	7.5YR 3.5/2	4.1	.22	.30	.27	89	359	242	58.1	.55
082-096	19	8	3	7.5YR 3.5/2	4.0	.20	.33	.29	90	400	215	62.8	.50
C96-147	13	64	6	10YR 5/3	4.5	.13	.24	.33	63	670	269	65.2	.49
147-167					4.9								

Soil classification: Typic Borosaprists; euic.
Series: Seelyeville.
Pedon No.: S74WI-83-3.
Location: Oconto County, Wisconsin; SW¼, SE¼, Sec. 4, T. 30 N., R. 18 E.; 600 feet east (opposite machine shed) of farm lane. About 45.1° north latitude and about 88.2° west longitude.
Climate: Humid continental. Mean annual temperature is 43.4° F; mean July temperature is 69.6° F; mean January temperature is 15.6° F; mean annual precipitation is 27.94 inches with nearly two-thirds of the precipitation falling during the growing season; total amount of snowfall is 47.9 inches; the growing season averages 119 days, but less in the organic areas (data from Crivitz High Falls, WI, weather bureau substation).
Parent material: Deposits of herbaceous organic material more than 51 inches thick.
Physiography: Large glacial lake basin with many scattered sand "islands."
Vegetation: Area sampled was in potatoes and Cris variety of spring wheat.
Size of area: About 4,000 to 5,000 acres.
Distance to adjacent mineral soil: About 200 feet to nearest sand "island."
Depth to water table: 152 cm.
Microrelief: None
Subsidence: Estimated as moderate.
Soil temperature: Measured soil temperature of 15.2° C at 50 cm.
Described and sampled by: G.W. Hudelson, W.C. Lynn, W.E. McKinzie, G.B. Lee, and A.J. Klingelhoets on August 6, 1974. Samples were obtained from pit.

Oap 74L878 0 to 15 cm. Black (10YR 2/1) broken face, rubbed, or pressed sapric material; about 5-10 percent fiber, less than 5 percent rubbed; weak fine granular structure; very friable; fibers primarily herbaceous; about 20 percent mineral soil material; common roots; pH 5.5 (Truog); abrupt smooth boundary.

Oa2 74L879 15 to 38 cm. Black (10YR 2/0), black (10YR 2/1) rubbed or pressed sapric material; about 5-10 percent fiber, less than 5 percent rubbed; weak medium subangular blocky structure parting to weak fine subangular blocky structure; friable; fibers primarily herbaceous; about 25 percent mineral soil material; common roots; pH 5.5 (Truog); abrupt smooth boundary.

Oa3 74L880 38 to 82 cm. Black (10YR 2/0), black (10YR 2/1) rubbed or pressed sapric material; about 5-10 percent fibers, less than 5 percent rubbed; weak coarse prismatic structure parting to moderate coarse subangular blocky structure; friable; fibers primarily herbaceous; about 2.5 percent mineral soil material; common roots; pH 5.5 (Truog); abrupt wavy boundary.

Oa4 74L881 82 to 96 cm. Very dark brown (10YR 2/2), black (10YR 2/1) rubbed, very dark brown (10YR 2/2) pressed sapric material; about 25 percent fiber, 5-10 percent rubbed; weak coarse platy structure with matted areas; very friable; fibers primarily herbaceous, about 20 percent mineral soil material; few roots; pH 5.5 (Truog); clear wavy boundary.

Oa5 74L882 96 to 147 cm. Very dark grayish brown (10YR 3/2), black (10YR 2/1) rubbed, very dark grayish brown (10YR 3/2) pressed hemic material; about 60 percent fiber, 5 to 10 percent rubbed; massive; very friable; fibers primarily herbaceous; about 20 percent mineral soil material; pH 5.8 (Truog); abrupt smooth boundary.

IIC 74L883 147 to 167 cm. Grayish brown (10YR 4/2) sand; few fine faint brown (10YR 5/3) mottles; single grained; loose; pH 7.0 (Truog).

Remarks:
1. In Oa3, iron segregations along old root channels are dark reddish brown (5YR 3/4 and 3/3).

2. In Oa4, spots and streaks of soft iron (limonite) segregations, 1/2 to 3 cm in diameter, are dark reddish brown (2.5YR 3/4), dark red (2.5YR 3/6), dark reddish brown (5YR 3/3), and strong brown (7.5YR 5/6).

3. In C horizon, 3/4 inch mixed sedge and limnic material at contact of sand).

SOIL CLASSIFICATION- MOLLIC HAPLAQUEPT; FINE-SILTY OVER CLAYEY, MIXED, FRIGID
SERIES - - - - - - - SHERRY VARIANT

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NATIONAL SOIL SURVEY LABORATORY
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SOIL NO - - - - - - S70WIS-71-1 COUNTY - - - WOOD

GENERAL METHODS- - -1A,1B1B,2A1,2B SAMPLE NOS. 70L912-70L923

DEPTH CM	HORIZON	SAND 2-.05	SILT .05-.002	CLAY LT .002	FINE CLAY LT .0002	VCOS 2-1	CORS 1-.5	MEDS .5-.25	FNES .25-.10	VFNS .10-.05	COSI .05-.02	FNSI .02-.002	VFSI .005-.002	FAML TEXT SAND 2-.1	INTR II .2-.02	FINE CLAY TO CLAY	NON-CO3-CLAY	RATIO 8D1 15-BAR TO CLAY
		PARTICLE SIZE ANALYSIS, LT 2MM, 3A1, 3A1A, 3A1B (PCT LT 2MM)																
000-7	A11	7.0	68.3	24.7		.5	1.4	1.5	1.6	2.0	19.5	44.7		5.0	22.2			.98
007-16	A12	5.8	74.0	20.2		.2	.9	1.3	1.5	1.9	20.9	27.2		3.9	23.5			1.14
016-34	B21G	4.8	70.8	24.4		.0	.5	.8	.6	2.9	30.9	39.9		1.9	34.1			.45
034-53	B22G	6.7	73.7	19.6		.1	.8	1.4	1.0	3.4	37.7	36.0		3.3	41.5			.48
053-80	B23G	7.9	73.7	18.4		.2	1.1	2.0	1.5	3.1	40.1	33.6		4.8	43.8			.47
080-96	2B24	87.3	8.0	4.7		.8	18.0	39.6	25.6	3.3	5.2	2.8		84.0	14.7			.34
096-124	3B25(TB)	34.9	22.6	42.5		2.4	6.7	7.4	11.0	7.4	6.5	16.1		27.5	19.6			.32
124-160	3B26(TB)	30.4	21.5	48.1		2.0	6.6	6.0	9.3	6.5	6.1	15.4		23.9	17.5			.31
160-180	3B3(TB)	40.4	27.9	31.7		4.7	10.6	5.9	10.3	8.9	7.9	20.0		31.5	22.7			.43
180-200	3C1	44.4	34.7	20.9		.9	2.6	3.3	15.7	21.9	14.0	20.7		22.5	46.8			.81
200-240	3C2	34.0	36.4	29.6		2.3	4.3	3.7	10.6	13.1	11.3	25.1		20.9	31.3			.61
240-295	3C3	51.6	29.7	18.7		4.3	6.6	5.3	16.9	18.5	11.7	18.0		33.1	41.5			.65

DEPTH CM	(PARTICLE SIZE ANALYSIS, MM, 3B, 3B1, 3B2) VOL. GT 2 PCT	WEIGHT GT 75 PCT	75-20	20-5	5-2	LT .074	20-2 PCT LT20	(BULK DENSITY) 4A1D 1/3-BAR G/CC	4A1H OVEN DRY G/CC	4D1 COLE	(WATER CONTENT) 4B1C 1/10 BAR PCT	4B1C 1/3-BAR PCT	4B2 15-BAR PCT	4C1 WRD CM/CM	CARBONATE 6E1B LT 2 PCT	3A1A LT .002 PCT	(PH) 8C1A 1/1 H2O	8C1E 1/2 CACL
000-7	TR	0	0	TR	TR	94	TR	.85	1.05	.075	61.5	59.8	24.2	.31	3.5B		5.8	5.5
007-16	TR	0	TR	TR	TR	95	TR	.93	1.07	.048	55.7	54.7	23.1	.29	5.6B		5.2	5.0
016-34	TR	0	0	TR	TR	97	TR	1.61	1.76	.031	23.6	22.1	10.9	.18	3.1B		6.0	5.7
034-53	TR	0	0	TR	TR	96	TR	1.52	1.64	.026	26.4	24.9	9.4	.24	1.4B		7.3	6.9
053-80	TR	0	0	TR	TR	95	TR	1.62	1.75	.027	22.6	21.4	8.7	.21	2.5B		7.5	7.0
080-96	1	0	0	1	1	14	2	1.50A					1.6		7.6B		6.6	5.9
096-124	3	0	TR	3	1	66	4	1.50A					13.4				6.3	5.7
124-160	TR	0	TR	TR	1	72	1	1.50A					14.9				5.6	5.0
160-180	TR	0	0	TR	TR	64	TR	1.50A					13.6				5.8	5.2
180-200	TR	0	0	0	TR	68	TR	1.46	1.66	.045	34.2	30.4	17.0	.20	1.6B		6.3	5.9
200-240	TR	0	0	TR	TR	74	TR						18.0				7.2	6.8
240-295	TR	0	0	TR	1	58	1						12.2				7.2	6.6

DEPTH CM	(ORGANIC MATTER) 6A1A ORGN CARB PCT	6B1A NITG PCT	C/N	IRON 6C2B EXT FE PCT	PHOS TOTL PCT	(EXTRACTABLE BASES 5B4A-) 6N2E CA	6O2D MG	6P2B NA	6Q2B K	SUM EXTB / 100	ACTY 6H1A BACL TEA G-	AL 6G1E KCL EXT	(CAT EXCH) 5A3A EXTB ACTY	5A6A NHAC	RATIO 8D1 NHAC TO CLAY	RATIO 8D3 CA TO MG	CA 5F1 SAT NHAC PCT	(BASE SAT) 5C3 EXTB ACTY PCT	5C1 NHAC PCT
						(MEQ													
000-7	1.0CC	.766	14	0.5		27.3	10.3	0.3	0.4	38.3	31.6		69.9	48.9	1.98	2.7	56	55	78
007-16	9.59	.676	14	0.6		19.1	11.3	0.3	0.3	31.0	34.7		65.7	45.4	2.25	1.7	42	47	68
016-34	0.87	.066	13	0.2		9.3	9.6	0.2	0.4	19.5	5.3		24.8	19.9	0.82	1.0	47	79	98
034-53	0.32	.022		0.5		8.5	9.5	0.2	0.4	18.6	2.1		20.7	15.8	0.81	0.9	54	90	118
053-80	0.23			0.5		8.3	8.9	0.2	0.5	17.9	1.8		19.7	14.0	0.76	0.9	59	91	128
080-96	0.03			0.4		1.5	1.7	0.1	0.1	3.4	0.6		4.0	3.1	0.66	0.9	48	85	110
096-124	0.03			6.0		2.7	3.3	TR	0.2	6.2	3.0		9.2	6.1	0.14	0.8	44	67	102
124-160	0.03			6.0		2.5	3.3	TR	0.2	6.0	4.1		10.1	6.2	0.13	0.8	40	59	97
160-180	0.03			4.7		3.7	4.7	TR	0.4	8.8	2.9		11.7	9.7	0.31	0.8	38	75	91
180-200	0.03			6.5		6.3	7.9	0.1	0.7	15.0	3.7		18.7	16.4	0.78	0.8	38	80	91
200-240	0.07			5.6		7.5	9.0	0.1	0.8	17.4	2.4		19.8	17.2	0.58	0.8	44	88	101
240-295	0.02			6.1		4.2	3.5	0.1	0.5	8.3	1.3		9.6	9.6	0.51	1.2	44	86	86

DEPTH CM	(SATURATED PASTE) 8E1 REST OHM-CM	8C1B PH	8A H2O PCT	NA 5D2 ESP PCT	NA 5E SAR	SALT 8D5 TOTL SOLU PPM	GYP 6F1A PCT	(SATURATION EXTRACT 8A1) 8A1A EC MMHOS/CM	6N1B CA	6O1B MG	6P1B NA	6Q1B K	6I1A CO3	6J1A HCO3	6K1A CL	6L1A SO4	6M1A NO3	ATTERBERG 4F1 LQID LMIT PCT	4F2 PLST INDX
									(MEQ / LITER)										
000-7																			
007-16																			
016-34																			
034-53	1600	7.0	40.3	1		200		0.71	3.0	4.2	0.5	TR							
053-80																			
080-96																			
096-124	4000	5.9	37.0			40		0.21	0.7	1.0	0.1	TR							
124-160																			
160-180																			
180-200																			
200-240																			
240-295																			

(A) ESTIMATED.
(B) MICRO-PENETRATION RESISTANCE - A ROD 0.6 CM DIA IS SLOWLY PUSHED INTO BULK DENSITY CLOD, EQUILIBRATED AT 1/10- BAR, A DISTANCE OF 0.6 CM USING A POCKET PENETROMETER. UNITS ARE FORCE (KG) AND NOT ESTIMATES OF UNCONFINED COMPRESSIVE STRENGTH.
(C) ORGANIC CARBON IS 19 KG/M SQ TO A DEPTH OF 1 M (6A).

Soil classification: Mollic Haplaquept; fine-silty over clayey, mixed, frigid.
Soil: Sherry variant.
Soil No.: S70WI-71-1.
Location: Wood County, Wisconsin; NW¼, NW¼, Sec. 12, T. 23 N., R. 6 E.
Climate: Humid continental; mean annual temperature about 43° F; mean annual precipitation about 30 inches; and frost-free season is about 133 days.
Vegetation and land use: Original vegetation was sedges and water tolerant trees. Much of this soil is in pasture and woodland. Small areas are cleared for general farming.
Parent material: Silty sediments over clayey residuum from micaceous schists.
Physiography: Rock-controlled lowlands.
Topography: Nearly level site with 1 percent slope.
Drainage: Poorly drained.
Ground water: 2 meters.
Erosion: None
Permeability: Moderate to 80 cm; slow or very slow to 160 cm.
Described by: Paul H. Carroll

(Colors are for moist conditions unless otherwise stated)

A11 70L912 0 to 7 cm (0 to 3 inches). Black (10YR 2/1) silt loam; weak fine subangular blocky structure; friable; many fine fibrous roots; slightly acid; abrupt smooth boundary.

A12 70L913 7 to 16 cm (3 to 6 inches). Black (10YR 2/1) silt loam; moderate fine and medium subangular blocky structure; friable; many fine fibrous roots; slightly acid; abrupt wavy boundary.

B21g 70L914 16 to 34 cm (6 to 13 inches). Olive gray (5Y 5/2) silt loam with common fine prominent mottles of strong brown (7.5YR 5/6-5/8) and yellowish red (5YR 5/6-5/8) mostly along root channels; weak medium angular and subangular blocky structure displaying very weak thin platy structure; firm; neutral; gradual wavy boundary.

B22g 70L915 34 to 53 cm (13 to 21 inches). Olive gray (5Y 5/2) silt loam with many fine prominent mottles of strong brown (7.5YR 5/6-5/8) and yellowish red (5YR 5/6-5/8) mostly along root channels; weak medium angular and subangular blocky structure displaying very weak thin platy structure; friable; neutral; gradual wavy boundary.

B23g 70L916 53 to 80 cm (21 to 31 inches). Olive gray (5Y 5/2) silt loam with common fine prominent mottles of strong brown (7.5YR 4/6-4/8) and yellowish red (5YR 4/6-4/8) mostly along old root channels; weak medium subangular blocky structure; friable; neutral; abrupt wavy boundary.

IIB24 70L917 80 to 96 cm (31 to 38 inches). Reddish brown (5YR 5/4-4/4) medium sand; single grained; loose; slightly acid; abrupt wavy boundary.

IIIB25(tb) 70L918 96 to 124 cm (38 to 49 inches). Dusky red (10R 3/4) clay; weak coarse prismatic structure; very firm; continuous thin clay films on faces of prisms; 1 to 2 percent fine and medium subrounded polished quartz pebbles; slightly acid; abrupt wavy boundary.

IIIB26(tb) 70L919 124 to 160 cm (49 to 63 inches). Dusky red (10R 3/4) clay; weak coarse prismatic structure; very firm; common thin clay films on faces of prisms; 1 to 2 percent fine and medium subrounded polished quartz pebbles; slightly acid; clear wavy boundary.

IIIB3(tb) 70L920 160 to 180 cm (63 to 71 inches). Olive brown (2.5Y 4/4), light yellowish brown (2.5Y 6/4), brown (10YR 5/3) and yellowish brown (10YR 5/4) sandy clay loam; weak medium angular blocky structure; firm; thin, obliquely-oriented quartz vein; slightly acid; clear smooth boundary.

IIIC1 70L921 180 ro 200 cm (71 to 79 inches). Very dark grayish brown (2.5Y 3/2) and dark reddish brown (5YR 3/3) silt loam; weak very fine platy structure (rock fabric of disintegrating and weathering micaceous schist bedrock; friable; slightly acid; gradual smooth boundary.

IIIC2 70L922 200 to 240 cm (79 to 95 inches). Light yellowish brown (2.5Y 6/3), grayish green (5G 5/2), and dark reddish brown (5YR 3/3) silty clay loam or silt loam; weak thin platy structure (rock fabric of disintegrated and weathered micaceous schist bedrock); friable; slightly acid; gradual smooth boundary.

IIIC3 70L923 240 to 295 cm (95 to 113 inches). Dusky red (2.5YR 3/2-3/3) and dark reddish brown (5YR 3/2-3/3) silt loam or very fine sandy loam; weak thin platy structure (rock fabric of disintegrated and weathered micaceous schist bedrock); friable; neutral.

Additional notes: Temperature readings: 50 cm 60° F.
100 cm 59° F.
200 cm 58° F.
310 cm 53° F

The question of clay films in the IIIB25, IIIB26, and IIIB3 is subject to further inquiry. If clay films are determined to be present, the subgroup classification may need to be changed. IIB24 appears to be an old erosional surface of a truncated paleosolic profile.

SOIL CLASSIFICATION- AERIC HAPLAQUEPT; COARSE-LOAMY, MIXED, NONACID, FRIGID
SERIES - - - - - - -SHERRY TAXADJUNCT

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE, NTSC
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

SOIL NO - - - - - - S70WIS-71-4 COUNTY - - - WOOD

GENERAL METHODS- - -1A,1B1B,2A1,2B SAMPLE NOS. 70L943-70L951

DEPTH CM	HORIZON	PARTICLE SIZE ANALYSIS, LT 2MM, 3A1, 3A1A, 3A1B: SAND 2-.05	SILT .05-.002	CLAY LT .002	FINE CLAY LT .0002	SAND VCOS 2-1	CORS 1-.5	MEDS .5-.25	FNES .25-.10	VFNS .10-.05	SILT COSI .05-.02	FNSI .02-.002	VFSI .005-.002	FAML TEXT SAND 2-.1	INTR II .2-.02	FINE CLAY TO CLAY	NON-CO3-CLAY	RATIO 8D1 15-BAR TO CLAY
		PCT LT 2MM															PCT	
000-10	AP1	11.0	63.9	25.1	10.6	.4	2.2	3.0	2.4	3.0	27.2	36.7	9.5	8.0	31.2	42		.59
010-23	AP2	12.6	63.1	24.3	9.7	.4	2.5	3.5	3.0	3.2	27.6	35.5	8.8	9.4	31.9	40		.54
023-35	B1	14.2	60.9	24.9	8.9	.6	2.7	4.1	3.8	3.0	26.2	34.7	5.7	11.2	30.7	36		.46
035-52	B21T	17.3	55.5	27.2	11.4	.5	3.4	5.3	4.6	3.5	28.3	27.2	3.4	13.8	33.6	42		.45
052-83	2B22T	60.0	25.4	14.6	6.8	3.8	12.8	20.1	17.2	6.1	13.0	12.4	2.0	53.9	25.1	47		.48
083-124	2B3 1T	74.2	16.3	9.5	5.1	5.4	14.6	21.6	24.3	8.3	10.6	5.7	1.1	65.9	27.7	54		.46
124-141	2B 32T	32.9	50.3	16.8	7.5	2.0	4.8	5.3	10.7	10.1	15.1	35.2	4.5	22.8	31.2	45		.61
141-171	2C1	33.3	48.5	18.2	8.6	4.1	6.4	4.3	9.2	9.3	14.1	34.4	4.4	24.0	28.8	47		.53
171-211	2C2	30.3	52.3	17.4	7.5	3.2	6.0	3.5	7.4	10.2	18.8	33.5	3.4	20.1	33.4	43		.50

DEPTH CM	PARTICLE SIZE ANALYSIS, MM, 3B, 3B1, 3B2: VOL. GT 2 PCT	WEIGHT GT 75 PCT	75-20	20-5	5-2	LT .074	BULK DENSITY 4A1D 1/3-BAR G/CC	4A1H OVEN DRY G/CC	4D1 COLE	WATER CONTENT 4B1C 1/10 BAR PCT	4B1C 1/3-BAR PCT	4B2 15-BAR PCT	4C1 WRD CM/CM	CARBONATE 6E1B LT 2 PCT	3A1A LT .002 PCT	PH 8C1A 1/1 H2O	8C1E 1/2 CACL
			PCT LT 75														
000-10	TR	0	0	TR	TR	91	TR	1.08	1.20	.037	37.0	35.9	14.8	.23	2.88		4.4	4.2
010-23	TR	0	0	TR	TR	90	TR	1.15	1.29	.040	38.2	37.5	13.0	.29	3.68		4.5	4.2
023-35	TR	0	0	TR	TR	88	TR	1.45	1.59	.032	31.1	29.3	11.4	.26	3.08		4.8	4.1
035-52	1	0	0	TR	1	84	1	1.47	1.65	.039	27.9	26.1	12.1	.20	2.08		5.1	4.4
052-83	6	0	TR	4	7	39	11	1.61	1.84	.043	17.3	15.8	7.0	.13	3.18		6.1	5.5
083-124	15	0	TR	7	14	25	20	1.80	1.91	.017	13.9	11.4	4.4	.11	4.68		6.5	6.0
124-141	1	0	0	TR	2	72	2	1.70A					10.3				6.6	6.2
141-171	5	0	0	1	8	66	9	1.70A					9.6				6.8	6.2
171-211	1	0	0	0	1	75	1	1.68	1.83	.029	23.0	21.8	8.7	.22	2.38		6.8	6.4

DEPTH CM	ORGANIC MATTER 6A1A ORGN CARB PCT	6B1A NITG PCT	C/N	IRON 6C2B EXT FE PCT	PHOS TOTL PCT	EXTRACTABLE BASES 5B4A: 6N2E CA	6O2D MG	6P2B NA	6Q2B K	SUM EXTB	ACTY 6H1A BACL TEA	AL 6G1E KCL EXT	CAT EXCH 5A3A EXTB ACTY	5A6A NHAC	RATIO 8D1 NHAC TO CLAY	RATIO 8D3 CA TO MG	CA 5F1 SAT NHAC PCT	BASE SAT 5C3 EXTB ACTY PCT	5C1 NHAC PCT
						MEQ / 100 G													
000-10	4.21C	.338	12	0.5		9.0	3.7	0.3	0.5	13.5	18.8	1.4	32.3	25.5	1.02	2.4	35	42	53
010-23	3.24	.277	12	0.5		7.7	3.4	0.2	0.4	11.7	18.0	1.6	29.7	23.1	0.95	2.3	33	39	51
023-35	0.53	.070	8	0.9		7.2	4.5	0.2	0.3	12.2	11.6	1.7	23.8	18.7	0.75	1.6	39	51	65
035-52	0.20	.034		1.0		9.2	6.7	0.2	0.4	16.5	7.7	0.9	24.2	20.0	0.74	1.4	46	68	83
052-83	0.07	.011		1.4		6.4	4.0	0.1	0.3	10.8	3.8		14.6	11.2	0.77	1.6	57	74	96
083-124	0.04			1.4		3.5	2.4	TR	0.2	6.1	2.1		8.2	6.2	0.65	1.5	56	74	98
124-141	0.08			2.1		12.6	6.7	0.1	0.5	19.9	2.7		22.6	19.8	1.18	1.9	64	88	101
141-171	0.07			2.1		8.9	5.5	0.2	0.4	15.0	1.6		16.6	14.8	0.81	1.6	60	90	101
171-211	0.03			2.3		7.9	4.7	0.2	0.4	13.2	1.2		14.4	12.7	0.73	1.7	62	92	104

DEPTH CM	SATURATED PASTE 8E1 BEST OHM-CM	8C1B PH	8A H2O PCT	NA 5D2 ESP PCT	NA 5E SAR	SALT 8D5 TOTL SOLU PPM	GYP 6F1A PCT	SATURATION EXTRACT 8A1: 8A1A EC MMHOS/CM	6N1B CA	6O1B MG	6P1B NA	6Q1B K	6I1A CO3	6J1A HCO3	6K1A CL	6L1A SO4	6M1A NO3	ATTERBERG 4F1 LQID LIMIT PCT	4F2 PLST INDX
								MEQ / LITER											
000-10																		48D	11
010-23																			
023-35																			
035-52																			
052-83																		24D	7
083-124	8500	6.1	17.1			20		0.15	0.6	0.5	0.3	TR							
124-141																			
141-171																			
171-211																		41D	16

(A) ESTIMATED.
(B) MICRO-PENETRATION RESISTANCE - A ROD 0.6 CM DIA IS SLOWLY PUSHED INTO BULK DENSITY CLOD, EQUILIBRATED AT 1/10- BAR, A DISTANCE OF 0.6 CM USING A POCKET PENETROMETER. UNITS ARE FORCE (KG) AND NOT ESTIMATES OF UNCONFINED COMPRESSIVE STRENGTH.
(C) ORGANIC CARBON IS 11 KG/M SQ TO A DEPTH OF 1 M (6A).
(D) DETERMINED BY SOIL MECHANICS LAB - SCS, LINCOLN, NE.

Soil classification: Aeric Haplaquept; coarse-loamy, mixed, nonacid, frigid.
Soil: Sherry taxadjunct*.
Soil No.: S7OWI-71-4.
Location: Wood County, Wisconsin; NW¼, NW¼, NW¼, Sec. 4, T. 24 N., R. 5 E.; 200 feet south of county road.
Climate: Humid continental; mean annual temperature is about 43° F, mean annual precipitation is about 30 inches; and frost-free season is about 133 days.
Vegetation and land use: Native vegetation was sedge and water-tolerant trees. Much of this land is idle or in forest. Some areas are cleared and used for general farming.
Parent material: Thin silty sediments over loamy residuum from micaceous schist.
Physiography: Depressional or nearly level areas in rock-controlled upland.
Topography: Nearly level site with 1 percent slope in a pasture.
Drainage: Poorly drained.
Ground water: Deep - perched water table exists near the surface for short periods.
Erosion: None
Permeability: Moderately slow to slow.
Described by: Paul H. Carroll

(Colors are for moist conditions unless otherwise stated)

Ap1 70L943 0 to 10 cm (0 to 4 inches). Black (10YR 2/1) and very dark brown (10YR 2/2) silt loam, grayish brown (10YR 5/2) dry; common fine prominent mottles of strong brown (7.5YR 4/6-4/8); moderate fine subangular blocky structure; friable; strongly acid; clear wavy boundary.

Ap2 70L944 10 to 23 cm (4 to 9 inches). Very dark gray (10YR 3/1) silt loam mixed with a small amount of dark gray (10YR 4/1) from the B1 horizon below and having many fine prominent mottles of yellowish red (5YR 4/6-4/8); weak fine subangular blocky structure; friable; strongly acid; abrupt smooth boundary.

B1 70L945 23 to 35 cm (9 to 14 inches). Dark gray (10YR 4/1) heavy silt loam with many fine and medium prominent mottles of strong brown (7.5YR 5/6-5/8) and yellowish red (5YR 5/6-5/8); weak medium subangular blocky structure; firm; few thin interfingers of clean silt from an old A2 horizon above; few black (10YR 2/1) organic stains on faces of some peds; strongly acid; clear wavy boundary.

B21t 70L946 35 to 52 cm (14 to 20 inches). Dark gray (10YR 4/1) light silty clay loam with many fine and medium prominent mottles of strong brown (7.5YR 5/6-5/8) and yellowish red (5YR 5/6-5/8); weak medium angular and subangular blocky structure; firm; few thin clay films on faces of peds and in continuous tubular pores; medium acid; clear wavy boundary.

IIB22t 70L947 52 to 83 cm (20 to 33 inches.) Variegated yellowish brown (10YR 5/6-5/8), strong brown (7.5YR 5/6-5/8), dark yellowish brown (10YR 4/4) and dark brown (7.5YR 4/4) sandy clay loam with few medium prominent mottles of brown (7.5YR 4/2-5/2); moderate medium angular blocky structure; very firm; many thin dark brown (7.5YR 3/2) clay films on faces of peds and in tubular pores; slightly acid; gradual wavy boundary.

IIB31t 70L948 83 to 124 cm (33 to 49 inches). Dark brown (7.5YR 4/4) and reddish brown (5YR 4/4) sandy loam; weak medium and coarse subangular blocky structure; friable; few thin clay films on faces of peds and as clay bridging of sand grains; neutral; clear wavy boundary.

IIB32t 70L949 124 to 141 cm (49 to 56 inches). Reddish brown (5YR 4/4) and dark reddish brown (2.5YR 3/4) loam; weak medium subangular blocky structure; firm; few thin dark reddish brown (5YR 3/4) clay films on faces of peds and in tubular pores; neutral; clear wavy boundary.

IIC1 70L950 141 to 171 cm (56 to 68 inches).Dark reddish brown (5YR 3/2) and dark brown (7.5YR 3/2), brown (7.5YR 4/2-5/2) rubbed (pearly luster) loam; weak medium and coarse platy structure; firm; few thin clay films in root pores; neutral; clear wavy boundary.

IIC2 70L951 171 to 211 cm (68 to 84 inches). Variegated dark reddish brown (5YR 3/2-3/3),(pearly luster on rubbing), yellowish brown (10YR 5/6-5/8) and olive (5Y 4/3) loam; weak medium and coarse platy structure; firm; few thin clay films in root pores; neutral.

Additional notes: Temperature measurements: 50 cm depth - 14.2° C.
100 cm depth - 12.7° C.
150 cm depth - 11.5° C.

*This pedon lacks an argillic horizon; therefore, it is a taxadjunct to the Sherry series.

SOIL CLASSIFICATION- EUTRIC GLOSSOBORALF
COARSE-LOAMY,MIXED
SERIES - - - - - - - -STAMBAUGH TAXADJUNCT

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE, MTSC
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

SOIL NO - - - - - - S72NI-21-7 COUNTY - - - FOREST

GENERAL METHODS- - -1A,1B1B,2A1,2B SAMPLE NOS. 72L860-72L868

DEPTH CM	HORIZON	PARTICLE SIZE ANALYSIS, LT 2MM, 3A1, 3A1A, 3A1B (PCT LT 2MM) SAND 2-.05	SILT .05-.002	CLAY LT .002	FINE CLAY LT .0002	SAND VCOS 2-1	CORS 1-.5	MEDS .5-.25	FNES .25-.10	VFNS .10-.05	SILT COSI .05-.02	FNSI .02-.002	VFSI .005-.002	SAND 2-.10	INTR II .2-.02	FINE CLAY TO CLAY PCT	NON-CO3-CLAY PCT	RATIO 8D1 15-BAR TO CLAY
000-5	A1	17.9	71.9	10.2	3.5	.9	3.2	3.7	2.6	7.5	36.6	35.3		10.4	45.0	34		.84
C05-10	A2	18.3	74.0	7.7	1.5	1.7	3.2	3.7	2.3	7.4	37.0	37.0		10.9	45.3	19		.48
010-20	B21HIR	19.1	72.9	8.0	1.0	1.4	3.4	3.4	2.6	8.3	37.8	35.1		10.8	47.1	13		.86
C20-36	B22IR	19.3	74.6	6.1	.3	.9	3.1	3.4	2.4	9.5	39.3	35.3		9.8	49.7	5		.88
036-59	B*2	17.8	74.0	8.2	.7	.9	2.3	2.8	2.1	9.7	38.6	35.4		8.1	49.2	9		.65
C59-75	A&B*	20.8	65.7	13.5	3.3	1.2	3.3	4.1	2.5	9.7	35.3	30.4		11.1	45.9	24		.48
075-96	2B*21T	32.8	54.5	12.7	3.8	2.3	7.2	8.1	4.9	10.3	30.6	23.9		22.5	42.4	30		.48
C96-113	2B*22T	57.1	34.0	8.9	2.2	5.3	16.9	18.5	9.8	6.6	18.6	15.4		50.5	27.8	25		.44
113-165	2C	94.2	3.6	2.2	.8	15.3	37.3	25.8	13.8	2.0	1.6	2.0		92.2	7.6	36		.59

DEPTH CM	(PARTICLE SIZE ANALYSIS, MM, 3B, 3B1, 3B2) VOL. GT 2 PCT	WEIGHT GT 75 PCT	75-20	20-5	5-2	LT .074	20-2 PCT LT20	BULK DENSITY 4A1D 1/3-BAR G/CC	4A1H OVEN DRY G/CC	4D1 COLE	WATER CONTENT 4B1C 1/10 BAR PCT	4B1C 1/3-BAR PCT	4B2 15-BAR PCT	4C1 WRD CM/CM	CARBONATE 6E1B LT 2 PCT	3A1A LT .002 PCT	PH 8C1A 1/1 H2O	8C1E 1/2 CACL
000-5	1	0	3	1	1	84	2	1.0 A					8.6				5.2	4.8
C05-10	2	0	3	TR	4	82	4	1.1 A					3.7				4.8	4.2
010-20	2	0	0	2	2	85	4	1.19	1.26	.019	36.2	32.0	6.9	.29	.78		4.7	4.1
C20-36	2	0	0	2	2	86	4	1.18	1.21	.008	39.0	31.9	5.4	.31	1.18		4.8	4.2
036-59	1	0	0	1	1	89	2	1.4 A					5.3				4.9	4.1
C59-75	1	0	TR	1	2	86	3	1.57	1.62	.010	22.6	21.3	6.5	.23	4.1B		4.9	4.1
075-96	5	0	5	4	3	67	7	1.59	1.67	.016	22.6	20.4	6.1	.22	3.1B		4.9	4.1
C96-113	20	TR	10	9	8	35	17	1.81	1.89	.013	13.6	12.0	3.9	.13	6.3B		4.9	4.2
113-165	45	5	20	20	10	3	37	1.6 A					1.3				5.1	4.4

DEPTH CM	(ORGANIC MATTER) 6A1A ORGN CARB PCT	6B1A NITG PCT	C/N	IRON 6C2B EXT FE PCT	PHOS TOTL PCT	(EXTRACTABLE BASES 5B4A) 6N2E CA	6G2C MG	6P2B NA	6Q2B K	SUM EXTB / 100	ACTY 6H1A BACL TEA	AL 6G1E KCL EXT	(CAT EXCH) 5A3A EXTB ACTY	5A6A NHAC	RATIO 8D1 NHAC TO CLAY	RATIO 8D3 CA TO MG	CA 5F1 SAT NHAC PCT	(BASE SAT) 5C3 EXTB ACTY PCT	5C1 NHAC PCT
						(MEQ / 100 G)													
000-5	3.73C	.27B	13	.8		8.5	1.8	.1	.4	10.8	11.8	.1	22.6	17.7	1.74	4.7	48	48	61
C05-10	.87	.C79	11	.5		1.9	.5	.1	.2	2.7	7.1	1.4	9.8	8.4	1.09	3.8	23	28	32
010-20	1.81	.110	16	1.4		1.5	.3	.1	.2	2.1	19.8	3.3	21.9	14.7	1.84	5.0	10	10	14
C20-36	1.24	.C90	14	1.0		.6	.1	.1	.1	.9	16.1	2.7	17.0	11.3	1.85	6.0	5	5	8
036-59	.31			1.1		1.5	.5	.1	.1	2.2	10.4	3.6	12.6	9.8	1.20	3.0	15	17	22
C59-75	.12			1.0		3.1	1.3	.1	.2	4.7	9.1	3.3	13.8	11.2	.83	2.4	28	34	42
075-96	.12			1.3		3.3	1.5	.1	.2	5.1	8.3	2.1	13.4	10.9	.86	2.2	30	38	47
C96-113	.C5			.9		2.7	1.3	.1	.2	4.3	4.4	1.2	8.7	7.6	.85	2.1	36	49	57
113-165																			

DEPTH CM	(SATURATED PASTE) 8E1 REST OHM-CM	8C1B PH	8A H2O PCT	NA 5D2 ESP PCT	NA 5E SAR	SALT 8D5 TOTL SOLU PPM	GYP 6F1A PCT	(SATURATION EXTRACT 8A1) 8A1A EC MMHOS/CM	6N1B CA	6O1B MG	6P1B NA	6Q1B K	6I1A CO3	6J1A HCO3	6K1A CL	6L1A SO4	6M1A NO3	ATTERBERG 4F1 LQID LMIT PCT	4F2 PLST INDX
									(MEQ / LITER)										
C00-5																			
005-10																			
C1C-2C																		32D	7D
020-36	34000	4.8	42.7					.14											
C36-59																		23D	4D
059-75																			
075-96																			
C96-113	9000	4.6	20.3					.20											
113-165																			

IDENTIFICATION OF THE SPECIC HORIZON BY LABORATORY CRITERIA.

DEPTH	HORIZON	(PYROPHOSPHATE,PH10) 6C5A EXT FE PCT	6G5A EXT AL PCT	6A1B EXT C PCT	(CIT - DIT) 6C2B EXT FE PCT	6G7A EXT AL PCT	(PYROPHOSP) FE+AL / CLAY	AL+C / CLAY	PYRO FE+AL / C - D FE+AL	CEC -1/2 CLAY X THIC
010-20	B21HIR	.8	.4		1.4	.3	.15		.71	107
020-36	B22IR	.4	.4		1.0	.4	.13		.57	132

(A) ESTIMATED.
(B) MICRO-PENETRATION RESISTANCE. A ROD 0.6 CM DIA IS SLOWLY PUSHED INTO BULK DENSITY CLOD, EQUILIBRATED AT 0.1-BAR, A DISTANCE OF 0.6 CM USING A POCKET PENETROMETER. UNITS ARE FORCE (KG) AND NOT ESTIMATES OF UNCONFINED COMPRESSIVE STRENGTH.
(C) ORGANIC CARBON IS 8 KG/M SQ TO A DEPTH OF 1 M (6A).
(D) BY USDA-SCS, SOIL MECHANICS LAB, LINCOLN, NE.

Soil classification: Eutric Glossoboralf; coarse-loamy, mixed.
Soil: Stambaugh taxadjunct*.
Soil No.: S72WI-21-7 (LSL Nos. 72L860-72L868).
Location: Forest County, Wisconsin; NW¼, NW¼, Sec. 13, T. 37 N., R. 13 E.; near Highway 55.
Climate: Humid continental; mean annual temperature ranges from 40° to 45° F; mean annual precipitation ranges from 28 to 34 inches; and frost-free season is 130 to 135 days.
Vegetation and land use: Native vegetation was mixed northern hardwoods and conifers. Cutover areas are presently in aspen. About 30 percent of this soil is cleared and used for general farming. Some wooded areas are pastured.
Parent material: Silt (probably loess) over acid sand and gravel glacial outwash.
Physiography: Nearly level to sloping glacial outwash plains and stream benches.
Topography: Site is on a 1 percent plane slope in a second growth stand of hardwood and conifer trees.
Drainage: Moderate and well drained.
Ground water: Deep.
Erosion: Slight.
Permeability: Moderate.
Described by: Steve Payne and Robert Fox.
Sampled by: Robert H. Jordan and Robert L. Juve, September 22, 1972
(Colors are for moist soils unless otherwise stated)

A1 72L860 0 to 5 cm (0 to 2 inches). Dark reddish brown (5YR 2/2) silt loam; weak fine granular structure; friable; many roots; about 5 percent medium gravel; strongly acid; abrupt boundary.

A2 72L861 5 to 10 cm (2 to 4 inches). Brown (7.5YR 5/2) silt loam; weak fine subangular blocky structure; very friable; roots common; about 5 percent medium gravel; strongly acid; abrupt boundary.

B21hir 72L862 10 to 20 cm (4 to 8 inches). Reddish brown (5YR 4/3) silt loam; weak fine subangular blocky structure; very friable; many roots; few fine pores; strongly acid; clear boundary.

B22ir 72L863 20 to 36 cm (8 to 14 inches). Brown (7.5YR 4/4) silt loam; weak fine subangular blocky structure; very friable; roots common; few fine pores; strongly acid; abrupt boundary.

A'2 72L864 36 to 59 cm (14 to 23 inches). Brown (7.5YR 5/4) silt loam; weak medium platy structure parting to weak fine subangular blocky structure; friable; vesicular; few roots; strongly acid; abrupt boundary.

A&B' 72L865 59 to 75 cm (23 to 30 inches). Brown (7.5YR 5/4 and 4/4) silt loam; weak fine subangular blocky structure; friable; few tongues of brown (7.5YR 4/4) silt loam B't extend into this horizon; strongly acid; clear boundary.

IIB'21t 72L866 75 to 96 cm (30 to 38 inches). Brown (7.5YR 4/4) loam; moderate medium subangular blocky structure; firm; about 5 percent fine gravel; common thick patchy clay films; slightly vesicular; strongly acid; clear boundary.

IIB'22t 72L867 96 to 113 cm (38 to 45 inches). Brown (7.5YR 4/2) heavy sandy loam; weak medium subangular blocky structure; firm; thick patchy clay films; about 5 percent of medium gravel and 15 percent of fine gravel; a few fine pores; strongly acid; clear boundary.

IIC 72L868 113 to 165 cm (45 to 66 inches). Yellowish brown (10YR 5/4) medium and coarse sand; structureless; loose; sand is about 10 percent fine and about 15 percent coarse; some dark colored sand grains; about 10 percent of medium gravel, about 20 percent fine gravel, and about 5 percent cobblestones; strongly acid.

*This pedon lacks contrasting texture and a fragipan; therefore, it is a taxadjunct to the Stambaugh series.

SOIL CLASSIFICATION-TERRIC BOROSAPRIST
SANDY OR SANDY-SKELETAL, MIXED, EUIC
SERIES - - - - - - -TAWAS

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE, MTSC
NATIONAL SOIL SURVEY LABORATORY
LINCOLN, NEBRASKA

SOIL NO - - - - - - S74WI-75-1 COUNTY - - - MARINETTE

GENERAL METHODS- - -1A,1B1B,2A1,2B SAMPLE NOS. 74L857-74L863

DEPTH CM	HORIZON	SAND 2-.05	SILT .05-.002	CLAY LT .002	FINE CLAY LT .0002	VCOS 2-1	CORS 1-.5	MEDS .5-.25	FNES .25-.10	VFNS .10-.05	COSI .05-.02	FNSI .02-.002	VFSI .005-.002	SAND 2-.10	INTR II .2-.02	FINE CLAY TO CLAY	NON-CO3-CLAY	RATIO 8D1 15-BAR TO CLAY
		(- - - - - - - - - - - - - - - - PARTICLE SIZE ANALYSIS, LT 2MM, 3A1, 3A1A, 3A1B - - - - - - - - - -)RATIO																
						(- - - - - SAND - - - - - -)(- - -SILT- - - -)												
		(- PCT LT 2MM -)																
C00-018	CAP																	
018-036	CA2																	
036-056	CA3																	
056-076	OA4																	
076-092	CA5																	
092-097	2C1	56.9	25.0	18.1		.1	1.7	11.3	34.3	9.5	8.8	16.2		47.4				1.41
097-150	2C2	90.1	8.0	1.9		.2	3.5	21.4	54.5	10.5	5.9	2.1		79.6				1.7

DEPTH CM	VOL. GT 2 PCT	GT 75 PCT	75-20	20-5	5-2	LT .074	20-2 PCT LT20	4A1D 1/3-BAR G/CC	4A1H OVEN DRY G/CC	4D1 COLE	4B1C 1/10 BAR PCT	4B1C 1/3-BAR PCT	4B2A 15-BAR PCT	4C1 WRD CM/CM	6E1B LT 2 PCT	3A1A LT .002 PCT	8C1A 1/1 H2O	8C1E 1/2 CACL
	(PARTICLE SIZE ANALYSIS, MM, 3B, 3B1, 3B2)(BULK DENSITY)(- - - -WATER CONTENT- - - -) CARBONATE (- -PH - -)																	
	(- - - - - - - WEIGHT - - - - - - -)																	
	(- - - PCT LT 75 - - -)																	
000-018	TR	0	0	0	TR		TR	.27	.57		337	296	90.5	.66			6.6	6.1
018-036	0	0	0	0	0		0	.28	.50		302	247	92.2	.59			6.2	6.0
036-056	0	0	0	0	0		0	.25	.43		362	317	137	.56			6.0	5.7
056-076	0	0	0	0	0		0	.22	.43		415	369	105	.68			5.5	5.7
076-092	0	0	0	0	0		0						84.3				5.7	5.6
092-097	0	0	0	0	TR		TR						25.5				6.2	6.2
097-150	1	0	0	TR	1		1						3.3				4.7	4.6

DEPTH CM	6A1A ORGN CARB PCT	6B1A NITG PCT	C/N	6C2B EXT FE PCT	TOTL PCT	6N2E CA	6O2D MG	6P2B NA	6Q2B K	SUM EXTB	6H1A BACL TEA	AL 6G1E KCL EXT	5A3A EXTB ACTY	5A6A NHAC	8D1 NHAC TO CLAY	8D3 CA TO MG	5F1 SAT NHAC PCT	5C3 EXTB ACTY PCT	5C1 NHAC PCT
	(ORGANIC MATTER)			IRON	PHOS	(- -EXTRACTABLE BASES 5B4A- -)					ACTY	AL	(CAT EXCH)		RATIO	RATIO	CA	(BASE SAT)	
	(- - - - - - - - - - - -MEQ / 100 G- - - - - - - - - - -)																		
000-018	47.1	1.86	25			184	46.3	.5	.5	231	39.5		270	189		4.0	97	85	122
018-036	49.8	1.96	25			135	39.0	.3	.1	174	48.4		223	162		3.5	83	78	108
036-056	49.8	1.71	29			151	45.2	.3	.1	197	53.6		250	180		3.3	84	79	109
056-076	46.7	1.96	24			126	39.8	.2	.1	166	58.8		225	147		3.2	86	74	113
076-092	28.6	2.31	12			84.7	27.4	.2	.2	113	46.4		159	102		3.1	83	71	110
092-097	5.69	.336	17			28.2	10.3	.1	.2	38.8	13.4		52.2	30.8		2.7	92	74	126
097-150	1.10	.033	33			7.5	4.7	TR	TR	12.2	.8		13.0	3.8		1.6	197	94	321

DEPTH CM	8E1 REST OHM-CM	8C1B PH	8A H2O PCT	NA 5D2 ESP PCT	NA 5E SAR	SALT 8D5 TOTL SOLU PPM	GYP 6F1A PCT	8A1A EC MMHOS/CM	6N1B CA	6O1B MG	6P1B NA	6Q1B K	6I1A CO3	6J1A HCO3	6K1A CL	6L1A SO4	6M1A NO3	4F1 LQID LMIT PCT	4F2 PLST INDX
	(SATURATED PASTE)							(- - - - - - - - - - SATURATION EXTRACT 8A1- - - - - - - - - -)										ATTERBERG	
								(- MEQ / LITER -)											
000-018	1700	6.9	477.0			3500		.95	6.9	4.2	.4	.1	0	5.2	.0	3.8	1.7		
018-036	1400	5.7	552.0			4400		1.05	7.3	4.9	.2	TR	0	.6	.0	12.0	1.3		
036-056	1000	5.5	632.0			9100		1.65	13.1	9.2	.2	.1	0	.6	.0	23.5	.0		
056-076	650	5.2	555.0			15000		2.74	25.1	17.0	.2	.1	0	1.5	.3	44.4	.0		
076-092	610	5.3	358.0			11000		3.09	28.5	19.0	.2	.1	0	.6	.5	49.1	.0		
092-097	620	4.7	150.0			5000		3.29	27.5	24.1	.2	.2	0	.6	.5	53.1	.0		
097-150	960	6.2	28.9			1500		4.55	25.1	56.8	.2	.1	0	1.8	.5	76.3	.0		

DEPTH CM	8F MINL CONT PCT	8G (STATE OF DECOMPOSITION) (FIBER VOL) UNRB PCT	RUB PCT	8H PYROPHOSPHT SOLUBILITY (MUNS COLOR)	PH 8C1E .01M CACL	(BULK DEN) 4A3A FILD STAT G/CC	4A1I 1/3B REWT G/CC	COLE 4D1 RE-WET	SUBS RES-IDUE PCT	(- -WATER CONTENT- -) 4B4 FILD STAT PCT	4B1C 1/3B REWT PCT	4B2 15-BAR PCT	4C1 WRD CM/CM
	(- - - - - - - - - - - - - - -HISTOSOL CHARACTERIZATION- - - - - - - - - - - - - - -)												
000-018	25	30A	8A	10YR 3/2	6.6	.25			70	309		90.5	
018-036	22	16	3	10YR 3/2	6.1	.21			76B	365		80.6	
036-056	18	26	5	7.5YR 4/4	5.0	.18			82	451		82.0	
056-076	19	34	7	7.5YR 5/2	5.4	.18			81	456		85.3	
076-092			1	10YR 2/2	5.6							73.4	
092-097												16.2	
097-150												1.7	

(A) INCLUDES LIVE ROOTS (10-15 PCT).
(B) TREATED AS HALF SURFACE AND HALF SUBSURFACE.

Soil classification: Terric Borosaprist; sandy or sandy-skeletal, mixed, euic.
Series: Tawas.
Soil No.: S74WI-75-1.
Location: Marinette County, Wisconsin; SW¼, SE¼, Sec. 9, T. 30 N., R. 20 E.; 200 feet north of county road and 60 feet east of fence line. About 45.1° north latitude and about 88.0 west longitude.
Climate: Humid continental. Mean annual temperature at Marinette is 45.8° F; mean July temperature is 71.9° F; mean January temperature is 20.4° F; mean annual precipitation is 28.19 inches, with nearly two-thirds of this during the growing season; total annual snowfall is 40.3 inches; the frost-free season is 143 days but less on the bog soil areas.
Parent material: Organic soil material derived primarily from woody remains with some herbaceous materials over fine and medium sands of outwash or lacustrine derivation.
Physiography: Shallow depression in a large lake plain. Area is nearly level to gently sloping and local relief is less than 6 feet. Elevation is about 900 feet.
Vegetation: Overstory of white cedar, black ash, American elm, soft maple with understory of tag alder, willow, spirea, and dogwood in virgin site to east. Area sampled has been in pasture for 30 years and has a cover of sedges, redtop, bluegrass, and native forbs.
Size of area: Several hundred acres. Tawas occurs along the edge of the bog in a narrow belt several hundred feet wide bordering on the mineral soils.
Distance to adjacent mineral soils: 100 feet to the west.
Depth to water table; Surface was saturated to 25 cm. Water table was at 75 cm.
Microrelief: Low hummocks of 6 inches to 1 foot common over the area. Some of this was caused by cattle grazing.
Subsidence: Slight; some surface drainage had been achieved by a road ditch on the south side.
Soil temperature: Measured soil temperature of 14.7° C at 50 cm and 12.5° C at 70 cm.
Described and sampled by: G.W. Hudelson, A.J. Klingelhoets, G.B. Lee, W.E. McKinzie, and H. Lorenz on August 5, 1974. Samples were obtained from a pit dug with shovels.

Oap 74L857 0 to 18 cm. Black (7.5YR 2/1) broken face, rubbed or pressed sapric material; weak fine subangular blocky structure and weak medium granular structure; very friable; about 10 percent fibers undisturbed and less than 2 percent rubbed; fibers dominantly from woody material but some herbaceous fibers also; 25 percent mineral content; fine roots abundant; pH 7.5 (Truog); abrupt smooth boundary.

Oa2 74L858 18 to 36 cm. Black (7.5YR 2/1) broken face, rubbed or pressed sapric material; weak medium subangular blocky structure; very friable; about 30 percent fibers undisturbed, rubbed less than 5 percent; fibers dominantly from woody material with dark brown (7.5YR 3/2, 4/4, and 3/3) colors; about 30 percent mineral content; many fine roots; pH 7.5 (Truog); clear wavy boundary.

Oa3 74L859 36 to 56 cm. Black (7.5YR 2/1) broken face, rubbed, or pressed sapric material; weak coarse platy structure parting to weak medium subangular blocky structure; very friable; about 25 percent fibers undisturbed, less 10 percent rubbed; dominantly wood fibers; 35 percent mineral content; many fine roots; pH 7.5 (Truog); clear wavy boundary.

Oa4 74L860 56 to 76 cm. Black (7.5YR 2/1) broken face, rubbed, or pressed sapric material; weak coarse prismatic structure parting to weak coarse platy structure; very friable; about 20 percent fibers undisturbed, less than 10 percent rubbed; fibers are dominantly woody; 25 percent mineral content; few fine roots, dominantly sedges; pH 7.5 (Truog); gradual smooth boundary.

Oa5 74L861 76 to 92 cm. The description of this horizon is essentially the same as for the 56 to 76 cm horizon except it contains a small percent (10 percent) of limnic material especially near the contact with the mineral soil.

IIC1 74L862 92 to 97 cm. Sampled separately but not described. Transitional layer between the mineral and organic horizons.

IIC2 74L863 97 to 150 cm. Grayish brown (10YR 5/2) medium and fine sand; single grained; loose; contains thin 1/4 to 1 inch strata of silt, silty clay loam, and fine sandy loam; few medium distinct mottles of yellowish brown (10YR 5/4) in upper part of sand; moderate effervescence with HCl.

SOIL CLASSIFICATION-TYPIC HAPLUDALF
FINE-LOAMY, MIXED, MESIC
SERIES - - - - - - -THERESA

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE MRTSC
SOIL SURVEY INVESTIGATIONS UNIT
LINCOLN, NEBRASKA

SOIL NO - - - - - - S68WI-8-3 COUNTY - - - CALUMET

GENERAL METHODS- - -1A,1B1B,2A1,2B SAMPLE NOS. 68L1108-68L1117

DEPTH CM	HORIZON	PARTICLE SIZE ANALYSIS, LT 2MM, 3A1, 3A1A, 3A1B: SAND 2-.05	SILT .05-.002	CLAY LT .002	FINE CLAY LT .0002	SAND VCOS 2-1	CORS 1-.5	MEDS .5-.25	FNES .25-.10	VFNS .10-.05	SILT COSI .05-.02	FNSI .02-.002	VFSI .005-.002	FAML TEXT SAND 2-.1	INTR II .2-.02	FINE CLAY TO CLAY	NON-CO3-CLAY PCT	RATIO 8D1 15-BAR TO CLAY
		PCT LT 2MM														PCT		
000-10	A1	14.5	73.8	11.7	5.1	.5	1.5	2.3	4.5	5.7	36.6	37.2		8.8	44.7	44	12	.80
010-18	A21	14.0	76.1	9.9		.6	1.4	2.2	4.2	5.6	38.6	37.5		8.4	46.5		10	.58
018-25	A22	16.1	73.5	10.4		.4	1.7	2.6	5.2	6.2	37.5	36.0		9.9	46.5		10	.47
025-36	B1	22.5	59.1	18.4		.9	2.8	4.0	8.2	6.6	30.0	29.1		15.9	41.0		18	.43
036-46	B21T	34.4	42.9	22.7	7.1	2.3	4.7	6.8	13.1	7.5	18.2	24.7		26.9	32.6	31	23	.44
046-61	2B22T	34.1	36.5	29.4	9.2	2.4	5.1	6.2	12.9	7.5	12.9	23.6		26.6	27.4	31	29	.41
061-86	2B3	46.2	36.8	17.0		2.8	4.5	5.3	19.0	14.6	18.4	18.4		31.6	45.1		17	.36
086-112	2C1	49.0	39.9	11.1		5.4	5.7	5.7	18.3	13.9	20.1	19.8		35.1	45.3		11	.39
112-163	2C2	46.4	43.4	10.2	4.5	5.0	5.8	5.5	16.6	13.5	20.6	22.8		32.9	44.4	44	7	.37
000-20	AP (A)																	

DEPTH CM	PARTICLE SIZE ANALYSIS, MM, 3B, 3B1, 3B2: VOL. GT 2 PCT	WEIGHT GT 75 PCT	75-20	20-5	5-2	LT .074	20-2 PCT LT 75	BULK DENSITY: 4A1D 1/3-BAR G/CC	4A1H OVEN DRY G/CC	4D1 COLE	WATER CONTENT: 4B1C 1/10 BAR PCT	4B1C 1/3-BAR PCT	4B2 15-BAR PCT	4C1 WRD CM/CM	CARBONATE: 6E1B LT 2 PCT	3A1A LT .002 PCT	PH: 8C1A 1/1 H2O	8C1E 1/2 CACL
000-10	TR	0	0	TR	TR	90	TR	1.108					9.4		TR		7.0	6.5
010-18	TR	0	0	TR	TR	90	TR	1.27	1.31	.011		25.0	5.7	.25	0		6.8	6.1
018-25	TR	0	0	0	TR	88	TR	1.41	1.43	.005		19.9	4.9	.22	0		6.2	5.5
025-36	1	0	0	1	1	80	2	1.62	1.70	.016		18.2	8.0	.16	0		5.5	4.8
036-46	2	0	0	1	1	68	2	1.70	1.79	.017		17.7	10.0	.13	0		5.6	5.0
046-61	15	15	5	TR	TR	65	4	1.45	1.64	.035		23.5	12.1	.14	0		6.9	6.2
061-86	20	15	5	10	TR	50	12	1.608					6.1		40	TR	7.9	7.0
086-112	25	5	15	10	5	40	20	1.80	1.86	.008	16.8		4.3	.17	53	TR	8.0	7.2
112-163	30	5	15	20	5	40	26	1.93	1.98	.006	14.7		3.8	.15	59	3	8.2	7.3
000-20	TR	0	0	TR	TR	TR	TR	1.45	1.51	.014		20.2	4.6	.23				

DEPTH CM	ORGANIC MATTER: 6A1A ORGN CARB PCT	6B1A NITG PCT	C/N	IRON 6C2A EXT FE PCT	PHOS 6S1A TOTL PCT	EXTRACTABLE BASES 5B4A (MEQ / 100 G): 6N2E CA	6Q2D MG	6P2A NA	6Q2A K	SUM EXTB	ACTY 6H1A BACL TEA	AL 6G1D KCL EXT	CAT EXCH: 5A3A EXTB ACTY	5A6A NHAC	RATIO 8D1 NHAC TO CLAY	RATIO 8D3 CA TO MG	CA 5F SAT NHAC PCT	BASE SAT: 5C3 EXTB ACTY PCT	5C1 NHAC PCT
000-10	3.89C	.269	14	0.9		20.8	5.2	TR	0.3	26.3	5.4		31.7	21.1	1.80	4.0	99	83	125
010-18	1.68	.120	14	0.9		8.0	3.6	0.1	0.2	11.9	5.0		16.9	11.6	1.20	2.2	69	70	103
018-25	0.75	.053	14	1.0		4.3	2.6	0.1	0.1	7.1	5.6		12.7	8.7	0.84	1.7	49	56	82
025-36	0.46	.037	12	1.3		5.5	3.4	0.1	0.2	9.2	7.6		16.8	12.3	0.67	1.6	45	55	75
036-46	0.38	.031	12	1.5		7.4	4.9	0.1	0.3	12.7	7.0		19.7	14.9	0.66	1.5	50	64	85
046-61	0.38	.035	11	1.8		10.7	7.6	0.1	0.4	18.8	4.5		23.3	18.9	0.64	1.4	57	81	99
061-86	0.30			0.8		5.0D	3.3D	0.1	0.2	8.6				8.9	0.52				
086-112	0.19			0.4		3.5D	2.3D	0.1	0.1	6.0				5.0	0.45				
112-163	0.12			0.5		3.0D	1.9D	0.1	0.1	5.1				4.0	0.39				
000-20	1.58																		

DEPTH CM	SATURATED PASTE: 8E1 REST OHM-CM	8C1B PH	8A H2O PCT	NA 5D2 ESP PCT	NA 5E SAR	SALT 8D5 TOTL SOLU PPM	GYP 6F1A PCT	SATURATION EXTRACT 8A1 (MEQ / LITER): 8A1A EC MMHOS/CM	6N1B CA	6Q1B MG	6P1A NA	6Q1A K	6I1A CO3	6J1A HCO3	6K1A CL	6L1A SO4	6M1A NO3	ATTERBERG: 4F1 LQID LMIT PCT	4F2 PLST INDX
000-10																			
010-18																		28E	4
018-25																			
025-36	5800	5.1	47.5			80		0.27											
036-46																		28E	9
046-61																			
061-86																			
086-112	5800	7.8	33.4			90		0.41											
112-163																		14E	2
000-20																			

CLAY MINERALOGY (7A2C).
036-46 MI1 KK1 MV1.
046-61 MI1 KK1 MV1.
COMMENTS - BY INFERENCE, A CONSIDERABLE AMORPHOUS COMPONENT IS PRESENT. CLAY MINERALOGY IS MIXED.
RELATIVE AMOUNTS - (X-RAY) 5 = DOMINANT 4 = ABUNDANT 3 = MODERATE 2 = SMALL 1 = TRACE.
MINERAL CODE - MI = MICA KK = KAOLINITE MV = MONTMORILLONITE-VERMICULITE.
(A) COLLECTED 90 M SOUTH OF 8-3 FROM A FIELD OF ALFALFA-BROME.
(B) ESTIMATED.
(C) ORGANIC CARBON IS 10 KG PER SQ M TO A DEPTH OF 1 METER (METHOD 6A).
(D) METHODS 6N4C FOR CA AND 6Q4C FOR MG.
(E) LL AND PI BY SOIL MECHANICS LAB, USDA-SCS, LINCOLN, NE.

Soil classification: Typic Hapludalfs; fine-loamy, mixed, mesic.
Soil: Theresa.
Soil No.: S68WI-8-3.
Location: Calumet County, Wisconsin; SE¼, SE¼, Sec. 1, T. 17 N., R. 20 E.; 150 feet north or road and 25 feet east of logging road in small woodlot.
Climate: Humid continetnal. Average annual air temperature ranges from 47° to 51° F; average annual precipitation is about 21 to 31 inches; frost-free season is 130 to 140 days.
Vegetation and land use: Most of this soil, except for extremely stony areas, is cultivated and used for growing general farm crops. Native vegetation was maple-basswood forest.
Parent material: Thin silt mantle (10 to 30 inches thick) over highly calcareous light loam to sandy loam glacial till.
Physiography: Gently undulating to hilly drumlins and glacial till plains.
Topography: On a large drumlin with an east aspect. Slope is 1 percent. Site was about halfway down the slope.
Drainage: Well drained.
Ground water: Deep.
Erosion: Slight.
Permeability: Moderate.
Described by: A. Klingelhoets, R. Fox, and E. Link, August 20, 1968.

(Colors are for moist conditions unless otherwise stated)

A1 68L1108 0 to 10 cm (0 to 4 inches). Very dark brown to very dark grayish brown (10YR 2/2 to 3/2) silt loam; weak medium subangular blocks parting to moderate fine crumb structure; friable; roots common; mildly alkaline; abrupt smooth boundary.

A21 68L1109 10 to 18 cm (4 to 7 inches). Dark brown (10YR 4/3) silt loam; weak coarse platy parting to weak fine subangular blocks; friable; (nondiagnostic Bir horizon is starting to develop); roots common; few large stones in this horizon; much earthworm activity; mildly alkaline; clear wavy boundary.

A22 68L1110 18 to 25 cm (7 to 10 inches). Brown (10YR 5/3) silt loam; moderate coarse platy structure; friable; roots common; few earthworm holes and casts; few large stones extending into this horizon; mildly alkaline; clear wavy boundary.

B1 68L1111 25 to 36 cm (10 to 14 inches). Dark brown (10YR 4/3) heavy silt loam; weak coarse plates parting to moderate fine and medium subangular blocks; firm when moist; few large stones; roots common; light gray (10YR 7/2) silt coatings on vertical faces of peds; slightly acid; gradual wavy boundary.

B21t 68L1112 36 to 46 cm (14 to 18 inches). Dark yellowish brown (10YR 4/4) silty clay loam; moderate fine and medium subangular blocky structure; firm when moist; thin patchy clay films and light gray (10YR 7/2) silt coatings on faces of peds; roots common; few pebbles and stones; slightly acid; clear wavy boundary.

IIB22t 68L1113 46 to 61 cm (18 to 24 inches). Dark brown (7.5YR 4/4) heavy clay loam; moderate medium angular and subangular blocky structure; firm when moist; thick patchy clay films with dark brown (7.5YR 4/2) color; at the contact with the B3 there is a thin discontinuous beta B with some dark brown (7.5YR 3/2) organic stains; roots common; stones 3/4 to 3 inches in diameter constitute 3 percent of the volume and stones over 3 inches in diameter make up 10 percent of the volume; neutral; clear wavy boundary.

IIB3 68L1114 61 to 86 cm (24 to 34 inches). Dark brown (7.5YR 4/4) in upper part, grading to brown (7.5YR 5/4) in the lower part heavy loam; weak to moderate medium subangular blocky structure; firm when moist; many remnants of partially weathered dolomite pebbles; few thin patchy clay films; stones 3/4 to 3 inches in diameter make up 3 percent of the volume and stones over 3 inches in diameter make up 10 percent of the volume; roots common; moderately alkaline in places to calcareous around partially weathered dolomite pebbles; gradual irregular boundary.

IIC1 68L1115 86 to 112 cm (34 to 44 inches). Yellowish brown (10YR 5/4) loam; weak coarse platy structure parting to weak medium subangular blocks; friable; few tree roots; 10 percent of volume made up of stones 3/4 to 3 inches in diameter and 5 percent made up of stones over 3 inches in diameter; over 50 percent of the stones are dolomite; strong effervescence; gradual wavy boundary.

IIC2 68L1116 112 to 163 cm (44 to 64 inches). Yellowish brown (10YR 5/4) loam; weak medium subangular blocky structure; friable when moist; few tree roots in upper part; 5 percent of volume made up of stones over 3 inches in diameter and 10 percent made up of stones 3/4 to 3 inches in diameter; over 50 percent of the stones are dolomite; strong effervescence; rests abruptly on dolomite bedrock at 64 inches.

Remarks: Soil was moist when sampled. The glacial till is estimated to have over 30 percent calcium carbonate equivalent. Original vegetation is still present on this site.

Wooded site: Soil temperature at 10 inches - 20.0° C.
20 inches - 18.5° C.
40 inches - 16.0° C.

A plow layer sampled in a cultivated field, 100 feet south of the road directly across from the site in the woodlot had the following characteristics:

Pedon S68Wis-8-3(1)

Ap 68L1117 0 to 8 inches. Dark grayish brown to very dark grayish brown (10YR 4/2 to 3/2) moist; and grayish brown to light brownish gray (10YR 5/2 to 6/2) dry; silt loam; weak medium subangular blocks breaking to moderate very fine subangular blocky structure; friable when moist; mildly alkaline in reaction.
Soil temperature at 10 inches - 19.5° C.

SOIL CLASSIFICATION-TYPIC HAPLUDALF
FINE-LOAMY, MIXED, MESIC
SERIES - - - - - - -THERESA

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE MRTSC
SOIL SURVEY INVESTIGATIONS UNIT
LINCOLN, NEBRASKA

SOIL NO - - - - - - S68WI-8-4 COUNTY - - - CALUMET

GENERAL METHODS- - -1A,1B1B,2A1,2B SAMPLE NOS. 68L1118-68L1128

PARTICLE SIZE ANALYSIS, LT 2MM, 3A1, 3A1A, 3A1B (PCT LT 2MM)

DEPTH CM	HORIZON	SAND 2-.05	SILT .05-.002	CLAY LT .002	FINE CLAY LT .0002	SAND VCOS 2-1	SAND CORS 1-.5	SAND MEDS .5-.25	SAND FNES .25-.10	SAND VFNS .10-.05	SILT COSI .05-.02	SILT FNSI .02-.002	SILT VFSI .005-.002	FAML TEXT SAND 2-.1	INTR II .2-.02	FINE CLAY TO CLAY PCT	NON-CO3-CLAY PCT	RATIO 8D1 15-BAR TO CLAY
000-13	A1	19.3	67.6	13.1		.4	1.5	2.7	7.2	7.5	34.8	32.8		11.8	46.3		13	.80
013-18	A21	20.5	69.9	9.6		.6	1.7	2.8	7.3	8.1	36.1	33.8		12.4	48.2		10	.51
018-23	A22	21.9	68.3	9.8		.8	1.9	3.1	7.9	8.2	35.5	32.8		13.7	48.0		10	.42
023-30	B1	21.9	59.8	18.3		.6	2.0	3.5	8.4	7.4	32.5	27.3		14.5	44.5		18	.39
030-43	2B21T	26.3	44.1	29.6		1.6	3.1	4.5	10.4	6.7	21.4	22.7		19.6	33.6		30	.37
043-58	2B22T	28.4	33.2	38.4		2.1	3.2	4.8	11.6	6.7	13.8	19.4		21.7	26.8		38	.39
058-86	2B3T	54.2	32.7	13.1		2.6	4.1	5.5	23.3	18.7	17.5	15.2		35.5	51.1		13	.38
086-104	2C1	56.4	34.5	9.1		8.8	6.8	6.8	20.1	13.9	16.3	18.2		42.5	42.1		9	.36
104-142	2C2	48.6	41.4	10.0		5.4	5.3	5.9	18.4	13.6	18.4	23.0		35.0	43.0		10	.35
142-178	2C3	46.2	42.1	11.7		5.2	6.0	6.3	16.8	11.9	17.4	24.7		34.3	39.1		10	.32
000-15	AP (A)																	

DEPTH CM	(PARTICLE SIZE ANALYSIS, MM, 3B, 3B1, 3B2) VOL. GT 2 PCT	WEIGHT GT 75 PCT	WEIGHT 75-20 (PCT LT 75)	WEIGHT 20-5 (PCT LT 75)	WEIGHT 5-2 (PCT LT 75)	WEIGHT LT .074 (PCT LT 75)	20-2 PCT LT20	BULK DENSITY 4A1D 1/3-BAR G/CC	BULK DENSITY 4A1H OVEN DRY G/CC	4D1 COLE	WATER CONTENT 4B1C 1/10 BAR PCT	WATER CONTENT 4B1C 1/3-BAR PCT	WATER CONTENT 4B2 15-BAR PCT	WATER CONTENT 4C1 WRD CM/CM	CARBONATE 6E1B LT 2 PCT	3A1A LT .002 PCT	PH 8C1A 1/1 H2O	PH 8C1E 1/2 CACL
000-13	TR	0	0	TR	TR	86	TR	1.08	1.20	.037		34.6	10.5	.27	TR	0	6.9	6.6
013-18	TR	0	0	TR	TR	85	TR	1.34	1.39	.013		24.9	4.9	.27	0		6.9	6.2
018-23	TR	0	0	TR	TR	84	TR	1.46	1.50	.009	24.0		4.1	.30	0		6.9	6.0
023-30	TR	0	0	TR	TR	83	TR	1.61	1.66	.011		17.3	7.1	.17	0		6.7	5.9
030-43	TR	TR	TR	TR	TR	75	TR	1.50B					11.0		TR	0	6.7	6.0
043-58	15	20	5	TR	5	70	5	1.43	1.65	.041		25.3	15.1	.12	2	0	7.1	6.6
058-86	25	15	15	10	TR	40	14	1.70B					5.0		43	0	7.9	7.1
086-104	35	15	15	20	5	30	29	1.80B					3.3		50	0	8.0	7.2
104-142	25	10	5	15	5	40	22	1.90	1.96	.008	14.3		3.5	.15	55	0	8.3	7.2
142-178	25	15	10	15	TR	45	16	1.97	2.01	.005	12.6		3.8	.13	53	2	8.3	7.4
000-20	2	0	0	2	1		3	1.47	1.57	.022		21.4	7.3	.20				

DEPTH CM	(ORGANIC MATTER) 6A1A ORGN CARB PCT	6B1A NITG PCT	C/N	IRON 6C2A EXT FE PCT	PHOS 6S1A TOTL PCT	EXTRACTABLE BASES 5B4A 6N2E CA (MEQ / 100 G)	6O2D MG	6P2A NA	6Q2A K	SUM EXTB	ACTY 6H1A BACL TEA	AL 6G1D KCL EXT	(CAT EXCH) 5A3A EXTB ACTY	(CAT EXCH) 5A6A NHAC	RATIO 8D1 NHAC TO CLAY	RATIO 8D3 CA TO MG	CA 5F SAT NHAC PCT	(BASE SAT) 5C3 EXTB ACTY PCT	(BASE SAT) 5C1 NHAC PCT
000-13	4.30C			1.0		19.8	7.2	0.1	0.3	27.4	5.4		32.8	23.9	1.80	2.8	83	84	115
013-18	1.47			0.9		7.2	3.7	TR	0.2	11.1	5.5		16.6	11.1	1.20	1.9	65	67	100
018-23	0.68			0.9		4.4	2.7	TR	0.1	7.2	3.7		10.9	7.6	0.78	1.6	58	66	95
023-30	0.46			1.2		6.7	4.3	0.1	0.2	11.3	4.6		15.9	11.9	0.65	1.6	56	71	95
030-43	0.41			1.8		7.1D	6.9D	0.1	0.4	14.5	5.3	19.8	19.0	0.64	1.0	37	73	76	
043-58	0.50			1.9		13.2D	9.7D	0.1	0.5	23.5				23.9	0.62				
058-86	0.38			0.7		5.0D	2.9D	0.1	0.2	8.2				8.0	0.61				
086-104	0.30			0.5		3.2D	1.9D	TR	0.1	5.2				4.8	0.53				
104-142	0.14			0.5		2.8D	1.7D	TR	0.1	4.6				3.8	0.38				
142-178	0.16			0.4		3.3D	2.4D	0.1	0.1	5.9				4.3	0.37				
000-20	1.24																		

(A) COLLECTED 80 M WEST OF 8-4 IN AN OAT FIELD.
(B) ESTIMATED.
(C) ORGANIC CARBON IS 12 KG PER SQ M TO A DEPTH OF 1 METER (METHOD 6A).
(D) METHODS 6N4C FOR CA AND 6O4C FOR MG.

Soil classification: Typic Hapludalfs; fine-loamy, mixed, mesic .
Soil: Theresa .
Soil No.: S68WI-8-4 .
Location: Calumet County, Wisconsin; SE¼, SE¼, Sec. 21, T. 18 N., R. 20 E.; 150 feet north and 100 feet west of southwest corner of woodlot.
Climate: Climate is humid continental. Mean annual temperature ranges from about 47° to 51° F; mean annual precipitation is about 30 inches; frost-free season is about 135 days.
Vegetation and land use: Most of this soil, except for very stony areas, is used for growing general farm crops. Native vegetation was maple-basswood forest.
Parent material: Thin silt mantle (10 to 30 inches thick) over highly calcareous light loam to sandy loam glacial till.
Physiography: Gently undulating to hilly drumlins and glacial till plains.
Topography: On gently sloping ground moraine with a southwest aspect. Slope is 1 percent.
Drainage: Well drained.
Ground water: Deep.
Erosion: Slight.
Permeability: Moderate.
Described by: R.B. Grossman, R.E. Fox - August 20, 1968.

(Colors are for moist soils unless stated otherwise)

A1 68L1118 0 to 13 cm (0 to 5 inches). Very dark brown and very dark grayish brown (10YR 2/2 and 3/2) silt loam; weak fine granular structure; friable; common roots; mildly alkaline; abrupt wavy boundary.

A21 68L1119 13 to 18 cm (5 to 7 inches). Dark grayish brown (10YR 4/2) silt loam; weak fine granular structure; friable when moist; common roots; mildly alkaline; clear wavy boundary.

A22 68L1120 18 to 23 cm (7 to 9 inches). Grayish brown (10YR 5/2) silt loam; weak fine platy structure; friable when moist; common roots; neutral; gradual wavy boundary.

B1 68L1121 23 to 30 cm (9 to 12 inches). Dark brown (10YR 4/3) silt loam; moderate fine subangular blocky structure; friable when moist; over 15 percent of sand coarser than very fine; light brownish gray (10YR 6/2) silt coatings on faces of peds; common roots; slightly acid; clear wavy boundary.

IIB21t 68L1122 30 to 43 cm (12 to 17 inches). Reddish brown (5YR 4/3) loam; moderate fine subangular blocky structure; firm when moist; thick continuous clay films and light brownish gray (10YR 6/2) silt coatings on peds; 1 percent of the volume is made up of stones over 3 inches in diameter and 1 percent of stones are 3/4 to 3 inches in diameter; common roots; slightly acid; gradual wavy boundary.

IIB22t 68L1123 43 to 58 cm (17 to 23 inches). Reddish brown (5YR 4/4) clay loam; moderate fine angular blocky structure; firm when moist; thick continuous clay films with dark reddish brown (5YR 3/3) colors; many weathered dolomite pebbles; 10 percent of volume composed of stones over 3 inches in diameter and 3 percent of stones are 3/4 to 3 inches in diameter; common roots; neutral; gradual wavy boundary.

IIB3t 68L1124 58 to 86 cm (23 to 34 inches). Dark brown (10YR 4/3) loam; weak fine subangular blocky structure; friable when moist; few thin patchy clay films; 10 percent of volume made up of stones over 3 inches in diameter and 8 percent of stones are 3/4 to 3 inches in diameter; common roots; moderately alkaline; gradual irregular boundary.

IIC1 68L1125 86 to 104 cm (34 to 41 inches). Brown (10YR 5/3) light loam; weak fine fragmental blocks; friable when moist, brittle when dry; 10 percent of volume composed of stones over 3 inches in diameter and 10 percent of stones 3/4 to 3 inches in diameter; few roots; strong effervescence; gradual wavy boundary.

IIC2 68L1126 104 to 142 cm (41 to 56 inches). Brown (10YR 5/3) light loam; weak fine fragmental blocks; friable when moist, brittle when dry; 7 percent of volume composed of stones over 3 inches in diameter and 5 percent of stones are 3/4 to 3 inches in diameter; violent effervescence.

IIC3 68L1127 142 to 178 cm (56 to 70 inches). Pale brown (10YR 6/3) light loam; weak fine fragmental blocks; friable when moist, brittle when dry; 10 percent of volume composed of stones over 3 inches in diameter and 5 percent of stones are 3/4 to 3 inches in diameter; violent effervescence.

Remarks: Soil was moist when sampled. The glacial till is estimated to have over 40 percent calcium carbonate equivalent. The original vegetation is still present on the site sampled.

Soil temperature: At 10 inches - 20.5° C; at 20 inches - 19.5° C; and at 40 inches - 18.0° C.

A plow layer sampled in a cultivated field 150 feet west of the wooded site had the following characteristics:

Pedon S68WI-8-4 (1)

Ap 68L1128 0 to 15 cm (0 to 6 inches). Dark brown (10YR 3/3) silt loam; weak fine subangular blocky structure; friable when moist; mildly alkaline; abrupt smooth boundary. Temperature at 10 inches - 19.5° C.

SOIL CLASSIFICATION-TYPIC HAPLUDALF
FINE-LOAMY, MIXED, MESIC
SERIES - - - - - - -WAYMOR TAXADJUNCT

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE NRTSC
SOIL SURVEY INVESTIGATIONS UNIT
LINCOLN, NEBRASKA

SOIL NO - - - - - - S68WI-36-1 COUNTY - - - MANITOWOC

GENERAL METHODS- - -1A,1B1B,2A1,2B SAMPLE NOS. 68L1129-68L1135

DEPTH CM	HORIZON	PARTICLE SIZE ANALYSIS, LT 2MM, 3A1, 3A1A, 3A1B: SAND 2-.05 PCT LT 2MM	SILT .05-.002	CLAY LT .002	FINE CLAY LT .0002	VCOS 2-1	CORS 1-.5	MEDS .5-.25	FNES .25-.10	VFNS .10-.05	COSI .05-.02	FNSI .02-.002	VFSI .005-.002	FAML TEXT SAND 2-.1	INTR II .2-.02	FINE CLAY TO CLAY PCT	NON-CO3-CLAY PCT	RATIO 8D1 15-BAR TO CLAY
000-20	AP	30.2	61.6	8.2		1.1	2.6	5.5	11.7	9.3	34.7	26.9		20.9	50.1		8	.62
020-28	A&B	33.6	50.4	16.0		1.3	3.3	6.4	13.7	8.9	25.5	24.9		24.7	41.5		16	.38
028-46	2B21T	33.1	38.1	28.8	7.7	1.5	3.7	6.4	13.7	7.8	16.1	22.0		25.3	31.2	27	29	.35
046-64	2B22T	39.8	39.6	20.6		3.0	5.2	7.5	15.2	8.9	18.4	21.2		30.9	35.4		21	.38
064-91	2B3	51.7	37.2	11.1		2.6	5.3	8.7	20.9	14.2	19.8	17.4		37.5	46.0		11	.43
091-130	2C1	50.9	40.2	8.9		3.3	5.2	7.4	20.2	14.8	21.7	18.5		36.1	48.3		9	.40
130-170	2C2	50.9	41.4	7.7		3.9	5.3	7.2	19.9	14.6	21.3	20.1		36.3	47.3		8	.45

DEPTH CM	VOL. GT 2 PCT	WEIGHT GT 75 PCT	75-20	20-5	5-2	LT .074 PCT	20-2 LT20	BULK DENSITY 4A1D 1/3-BAR G/CC	4A1H OVEN DRY G/CC	4D1 COLE	4B1C 1/10 BAR PCT	WATER CONTENT 4B1C 1/3-BAR PCT	4B2 15-BAR PCT	4C1 WRD CM/CM	CARBONATE 6E1B LT 2 PCT	3A1A LT .002 PCT	PH 8C1A 1/1 H2O	8C1E 1/2 CACL
000-20	1	0	0	1	1	74	2	1.42	1.45	.007		19.9	5.1	.21	0.	0	7.0	6.3
020-28	1	0	0	1	1	70	2	1.40A					6.1		0	0	7.0	6.3
028-46	10	TR	10	TR	5	60	5	1.54	1.60	.012		15.8	10.1	.08	TR	0	7.2	6.6
046-64	10	TR	15	TR	TR	55	2	1.70	1.78	.014		14.6	7.9	.10	2	0	7.6	6.8
064-91	25	15	10	5	5	45	14	1.70A					4.8		24	0	7.9	7.1
091-130	20	5	5	10	5	45	16	1.78	1.82	.006	17.0		3.6	.19	33	0	8.2	7.3
130-170	20	15	5	10	5	45	15	1.86	1.90	.006	15.4		3.5	.18	34	TR	8.2	7.4

DEPTH CM	ORGANIC MATTER 6A1A ORGN CARB PCT	6B1A NITG PCT	C/N	IRON 6C2A EXT FE PCT	PHOS 6S1A TOTL PCT	EXTRACTABLE BASES 5B4A: 6N2E CA MEQ / 100 G	6Q2D MG	6P2A NA	6Q2A K	SUM EXTB	ACTY 6H1A BACL TEA	AL 6G1D KCL EXT	CAT EXCH 5A3A EXTB ACTY	5A6A NHAC	RATIO 8D1 NHAC TO CLAY	RATIO 8D3 CA TO MG	CA 5F SAT NHAC PCT	BASE SAT 5C3 EXTB ACTY PCT	5C1 NHAC PCT
000-20	1.69B	.128	13	0.8		8.0	2.5	0.1	0.1	10.7	3.6		14.3	10.4	1.30	3.2	77	75	103
020-28	0.74	.055	13	1.1		7.3	2.6	0.1	0.1	10.1	3.6		13.7	10.0	0.63	2.8	73	74	101
028-46	0.68	.065	10	1.5		10.6C	3.9C	0.1	0.3	14.9				16.6	0.58				
046-64	0.55	0.049	11	1.3		8.6C	3.2C	0.1	0.2	12.1				12.2	0.59				
064-91	0.23			0.7		4.8C	1.9C	0.1	0.1	6.9				5.9	0.53				
091-130	0.16			0.5		3.0C	1.5C	TR	0.1	4.6				3.9	0.44				
130-170	0.16			0.5		3.1C	1.6C	0.1	0.1	4.9				3.8	0.49				

DEPTH CM	SATURATED PASTE 8E1 REST OHM-CM	8C1B PH	8A H2O PCT	NA 5D2 ESP PCT	NA 5E SAR	SALT 8D5 TOTL SOLU PPM	GYP 6F1A PCT	SATURATION EXTRACT 8A1: 8A1A EC MMHOS/CM	6N1B CA	6O1B MG	6P1A NA	6Q1A K	6I1A CO3	6J1A HCO3	6K1A CL	6L1A SO4	6M1A NO3	ATTERBERG 4F1 LQID LMIT PCT	4F2 PLST INDX
000-20																			
020-28																			
028-46																		32D	11
046-64																			
064-91																			
091-130																			
130-170	7000	7.8	33.0			80		0.39											

CLAY MINERALOGY (7A2C).
028-46 MI2 KK1 VR1 MT1.
COMMENTS - BY INFERENCE, A CONSIDERABLE AMORPHOUS COMPONENT IS PRESENT. CLAY MINERALOGY IS MIXED.
RELATIVE AMOUNTS - (X-RAY) 5 = DOMINANT 4 = ABUNDANT 3 = MODERATE 2 = SMALL 1 = TRACE.
MINERAL CODE - MT = MONTMORILLONITE MI = MICA KK = KAOLINITE VR = VERMICULITE.
(A) ESTIMATED.
(B) ORGANIC CARBON IS 10 KG PER SQ M TO A DEPTH OF 1 METER (METHOD 6A).
(C) METHODS 6N4C FOR CA AND 6O4C FOR MG.
(D) LL AND PI BY SOIL MECHANICS LAB, USDA-SCS, LINCOLN, NE.

Soil classification: Typic Hapludalf; fine-loamy, mixed, mesic.
Soil: Waymor taxadjunct*.
Soil No.: S68WI-36-1.
Location: Manitowoc County, Wisconsin; SW¼, SE¼, Sec. 13, T. 21 N., R. 22 E.; 300 feet north of county park road and 400 feet west of woodlot.
Climate: The climate is humid continental. Mean annual temperature ranges from 45° to 47° F; mean annual precipitation ranges from 26 to 32 inches, and the frost-free season is about 135 days.
Vegetation and land use: Native vegetation was mixed hardwoods, predominantly maple, basswood, beech, oak, yellow birch, and elm. About 80 percent of this soil is cultivated or in pasture. Corn, oats, and legume hay are the principal crops.
Parent material: Calcareous loam and sandy loam glacial till with a thin silt mantle.
Physiography: Gently sloping to moderately steep plane and convex slopes on glacial ground moraines.
Topography: Site is on a convex slope of 2 percent with a southeast aspect.
Drainage: Well drained.
Ground water: Deep.
Erosion: Slight.
Permeability: Moderate
Described by: Robert Fox, Ernest Link, Howard Lorenz, August 21, 1968.

(Colors are for moist soil unless otherwise stated)

Ap 68L1129 0 to 20 cm (0 to 8 inches). Very dark grayish brown (10YR 3/2) silt loam, light brownish gray (10YR 6/2) dry; weak fine subangular blocky structure; friable when moist; common roots; much earthworm activity (casts and holes); neutral; abrupt smooth boundary.

A&B 68L1130 20 to 28 cm (8 to 11 inches). Dark brown (10YR 4/3) silt loam; weak fine subangular blocky structure parting to weak fine granules; friable when moist; common roots; few pebbles and earthworm casts; neutral; abrupt wavy boundary.

IIB21t 68L1131 28 to 46 cm (11 to 18 inches). Reddish brown (5YR 4/4, crushed) clay loam; moderate fine angular blocky structure; firm when moist, hard when dry; thick continuous clay films with dark reddish brown (5YR 3/4) colors; 1 percent of volume composed of stones over 3 inches in diameter and 5 percent of stones 3/4 to 3 inches in diameter; common roots; mildly alkaline; gradual wavy boundary.

IIB22t 68L1132 46 to 64 cm (18 to 25 inches). Dark reddish brown (5YR 3/4, crushed) clay loam; moderate fine angular blocky structure; firm when moist; thick continuous clay films with dark reddish brown (5YR 3/3) colors; 1 percent of volume composed of stones over 3 inches in diameter and 10 percent of stones 3/4 to 3 inches in diameter; many of the stones are partly weathered dolomite; common roots; mildly alkaline; clear wavy boundary.

IIB3 68L1133 64 to 91 cm (25 to 36 inches). Brown (7.5YR 5/4) loam; weak fine subangular blocky structure; friable when moist; 10 percent of volume composed of stones over 3 inches in diameter and 5 percent of stones 3/4 to 3 inches in diameter, most of them are dolomite and partly weathered; common roots; mildly alkaline; gradual wavy boundary.

IIC1 68L1134 91 to 130 cm (36 to 51 inches). Brown (7.5YR 5/4) heavy fine sandy loam; weak fine fragmental blocks; friable when moist; 5 percent of volume composed of stones over 3 inches in diameter and 5 percent of stones 3/4 to 3 inches in diameter; a few bright chroma mottles, and spots and streaks of free carbonates; few roots; strong effervescence.

IIC2 68L1135 130 to 170 cm (51 to 67 inches). Brown (7.5YR 5/4) heavy fine sandy loam; weak fine fragmental blocks; friable when moist; 10 percent of volume composed of stones over 3 inches in diameter and 3 percent of stones 3/4 to 3 inches in diameter; few bright chroma mottles, and streaks of free carbonates; strong effervescence.

Remarks: Soil nearly dry in solum and moist in substratum when sampled. The glacial till is bordering on loam texture with a moderate to high carbonate content. Original vegetation consisted of mixed hardwood with occasional scattered conifers. In the past this soil was included in with the Miami series but is now considered outside of the range as presently defined.

Soil temperature: At 10 inches - 20.0° C.
20 inches - 19.5° C.
40 inches - 17.0° C.

*This pedon lacks tongues of albic material in the argillic horizon; therefore, it is a taxadjunct to the Waymor series.

SOIL CLASSIFICATION-TYPIC HAPLUDALF
FINE-LOAMY, MIXED, MESIC
SERIES - - - - - - -WAYMOR TAXADJUNCT

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE MRTSC
SOIL SURVEY INVESTIGATIONS UNIT
LINCOLN, NEBRASKA

SOIL NO - - - - - - S68WI-36-2 COUNTY - - - MANITOWOC

GENERAL METHODS- - -1A,1B1B,2A1,2B SAMPLE NOS. 68L1136-68L1143

DEPTH CM	HORIZON	SAND 2-.05	SILT .05-.002	CLAY LT .002	FINE CLAY LT .0002	VCOS 2-1	CORS 1-.5	MEDS .5-.25	FNES .25-.10	VFNS .10-.05	COSI .05-.02	FNSI .02-.002	VFSI .005-.002	FAML TEXT SAND 2-.1	INTR II .2-.02	FINE CLAY TO CLAY PCT	NON-CO3-CLAY PCT	RATIO 8D1 15-BAR TO CLAY
		(- - PARTICLE SIZE ANALYSIS, LT 2MM, 3A1, 3A1A, 3A1B - -) PCT LT 2MM																
000-018	AP	38.5	53.4	8.1		.8	2.0	4.4	17.2	14.1	31.5	21.9		24.4	56.5		8	.64
018-28	A2	42.4	52.0	5.6		.9	2.8	5.8	18.0	14.9	31.2	20.8		27.5	57.0		7	.50
028-38	2B1	44.3	38.9	16.8		2.0	4.5	8.0	18.8	11.0	19.4	19.5		33.3	40.9		17	.33
038-61	2B21T	39.4	33.8	26.8		2.1	3.6	6.6	17.0	10.1	16.2	17.6		29.3	35.8		27	.35
061-89	2B22T	47.5	33.7	18.8		1.7	4.0	7.3	20.3	14.2	17.8	15.9		33.3	43.8		19	.37
089-119	2B3T	40.2	40.9	18.9		2.3	4.0	5.7	15.7	12.5	20.6	20.3		27.7	42.1		19	.40
119-147	2C1	46.8	39.8	13.4		4.5	5.9	7.2	17.8	11.4	18.8	21.0		35.4	40.0		13	.38
147-173	2C2	60.1	32.1	7.8		6.1	7.4	11.0	23.0	12.6	17.2	14.9		47.5	42.3		8	.38

DEPTH CM	(PARTICLE SIZE ANALYSIS, MM, 3B, 3B1, 3B2) VOL. GT 2 PCT	WEIGHT GT 75 PCT	75-20	20-5	5-2	LT .074	20-2 PCT LT20	(BULK DENSITY) 4A1D 1/3-BAR G/CC	4A1H OVEN DRY G/CC	4D1 COLE	(WATER CONTENT) 4B1C 1/10 BAR PCT	4B1C 1/3-BAR PCT	4B2 15-BAR PCT	4C1 WRD CM/CM	CARBONATE 6E1B LT 2 PCT	3A1A LT .002 PCT	(PH) 8C1A 1/1 H2O	8C1E 1/2 CACL
			(- - - PCT LT 75 - - -)															
000-018	TR	0	0	TR	TR	70	TR	1.45	1.49	.009		20.1	5.2	.22	0		7.0	6.5
018-28	1	0	0	1	1	65	2	1.58	1.59	.002	19.1		2.8	.26	0		7.0	6.2
028-38	2	0	0	1	1	60	2	1.67	1.69	.004		12.3	5.6	.11	0		6.7	5.8
038-61	15	15	10	TR	TR	55	3	1.49	1.60	.020		16.8	9.4	.09	TR	0	7.3	6.8
061-89	15	15	5	5	TR	50	8	1.48	1.57	.017		19.1	6.9	.15	18	0	7.9	7.1
089-119	4	0	0	6	1	62	7	1.58	1.64	.012		17.1	7.6	.14	22	0	7.9	7.3
119-147	15	5	5	10	5	50	11	1.87	1.90	.005		13.6	5.1	.14	35	0	8.2	7.5
147-173							19						3.0		39	0	8.2	7.5

DEPTH CM	(ORGANIC MATTER) 6A1A ORGN CARB PCT	6B1A NITG PCT	C/N	IRON 6C2A EXT FE PCT	PHOS 6S1A TOTL PCT	(EXTRACTABLE BASES 5B4A) 6N2E CA	6O2D MG	6P2A NA	6Q2A K	SUM EXTB	ACTY 6H1A BACL TEA	AL 6G1D KCL EXT	(CAT EXCH) 5A3A EXTB ACTY	5A6A NHAC	RATIO 8D1 NHAC TO CLAY	RATIO 8D3 CA TO MG	CA 5F SAT NHAC PCT	(BASE SAT) 5C3 EXTB ACTY PCT	5C1 NHAC PCT
						(- - - MEQ / 100 G - - -)													
000-018	1.91A			0.7		7.6	2.9	0.1	0.3	10.9	3.6		14.5	10.0	1.20	2.6	76	75	109
018-28	0.49			0.7		3.2	1.2	0.1	0.1	4.6	3.0		7.6	4.5	0.80	2.7	71	61	102
028-38	0.41			1.2		4.9	3.1	0.1	0.2	8.3	3.8		12.1	8.6	0.51	1.6	57	69	97
038-61	0.46			1.3		9.8B	4.6B	0.1	0.3	14.8				14.0	0.52				
061-89	0.33			0.9		6.0B	3.1B	0.1	0.2	9.4				8.8	0.47				
089-119	0.28			0.8		6.3B	3.3B	0.1	0.2	9.9				8.9	0.47				
119-147	0.16			0.5		5.3B	2.0B	0.1	0.1	7.5				5.2	0.39				
147-173	0.16			0.4		3.0B	1.5B	0.1	0.1	4.7				3.3	0.42				

(A) ORGANIC CARBON IS 9 KG PER SQ M TO A DEPTH OF 1 METER (METHOD 6A).
(B) METHODS 6N4C FOR CA AND 6O4C FOR MG.

Soil classification: Typic Hapludalf; fine-loamy, mixed, mesic.
Soil: Waymor taxadjunct*.
Soil No.: S68WI-36-2.
Location: Manitowoc County, Wisconsin; SW¼, SW¼, Sec. 10, T. 21 N., R. 22 E.; 140 feet east of road and 60 feet south of field boundary.
Climate: The climate is humid continental; mean annual temperature ranges from 45° to 47° F; mean annual precipitation ranges from 26 to 32 inches; and the frost-free season is about 135 days.
Vegetation and land use: Native vegetation was mixed hardwoods, predominantly maple, basswood, beech, yellow birch, and oak. About 80 percent of this soil is cultivated or in pasture. Corn, oats, and legume hay are the principal crops.
Parent material: Calcareous loam on sandy loam glacial till with a thin silt mantle.
Physiography: Gently sloping to moderately steep plane and convex slopes on glacial ground moraine.
Topography: Site is on a 3 percent convex slope with a southwest aspect.
Drainage: Well drained.
Ground water: Deep.
Erosion: Slight.
Permeability: Moderate.
Described by: R. Fox, E. Link, H. Lorenz, Aug. 21, 1968.

(Colors are for moist soil unless otherwise stated)

Ap 68L1136 0 to 18 cm (0 to 7 inches). Very dark grayish brown (10YR 3/2) silt loam, light brownish gray (10YR 6/2) dry; weak fine subangular blocky structure; friable; common roots; mildly alkaline; abrupt smooth boundary.

A2 68L1137 18 to 28 cm (7 to 11 inches). Brown (10YR 5/3) silt loam; weak medium platy structure; friable when moist; common roots; moderately alkaline; clear wavy boundary.

IIB1 68L1138 28 to 38 cm (11 to 15 inches). Reddish brown (5YR 4/4, crushed) loam; weak fine subangular blocky structure; friable when moist; silt coatings (skeletans) grayish brown (10YR 5/2) on peds; common roots; moderately alkaline; clear wavy boundary.

IIB21t 68L1139 38 to 61 cm (15 to 24 inches). Reddish brown (5YR 4/4, crushed) clay loam; moderate fine angular blocky structure; firm when moist; thick continuous clay films with dark reddish brown (5YR 3/4) colors on faces of peds; 10 percent of volume composed of stones over 3 inches in diameter and 5 percent of stones 3/4 to 3 inches in diameter; common roots; neutral; gradual wavy boundary.

IIB22t 68L1140 61 to 89 cm (24 to 35 inches). Reddish brown (5YR 4/4) clay loam; weak fine angular blocky structure; firm when moist; thick continuous clay films on faces of peds with reddish brown (5YR 4/3) color; 10 percent of volume composed of stones over 3 inches in diameter and 3 percent of stones 3/4 to 3 inches in diameter; many of these are partially weathered dolomite; common roots; moderately alkaline; gradual wavy boundary.

IIB3t 68L1141 89 to 119 cm (35 to 47 inches). Dark brown (7.5YR 4/4) light clay loam; weak medium angular blocky structure; friable when moist; thin patchy clay films on faces of peds; common roots in upper 6 inches becoming few below; moderately alkaline; clear wavy boundary.

IIC1 68L1142 119 to 147 cm (47 to 58 inches). Brown (7.5YR 5/4) loam; weak medium fragmental blocks; friable when moist; 5 percent of volume composed of stones over 3 inches in diameter and 3 percent of stones 3/4 to 3 inches in diameter; few spots and streaks of free carbonates; strong effervescence.

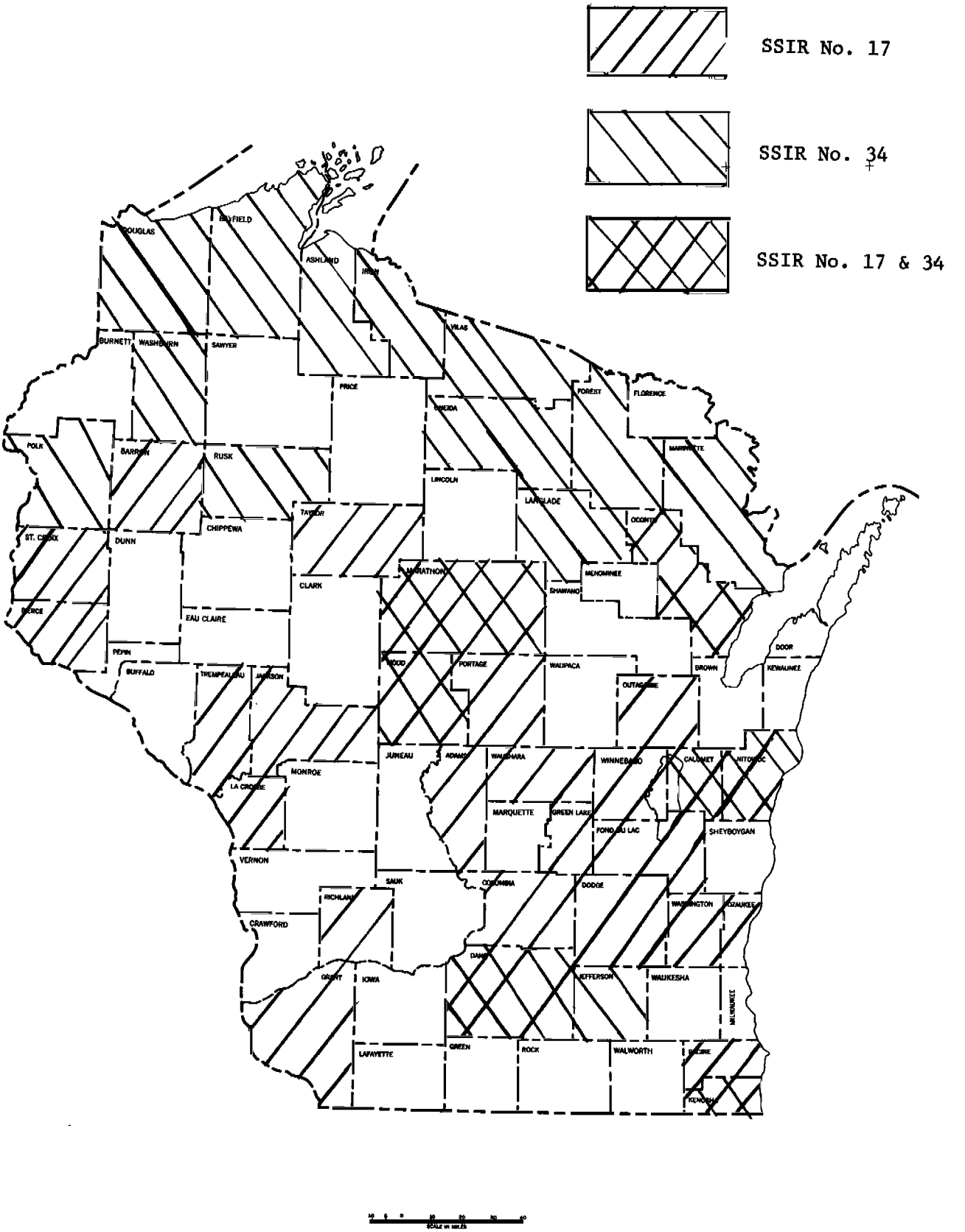
IIC2 68L1143 147 to 173 cm (58 to 68 inches). Brown (7.5YR 5/4) light loam; weak medium fragmental blocks; friable when moist; 5 percent of volume composed of stones over 3 inches in diameter and 3 percent of stones 3/4 to 3 inches in diameter; spots and streaks of free carbonates; strong effervescence.

Remarks: Soil nearly dry in solum and moist in substratum when sampled. The glacial till is believed to be a light loam but contains pockets of sandy loam. It has a moderate to high carbonate content. Original vegetation was dominantly mixed hardwood with scattered conifers. In the past, this soil was included with the Miami series but is now considered to be outside the range of characteristics called for in the Miami.

Soil temperature: At 10 inches - 21.5° C.
20 inches - 19.5° C.
40 inches - 17.0° C.

*This pedon lacks tongues of albic material in the argillic horizon; therefore, it is a taxadjunct to the Waymor series.

*U.S. GOVERNMENT PRINTING OFFICE: 1979 631-777/2979 1-3


SSIR No. 17
SSIR No. 34
SSIR No. 17 & 34
DOUGLAS
BAYFIELD
ASHLAND
IRON
VILAS
BURNETT
WASHBURN
SAWYER
PRICE
FOREST
FLORENCE
ONEIDA
POLK
BARRON
RUSK
MARINETTE
LINCOLN
LANGLADE
TAYLOR
OCONTO
ST. CROIX
DUNN
CHIPPEWA
MARATHON
MENOMINEE
CLARK
SHAWANO
PIERCE
EAU CLAIRE
PEPIN
DOOR
WOOD
PORTAGE
WAUPACA
BROWN
KEWAUNEE
BUFFALO
TREMPEALEAU
JACKSON
OUTAGAMIE
JUNEAU
ADAMS
WAUSHARA
WINNEBAGO
CALUMET
MANITOWOC
MONROE
LA CROSSE
MARQUETTE
GREEN LAKE
FOND DU LAC
SHEBOYGAN
VERNON
SAUK
COLUMBIA
DODGE
RICHLAND
WASHINGTON
OZAUKEE
CRAWFORD
DANE
GRANT
IOWA
JEFFERSON
WAUKESHA
MILWAUKEE
LAFAYETTE
GREEN
ROCK
WALWORTH
RACINE
KENOSHA
SCALE IN MILES