

**Natural  
Resource  
Technology, Inc.**



May 21, 1999  
(1226/4.1)

Ms. Liesa Nesta  
Water Management Specialist  
Wisconsin Department of Natural Resources  
8770 Hwy J  
Woodruff, WI 54568

RE: Request for Grading Permit  
C.M. Christiansen Company, Former Wood Treatment Site, Phelps, Wisconsin  
Ref: WID998639035, BRR Case # 02-64-000068

Dear Ms. Nesta:

Natural Resource Technology Inc. is requesting a grading permit on behalf of C.M. Christiansen Co., Inc. for proposed work near a waterway involving disturbing an area greater than 10,000 square feet. The proposed work is remediation of pentachlorophenol-contaminated soil at the above referenced former wood pole treatment facility in Phelps, Wisconsin. We initially contacted Mr. Tim O'Neill of the Rhinelander office regarding this issue and he indicated we should submit the application to you. Remediation activities will consist of excavation of five areas and on-site treatment in a constructed biological treatment cell. Areas 1, 2, and 3, with a total volume of approximately 2,200 cubic yards, are interpreted to be within the unbroken slope of a navigable waterway, Military Creek, as shown on the attached maps and plans.

Materials for erosion control will include silt fence and/or straw bales. Activities described in the attached Erosion Control Plan will be performed in accordance with *Wisconsin Best Management Practices for Construction Site Erosion Control*. The equipment to be used for construction include any or all of the following: a hydraulic excavator, a skid-loader; end-loader; and/or bulldozer, for the purpose of clearing, excavating and restoring the excavated areas. The excavated soil will be processed and deposited in the treatment cell. Components of the treatment cell include a sloped base and drainage swale to divert and collect run-on. Excavated areas outside the wetlands will be backfilled and graded with a loader and/or bulldozer, and immediately mulched and seeded.

Capping for the purpose of direct contact protection from pentachlorophenol will be accomplished in the areas shown. Capping materials will consist of a 6-inch thickness of clean fill. Erosion control materials will remain in areas where capping is accomplished, until vegetation has been re-established.

We contacted Mr. Mike O'Keefe of the U.S. Army Corps of Engineers (USACOE) to discuss excavation and restoration of excavated wetland areas. Mr. O'Keefe visited the site recently, and had the following suggestions with regard to excavation of the wetlands:

- If the southern tip of excavation 2B is within 10 to 15 feet of the current bank of military creek, he suggested construction of a berm to prevent the creek from further extending into the property. Suggested berm materials include organic soil backfilled to existing grade of the wetlands capped with material suitable to prevent erosion, for example, 2 inches of 2- to 3-inch diameter stone (riprap).
- If excavation of area 2B extends to Military Creek, a sediment boom, in addition to silt fence and/or straw bales, is suggested.
- Capping using a 6-inch thickness of organic soil is acceptable for wetland areas shown on the site plan.

Ms. Liesa Nesta  
May 21, 1999  
Page 2

- If the base of the excavation area meets our site-specific residual contaminant level for pentachlorophenol, and sunlight can penetrate to the final depth of excavation, no backfilling will be required, except for area 2B where within 10 - 15 feet of the creek.
- If either of the above conditions is not met, a wetlands contingency plan would include a discussion with the USACOE of a plan for restoration by backfilling with similar organic material.

The WDNR Form 3500-53 is attached. Details of the proposed remedial actions as requested in the "Grading in Excess of 10,000 Square Feet Information Requirements" checklist are attached. Further details regarding the remediation are presented in design documents recently submitted to Mr. Chris Saari, the WDNR project manager we are working with on this case.

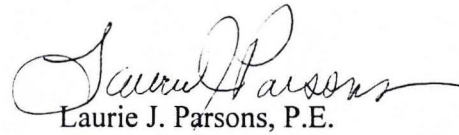
Please do not hesitate to call should you have any questions or require additional information as you review this application.

Sincerely,

NATURAL RESOURCE TECHNOLOGY, INC.



Spiros L. Fafalios, P.E.  
Environmental Engineer



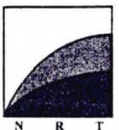
Laurie J. Parsons, P.E.  
Senior Environmental Engineer

Encl: WDNR Form 3500-53  
"Grading in Excess of 10,000 Square Feet Information Requirements" Checklist  
Property Deed Warranty  
Figure 1 - Site Location Map (USGS Phelps Quadrangle, 1981)  
Wisconsin Wetland Inventory Map  
Soil Survey Atlas Sheets  
Floodplain Map  
Zoning Map  
Table 1 - Excavation Soil Volume Estimate  
Proposed Project Schedule  
Plate 1 - Remedial Construction Plan  
Cross-Sections A-A' and B-B'  
Erosion Control Plan  
WDNR Review Fee (\$300)

cc: Mr. Chris Saari, Wisconsin Department of Natural Resources, Brule Office  
Ms. Elizabeth Gamsky Rich, Whyte Hirschboeck Dudek, S.C.  
Mr. Eric Christiansen, C. M. Christiansen Company, Inc.  
Mr. Mike O'Keefe, U.S. Army Corps of Engineers

w:\1226\permits\1226 Grading Permit Cov.ltr

Natural  
Resource  
Technology



U.S. Army Corps of Engineers  
 Regulatory Functions  
 190 Fifth Street East  
 St. Paul, MN 55101-1638

STATE/FEDERAL APPLICATION  
 FOR WATER REGULATORY  
 PERMITS AND APPROVALS  
 Form 3500-53 Rev. 2-94

State of Wisconsin  
 Department of Natural Resources  
 (Return to appropriate  
 DNR District/Area Office)

PLEASE COMPLETE BOTH PAGES 1 & 2 OF THIS APPLICATION. PRINT OR TYPE. Use of this form is required by the Department for any application filed pursuant to Chapter 30, Wis. Stats. The Department will not consider your application unless you complete and submit this application form. Personally identifiable information on this form will be used for no other purpose.

1. Applicant (Individual or corporate name) <u>C.M. Christiansen Co., Inc.</u>	2. Agent/Contractor (firm name) <u>Natural Resource Technology, Inc.</u>
Address <u>P.O. Box 100</u>	Address <u>23713 West Paul Road</u>
City, State, Zip Code <u>Phelps, WI 54554</u>	City, State, Zip Code <u>Pewaukee WI 53072</u>
Telephone No. (Include area code) <u>(715) 545-2333</u>	Telephone No. (Include area code) <u>414-523-9000</u>

3. If applicant is not owner of the property where the proposed activity will be conducted, provide name and address of owner and include letter of authorization from owner. Owner must be the applicant or coapplicant for structure, diversion and channel change activities. A purchaser under a land contract is not considered a riparian owner until property transfer has occurred.

Owner's Name	Address	City, State, Zip Code
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4. Is the applicant a business?  Yes  No

If YES, is the permit or approval you are applying for necessary for you to conduct this business in the State of Wisconsin?  Yes  No

If YES, please explain why (attach additional sheets if necessary):

5. Project Location

Address County E

Village/City/Town Phelps

Waterway Military Creek

County Vilas

Govt. Lot 3 <sup>AND</sup> OR NE 1/4 SW 1/4 of section 35

Township 42 North, Range 11 (East) (West)

6. Adjoining Riparian (Neighboring Waterfront Property Owner) Information none adjacent upstream or downstream

Name of Riparian #1	Address	City, State, Zip Code
Name of Riparian #2	Address	City, State, Zip Code

7. Project Information (Attach additional sheets if necessary)

(a) Describe proposed activity (include how this project will be constructed) erosion control: silt fences and clearing of shrubs, excavation and restoration where necessary. hay bales - see cover letter

(b) Purpose, need and intended use of project  
excavation and restoration of soils impacted by former power pole treatment operations

(c) I have applied for or received permits from the following agencies: (Check )

Municipal  County  Wis. DNR  Corps of Engineers

(d) Date activity will begin if permit is issued immediately; be completed: 6-8 weeks after start date

(e) Is any portion of the requested project now complete?  
 Yes  No

If yes, identify the completed portion on the enclosed drawings and indicate here the date activity was completed:

I hereby certify that the information contained herein is true and accurate. I also certify that I am entitled to apply for a permit, or that I am the duly authorized representative or agent of an applicant who is entitled to apply for a permit. Any inaccurate information submitted may result in permit revocation, the imposition of a forfeiture(s) and requirement of restoration.

Signature of Applicant or Duly Authorized Agent <u>Spiros L. Fafalios, PE., NRT</u>	Date Signed <u>5/21/99</u>
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LEAVE BLANK - FOR RECEIVING AGENCY USE ONLY

Corps of Engineers Process No.	Wisconsin DNR File No.
Received By	Date Received
	Date Application Was Complete



## Grading in Excess of 10,000 Square Feet Information Requirements

All applications to grade more than 10,000 square feet on the unbroken slope of a navigable waterway require the following information. Grading is the manipulation of earth and includes both cut and fill. This information must be provided on the application form supplied, or on additional sheets if necessary. Clearly label each of the items in the application package and check off each item on this list as you prepare your application. **Please note that your application will be considered INCOMPLETE if you fail to supply the requested information. Failure to supply the information or provide adequate information will result in the delay of your permit decision.**



DEED  
WARRANTY

Please include a copy of the deed, lease, land contract or other documents showing riparian status. Supply the name and address of the secretary of property owners association on the waterway, or the names and addresses of at least five persons living on the waterway if there is no association.



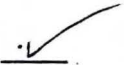
NO FLOODPLAIN  
IN VICINITY  
ZONED COMMERCIAL

Provide copies of the USGS topographic map, Wisconsin Wetland Inventory Map, Soils Mapping(SCS), floodplain maps, and local zoning maps. The project location must be clearly identified on these maps.



Figure 1

In the "location sketch" box, sketch or trace a map which clearly indicates the location of your project. Recommended scale is 1"=2000'. This map enables the Water Management Specialist to easily locate the project site.



In the "proposed" materials box, indicate what erosion materials and vegetation supplies you intend to use for the proposed project. If any additional riprap or bank protection is to be used, describe it.



SEE COVER  
LETTER

The application must contain a narrative identifying the method of construction describing the materials and equipment to be used for the grading and the installation of stormwater and erosion control measures.



SEE TABLE 1

Provide accurate computations of volumes and areas of grading, detailing the amount to be cut and the amount to be filled. You should also identify the volume and areas of stockpiled or dewatered materials.



Proposed  
Project  
Schedule

Provide a proposed schedule of construction. The schedule should outline the project from start to finish including the implementation and maintenance of erosion control measures, vegetation plans and any other necessary project maintenance, beyond the completion of the actual grading work. Please provide this information on the supplementary Construction Schedule Worksheet.

Your project plans must supply a top view and as many cross-sections as necessary. Cross-sectional views depict the ground surface as though it were sliced and are usually placed perpendicular to the waterway. You should provide as many cross-sectional views as necessary to reflect variation in topography and/or stream gradient. All elevations should be referenced to the same benchmark. A benchmark is a permanent vertical reference mark.

The top (plan) view should include the following information:

- Plate 1 The existing waterway and the area to be graded. A topographic plan should be included to demonstrate the existing and proposed conditions. A topographic map identifies the elevations of the site. The floodplain and wetland boundaries must be clearly marked on the plan. Estimated wetland boundaries.
- The location, elevation and description of the benchmark.
- A north arrow.
- The scale of the top view. The scale should be adequate to provide the Water Management Specialist with a clear idea of the existing conditions and your proposed project.

The cross-sectional views should include the following:

- Cross sections  
A-A'  
B-B'  
N/A The water level of the existing waterway as well as the existing and proposed slope conditions. The cross-section should include the waterway as well the overbank areas.
- N/A The limits of the 100-year floodplain and the floodway width. NOT APPLICABLE
- The scale of the cross-sectional views must be clearly labelled. Both horizontal and vertical scale shall be provided. Reference all elevations to the benchmark.

Your project scope requires that you provide an **erosion control plan**. A proper erosion control plan protects your site from losing soil and minimizes the amount of soil and other nutrients from entering waterways. The erosion control plan must provide for erosion control both during construction and after construction is complete. You may need to incorporate several different practices to suit your site. This plan must also include a vegetation plan.

- See attached E.C.P. If your project involves the grading of one lot only, please refer to the supplementary handout Erosion Control for Home Builders.
- For all other grading projects, please provide all information materials as identified in Master at 1.

334048

LVOL 801 PAGE 410

WARRANTY DEED

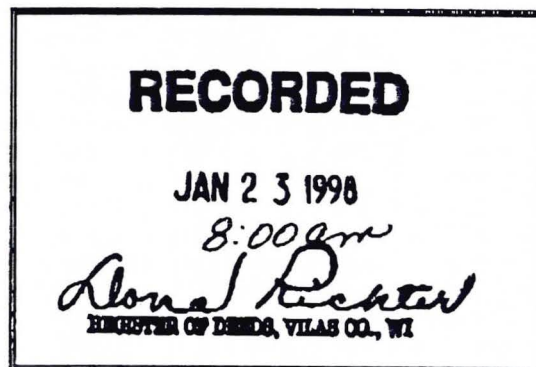
THE GRANTOR, including all successors and assigns,

C.M. CHRISTIANSEN CO., a Wisconsin corporation, 1 Lake Street, P.O. Box 100, Phelps, WI 54554, for \$1.00 and other good and valuable consideration, receipt and sufficiency of which is hereby acknowledged,

CONVEYS, GRANTS AND WARRANTS TO:

C.M. CHRISTIANSEN CO., INC., a Michigan corporation, c/o Michigan Runner Service, P.O. Box 266, Eaton Rapids, MI 48827-02766, and to its successors and assigns

TRANSFER \$15.00 FEE \$3/1000



Tax Parcel No. 9-5 and parts of 9-1 and GL3-4

The real property located in the NE 1/4 SW 1/4 and Govt. Lot 3 of Section 35, Township 42 North, Range 11 East, Town of Phelps, Vilas County, State of Wisconsin, more completely described in the attached Exhibit A, made a part hereof.

TOGETHER WITH AND SUBJECT TO all easements, covenants, restrictions and reservations of record;

RESERVING TO GRANTOR all mineral and timber rights to the extent not previously reserved of record;

TOGETHER WITH all and singular the tenements, hereditaments and appurtenances thereunto belonging or in anywise pertaining, to have and to hold forever; AND

GRANTOR hereby warrants that at the time of delivery of these presents GRANTOR is seized of the above granted premises in fee simple, that they are free from all encumbrances whatsoever and that GRANTOR shall Warrant and Defend the same against all lawful claims.

This is not homestead property.

DATED THIS 22nd DAY OF JANUARY, 1998.

C.M. CHRISTIANSEN CO.

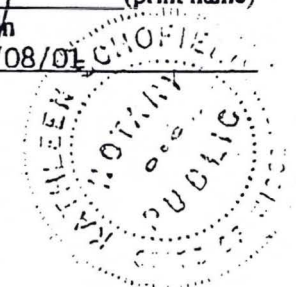
By: [Signature] Eric R. Christiansen, Vice President

Attest: [Signature] Miriam Saucke, Secretary

STATE OF WISCONSIN ) ) S.S. COUNTY OF VILAS )

Personally acknowledged before me this 22nd day of January, 1998 by Eric R. Christiansen, Vice President and Miriam Saucke, Secretary, of C.M. CHRISTIANSEN CO.

[Signature] Kathleen Schofield (print name) Notary Public, State of Wisconsin My commission expires: 07/08/01



Drafted by and returnable to:

Eric R. Christiansen C.M. Christiansen Co. P.O. Box 100 Phelps, WI 54554 [Signature]

## VOL 801 PAGE 411

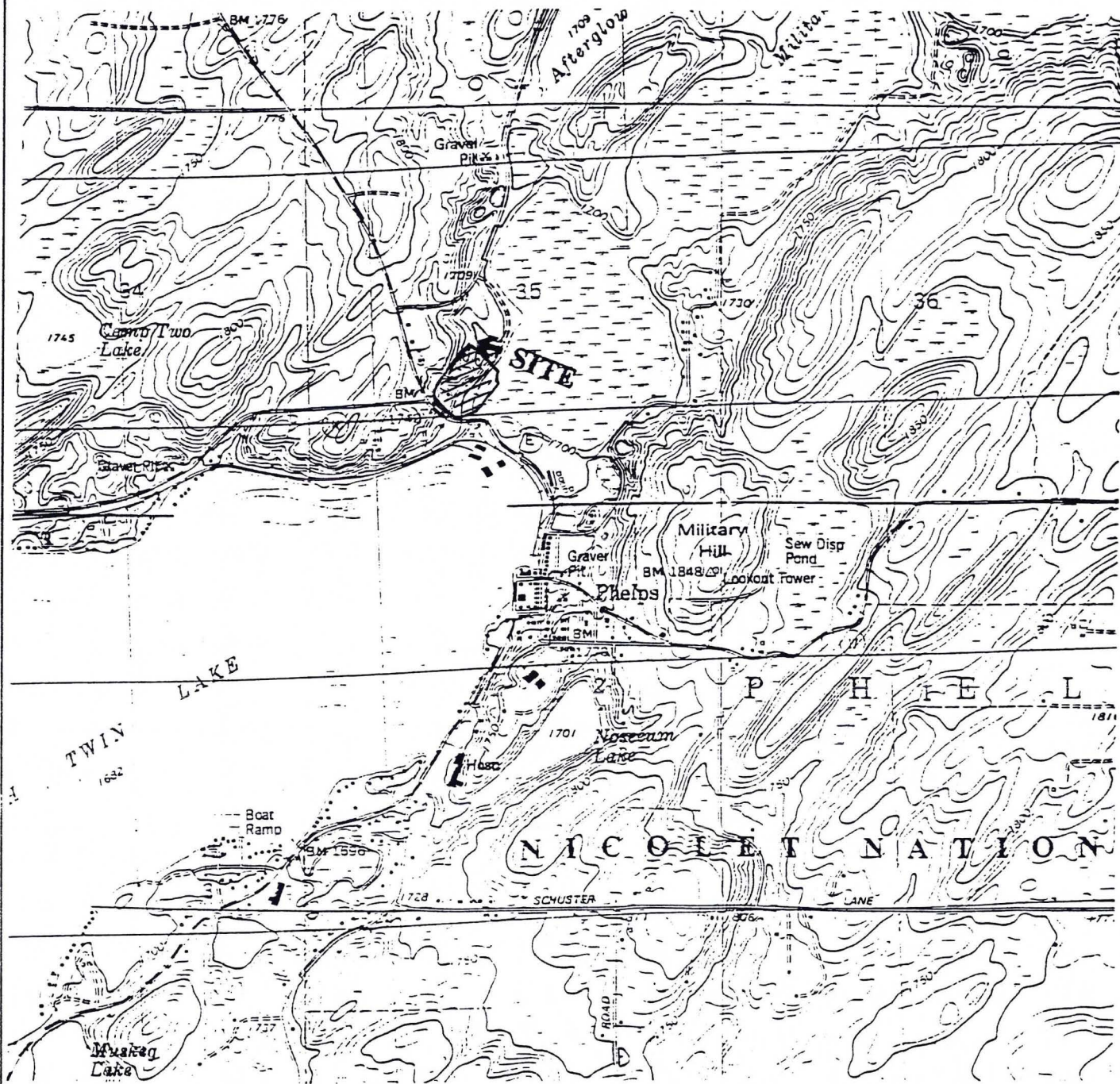
EXHIBIT A TO WARRANTY DEEDLegal Description

A parcel of land being a part of Gov't. Lot 3 and the NE $\frac{1}{4}$ -SW $\frac{1}{4}$ , Section 35, T 42 N, R 11 E, Town of Phelps, Vilas County, Wisconsin, and being more particularly described as follows:

Commencing at the South  $\frac{1}{4}$  corner of said Section 35 being marked by a U.S. Forest Service monument, thence N 0°-04'-39" E 2414.99 feet along the North-South  $\frac{1}{4}$  line of said Section 35 to an iron pipe and the Place of Beginning, thence returning S 0°-04'-39" W 884.28 feet along the East line of said NE $\frac{1}{4}$ -SW $\frac{1}{4}$  to an iron pipe on the Right Bank of Military Creek, thence meandering along said Creek Bank S 45°-02'-00" W 73.60 feet, S 73°-08'-00" W 102.50 feet, S 51°-33'-00" W 82.61 feet, N 61°-31'-13" W 179.00 feet, S 55°-07'-00" W 166.00 feet, S 3°-32'-00" E 90.00 feet, S 34°-44'-00" E 77.44 feet and S 2°-29'-00" E 58.17 feet to the Northerly R/W line of County Trunk Hwy. E, thence along the Northerly R/W line of said Hwy. E Easterly 36 feet more or less along the arc of a 336.51 foot radius curve to the Right to the middle thread of said Military Creek, thence returning Westerly 36 feet more or less along the arc of said 336.51 foot radius curve to the Left to the aforementioned point, thence along the Northerly and Northeasterly R/W line of said Hwy. E as follows: Westerly 91.70 feet along the arc of said 336.51 foot radius curve to the Left (chord bearing S 89°-37'-40" W 91.42 feet) to the point of tangency of said curve, S 81°-49'-18" W 5.39 feet to the point of tangency of a 672.00 foot radius curve to the Right, Westerly 177.34 feet along the arc of said 672.00 foot radius curve to the Right (chord bearing S 89°-22'-54" W 176.82 feet) to the point of tangency of a 183.42 foot radius curve to the Right, Northwesterly 121.07 feet along the arc of said 183.42 foot radius curve to the Right (chord bearing N 64°-08'-56" W 118.88 feet) to the point of tangency of a 2952.00 foot radius curve to the Right, Northwesterly 310.80 feet along the arc of said 2952.00 foot radius curve to the Right (chord bearing N 42°-13'-23" W 310.66 feet) to the point of tangency of a 518.61 foot radius curve to the Right, Northwesterly 152.27 feet along the arc of said 518.61 foot radius curve to the Right (chord bearing N 30°-47'-44" W 151.72 feet) to the point of tangency of said curve and N 22°-23'-04" W 285.74 feet to an iron pipe which lies 800.00 feet South of the North line of said NW $\frac{1}{4}$ -SW $\frac{1}{4}$ , thence leaving said R/W line S 89°-33'-15" E 568.19 feet parallel with and 800.00 feet South of the North line of said NE $\frac{1}{4}$ -SW $\frac{1}{4}$  to an iron pipe, thence N 0°-01'-30" E 575.00 feet parallel with the West line of said NE $\frac{1}{4}$ -SW $\frac{1}{4}$  to an iron pipe, thence S 89°-33'-15" E 664.78 feet parallel with the North line of said NE $\frac{1}{4}$ -SW $\frac{1}{4}$  and back to the Place of Beginning, including all lands lying between the meander line and the lateral lot lines extended to the middle thread of said Military Creek, and including all riparian rights; the same being approximately 22.50 acres, more or less.

Subject to any easements, restrictions or reservations of record. Reserving and excepting all mineral and timber rights to the extent not previously reserved of record.

334078



SOURCE: USGS 7.5 MINUTE QUADRANGLE, PHELPS. DATED 1981.

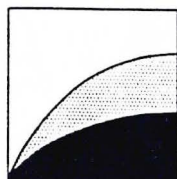


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SCALE IN FEET

CONTOUR INTERVAL 10 FEET



Natural  
Resource  
Technology

N R T

### SITE LOCATION MAP

C.M. CHRISTIANSEN COMPANY, INC.  
FORMER POLE TREATMENT FACILITY  
PHELPS, WISCONSIN

DRAWN BY: TAS

APPROVED BY: LJP

DATE: 5/15/98

PROJECT NO.  
1226-SR

DRAWING NO.  
1226-A01

FIGURE NO.  
1



11/13/19

# Missing Page # 9

## Wisconsin Wetland Inventory Map

(map D)

**LAND CONSERVATION**  
**VILAS COUNTY**  
639 W. Kemp Street  
Rhineland, Wisconsin 54501-3879  
Telephone (715) 362-5941  
Fax (715) 362-9370

May 6, 1999

MAY 10 1999

Natural Resource Technology  
Attn: Dan Plovnick  
23713 W. Paul Road  
Pewaukee, WI 53072

Dear Mr. Plovnick:

Enclosed please find the Soil Survey Atlas Sheets, the corresponding soil single sheet interpretation records and a soil description report for the soils mapped in Section 35, Township 42 North, Range 11 East, Vilas County, as per your telephone request.

Also included is a billing statement to cover the administrative costs of the Land Conservation Department in providing this information. Please remit your payment to:

Vilas County Land Conservation Dept.  
639 W. Kemp Street  
Rhineland, WI 54501-3879

If you have any questions or need any further help, please contact this office.

Sincerely,



Nancy Hollands  
County Conservationist

NH/lch

enc.

Nearly level and gently sloping, somewhat poorly drained soil formed in silty and loamy deposits and in the underlying loamy or sandy glacial till. This map unit is not highly erodible. The land capability classification is 2W. This map unit is prime farmland where drained.

Component Name: MONICO

Classification: ENTIC HAPLAQUODS, COARSE-LOAMY, MIXED, FRIGID

ESTIMATED SOIL PROPERTIES

Depth	USDA Texture	Classification		>10 In.	3-10 Inches	Percent < 3 in. passing sieve				Clay % <.002 mm
		Unified	AASHTO			No 4	No.10	No.40	No.200	
0- 7	SIL	ML CL-ML SM SM-SC	A-4	-	0-25	75-100	70-100	60-100	40- 90	8-15
7-21	SL GR-L FSL	SM SC ML CL	A-2 A-4 A-1	-	0-25	65-100	60-100	35- 95	20- 75	3-18
21-60	SL GR-SL LS	SM SM-SC GM GP-GM	A-1 A-2	-	0-25	60-100	60-100	30- 85	10- 35	2- 8

Depth (In)	Liquid Limit	Plasticity Index	Moist Bulk Density g/cc	Permeability In/hr	Available Water Capacity (In./in)	Soil Reaction (pH)	CEC (me/100g)	CaCO3 Pct	Organic Matter Pct	Shrink Swell Potential	Erosion Factor K
0- 7	<25	NP-7	1.1-1.4	0.6-2.	0.18-0.24	4.5-6.5	-	-	1.- 2.	LOW	0.37
7-21	<30	NP-10	1.6-1.8	0.6-2.	0.09-0.19	4.5-6.5	-	-	-	LOW	0.24
21-60	<19	NP-4	1.7-1.9	0.6-2.	0.06-0.12	5.1-7.3	-	-	-	LOW	0.17

Frequency	Floding	Duration	Months	Water Table-(feet) Depth	Kind	Months	Bedrock-(in) Depth	Hard.	HYD GRP	T Fact.	Wind Eroded. Index	Risk of Corrosion	Potential Frost Action
OCCASIONA	-	-	NOV-MAY	1.0-3.0	PERCHED	NOV-MAY	>60		C	5	56	MODERATE HIGH	HIGH

SANITARY FACILITIES	RATING	RESTRICTIVE FEATURE(S)
Septic Tank Absorption Fields	SEVERE	Flooding Wetness
Daily Cover for Landfill	POOR	Seepage Small Stones Wetness

BUILDING SITE DEVELOPMENT	RATING	RESTRICTIVE FEATURE(S)
Shallow Excavations	SEVERE	Cutbanks Cave Wetness
Dwellings Without Basements	SEVERE	Flooding Wetness
Dwellings With Basements	SEVERE	Flooding Wetness
Small Commercial Buildings	SEVERE	Flooding Wetness
Local Streets and Roads	SEVERE	Flooding Frost Action
Lawns, Landscaping, and Golf Fairways	MODERATE	Small Stones Large Stones Wetness

CONSTRUCTION MATERIAL	RATING	RESTRICTIVE FEATURE(S)
Roadfill	FAIR	Wetness
Sand	PROBABLE	
Gravel	PROBABLE	
Topsoil	POOR	Area Reclaim Small Stones

WATER MANAGEMENT	RATING	RESTRICTIVE FEATURE(S)
Pond Reservoir Area	MODERATE	Seepage
Embankments, Dikes and Levees	SEVERE	Seepage Piping
Drainage	LIMITATION	Flooding Frost Action
Irrigation	LIMITATION	Wetness Droughty
Terraces and Diversions	LIMITATION	Large Stones Erodes Easily Wetness
Grassed Waterways	LIMITATION	Large Stones Wetness Erodes Easily

RECREATIONAL DEVELOPMENT	RATING	RESTRICTIVE FEATURE(S)	
Camp Areas	SEVERE	Flooding	Wetness
Picnic Areas	MODERATE	Wetness	Small Stones
Playgrounds	SEVERE	Small Stones	Wetness
Paths and Trails	MODERATE	Wetness	

CROPS AND PASTURE YIELDS

Crop yields in this table are averages for high level management where the crop is commonly grown on the map unit.

Corn Grain bu/a	Corn Silage tons/a	Soybeans bu/a	Wheat bu/a	Oats bu/a	Alfalfa Hay tons/acre	Red Clover Hay tons/acre	Improved Pasture AUM	Permanent Pasture AUM
				70	4.	3.5	5.	3.3

WOODLAND INTERPRETATIONS

WOODLAND ORD. SYB.	EROSION HAZARD	EQUIPMENT LIMITATION	SEEDLING MORTALITY	WIND TH. HAZARD	PLANT COMPETITION	INTERP ASPECT	COMMONLY EXISTING TREES (E) and/or TREES RECOMENDED TO PLANT (P)	SITE INDEX	WOODLAND PRODUCT- IVITY	
3W	SLIGHT	MODERATE	SLIGHT	MODERATE	MODERATE		sugar maple yellow birch American basswood red maple white ash white spruce black spruce eastern white pine	E E E EP EP P P P	63 0 0 0 0 0 0 0	3 0 0 0 0 0 0 0

RECOMMENDED WINDBREAK SPECIES AND EXPECTED HEIGHT AT 20 YEARS

Plant Name	Height	Plant Name	Height	Plant Name	Height	Plant Name	Height
American cranberrybush	10	common ninebark	8	eastern white pine	30	lilac	10
nannyberry viburnum	8	northern whitecedar	15	red maple	30	redosier dogwood	8
silky dogwood	10	silver maple	30	white ash	30	white spruce	20

For more information contact: Area Resource Soil Scientist, Soil Conservation Service  
Route 2, Box 2355, Spooner, WI 54801, Phone: 715-635-3505

Nearly level and gently sloping, well drained soil formed in loamy deposits and the underlying stratified sand and gravel glacial outwash. This map unit is potentially highly erodible. The land capability classification is 2E. This map unit is prime farmland.

Component Name: PADUS

Classification: ALFIC HAPLORTHODS, COARSE-LOAMY, MIXED, FRIGID

ESTIMATED SOIL PROPERTIES

Depth	USDA Texture	Classification			>10 In.	3-10 Inches	Percent < 3 in. passing sieve				Clay % <.002 mm	
		Unified	AASHTO				No. 4	No.10	No.40	No.200		
0- 4	FSL	SM	A-2	A-4	A-1-B	-	0-7	80-100	75-100	45- 85	20- 50	3-10
4-31	FSL SL L	SM SC ML CL	A-2	A-4	A-1-B	-	0-7	80-100	75-100	45- 95	20- 90	5-18
31-35	GR-LS S GR-SL	SM SP GP GM	A-2	A-4	A-1 A-3	-	0-7	50-100	45-100	25- 75	2- 40	2-10
35-60	SR- S G	SP SP-SM GP GP-GM	A-1	A-2	A-3	-	0-7	30-100	25-100	10- 70	1- 12	0- 3

Depth (In)	Liquid Limit	Plasticity Index	Moist Bulk Density g/cc	Permeability In/hr	Available Water Capacity (In./in)	Soil Reaction (pH)	CEC (me/100g)	CaCO3 Pct	Organic Matter Pct	Shrink Swell Potential	Erosion Factor K
0- 4	<25	NP-4	1.4-1.7	0.6-2.	0.1-0.15	4.5-6.5	-	-	1.- 2.	LOW	0.24
4-31	<30	NP-10	1.4-1.6	0.6-2.	0.09-0.22	4.5-6.5	-	-	-	LOW	0.24
31-35	<25	NP-4	1.4-1.6	0.6-6.	0.05-0.14	4.5-6.5	-	-	-	LOW	0.1
35-60	-	NP	1.5-1.8	6.-20.	0.02-0.06	5.1-6.5	-	-	-	LOW	0.1

Frequency	Flooding Duration	Water Table-(feet) Depth	Bedrock-(in) Depth	HYD GRP	T Erod. Index	Wind Erod. Index	Risk of Corrosion	Potential Frost Action
NONE	-	>6.0	>60	B	4	86	LOW HIGH	MODERATE

SANITARY FACILITIES	RATING	RESTRICTIVE FEATURE(S)
Septic Tank Absorption Fields	SEVERE	Poor Filter
Daily Cover for Landfill	POOR	Seepage   Too Sandy   Small Stones

BUILDING SITE DEVELOPMENT	RATING	RESTRICTIVE FEATURE(S)
Shallow Excavations	SEVERE	Cutbanks Cave
Dwellings Without Basements	SLIGHT	
Dwellings With Basements	SLIGHT	
Small Commercial Buildings	SLIGHT	
Local Streets and Roads	MODERATE	Frost Action
Lawns, Landscaping, and Golf Fairways	MODERATE	Large Stones   Droughty

CONSTRUCTION MATERIAL	RATING	RESTRICTIVE FEATURE(S)
Roadfill	GOOD	
Sand	PROBABLE	
Gravel	PROBABLE	
Topsoil	POOR	Small Stones   Area Reclaim

WATER MANAGEMENT	RATING	RESTRICTIVE FEATURE(S)
Pond Reservoir Area	SEVERE	Seepage
Embankments, Dikes and Levees	SEVERE	Seepage   Piping
Drainage	LIMITATION	Deep To Water
Irrigation	LIMITATION	Slope   Droughty   Soil Blowing
Terraces and Diversions	LIMITATION	Too Sandy   Soil Blowing
Grassed Waterways	LIMITATION	Droughty   Rooting Depth

RECREATIONAL DEVELOPMENT	RATING	RESTRICTIVE FEATURE(S)
Camp Areas	SLIGHT	
Picnic Areas	SLIGHT	
Playgrounds	MODERATE	Slope Small Stones
Paths and Trails	SLIGHT	

CROPS AND PASTURE YIELDS

Crop yields in this table are averages for high level management where the crop is commonly grown on the map unit.

Corn Grain bu/a	Corn Silage tons/a	Soybeans bu/a	Wheat bu/a	Oats bu/a	Alfalfa Hay tons/acre	Red Clover Hay tons/acre	Improved Pasture AUM	Permanemt Pasture AUM
				75	4.	3.5	6.	2.6

WOODLAND INTERPRETATIONS

WOODLAND ORD. SYB.	EROSION HAZARD	EQUIPMENT LIMITATION	SEEDLING MORTALITY	WIND TH. HAZARD	PLANT COMPETITION	INTERP ASPECT	COMMONLY EXISTING TREES (E) and/or TREES RECOMENDED TO PLANT (P)	(E) SITE INDEX	WOODLAND PRODUCT- IVITY	
3A	SLIGHT	SLIGHT	SLIGHT	SLIGHT	MODERATE		sugar maple white ash bigtooth aspen northern red oak American basswood red pine white spruce eastern white pine	E E E E E EP P P	67 0 78 70 0 0 0 0	3 0 6 4 0 0 0 0

RECOMMENDED WINDBREAK SPECIES AND EXPECTED HEIGHT AT 20 YEARS

Plant Name	Height	Plant Name	Height	Plant Name	Height	Plant Name	Height
American cranberrybush	10	Amur maple	10	eastern redcedar	15	eastern white pine	30
gray dogwood	8	jack pine	30	lilac	10	manyflower cotoneaster	6
Norway spruce	20	red pine	30	Siberian peashrub	8	silky dogwood	8

For more information contact: Area Resource Soil Scientist, Soil Conservation Service  
Route 2, Box 2355, Spooner, WI 54801, Phone: 715-635-3505

PaC PADUS FINE SANDY LOAM, 6 TO 15 PERCENT SLOPES

Sloping and moderately steep, well drained soil formed in loamy deposits and the underlying stratified sand and gravel glacial outwash. This map unit is potentially highly erodible. The land capability classification is 3E.

Component Name: PADUS

Classification: ALFIC HAPLORTHODS, COARSE-LOAMY, MIXED, FRIGID

ESTIMATED SOIL PROPERTIES

Depth	USDA Texture	Classification		>10 In.	3-10 Inches	Percent < 3 in. passing sieve				Clay % <.002 mm
		Unified	AASHTO			No 4	No.10	No.40	No.200	
0- 4	FSL	SM	A-2 A-4 A-1-B	-	0-7	80-100	75-100	45- 85	20- 50	3-10
4-31	FSL SL L	SM SC ML CL	A-2 A-4 A-1-B	-	0-7	80-100	75-100	45- 95	20- 90	5-18
31-35	GR-LS S GR-SL	SM SP GP GM	A-2 A-4 A-1 A-3	-	0-7	50-100	45-100	25- 75	2- 40	2-10
35-60	SR- S G	SP SP-SM GP GP-GM	A-1 A-2 A-3	-	0-7	30-100	25-100	10- 70	1- 12	0- 3

Depth (In)	Liquid Limit	Plasticity Index	Moist Bulk Density g/cc	Permeability In/hr	Available Water Capacity (In./in)	Soil Reaction (pH)	CEC (me/100g)	CaCO3 Pct	Organic Matter Pct	Shrink Swell Potential	Erosion Factor K
0- 4	<25	NP-4	1.4-1.7	0.6-2.	0.1-0.15	4.5-6.5	-	-	1.- 2.	LOW	0.24
4-31	<30	NP-10	1.4-1.6	0.6-2.	0.09-0.22	4.5-6.5	-	-	-	LOW	0.24
31-35	<25	NP-4	1.4-1.6	0.6-6.	0.05-0.14	4.5-6.5	-	-	-	LOW	0.1
35-60	-	NP	1.5-1.8	6.-20.	0.02-0.06	5.1-6.5	-	-	-	LOW	0.1

Frequency	Duration	Months	Depth	Kind	Months	Depth	Hard.	HYD GRP	T Fact.	Erod. Index	Uncoated Steel	Concrete	Potential Action
NONE	-	-	>6.0	-	-	>60		B	4	86	LOW	HIGH	MODERATE

SANITARY FACILITIES	RATING	RESTRICTIVE FEATURE(S)
Septic Tank Absorption Fields	SEVERE	Poor Filter
Daily Cover for Landfill	POOR	Seepage   Too Sandy   Small Stones

BUILDING SITE DEVELOPMENT	RATING	RESTRICTIVE FEATURE(S)
Shallow Excavations	SEVERE	Cutbanks Cave
Dwellings Without Basements	MODERATE	Slope
Dwellings With Basements	MODERATE	Slope
Small Commercial Buildings	SEVERE	Slope
Local Streets and Roads	MODERATE	Slope   Frost Action
Lawns, Landscaping, and Golf Fairways	MODERATE	Large Stones   Droughty   Slope

CONSTRUCTION MATERIAL	RATING	RESTRICTIVE FEATURE(S)
Roadfill	GOOD	
Sand	PROBABLE	
Gravel	PROBABLE	
Topsoil	POOR	Small Stones   Area Reclaim

WATER MANAGEMENT	RATING	RESTRICTIVE FEATURE(S)
Pond Reservoir Area	SEVERE	Seepage   Slope
Embankments, Dikes and Levees	SEVERE	Seepage   Piping
Drainage	LIMITATION	Deep To Water
Irrigation	LIMITATION	Slope   Droughty   Soil Blowing
Terraces and Diversions	LIMITATION	Slope   Too Sandy   Soil Blowing
Grassed Waterways	LIMITATION	Slope   Droughty   Rooting Depth

RECREATIONAL DEVELOPMENT	RATING	RESTRICTIVE FEATURE(S)
Camp Areas	MODERATE	Slope
Picnic Areas	MODERATE	Slope
Playgrounds	SEVERE	Slope
Paths and Trails	SLIGHT	

CROPS AND PASTURE YIELDS

Crop yields in this table are averages for high level management where the crop is commonly grown on the map unit.

Corn Grain bu/a	Corn Silage tons/a	Soybeans bu/a	Wheat bu/a	Oats bu/a	Alfalfa Hay tons/acre	Red Clover Hay tons/acre	Improved Pasture AUM	Permanent Pasture AUM
				70	3.5	3.	5.8	2.2

WOODLAND INTERPRETATIONS

WOODLAND ORD. SYB.	EROSION HAZARD	EQUIPMENT LIMITATION	SEEDLING MORTALITY	WIND TH. HAZARD	PLANT COMPETITION	INTERP ASPECT	COMMONLY EXISTING TREES (E) and/or TREES RECOMMENDED TO PLANT (P)	(E) SITE INDEX	WOODLAND PRODUCT- IVITY	
3A	SLIGHT	SLIGHT	SLIGHT	SLIGHT	MODERATE		sugar maple white ash bigtooth aspen northern red oak American basswood red pine white spruce eastern white pine	E E E E E EP P P	67 0 78 70 0 0 0 0	3 0 6 4 0 0 0 0

RECOMMENDED WINDBREAK SPECIES AND EXPECTED HEIGHT AT 20 YEARS

Plant Name	Height	Plant Name	Height	Plant Name	Height	Plant Name	Height
American cranberrybush	10	Amur maple	10	eastern redcedar	15	eastern white pine	30
gray dogwood	8	jack pine	30	lilac	10	manyflower cotoneaster	6
Norway spruce	20	red pine	30	Siberian peashrub	8	silky dogwood	8

For more information contact: Area Resource Soil Scientist, Soil Conservation Service  
Route 2, Box 2355, Spooner, WI 54801, Phone: 715-635-3505



Sloping and moderately steep, well drained soil formed in loamy deposits and the underlying stratified sand and gravel glacial outwash. This map unit is potentially highly erodible. The land capability classification is 4E.

Component Name: PENCE

Classification: ENTIC HAPLORTHODS, SANDY, MIXED, FRIGID

ESTIMATED SOIL PROPERTIES

Depth	USDA Texture	Classification			>10 In.	3-10 Inches	Percent < 3 in. passing sieve				Clay % <.002 mm	
		Unified	AASHTO				No. 4	No.10	No.40	No.200		
0- 3	SL	SM ML	A-4	A-2	A-1	-	0-7	85-100	75-100	45- 85	20- 55	3-11
3-16	SL L GR-SL	SM ML CL-ML SM-SC	A-4	A-2	A-1	-	0-7	55-100	50-100	30- 95	15- 75	2-12
16-23	GR-COS LS S	SM SP-SM GM GP-GM	A-2	A-1	A-3	-	0-8	55-100	50-100	25- 75	2- 30	2-10
23-60	GR-COS S SG	SP SP-SM GP GP-GM	A-1	A-3	A-2	-	0-15	30-100	25-100	10- 70	1- 12	0- 4

Depth (In)	Liquid Limit	Plasticity Index	Moist Bulk Density g/cc	Permeability In/hr	Available Water Capacity (In./in)	Soil Reaction (pH)	CEC (me/100g)	CaCO3 Pct	Organic Matter Pct	Shrink Swell Potential	Erosion Factor K
0- 3	<21	NP-4	1.2-1.6	2.-6.	0.1-0.18	4.5-6.5	-	-	1.- 3.	LOW	0.24
3-16	<25	NP-7	1.4-1.5	2.-6.	0.1-0.15	4.5- 6.	-	-	-	LOW	0.24
16-23	-	NP	1.6-1.8	2.-6.	0.05-0.08	4.5- 6.	-	-	-	LOW	0.1
23-60	-	NP	1.4-1.8	6.-20.	0.02-0.05	5.1-6.5	-	-	-	LOW	0.1

Frequency	Duration	Months	Water Table-Depth	Kind	Months	Bedrock-Depth	Hard.	HYD GRP	T Fact.	Erod. Index	Wind	Risk of Corrosion	Potential Frost Action
NONE	-	-	>6.0	-	-	>60		B	3	86		LOW MODERATE	LOW

SANITARY FACILITIES	RATING	RESTRICTIVE FEATURE(S)
Septic Tank Absorption Fields	SEVERE	Poor Filter
Daily Cover for Landfill	POOR	Seepage   Too Sandy   Small Stones

BUILDING SITE DEVELOPMENT	RATING	RESTRICTIVE FEATURE(S)
Shallow Excavations	SEVERE	Cutbanks Cave
Dwellings Without Basements	MODERATE	Slope
Dwellings With Basements	MODERATE	Slope
Small Commercial Buildings	SEVERE	Slope
Local Streets and Roads	MODERATE	Slope
Lawns, Landscaping, and Golf Fairways	MODERATE	Large Stones   Droughty   Slope

CONSTRUCTION MATERIAL	RATING	RESTRICTIVE FEATURE(S)
Roadfill	GOOD	
Sand	PROBABLE	
Gravel	PROBABLE	
Topsoil	POOR	Small Stones   Area Reclaim

WATER MANAGEMENT	RATING	RESTRICTIVE FEATURE(S)
Pond Reservoir Area	SEVERE	Seepage   Slope
Embankments, Dikes and Levees	SEVERE	Seepage
Drainage	LIMITATION	Deep To Water
Irrigation	LIMITATION	Droughty   Soil Blowing   Slope
Terraces and Diversions	LIMITATION	Slope   Too Sandy   Soil Blowing
Grassed Waterways	LIMITATION	Slope   Droughty

RECREATIONAL DEVELOPMENT	RATING	RESTRICTIVE FEATURE(S)
Camp Areas	MODERATE	Slope
Picnic Areas	MODERATE	Slope
Playgrounds	SEVERE	Slope
Paths and Trails	SLIGHT	

CROPS AND PASTURE YIELDS

Crop yields in this table are averages for high level management where the crop is commonly grown on the map unit.

Corn Grain bu/a	Corn Silage tons/a	Soybeans bu/a	Wheat bu/a	Oats bu/a	Alfalfa Hay tons/acre	Red Clover Hay tons/acre	Improved Pasture AUM	Permanent Pasture AUM
				50	3.	2.5	4.8	1.3

WOODLAND INTERPRETATIONS

WOODLAND ORD. SYB.	EROSION HAZARD	EQUIPMENT LIMITATION	SEEDLING MORTALITY	WIND TH. HAZARD	PLANT COMPETITION	INTERP ASPECT	COMMONLY EXISTING TREES (E) and/or TREES RECOMMENDED TO PLANT (P)	SITE INDEX	WOODLAND PRODUCT- IVITY
3S	SLIGHT	SLIGHT	MODERATE	SLIGHT	MODERATE	NORTH	balsam fir sugar maple yellow birch paper birch quaking aspen American basswood red pine eastern white pine jack pine	E 0 E 59 E 0 E 0 E 0 E 0 EP 59 EP 57 P 0	0 3 0 0 0 0 7 8 0

RECOMMENDED WINDBREAK SPECIES AND EXPECTED HEIGHT AT 20 YEARS

Plant Name	Height	Plant Name	Height	Plant Name	Height	Plant Name	Height
American cranberrybush	10	Amur maple	10	eastern redcedar	15	eastern white pine	30
gray dogwood	8	jack pine	30	lilac	10	manyflower cotoneaster	6
Norway spruce	20	red pine	30	Siberian peashrub	8	silky dogwood	8

For more information contact: Area Resource Soil Scientist, Soil Conservation Service  
Route 2, Box 2355, Spooner, WI 54801, Phone: 715-635-3505

Nearly level, very poorly drained soils formed in organic material more than 51 inches thick or underlain by sandy glacial outwash at dept of 16 to 50 inches. This map unit is not highly erodible unless drained. The land capability classification is 6W. This map unit is hydric.

Component Name: SEELYEVILLE

This map unit has 2 components, and 2 interpretation sheet.

Classification: TYPIC BOROSAPRISTS, EUIC

ESTIMATED SOIL PROPERTIES

Depth	USDA Texture	Classification		>10 In.	3-10 Inches	Percent < 3 in. passing sieve				Clay % <.002 mm
		Unified	AASHTO			No 4	No.10	No.40	No.200	
0-60	SP	PT	A-8	-	0	-	-	-	-	-

Depth (In)	Liquid Limit	Plasticity Index	Moist Bulk Density g/cc	Permeability In/hr	Available Water Capacity (In./in)	Soil Reaction (pH)	CEC (me/100g)	CaCO3 Pct	Organic Matter Pct	Shrink Swell Potential	Erosion Factor K
	0-60	-	-	0.1-0.3	0.2-6.	0.35-0.45	4.5-8.4	-	-	25.-99.	

Frequency	Flooding Duration	Months	Water Table-(feet)			Bedrock-(in) Hard.	HYD GRP	T Eroded. Index	Risk of Corrosion		Potential Frost Action
			Depth	Kind	Months				Depth	Concrete	
NONE	-	-	+2-2.0	APPARENT	YEAR-ROUND	>60	A/D	5 134	HIGH	MODERATE	HIGH

SANITARY FACILITIES	RATING	RESTRICTIVE FEATURE(S)
Septic Tank Absorption Fields	SEVERE	Ponding Subsides
Daily Cover for Landfill	POOR	Ponding Excess Humus

BUILDING SITE DEVELOPMENT	RATING	RESTRICTIVE FEATURE(S)
Shallow Excavations	SEVERE	Excess Humus Ponding
Dwellings Without Basements	SEVERE	Ponding Subsides
Dwellings With Basements	SEVERE	Ponding Subsides
Small Commercial Buildings	SEVERE	Ponding Subsides
Local Streets and Roads	SEVERE	Ponding Subsides
Lawns, Landscaping, and Golf Fairways	SEVERE	Ponding Excess Humus

CONSTRUCTION MATERIAL	RATING	RESTRICTIVE FEATURE(S)
Roadfill	POOR	Wetness Low Strength
Sand	IMPROBABLE	Excess Humus
Gravel	IMPROBABLE	Excess Humus
Topsoil	POOR	Excess Humus Wetness

WATER MANAGEMENT	RATING	RESTRICTIVE FEATURE(S)
Pond Reservoir Area	SEVERE	Seepage
Embankments, Dikes and Levees	SEVERE	Excess Humus Ponding
Drainage	LIMITATION	Ponding Subsides
Irrigation	LIMITATION	Ponding
Terraces and Diversions	LIMITATION	Ponding
Grassed Waterways	LIMITATION	Wetness

RECREATIONAL DEVELOPMENT	RATING	RESTRICTIVE FEATURE(S)	
Camp Areas	SEVERE	Ponding	Excess Humus
Picnic Areas	SEVERE	Ponding	Excess Humus
Playgrounds	SEVERE	Excess Humus	Ponding
Paths and Trails	SEVERE	Ponding	Excess Humus

CROPS AND PASTURE YIELDS

Crop yields in this table are averages for high level management where the crop is commonly grown on the map unit.

Corn Grain bu/a	Corn Silage tons/a	Soybeans bu/a	Wheat bu/a	Oats bu/a	Alfalfa Hay tons/acre	Red Clover Hay tons/acre	Improved Pasture AUM	Permanemt Pasture AUM

WOODLAND INTERPRETATIONS

WOODLAND ORD. SYB.	EROSION HAZARD	EQUIPMENT LIMITATION	SEEDLING MORTALITY	WIND TH. HAZARD	PLANT COMPETITION	INTERP ASPECT	COMMONLY EXISTING TREES (E) and/or TREES RECOMENDED TO PLANT (P)	SITE INDEX	WOODLAND PRODUCT- IVITY
3W	SLIGHT	SEVERE	SEVERE	SEVERE	SEVERE	NORTH	black ash balsam fir tamarack black spruce northern whitecedar	E 55 EP 45 EP 56 EP 34 EP 30	2 6 4 3 3

RECOMMENDED WINDBREAK SPECIES AND EXPECTED HEIGHT AT 20 YEARS

Plant Name	Height	Plant Name	Height	Plant Name	Height	Plant Name	Height
common ninebark	7	golden willow	33	imperial Carolina poplar	50	Tatarian honeysuckle	8
white willow	33	-	-	-	-	-	-
-	-	-	-	-	-	-	-

For more information contact: Area Resource Soil Scientist, Soil Conservation Service, Hwy 70 E. and Timberland Road, Route 2, Box 2355, Spooner, WI 54801-1403, Phone: 715-635-3505

Nearly level, very poorly drained soils formed in organic material more than 51 inches thick or underlain by sandy glacial outwash at dept of 16 to 50 inches. This map unit is not highly erodible unless drained. The land capability classification is 6W. This map unit is hydric.

Component Name: MARKEY

This map unit has 2 components, and 2 interpretation sheet.

Classification: TERRIC BOROSAPRISTS, SANDY OR SANDY-SKELETAL, MIXED, EUIC

ESTIMATED SOIL PROPERTIES

Depth	USDA Texture	Classification		>10 In.	3-10 Inches	Percent < 3 in. passing sieve				Clay % <.002 mm
		Unified	AASHTO			No 4	No.10	No.40	No.200	
0-40	SP	PT	A-8	-	-	-	-	-	-	0-
40-60	S LS FS	SP SM SP-SM	A-2 A-3	-	0	95-100	75-100	35- 75	0- 30	0-10

Depth (In)	Liquid Limit	Plasticity Index	Moist Bulk Density g/cc	Permeability In/hr	Available Water Capacity (In./in)	Soil Reaction (pH)	CEC (me/100g)	CaCO3 Pct	Organic Matter Pct	Shrink Swell Potential	Erosion Factor K
0-40	-	-	0.2-0.4	0.2-6.	0.35-0.45	5.6-7.8	-	-	55.-85.		0.1
40-60	-	NP	1.4-1.6	6.-20.	0.03-0.08	5.6-8.4	-	-	-	LOW	

Frequency	Flooding Duration	Water Table-Depth (feet)	Bedrock-Depth (in)	HYD GRP Fact.	T Erod. Index	Wind Risk of Corrosion		Potential Frost Action
						Steel	Concrete	
NONE	-	+1-1.0 APPARENT YEAR-ROUND	>60	A/D	4 134	HIGH	LOW	HIGH

SANITARY FACILITIES	RATING	RESTRICTIVE FEATURE(S)	
Septic Tank Absorption Fields	SEVERE	Subsides	Ponding
Daily Cover for Landfill	POOR	Seepage	Too Sandy

BUILDING SITE DEVELOPMENT	RATING	RESTRICTIVE FEATURE(S)	
Shallow Excavations	SEVERE	Cutbanks Cave	Excess Humus
Dwellings Without Basements	SEVERE	Subsides	Ponding
Dwellings With Basements	SEVERE	Subsides	Ponding
Small Commercial Buildings	SEVERE	Subsides	Ponding
Local Streets and Roads	SEVERE	Ponding	Frost Action
Lawns, Landscaping, and Golf Fairways	SEVERE	Ponding	Excess Humus

CONSTRUCTION MATERIAL	RATING	RESTRICTIVE FEATURE(S)	
Roadfill	POOR	Wetness	
Sand	PROBABLE		
Gravel	IMPROBABLE	Too Sandy	
Topsoil	POOR	Excess Humus	Wetness

WATER MANAGEMENT	RATING	RESTRICTIVE FEATURE(S)	
Pond Reservoir Area	SEVERE	Seepage	
Embankments, Dikes and Levees	SEVERE	Seepage	Piping
Drainage	LIMITATION	Ponding	Subsides
Irrigation	LIMITATION	Ponding	Soil Blowing
Terraces and Diversions	LIMITATION	Ponding	Too Sandy
Grassed Waterways	LIMITATION	Wetness	Soil Blowing

RECREATIONAL DEVELOPMENT	RATING	RESTRICTIVE FEATURE(S)	
Camp Areas	SEVERE	Ponding	Excess Humus
Picnic Areas	SEVERE	Ponding	Excess Humus
Playgrounds	SEVERE	Excess Humus	Ponding
Paths and Trails	SEVERE	Ponding	Excess Humus

CROPS AND PASTURE YIELDS

Crop yields in this table are averages for high level management where the crop is commonly grown on the map unit.

Corn Grain bu/a	Corn Silage tons/a	Soybeans bu/a	Wheat bu/a	Oats bu/a	Alfalfa Hay tons/acre	Red Clover Hay tons/acre	Improved Pasture AUM	Permanemt Pasture AUM

WOODLAND INTERPRETATIONS

WOODLAND ORD. SYB.	EROSION HAZARD	EQUIPMENT LIMITATION	SEEDLING MORTALITY	WIND TH. HAZARD	PLANT COMPETITION	INTERP ASPECT	COMMONLY EXISTING TREES and/or TREES RECOMENDED TO PLANT (P)	(E) SITE INDEX	WOODLAND PRODUCT- IVITY
ZW	SLIGHT	SEVERE	SEVERE	SEVERE	SEVERE	NORTH	balsam fir red maple paper birch black ash tamarack white spruce black spruce quaking aspen northern whitecedar	E E E E E E E E E E	       45 2

For more information contact: Area Resource Soil Scientist, Soil Conservation Service, Hwy 70 E. and Timberland Road, Route 2, Box 2355, Spooner, WI 54801-1403, Phone: 715-635-3505

SOIL DESCRIPTION REPORT

SURVEY AREA - VILAS COUNTY, WISCONSIN

Map Unit

Symbol Description

- ChB CHAMPION SILT LOAM, 1 TO 6 PERCENT SLOPES  
Nearly level and gently sloping, moderately well drained soil formed in a thin mantle of loess and in the underlying sandy and loamy glacial till. This map unit is potentially highly erodible. The land capability classification is 2E. This map unit is prime farmland.
- ChC CHAMPION SILT LOAM, 6 TO 20 PERCENT SLOPES  
Sloping and moderately steep, moderately well drained soil formed in a thin mantle of loess and in the underlying sandy and loamy glacial till. This map unit is potentially highly erodible. The land capability classification is 3E.
- Lo LOXLEY AND DAWSON PEATS, 0 TO 1 PERCENT SLOPES  
Nearly level, very poorly drained soil formed in acid organic material more than 51 inches thick or underlain by sandy glacial outwash at depths of 16 to 50 inches. This map unit is not highly erodible unless drained. The land capability classification is 6W. This map unit is hydric.
- MoA MONICO SILT LOAM, 0 TO 3 PERCENT SLOPES  
Nearly level and gently sloping, somewhat poorly drained soil formed in silty and loamy deposits and in the underlying loamy or sandy glacial till. This map unit is not highly erodible. The land capability classification is 2W. This map unit is prime farmland where drained. This map unit may have hydric inclusions.
- PaB PADUS FINE SANDY LOAM, 0 TO 6 PERCENT SLOPES  
Nearly level and gently sloping, well drained soil formed in loamy deposits and the underlying stratified sand and gravel glacial outwash. This map unit is potentially highly erodible. The land capability classification is 2E. This map unit is prime farmland.
- PaC PADUS FINE SANDY LOAM, 6 TO 15 PERCENT SLOPES  
Sloping and moderately steep, well drained soil formed in loamy deposits and the underlying stratified sand and gravel glacial outwash. This map unit is potentially highly erodible. The land capability classification is 3E.
- PnC PENCE SANDY LOAM, 6 TO 15 PERCENT SLOPES

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SOIL DESCRIPTION REPORT

SURVEY AREA - VILAS COUNTY, WISCONSIN

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Map Unit

Symbol

Description

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Sloping and moderately steep, well drained soil formed in loamy deposits and the underlying stratified sand and gravel glacial outwash. This map unit is potentially highly erodible. The land capability classification is 4E.

Se

SEELYEVILLE AND MARKEY MUCKS, 0 TO 1 PERCENT SLOPES  
Nearly level, very poorly drained soils formed in organic material more than 51 inches thick or underlain by sandy glacial outwash at dept of 16 to 50 inches. This map unit is not highly erodible unless drained. The land capability classification is 6W. This map unit is hydric.

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Category Codes: AGR



Nearly level and gently sloping, moderately well drained soil formed in a thin mantle of loess and in the underlying sandy and loamy glacial till. This map unit is potentially highly erodible. The land capability classification is 2E. This map unit is prime farmland.

Component Name: CHAMPION

Classification: TYPIC FRAGIORTHODS, COARSE-LOAMY, MIXED, FRIGID

ESTIMATED SOIL PROPERTIES

Depth	USDA Texture	Classification		>10 In.	3-10 Inches	Percent < 3 in. passing sieve				Clay % <.002 mm
		Unified	AASHTO			No 4	No.10	No.40	No.200	
0-18	SIL	ML CL-ML	A-4	-	0-20	95-100	85-100	85-100	50- 90	10-15
18-39	VFSL FSL	ML CL-ML SM SM-SC	A-2-4 A-4	-	0-20	95-100	85-100	55-100	30- 85	2-15
39-60	GR-FSL SL GR-LS	SM SM-SC SP-SM	A-2-4 A-1-B A-4	-	0-20	75-100	55- 90	25- 80	10- 50	2-12
53-60	GR-FSL SL GR-LS	SM SM-SC SP-SM	A-2-4 A-1-B A-3	-	0-20	80-100	50- 90	25- 80	5- 50	1-12

A-4

Depth (In)	Liquid Limit	Plasticity Index	Moist Bulk Density g/cc	Permeability In/hr	Available Water Capacity (In./in)	Soil Reaction (pH)	CEC (me/100g)	CaCO3 Pct	Organic Matter Pct	Shrink Swell Potential	Erosion Factor K
0-18	<25	NP-7	1.4-1.6	0.6-2.	0.16- 0.2	3.6- 6.	-	-	1.- 3.	LOW	0.37
18-39	<25	NP-7	1.1-1.6	0.6-2.	0.09- 0.2	3.6- 6.	-	-	-	LOW	0.37
39-60	<25	NP-6	1.8- 2.	0.06-0.2	E-2-0.04	3.6- 6.	-	-	-	LOW	0.2
53-60	<25	NP-6	1.3-1.6	0.6-6.	E-2-0.04	3.6- 6.	-	-	-	LOW	0.2

Frequency	Duration	Months	Depth	Kind	Months	Depth	Hard.	HYD GRP	T Fact.	Erod. Index	Uncoated Steel	Concrete	Potential Frost Action
NONE	-	-	1.0-2.0	PERCHED	NOV-MAY	>60		B	4	56	MODERATE	HIGH	MODERATE

SANITARY FACILITIES	RATING	RESTRICTIVE FEATURE(S)
Septic Tank Absorption Fields	SEVERE	Wetness Percs Slowly
Daily Cover for Landfill	POOR	Seepage Small Stones

BUILDING SITE DEVELOPMENT	RATING	RESTRICTIVE FEATURE(S)
Shallow Excavations	SEVERE	Cutbanks Cave Wetness
Dwellings Without Basements	SEVERE	Wetness
Dwellings With Basements	SEVERE	Wetness
Small Commercial Buildings	SEVERE	Wetness
Local Streets and Roads	MODERATE	Wetness Frost Action
Lawns, Landscaping, and Golf Fairways	MODERATE	Large Stones Wetness

CONSTRUCTION MATERIAL	RATING	RESTRICTIVE FEATURE(S)
Roadfill	FAIR	Wetness
Sand	PROBABLE	
Gravel	IMPROBABLE	Too Sandy
Topsoil	POOR	Small Stones Area Reclaim

WATER MANAGEMENT	RATING	RESTRICTIVE FEATURE(S)
Pond Reservoir Area	SEVERE	Seepage
Embankments, Dikes and Levees	SEVERE	Seepage Piping
Drainage	LIMITATION	Percs Slowly Slope Cutbanks Cave
Irrigation	LIMITATION	Slope Wetness Droughty
Terraces and Diversions	LIMITATION	Large Stones Erodes Easily
Grassed Waterways	LIMITATION	Large Stones Wetness

RECREATIONAL DEVELOPMENT	RATING	RESTRICTIVE FEATURE(S)
Camp Areas	SEVERE	Wetness
Picnic Areas	MODERATE	Wetness   Percs Slowly
Playgrounds	SEVERE	Wetness
Paths and Trails	SEVERE	Erodes Easily

CROPS AND PASTURE YIELDS

Crop yields in this table are averages for high level management where the crop is commonly grown on the map unit.

Corn Grain bu/a	Corn Silage tons/a	Soybeans bu/a	Wheat bu/a	Oats bu/a	Alfalfa Hay tons/acre	Red Clover Hay tons/acre	Improved Pasture AUM	Permanemt Pasture AUM
				70	3.	2.8	5.3	3.5

WOODLAND INTERPRETATIONS

WOODLAND ORD. SYB.	EROSION HAZARD	EQUIPMENT LIMITATION	SEEDLING MORTALITY	WIND TH. HAZARD	PLANT COMPETITION	INTERP ASPECT	COMMONLY EXISTING TREES and/or TREES RECOMENDED TO PLANT	(E) SITE INDEX	WOODLAND PRODUCT- IVITY	
3W	SLIGHT	MODERATE	SLIGHT	MODERATE	MODERATE		balsam fir red maple sugar maple yellow birch eastern hophornbeam bigtooth aspen quaking aspen black cherry American basswood eastern hemlock jack pine white spruce eastern white pine	E E E E E E E E E E P P P	0 0 60 60 0 0 0 0 0 0 0 0 0	0 0 3 3 0 0 0 0 0 0 0 0 0

RECOMMENDED WINDBREAK SPECIES AND EXPECTED HEIGHT AT 20 YEARS

Plant Name	Height	Plant Name	Height	Plant Name	Height	Plant Name	Height
American cranberrybush	10	Amur maple	12	common ninebark	8	eastern white pine	28
green ash	26	nannyberry viburnum	13	northern whitecedar	14	Norway spruce	24
redosier dogwood	8	silky dogwood	8	white ash	26	white spruce	24

For more information contact: Area Resource Soil Scientist, Soil Conservation Service  
Route 2, Box 2355, Spooner, WI 54801, Phone: 715-635-3505

Sloping and moderately steep, moderately well drained soil formed in a thin mantle of loess and in the underlying sandy and loamy glacial till. This map unit is potentially highly erodible. The land capability classification is 3E.

Component Name: CHAMPION

Classification: TYPIC FRAGIORTHODS, COARSE-LOAMY, MIXED, FRIGID

ESTIMATED SOIL PROPERTIES

Depth	USDA Texture	Classification		>10 In.	3-10 Inches	Percent < 3 in. passing sieve				Clay % <.002 mm
		Unified	AASHTO			No 4	No.10	No.40	No.200	
0-18	SIL	ML CL-ML	A-4	-	0-20	95-100	85-100	85-100	50- 90	10-15
18-39	VFSL FSL	ML CL-ML SM SM-SC	A-2-4 A-4	-	0-20	95-100	85-100	55-100	30- 85	2-15
39-60	GR-FSL SL GR-LS	SM SM-SC SP-SM	A-2-4 A-1-B A-4	-	0-20	75-100	55- 90	25- 80	10- 50	2-12
53-60	GR-FSL SL GR-LS	SM SM-SC SP-SM	A-2-4 A-1-B A-3 A-4	-	0-20	80-100	50- 90	25- 80	5- 50	1-12

Depth (In)	Liquid Limit	Plasticity Index	Moist Bulk Density g/cc	Permeability In/hr	Available Water Capacity (In./in)	Soil Reaction (pH)	CEC (me/100g)	CaCO3 Pct	Organic Matter Pct	Shrink Swell Potential	Erosion Factor K
0-18	<25	NP-7	1.4-1.6	0.6-2.	0.16- 0.2	3.6- 6.	-	-	1.- 3.	LOW	0.37
18-39	<25	NP-7	1.1-1.6	0.6-2.	0.09- 0.2	3.6- 6.	-	-	-	LOW	0.37
39-60	<25	NP-6	1.8- 2.	0.06-0.2	E-2-0.04	3.6- 6.	-	-	-	LOW	0.2
53-60	<25	NP-6	1.3-1.6	0.6-6.	E-2-0.04	3.6- 6.	-	-	-	LOW	0.2

Frequency	Flooding Duration	Water Table-(feet) Depth	Kind	Bedrock-(in) Depth	HYD GRP	T Erod. Index	Wind Erod. Index	Risk of Corrosion Uncoated Steel	Concrete	Potential Frost Action
NONE	-	1.0-2.0	PERCHED	>60	B	4	56	MODERATE	HIGH	MODERATE

SANITARY FACILITIES	RATING	RESTRICTIVE FEATURE(S)
Septic Tank Absorption Fields	SEVERE	Wetness Percs Slowly
Daily Cover for Landfill	POOR	Seepage Small Stones

BUILDING SITE DEVELOPMENT	RATING	RESTRICTIVE FEATURE(S)
Shallow Excavations	SEVERE	Cutbanks Cave Wetness
Dwellings Without Basements	SEVERE	Wetness
Dwellings With Basements	SEVERE	Wetness
Small Commercial Buildings	SEVERE	Wetness Slope
Local Streets and Roads	MODERATE	Wetness Slope Frost Action
Lawns, Landscaping, and Golf Fairways	MODERATE	Large Stones Wetness Slope

CONSTRUCTION MATERIAL	RATING	RESTRICTIVE FEATURE(S)
Roadfill	FAIR	Wetness
Sand	PROBABLE	
Gravel	IMPROBABLE	Too Sandy
Topsoil	POOR	Small Stones Area Reclaim

WATER MANAGEMENT	RATING	RESTRICTIVE FEATURE(S)
Pond Reservoir Area	SEVERE	Seepage Slope
Embankments, Dikes and Levees	SEVERE	Seepage Piping
Drainage	LIMITATION	Percs Slowly Slope Cutbanks Cave
Irrigation	LIMITATION	Slope Wetness Droughty
Terraces and Diversions	LIMITATION	Slope Large Stones Erodes Easily
Grassed Waterways	LIMITATION	Large Stones Wetness Slope

RECREATIONAL DEVELOPMENT	RATING	RESTRICTIVE FEATURE(S)
Camp Areas	SEVERE	Wetness
Picnic Areas	MODERATE	Slope Wetness Percs Slowly
Playgrounds	SEVERE	Slope Wetness
Paths and Trails	SEVERE	Erodes Easily

CROPS AND PASTURE YIELDS

Crop yields in this table are averages for high level management where the crop is commonly grown on the map unit.

Corn Grain bu/a	Corn Silage tons/a	Soybeans bu/a	Wheat bu/a	Oats bu/a	Alfalfa Hay tons/acre	Red Clover Hay tons/acre	Improved Pasture AUM	Permanent Pasture AUM
				60	2.5	2.3	5.1	3.

WOODLAND INTERPRETATIONS

WOODLAND ORD. SYB.	EROSION HAZARD	EQUIPMENT LIMITATION	SEEDLING MORTALITY	WIND TH. HAZARD	PLANT COMPETITION	INTERP ASPECT	COMMONLY EXISTING TREES (E) and/or TREES RECOMMENDED TO PLANT (P)	SITE INDEX	WOODLAND PRODUCT- IVITY
3W	SLIGHT	MODERATE	SLIGHT	MODERATE	MODERATE				
							balsam fir	E 0	0
							red maple	E 0	0
							sugar maple	E 60	3
							yellow birch	E 60	3
							eastern hophornbeam	E 0	0
							bigtooth aspen	E 0	0
							quaking aspen	E 0	0
							black cherry	E 0	0
							American basswood	E 0	0
							eastern hemlock	E 0	0
							jack pine	P 0	0
							white spruce	P 0	0
							eastern white pine	P 0	0

RECOMMENDED WINDBREAK SPECIES AND EXPECTED HEIGHT AT 20 YEARS

Plant Name	Height	Plant Name	Height	Plant Name	Height	Plant Name	Height
American cranberrybush	10	Amur maple	12	common ninebark	8	eastern white pine	28
green ash	26	nannyberry viburnum	13	northern whitecedar	14	Norway spruce	24
redosier dogwood	8	silky dogwood	8	white ash	26	white spruce	24

For more information contact: Area Resource Soil Scientist, Soil Conservation Service  
Route 2, Box 2355, Spooner, WI 54801, Phone: 715-635-3505

Nearly level, very poorly drained soil formed in acid organic material more than 51 inches thick or underlain by sandy glacial outwash at depths of 16 to 50 inches. This map unit is not highly erodible unless drained. The land capability classification is 6W. This map unit is hydric.

Component Name: LOXLEY

This map unit has 2 components, and 2 interpretation sheet.

Classification: TYPIC BOROSAPRISTS, DYSIC

ESTIMATED SOIL PROPERTIES

Depth	USDA Texture	Classification		>10 In.	3-10 Inches	Percent < 3 in. passing sieve				Clay % <.002 mm
		Unified	AASHTO			No 4	No.10	No.40	No.200	
0-12	FB	PT	A-8	-	0	-	-	-	-	-
12-60	SP	PT	A-8	-	0	-	-	-	-	-

Depth (In)	Liquid Limit	Plasticity Index	Moist Bulk Density g/cc	Permeability In/hr	Available Water Capacity (In./in)	Soil Reaction (pH)	CEC (me/100g)	CaCO3 Pct	Organic Matter Pct	Shrink Swell Potential	Erosion Factor K
12-60	-	-	0.1-0.3	0.2-6.	0.35-0.45	3.6-4.5	-	-	-	-	

Frequency	Flooding Duration	Water Table-(feet) Depth	Bedrock-(in) Kind	HYD GRP	T Eroded	Wind Erod. Index	Risk of Corrosion		Potential Frost Action
							Steel	Concrete	
NONE	-	+1-1.0 APPARENT YEAR-ROUND	>60	A/D	5	38	HIGH	HIGH	HIGH

SANITARY FACILITIES	RATING	RESTRICTIVE FEATURE(S)
Septic Tank Absorption Fields	SEVERE	Subsides   Ponding   Percs Slowly
Daily Cover for Landfill	POOR	Ponding   Excess Humus   Too Acid

BUILDING SITE DEVELOPMENT	RATING	RESTRICTIVE FEATURE(S)
Shallow Excavations	SEVERE	Excess Humus   Ponding
Dwellings Without Basements	SEVERE	Subsides   Ponding   Low Strength
Dwellings With Basements	SEVERE	Subsides   Ponding   Low Strength
Small Commercial Buildings	SEVERE	Subsides   Ponding   Low Strength
Local Streets and Roads	SEVERE	Subsides   Ponding   Frost Action
Lawns, Landscaping, and Golf Fairways	SEVERE	Too Acid   Ponding   Excess Humus

CONSTRUCTION MATERIAL	RATING	RESTRICTIVE FEATURE(S)
Roadfill	POOR	Wetness   Low Strength
Sand	IMPROBABLE	Excess Humus
Gravel	IMPROBABLE	Excess Humus
Topsoil	POOR	Excess Humus   Wetness   Too Acid

WATER MANAGEMENT	RATING	RESTRICTIVE FEATURE(S)
Pond Reservoir Area	SEVERE	Seepage
Embankments, Dikes and Levees	SEVERE	Excess Humus   Ponding
Drainage	LIMITATION	Ponding   Subsides   Frost Action
Irrigation	LIMITATION	Ponding   Too Acid
Terraces and Diversions	LIMITATION	Ponding
Grassed Waterways	LIMITATION	Wetness

RECREATIONAL DEVELOPMENT	RATING	RESTRICTIVE FEATURE(S)		
Camp Areas	SEVERE	Ponding	Excess Humus	Too Acid
Picnic Areas	SEVERE	Ponding	Excess Humus	Too Acid
Playgrounds	SEVERE	Excess Humus	Ponding	Too Acid
Paths and Trails	SEVERE	Ponding	Excess Humus	

CROPS AND PASTURE YIELDS

Crop yields in this table are averages for high level management where the crop is commonly grown on the map unit.

Corn Grain bu/a	Corn Silage tons/a	Soybeans bu/a	Wheat bu/a	Oats bu/a	Alfalfa Hay tons/acre	Red Clover Hay tons/acre	Improved Pasture AUM	Permanemt Pasture AUM

WOODLAND INTERPRETATIONS

WOODLAND ORD. SYB.	EROSION HAZARD	EQUIPMENT LIMITATION	SEEDLING MORTALITY	WIND TH. HAZARD	PLANT COMPETITION	INTERP ASPECT	COMMONLY EXISTING TREES (E) and/or	WOODLAND SITE INDEX	PRODUCT- IVITY
ZW	SLIGHT	SEVERE	SEVERE	SEVERE	SEVERE		balsam fir tamarack black spruce	E E E 15	2

RECOMMENDED WINDBREAK SPECIES AND EXPECTED HEIGHT AT 20 YEARS

Plant Name	Height	Plant Name	Height	Plant Name	Height	Plant Name	Height
common ninebark	8	eastern white pine	28	green ash	28	nannyberry viburnum	8
northern whitecedar	16	Siberian crabapple	30	silky dogwood	9	-	
-		-		-		-	

For more information contact: Area Resource Soil Scientist, Soil Conservation Service, Hwy 70 E. and Timberland Road, Route 2, Box 2355, Spooner, WI 54801-1403, Phone: 715-635-3505

Nearly level, very poorly drained soil formed in acid organic material more than 51 inches thick or underlain by sandy glacial outwash at depths of 16 to 50 inches. This map unit is not highly erodible unless drained. The land capability classification is 6W. This map unit is hydric.

Component Name: DAWSON This map unit has 2 components, and 2 interpretation sheet.  
Classification: TERRIC BOROSAPRISTS, SANDY OR SANDY-SKELETAL, MIXED, DYSIC

ESTIMATED SOIL PROPERTIES

Depth	USDA Texture	Classification			>10 In.	3-10 Inches	Percent < 3 in. passing sieve				Clay % <.002 mm
		Unified	AASHTO				No 4	No.10	No.40	No.200	
0-11	FB	PT	A-8		-	0	-	-	-	-	0-
11-35	SP	PT	A-8		-	0	-	-	-	-	0-
35-60	S LFS GR-S	SM-SC SM SC SP-SM	A-2	A-3 A-1	-	0	45-100	35-100	15- 90	0- 30	0-10

Depth (In)	Liquid Limit	Plasticity Index	Moist Bulk Density g/cc	Permeability In/hr	Available Water Capacity (In./in)	Soil Reaction (pH)	CEC (me/100g)	CaCO3 Pct	Organic Matter Pct	Shrink Swell Potential	Erosion Factor K
	0-11	-	-	0.2-0.3	6.-20.	0.55-0.65	3.6-4.4	-	-	65.-85.	
11-35	-	-	0.2-0.4	0.2-6.	0.35-0.45	3.6-4.4	-	-	-		
35-60	<20	NP-10	1.5-1.8	6.-20.	0.03- 0.1	4.5-6.5	-	-	-	LOW	

Frequency	Duration	Months	Water Table-(feet)		Bedrock-(in) Hard.	HYD GRP	T Erod. Index	Risk of Corrosion		Potential Frost Action	
			Depth	Kind				Months	Depth		Steel
NONE	-	-	+1-1.0 APPARENT YEAR-ROUND		>60	A/D	4	38	HIGH	HIGH	HIGH

SANITARY FACILITIES	RATING	RESTRICTIVE FEATURE(S)
Septic Tank Absorption Fields	SEVERE	Subsides   Ponding   Percs Slowly
Daily Cover for Landfill	POOR	Ponding   Excess Humus

BUILDING SITE DEVELOPMENT	RATING	RESTRICTIVE FEATURE(S)
Shallow Excavations	SEVERE	Cutbanks Cave   Excess Humus   Ponding
Dwellings Without Basements	SEVERE	Subsides   Ponding   Low Strength
Dwellings With Basements	SEVERE	Subsides   Ponding
Small Commercial Buildings	SEVERE	Subsides   Ponding   Low Strength
Local Streets and Roads	SEVERE	Subsides   Ponding   Frost Action
Lawns, Landscaping, and Golf Fairways	SEVERE	Ponding   Excess Humus

CONSTRUCTION MATERIAL	RATING	RESTRICTIVE FEATURE(S)
Roadfill	POOR	Wetness
Sand	PROBABLE	
Gravel	IMPROBABLE	Too Sandy
Topsoil	POOR	Excess Humus   Wetness

WATER MANAGEMENT	RATING	RESTRICTIVE FEATURE(S)
Pond Reservoir Area	SEVERE	Seepage
Embankments, Dikes and Levees	SEVERE	Excess Humus   Ponding
Drainage	LIMITATION	Ponding   Subsides   Frost Action
Irrigation	LIMITATION	Ponding
Terraces and Diversions	LIMITATION	Ponding
Grassed Waterways	LIMITATION	Wetness

RECREATIONAL DEVELOPMENT	RATING	RESTRICTIVE FEATURE(S)	
Camp Areas	SEVERE	Ponding	Excess Humus
Picnic Areas	SEVERE	Ponding	Excess Humus
Playgrounds	SEVERE	Excess Humus	Ponding
Paths and Trails	SEVERE	Ponding	Excess Humus

CROPS AND PASTURE YIELDS

Crop yields in this table are averages for high level management where the crop is commonly grown on the map unit.

Corn Grain bu/a	Corn Silage tons/a	Soybeans bu/a	Wheat bu/a	Oats bu/a	Alfalfa Hay tons/acre	Red Clover Hay tons/acre	Improved Pasture AUM	Permanemt Pasture AUM

WOODLAND INTERPRETATIONS

WOODLAND ORD. SYB.	EROSION HAZARD	EQUIPMENT LIMITATION	SEEDLING MORTALITY	WIND TH. HAZARD	PLANT COMPETITION	INTERP ASPECT	COMMONLY EXISTING TREES (E) and/or TREES RECOMENDED TO PLANT (P)	(E) SITE INDEX	WOODLAND PRODUCT- IVITY
ZW	SLIGHT	SEVERE	SEVERE	SEVERE	SEVERE		tamarack black spruce	E E 15	2

For more information contact: Area Resource Soil Scientist, Soil Conservation Service, Hwy 70 E. and Timberland Road,  
Route 2, Box 2355, Spooner, WI 54801-1403, Phone: 715-635-3505



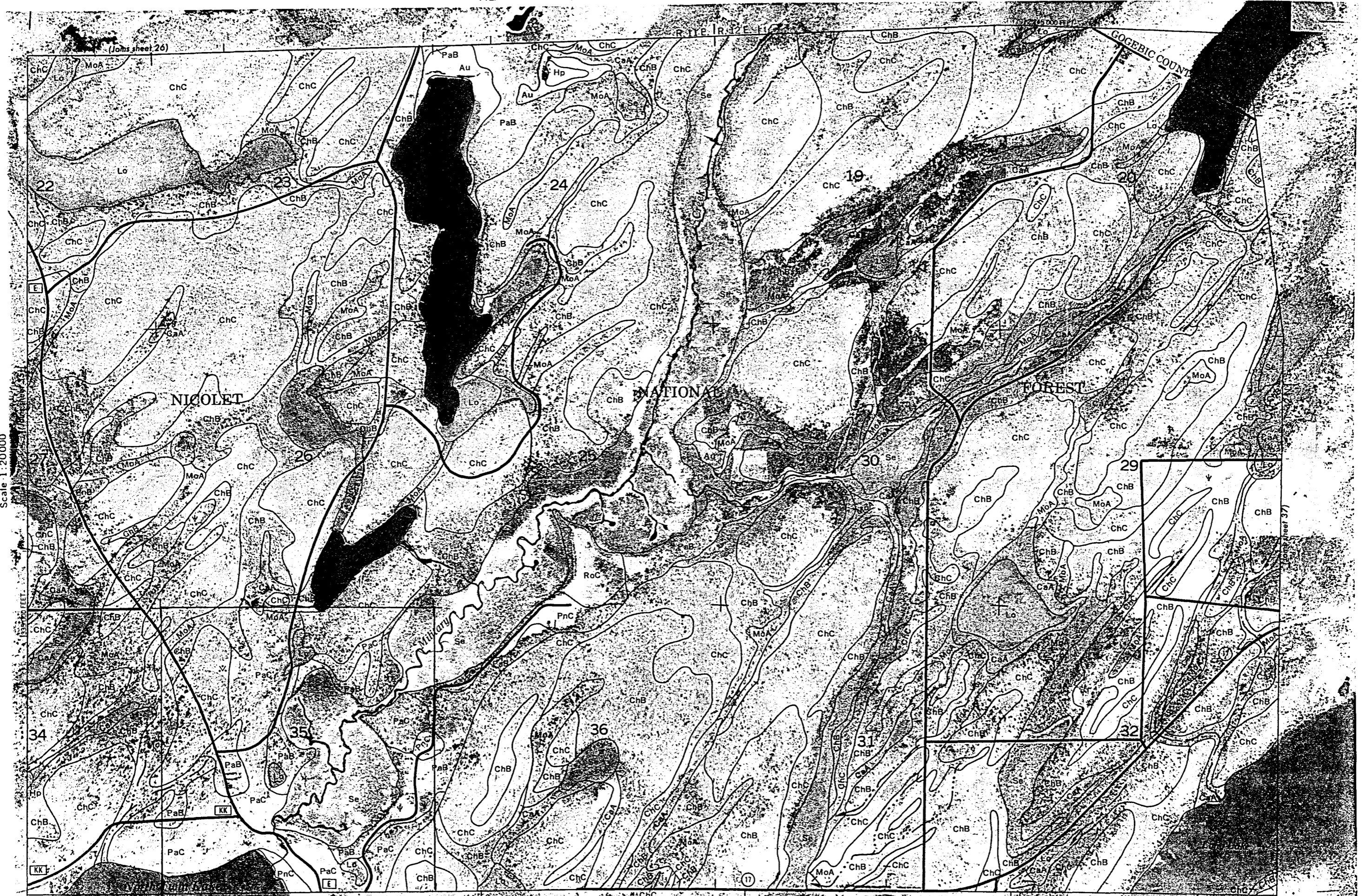
11/13/19

# Missing Page #33

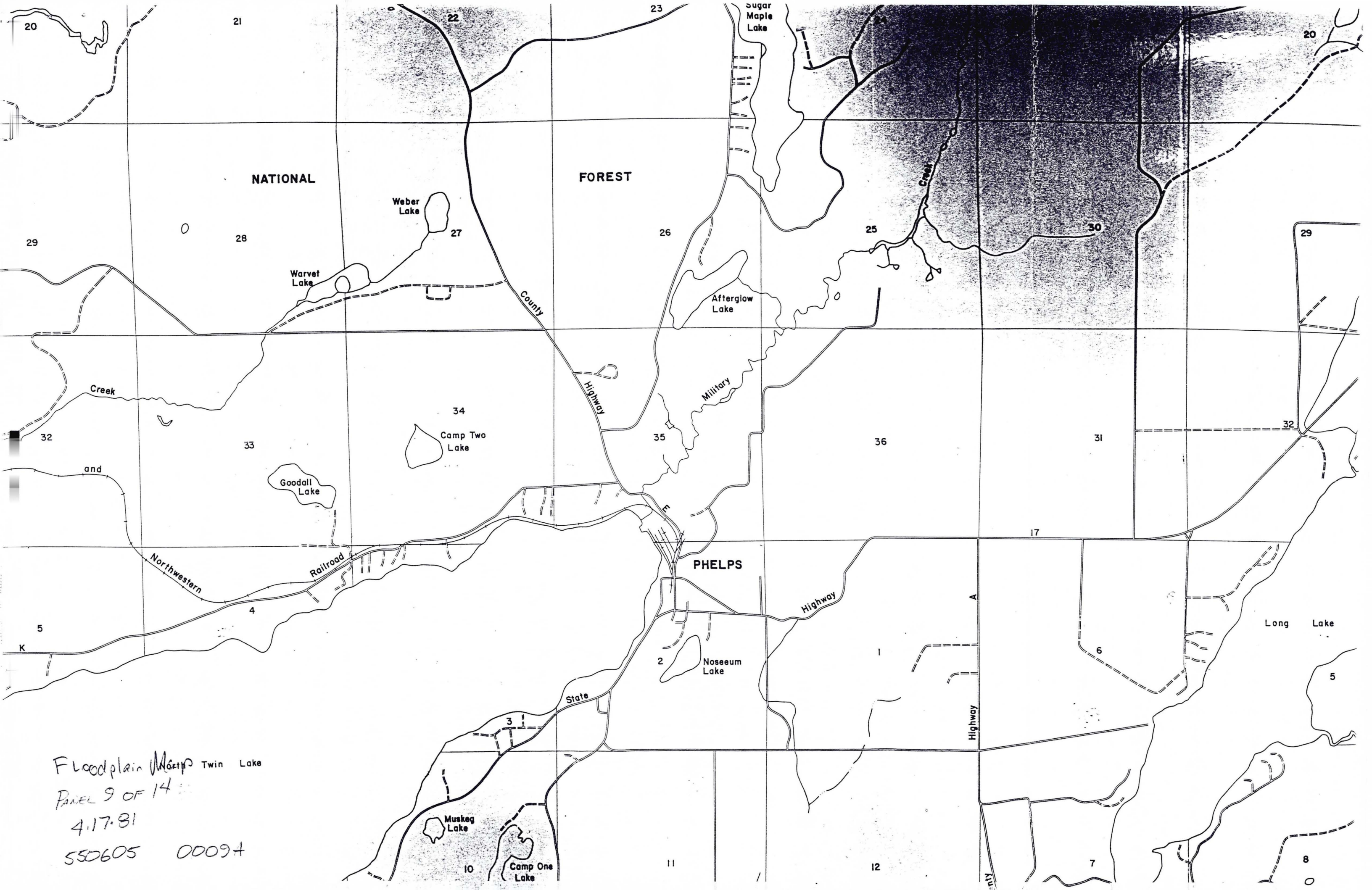
## Floodplain Map

(map E)

36



This map is compiled on 1978 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Contour and grid ticks and land division corners, if shown, are approximately positioned.



Floodplain Map Twin Lake  
Panel 9 of 14  
4.17.81  
550605 00094



**Table 1 - Excavation Soil Volume Estimate (revised)**  
*Design Report and Plan of Operation*  
*C.M. Christiansen Co., Inc. Former Pole Treatment Facility*  
*Phelps, Wisconsin*

NRT PROJ. NO.: 1226  
 BY: JAZ  
 CHKD BY: LJP  
 DATE: 10/21/98  
 FILE: Table 1 ExcSoilVol

Area	Location	Soil Sample	Max PCP Concentration	Estimated Surface Area	Max. Depth	Min. Depth	Average Depth	Estimated Volume <sup>1</sup>	Comments
1	Former AST Area	B-4	1,300 ppm	3,183 ft <sup>2</sup>	14 ft	6 ft	10 ft	1179 cy	Higher volume corresponds to removal of MW-7 below water table.
2A	Former Boiler Area	HA-2/S-1	1,700 ppm	1450 ft <sup>2</sup>	5 ft	5 ft	5 ft	269 cy	Max. depth of 5 ft confirmed during sampling at test pit TP-4.
2B	Creek Area	HA-27/28	470 ppm	4296 ft <sup>2</sup>	1 ft	1 ft	1 ft	159 cy	Excavation of this area depends on approval from WDNR due to wetland
3	Lower Wetland Area	HA-17/19	82,000 ppm	5,093 ft <sup>2</sup>	5 ft	2 ft	3 ft	566 cy	Max. depth of 5 ft confirmed during sampling at test pit TP-1.
4	Upper Wetland Area	HA-7/MW-13	44,000 ppm	1,793 ft <sup>2</sup>	6 ft	4 ft	5 ft	332 cy	
5	Western Tree-line	B-12/MW-8	340 ppm	707 ft <sup>2</sup>	3 ft	1 ft	2 ft	52 cy	

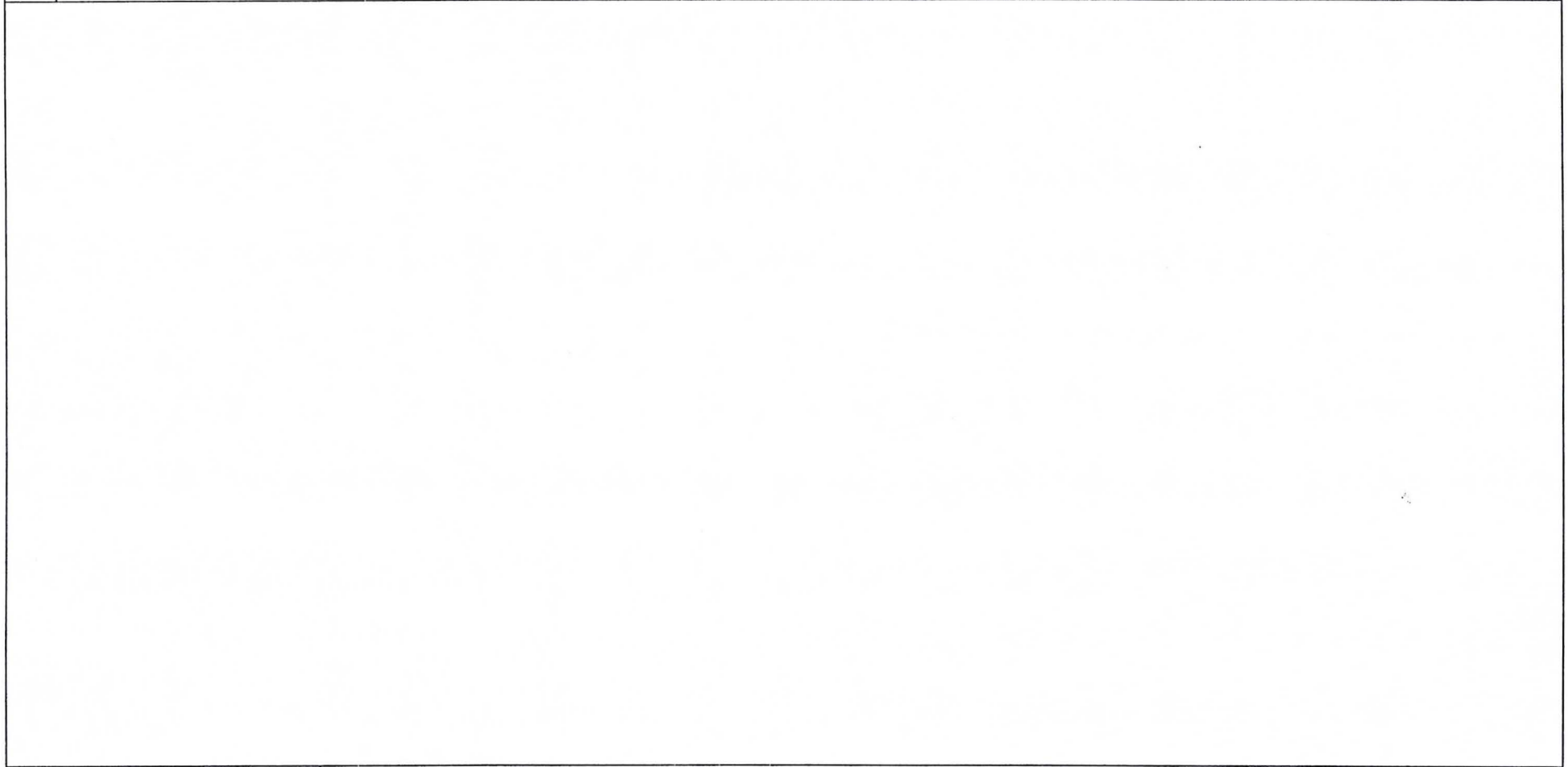
**Total Estimated Volume<sup>1</sup>      2,560 cy**  
**Total Estimated Tonnage<sup>2</sup>      3840 tons**

<sup>1</sup>Estimated soil volume, based on performance-based standard of 200 mg/kg for pentachlorophenol (PCP).

<sup>2</sup>Tonnage estimated at 1.5 tons per cubic yard of soil

PROPOSED PROJECT SCHEDULE

ID	Task Name	May				June				July				August				S			
		4/25	5/2	5/9	5/16	5/23	5/30	6/6	6/13	6/20	6/27	7/4	7/11	7/18	7/25	8/1	8/8	8/15	8/22	8/29	9/5
1	WDNR Permit Review and Public Notice																				
2	Site Preparation and Erosion Control																				
3	Soil Excavation and Processing																				
4	Biopile Construction																				
5	Excavation Dewatering and Treatment																				
6	Documentation Report																				



BY: DVP DATE: 5/6/99 CLIENT CM CHRISTIANSEN

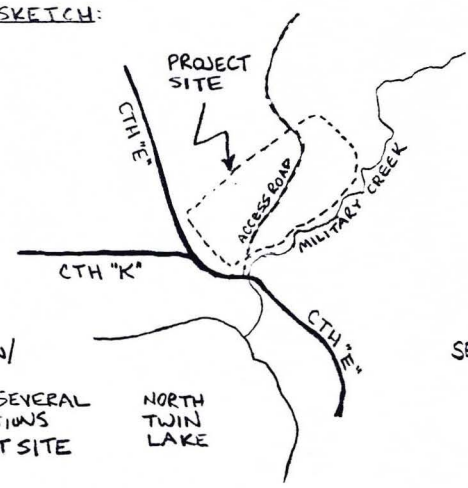
CHKD. BY: SLF DATE: 5/20/99 PROJECT/TASK 1226/4.1

SUBJECT: GRADING PERMIT: LOCATION SKETCH & CROSS-SECTION A-A' PAGE: 1 OF: 2



PROPOSED MATERIALS:  
Erosion control with silt fence/bales.  
Excavated areas will be backfilled with clean material, graded, topsoiled, mulched, and seeded with a grass mixture. Soil staging and treatment areas will be graded, topsoiled (following project), mulched, and grass-seeded.

LOCATION SKETCH:

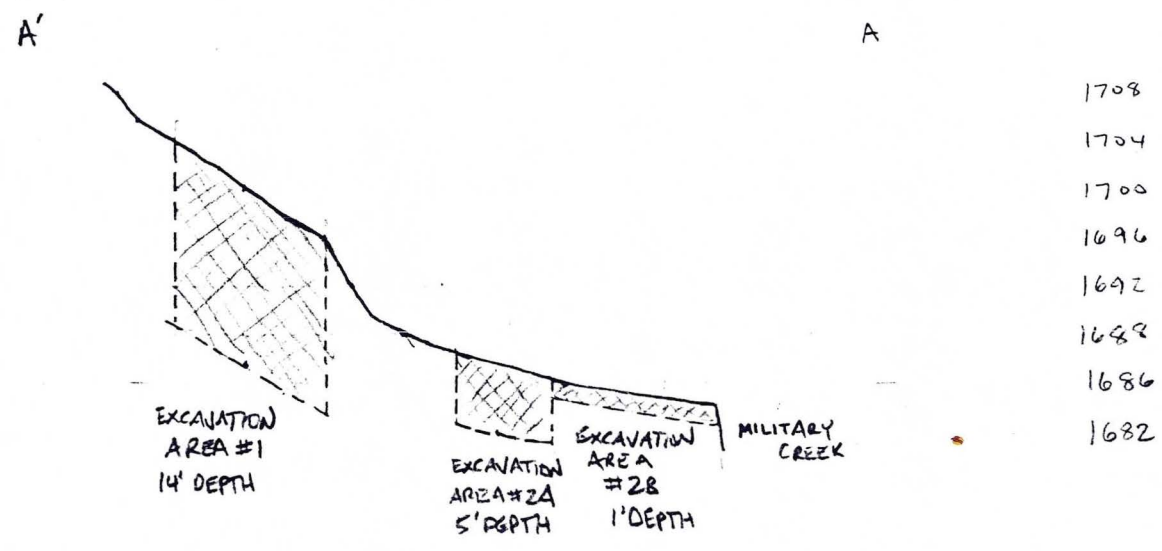
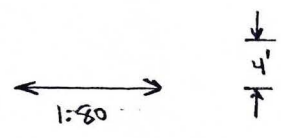


NOTE: EXCAVATION/GRADING TO BE CONDUCTED IN SEVERAL SEPARATE LOCATIONS WITHIN PROJECT SITE

SCALE 1:2000  
SE 1/4 AND SW 1/4, SEC 35  
T42N, R11E

SITE PLAN AND SECTIONS

SEE ATTACHED SITE PLAN FOR SECTION LOCATIONS



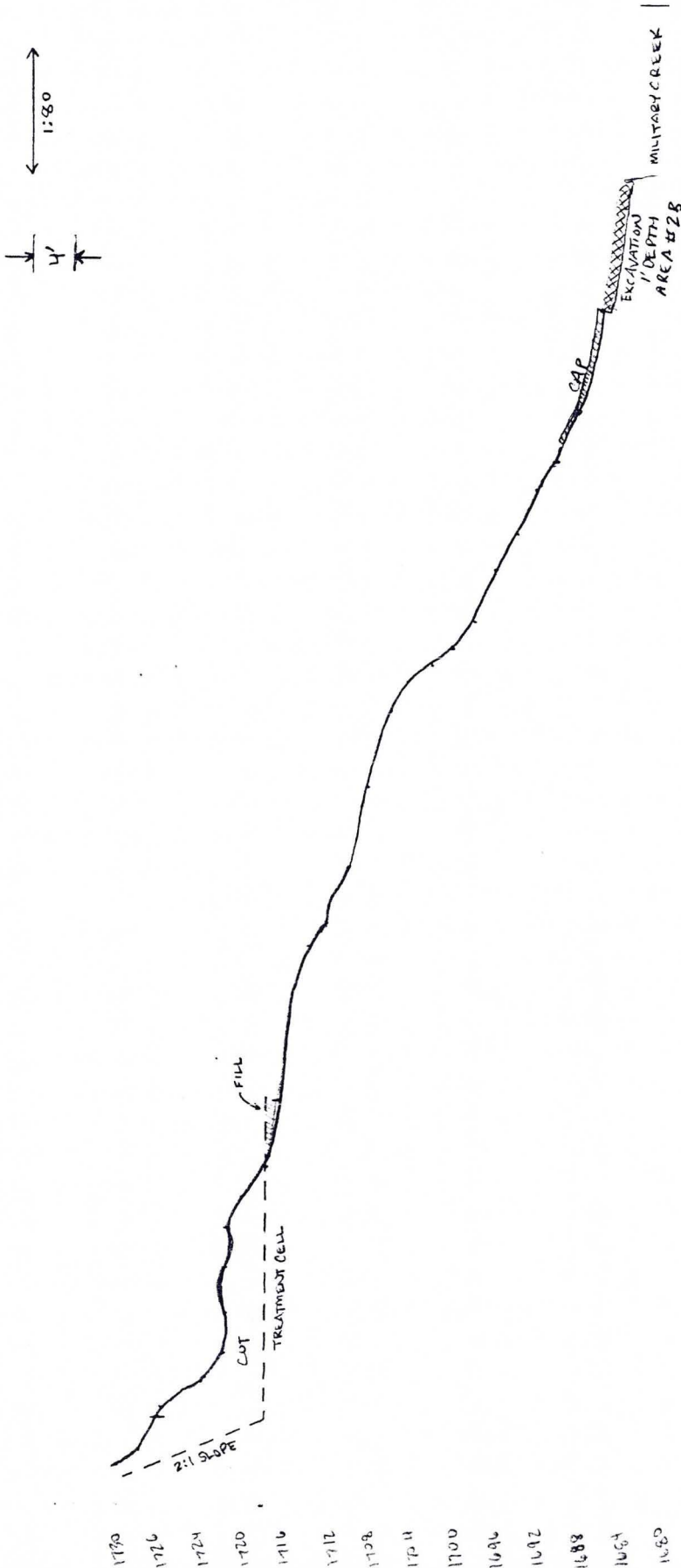
BY: DVP DATE: 5/6/99 CLIENT CMCHRISTIANSEN

CHKD. BY: SLF DATE: 5/20/99 PROJECT/TASK 1226/4.1



SUBJECT: GRADING PERMIT: CROSS SECTION B-B' PAGE: 2 OF: 2

A



B-B'



# EROSION CONTROL PLAN

## C.M. CHRISTIANSEN FORMER POLE TREATMENT FACILITY

### Overview

This document is a supplement to the *Grading in Excess of 10,000 Square Feet Information Requirements* for construction activities at the C.M. Christiansen Former Pole Treatment Facility in Phelps, Wisconsin. The site location is shown on attached Figure 1. The purpose of this supplemental plan is to address erosion control measures for excavation, grading, and backfilling to occur during remedial construction at the site. Contaminated soil will be excavated from five areas of the site, as shown on Plate 1. Three of these areas, including Area 1, 2 and 3 are located on the unbroken slope of a navigable waterway, Military Creek. Excavated soil is planned for stockpiling and on-site treatment in a constructed biological treatment pile. Activities described herein will be performed in accordance with *Wisconsin Best Management Practices for Construction Site Erosion Control*.

### Temporary Erosion Control Practices

The proposed schedule for this project is to begin grading activities, depending upon timely permit approval, in July 1999. Prior to the commencement of soil excavation, the following site preparation activities will be conducted:

- Silt fence will be placed on the down slope side of each excavation area for erosion control purposes as shown on Plan Plate 1. In addition, silt fence will be placed on the down slope side of the soil staging/material processing area and the above-ground treatment cell.
- A run-on control system will be constructed on three sides of the treatment cell. A diversion swale will be constructed along the northern, western and southern sides of the treatment cell which is capable of preventing flow onto the cell from a 24-hour, 25-year storm. The swale will divert run-on water around the cell in an easterly direction toward the creek. Calculations for determining the dimensions of the swale are contained in Appendix D and a typical cross section is shown on Figure 8. The swale will have 1:1 side slopes, with a width of 1 foot at the base, 3 feet at the top and 1 foot in depth with an average slope of 2 percent (1% minimum).
- A soil staging/material processing area will be constructed in accordance with NR 718.05 (3).

Installation methods and maintenance procedures for erosion control silt fences and straw bale fences will follow best management practices. Trucks, grading equipment, and other construction vehicles will use the gravel access roads as much as possible to minimize tracking. Temporary mulching may be used to reduce erosion and promote establishment of vegetative cover. Bare soils shall be temporarily mulched if additional grading or final cover placement will be delayed for over four weeks. Suitable mulching material includes straw, wood chips, or wood fiber. Erosion control nets and mats may also be used.

### **Maintenance Activities**

Over the duration of construction activities the primary construction manager will be responsible for implementing the erosion control plan. The construction manager or other designated contractor will conduct site inspections to: 1) document the conditions of silt fences; 2) document sediment accumulation amounts adjacent to fences; 3) evaluate eroded or potentially unstable soils; and 4) determine whether additional mulching/seeding is needed. Inspections will be made on a weekly basis and within 24-hours after significant rainfall events in accordance with the Wisconsin Construction Site Best Management Practice Handbook. Maintenance activities may include removal of sediment from fences, fence repair as needed, and mulching/seeding, if needed.

### **Permanent Erosion Control Practices**

Excavation areas disturbed by filling and grading will ultimately be covered by a compacted cap, topsoiled, and vegetated with grass. Routine inspection of the biological treatment cell and other areas will be conducted following construction, including checking that the run-on swale is properly diverting water away from the cell, monitoring the growth of seeded areas, and identification of potential erosion pathways.