Nonmetallic Mining Reclamation Plan

Oakdale Nonmetallic Mine
Monroe County, Wisconsin

Prepared for:

Fairview Cranberry, LLC
1 Ben Fairless Drive
Fairless Hills, PA 19030

April 2012

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Ayres Associates Project No. 23-1428.01
File: k:\municipal\smart sand\23-1428.01 oakdale processing facility\reclamation plan\reclamation plan document\recplan.docx

Contents

List of Appendices

General Information

Project Description

The purpose of the non-metallic sand mine is to extract industrial sand. The proposed mine is located in the southwest quadrant of the intersection of USH 12 and CTH N in the township of Oakdale, Monroe County, Wisconsin. See Appendix A, Figure A1, “Site Location Map”.

Contact Information

Mine Operator: Smart Sand, Inc.
28896 Cty Hwy CA
Tomah, WI 54660
215-295-7900

Property Owner: Fairview Cranberry, LLC
1 Ben Fairless Drive
Fairless Hills, PA 19030
908-507-3224

Property Description

All of the following described parcels in Section 8, Township 17 North, Range 1 East of the Fourth Principal Meridian:

That part of the Northwest Quarter of the Northwest Quarter lying south of the southerly right-of-way line of United States Highways 12 and 16 and north of the northerly right-of-way line of the Canadian Pacific Railroad; (Parcel No. 030-00190-2500)

That part of the Northeast Quarter of the Northwest Quarter lying south of the southerly right-of-way line of United States Highways 12 and 16; (Parcel No. 030-00187-0000)

That part of the Southeast Quarter of the Northwest Quarter lying north of the northerly right-of-way line of the Canadian Pacific Railroad; (Parcel No. 030-00193-0000)

That part of the Southeast Quarter of the Northwest Quarter lying south of the southerly right-of-way line of the Canadian Pacific Railroad; (Parcel No. 030-00194-0000)

That part of the Southwest Quarter of the Northeast Quarter lying south of the southerly right-of-way line of the Canadian Pacific Railroad; (Parcel No. 030-00183-0000)

The Northwest Quarter of the Southwest Quarter; (Parcel No. 030-00196-0000)

The Northeast Quarter of the Southwest Quarter; (Parcel No. 030-00195-0000)

That part of the Northwest Quarter of the Southeast Quarter lying south of the southerly right-of-way line of the Canadian Pacific Railroad; (Parcel No. 030-00201-0000)

That part of the Northeast Quarter of the Southeast Quarter lying south of the southerly right-of-way line of the Canadian Pacific Railroad; (Parcel No. 030-00200-0000)

The Southwest Quarter of the Southwest Quarter; (Parcel No. 030-00197-0000)

The Southeast Quarter of the Southwest Quarter; (Parcel No. 030-00198-0000)

The Southwest Quarter of the Southeast Quarter; (Parcel No. 030-00202-0000)

The Southeast Quarter of the Southeast Quarter. (Parcel No. 030-00203-0000)

AND, all of the following described parcels in Section 16, Township 17 North, Range 1 East of the Fourth Principal Meridian:

Those parts of the Northwest Quarter of the Northwest Quarter (including part of Lot A of the certified survey map recorded in Volume 2 of Certified Survey Maps on Page 224 at the office of the Monroe County Register of Deeds), the Northeast Quarter of the Northwest Quarter, the Southwest Quarter of the Northwest Quarter, and the Northwest Quarter of the Southwest Quarter lying north and west of the following described reference line: Commencing at the northwest corner of said Section 16; thence S87°13'31"E, on the north line of said Section 16, 1773.26 feet to the point of beginning of said reference line; thence S27°35'55"W, 302.95 feet; thence S31°41'00"W, 952.02 feet; thence N78°35'56"W, 274.38 feet; thence S27°52'24"W, 278.81 feet to a point on the south line of the said northwest quarter of the northwest quarter; thence S87°12'14'E, on said south line, 69.32 feet; thence S23°41'51"W, 1214.45 feet; thence S01°03'16"W, 196.50 feet; thence N88°34'04"W, 182.01 feet to a point on the west line of said Section 16 and terminating. (Parts of Parcel Nos. 030-00489-0000, 030-00490-5000, 030-00479-0000, and 030-00491-0000)

AND, all of the following described parcels in Section 17, Township 17 North, Range 1 East of the Fourth Principal Meridian:

The Northwest Quarter of the Northwest Quarter; (Parcel No. 030-00513-0000)

The Northeast Quarter of the Northwest Quarter; (Parcel Nos. 030-00511-0000 and 030-00512-0000)

The Northwest Quarter of the Northeast Quarter; (Parcel Nos. 030-00506-0000 and 030-00507-0000)

The Northeast Quarter of the Northeast Quarter; (Parcel No. 030-00505-0000)

The Southwest Quarter of the Northwest Quarter; (Parcel No. 030-00514-0000)

The Southeast Quarter of the Northwest Quarter; (Parcel Nos. 030-00515-0000 and 030-00516-0000)

The Southwest Quarter of the Northeast Quarter; (Parcel Nos. 030-00508-0000 and 030-00509-0000)

The Southeast Quarter of the Northeast Quarter; (Parcel No. 030-00510-0000)

That part of the Northeast Quarter of the Southwest Quarter lying north and east of Lot 1 of the certified survey map recorded in Volume 24 of Certified Survey Maps on Page 090 at the office of the Monroe County Register of Deeds; (Parcel Nos. 030-00517-0000 and 030-0518-0000)

The Northwest Quarter of the Southeast Quarter; (Parcel Nos. 030-00526-0000 and 030-0527-0000)

That part of the Northeast Quarter of the Southeast Quarter lying north and west of the following described reference line: Beginning at the east one-quarter corner of Section 17; thence S01°11'14"W, on the east line of said section, 536.95 feet; thence N88°28'28"W, 390.68 feet; thence S01°10'11"W, 100.00 feet; thence N85°45'19"W, 200.40 feet; thence S01°10'11"W, 217.71 feet; thence N85°45'19"W, 99.60 feet; thence S01°10'11"W, 449.92 feet to a point on the south line of said northeast quarter of the southeast quarter and terminating; (Parcel No. 030-00524-0000)

Lot 1 of the certified survey map recorded in Volume 24 of Certified Survey Maps on Page 090 at the office of the Monroe County Register of Deeds being part of the Southeast Quarter of the Southwest Quarter lying north of the northerly right-of-way line of Monroe County Trunk Highway "CA" and being part of the Northeast Quarter of the Southwest Quarter; (Parcel No. 030-00522-0000)

That part of the Southeast Quarter of the Southwest Quarter lying north of the northerly right-of-way line of Monroe County Trunk Highway "CA" and east of Lot 1 of the certified survey map recorded in Volume 24 of Certified Survey Maps on Page 090 at the office of the Monroe County Register of Deeds; (Parcel No. 030-00523-0000)

That part of the Southwest Quarter of the Southeast Quarter lying north of the northerly right-of-way line of Monroe County Trunk Highway "CA", except those lands described in Volume 195 of Records, Page 773, Document Number 440081 at the office of the Monroe County Register of Deeds as: Commencing at a point on the north right-of-way line of CTH "C" (aka "CA") 1½ rods east of the west line of the said southeast quarter, thence 300 feet Easterly on said north right-of-way line, thence Northerly 200 feet, thence Westerly 300 feet to a point 1½ rods east of the west line of the said southeast quarter, thence Southerly 200 feet to the point of beginning. (Parcel Nos. 030-00529-0000 and 030-00530-0000)

AND, all of the following described parcels in Section 18, Township 17 North, Range 1 East of the Fourth Principal Meridian:

That part of the Fractional Southwest Quarter of the Northwest Quarter lying east of the easterly right-of-way line of Monroe County Trunk Highway "CA", except the north 30 rods thereof and except Outlots 1 and 2 of the certified survey map recorded in Volume 20 of Certified Survey Maps on Page 051 at the office of the Monroe County Register of Deeds; (Parcel No. 030-00541-2000)

Outlot 2 of the certified survey map recorded in Volume 20 of Certified Survey Maps on Page 051 at the office of the Monroe County Register of Deeds lying in the Fractional Southwest Quarter of the Northwest Quarter; (Parcel No. 030-00542-5002)

The South Twenty-Five acres of the Southeast Quarter of the Northwest Quarter; (Parcel No. 030-00543-0000)

The Southwest Quarter of the Northeast Quarter, except the North 30 rods of the West 12 rods thereof; (Parcel No. 030-00535-0000)

The Southeast Quarter of the Northeast Quarter; (Parcel No. 030-00537-0000)

That part of the North Half of the Northeast Quarter of the Southwest Quarter lying east of the following described line: Beginning at the northwest corner of the said northeast quarter of the southwest quarter; thence S47°36'08"E, 223.27 feet; thence S00°25'34"E, 520.66 feet and terminating; (Part of Parcel No. 030-00545-0000)

The North Half of the West Three Quarters of the Northwest Quarter of the Southeast Quarter; (Parcel No. 030-00552-0000)

The East Quarter of the Northwest Quarter of the Southeast Quarter; (Parcel No. 030-00553-0000)

The Northeast Quarter of the Southeast Quarter; (Parcel No. 030-00551-0000)

That part of the Southwest Quarter of the Southeast Quarter lying north and east of the following described line: Beginning at the northwest corner of the said southwest quarter of the southeast quarter; thence S00°22'45"E, on the west line of the said southwest quarter of the southeast quarter, 720.61 feet, thence N89°37'15"E, 727.77 feet; thence S00°22'45"E, 662.21 feet to a point on the south line of the said southwest quarter of the southeast quarter and terminating; (Parts of Parcel Nos. 030-00554-0000 and 030-00555-0000)

That part of the Southeast Quarter of the Southeast Quarter lying west of the thread of Bear Creek; (Part of Parcel No. 030-00556-0000)

AND, all of the following described parcels in Section 19, Township 17 North, Range 1 East of the Fourth Principal Meridian:

That part of the Northwest Quarter of the Northeast Quarter lying north of the north right-of-way line of Monroe County Trunk Highway "CA"; (Part of Parcel No. 030-00555-0000)

That part of the North Half of the Northwest Quarter of the Northeast Quarter lying south of the south right-of-way line of Monroe County Trunk Highway "CA", east of the east right-of-way line of Holly Avenue, and north of the north right-of-way line of Hoover Road. (Part of Parcel No. 030-00559-0000)

Lands contain 1130 acres, more or less.

Bearings in this description are based on the west line of the Northwest Quarter, Section 8, Township 17 North, Range 1 East, which is assumed to bear N00°08'41"W.

See Appendix A, Figure A2, “Parcel Mapping”.Site Information

Current Property Use/Description

Existing land use within the proposed mine boundary includes agricultural, forested, and wetlands. The boundaries of the mining area are defined by the property lines as shown in Appendix A, Figure A3 “Aerial Extent”. Structures currently present within the mine boundary include residential and farm outbuildings on parcels 030005412000 and 030005560000.

Groundwater

According to the Water Table Elevation Map – Irrigable Land Inventory – Phase I Ground Water and Related Information Map (Lippelt, 1981) ground water occurs at approximately 930 to 980 foot msl. Depending on surface elevation, ground water is 4 to 170 feet below ground surface. The ground water discharge appears to be northeasterly towards the Lemonweir River. Appendix A, Figure A4, “Groundwater Elevation Map”.

Surface Waters

Based on the USGS Oakdale 7.5 minute quadrangle map and WDNR Surface Water Data Viewer mapping, several intermittent streams and two named streams, Bear Creek and Indian Creek, flow through the property. Bear Creek is classified as a Priority Navigable Waterway. See Appendix A, Figures A5 “USGS Quadrangle Mapping” and A12 “WDNR Surface Water Mapping”.

Wetlands

According to the Wisconsin DNR Surface Water Data Viewer data base, the property includes wetlands classified as emergent/wet meadow, forested, and scrub/shrub. In addition to the DNR Surface Water Data Viewer data base search, a wetland delineation was completed for the property area lying between the railroad and USH 12 on the far north of the property. See Appendix A, Figure A8, “WDNR Wetland Mapping” and Figure A9, “Wetland Study Report”.

Geology

The property is underlain by Cambrian age sandstone. A geotechnical exploration conducted in the proposed location of the processing plant indicated that the surface of sandstone bedrock is located between 13 feet and 24 feet below existing grade. It is anticipated that the depth of bedrock will vary across the site due to variable elevations and bedrock weathering. See Appendix A, Figure A11, “Geotechnical Exploration and Supplementary Report”.

Soils

Per data obtained from the Natural Resources Conservation Service Cooperative Soil Survey, site soils range from silt loams to sands. Topsoil thickness throughout the site ranges from 0 to 14 inches consisting of silt loams, sandy loams, loamy sands, sands, and peat. See Appendix A, Figure A6, “Soil Resource Report-Monroe County, Wisconsin”.

Biological Resources

Plant Communities

According to the Wisconsin DNR Web View data base the property consists primarily of broad-leaved deciduous forest on upland areas with the valley floors consisting of a mixture of agriculture, emergent-wet meadow wetland, forested wetland, grassland, barrens, and broad-leaved deciduous forest. See Appendix A, Figure A7, “WISCLAND Landcover”.

Threatened and Endangered Species

A review of the Natural Heritage Inventory (NHI) database indicated the presence of the Eleocharis engelmannii (Engelmann’s Spike-rush) and Lycaeides Melissa samuelis (Karner Blue) within Township17 North, Range 1 East. Each of these species is listed as Special Concern. See Appendix A, Figure A10 “Natural Heritage Inventory” for a listing of threatened and endangered species for Monroe County.

Mineral Deposit

Approximately 0 to 24 feet of unconsolidated material overlies very fine to fine grained sandstone Cambrian Age sandstone; possibly the Wonewoc formation (Cw). The Wonewoc formation is comprised primarily of quartzite sandstone. The upper unit, the Ironton member, generally described as white to brown, medium to coarse grained, poorly sorted sandstone. The sandstone is iron stained and vertical burrows are present. The formation is approximately 16 to 60 feet in thickness. The lower unit, the Galesville member, consists of fine to medium grained, well sorted sandstone. It is poorly cemented with crossbedding evident. The formation is approximately 16 to 60 feet thick. It is anticipated that the depth of bedrock will vary across the site due to variable elevations and bedrock weathering. See Appendix A, Figure A11, “Geotechnical Exploration and Supplementary Report”.

Post Mining Land Use

Reclamation of the site will result in a mixture of open water (lakes/ponds), meadow, and cranberry bogs. Slopes will be reclaimed to a maximum of 3:1 for safety and stability. Lakes will have bottom slopes extending a minimum of ten feet from shorelines at a maximum 3:1 slope. The bottom elevation of water bodies will extend a minimum of six feet below the lowest seasonal ground water level. See Appendix C, Figure C1 for final site topography. The existing rail spur and improvements associated with the processing facility will be removed upon completion of mining activities.

Reclamation Measures

Schedule and Phasing

Mining will occur in the areas as shown in Appendix B, Figure B1. Mining of a phase area will begin with stripping, stockpiling, and stabilization of topsoil and overburden in a subsequent phase area. Upon completion of mining within a phase area, overburden and screenings from the processing of mined material will be utilized to construct the finished surface of the phase as

shown in Appendix C, Figure C1. Topsoil will then be placed and re-vegetated in areas above the permanent water surface of water bodies as detailed in subsequent sections. The estimated cost for reclamation of each stage is as follows.

Table 1 – Phase Bluff A Reclamation Estimate

Item	Unit	Unit Price	Quantity	Est. Reclamation Cost
Earthwork	CY	$3.00	5,913,555	$17,740,665
Topsoil	SY	$1.00	163,441	$163,441
Seeding	LB	$4.00	4,417	$17,669
Mulching	SY	$0.15	163,441	$24,516
			TOTAL	**$17,946,291**

Table 2 – Phase Bluff B Reclamation Estimate

Item	Unit	Unit Price	Quantity	Est. Reclamation Cost
Earthwork	CY	$3.00	4,985,751	$14,957,254
Topsoil	SY	$1.00	161,573	$161,573
Seeding	LB	$4.00	4,367	$17,467
Mulching	SY	$0.15	161,573	$24,236
			TOTAL	**$15,160,531**

Table 3 – Phase Bluff C Reclamation Estimate

Item	Unit	Unit Price	Quantity	Est. Reclamation Cost
Earthwork	CY	$3.00	13,195,015	$39,585,045
Topsoil	SY	$1.00	394,074	$394,074
Seeding	LB	$4.00	10,651	$42,603
Mulching	SY	$0.15	394,074	$59,111
			TOTAL	**$40,080,833**

Table 4 – Phase Coulee A Reclamation Estimate

Item	Unit	Unit Price	Quantity	Est. Reclamation Cost
Earthwork	CY	$3.00	2,587,235	$7,761,705
Topsoil	SY	$1.00	0	$0
Seeding	LB	$4.00	0	$0
Mulching	SY	$0.15	0	$0
			TOTAL	**$7,761,705**

Table 5 – Phase Coulee B Reclamation Estimate

Item	Unit	Unit Price	Quantity	Est. Reclamation Cost
Earthwork	CY	$3.00	1,123,656	$3,370,967
Topsoil	SY	$1.00	27,013	$27,013
Seeding	LB	$4.00	730	$2,920
Mulching	SY	$0.15	27,013	$4,052
			TOTAL	**$3,404,952**

Table 6 – Phase Coulee C Reclamation Estimate

Item	Unit	Unit Price	Quantity	Est. Reclamation Cost
Earthwork	CY	$3.00	3,747,833	$11,243,498
Topsoil	SY	$1.00	60,564	$60,564
Seeding	LB	$4.00	1,637	$6,547
Mulching	SY	$0.15	60,564	$9,085
			TOTAL	**$11,319,694**

Handling of Topsoil

Upon installation of erosion and sediment control practices and completion of clearing and grubbing activities, topsoil and overburden will be stripped to the full depth encountered, stockpiled and seeded to minimize erosion. Topsoil and overburden will only be stripped as necessary for mining operations using heavy equipment including scrapers, bulldozers, dump trucks, and backhoes to limit the opportunity for erosion.

Stockpiles which are not to be used immediately for site reclamation will be constructed with maximum 3:1 side slopes, seeded and stabilized. Overburden stockpiles will be top dressed with topsoil, seeded, and stabilized. Seeding will be with WIDOT seed mixture No. 20 per the requirements of the WIDOT Standard Specifications for Highway and Structure Construction, Section 630. Additionally, seeded areas will be mulched per WIDOT Standard Specifications for Highway and Structure Construction, Section 627.

Erosion and sediment controls will be installed along the site perimeter at locations where runoff currently exits the site to minimize erosion and migration of sediment off site. Temporary erosion and sediment control measures will include silt fence, sediment logs, and surface water diversions. See Appendix B, Figure B1 for phasing of topsoil and overburden removal and stockpiling areas.

Proposed Slopes and Grades

Reclamation of the mine area will include placing overburden and non-marketable material to achieve maximum 3:1 side slopes and placing topsoil, seeding, mulching, and installing erosion mat where needed. Topsoil stripped from the site will be utilized for site reclamation as needed to allow adequate cover for establishment of vegetation. All salvaged topsoil from the project area will be utilized for reclaimed areas of the mine to be re-vegetated. At a minimum, reclaimed areas which require topsoil will receive a minimum of 4 inches to allow establishment of WIDOT seed mixture No. 20. Areas below the permanent water surface of water bodies will not receive topsoil or seeding.

Grading Methods

Grading work associated with site reclamation will be accomplished utilizing heavy equipment including scrapers, bulldozers, dump trucks, and backhoes.

Proposed Final Features

Reclamation of the site will result in a mixture of open water (lakes/ponds), meadow and cranberry bogs. Slopes will be reclaimed to a maximum slope of 3:1 for safety and stability. Lakes will have maximum bottom slopes bottom slopes of 3:1 extending a minimum of ten feet from shorelines. The bottom elevation of water bodies will extend a minimum of six feet below the lowest seasonal ground water level. See Appendix C, Figure C1 for proposed final site features.

Re-Vegetation Measures

Seed Mix, Sowing Rates, and Schedule

Reclamation Schedule

See previous sections for reclamation schedule. The seeding schedule will conform with the recommendations of WDNR Tech Standard 1059.

Planned Vegetation

Disturbed areas outside of proposed water bodies and cranberry bogs will be re-vegetated utilizing WIDOT Standard Specification Seed Mixture No. 20 per WDNR Tech Standard 1059.

Seed Bed Preparation Methods

Prior to placing topsoil, surfaces will be ripped and scarified to mitigate compaction resulting from mining and processing activities as well as promote adherence/bonding between the subsoil and topsoil to be placed. Topsoil placed will have all clods and lumps broken down using appropriate equipment to produce a uniformly textured soil; in addition, all rocks, twigs, foreign material, and clods which cannot be broken down will be removed. Once placed to the required grades, the topsoil surface will be dressed to provide uniform particle sizes and allow adequate soil contact with the seed for improved germination.

If it is determined that either fertilizer or lime are needed to promote adequate seed germination and growth, materials and construction methods will be in accordance with WIDOT Standard Specifications for Highway and Structures Construction, Subsection 629.

Erosion Control Methods

Erosion control for the project will include best management practices both structural and non-structural. Non-structural practices will include phasing of the mining activities to limit the amount of disturbed area. The phasing of mining activities will be in accordance with Appendix B, Figure B1.

Erosion and sedimentation best management practices will be established prior to activities resulting in soil disturbance. Erosion and sedimentation measures will include silt fence, mulch, sediment logs, erosion mat and surface water diversion systems. See Appendix C for erosion and sedimentation control measures.

The site will be graded to minimize offsite surface drainage from entering the mine area. Surface water from the mine area will be retained within the mine for groundwater recharge.

Criteria for Assessing Reclamation

Restored areas will be monitored and maintained until satisfactory growth has been achieved. Maintenance will include replacement of eroded areas, reseeding and other work as necessary to establish healthy growth. The standard for evaluating satisfactory growth will be healthy grass growth with no bare areas larger than 6 inches square and total bare spots not exceeding 2 percent of total seeded area.

Appendix A
Existing Site Conditions

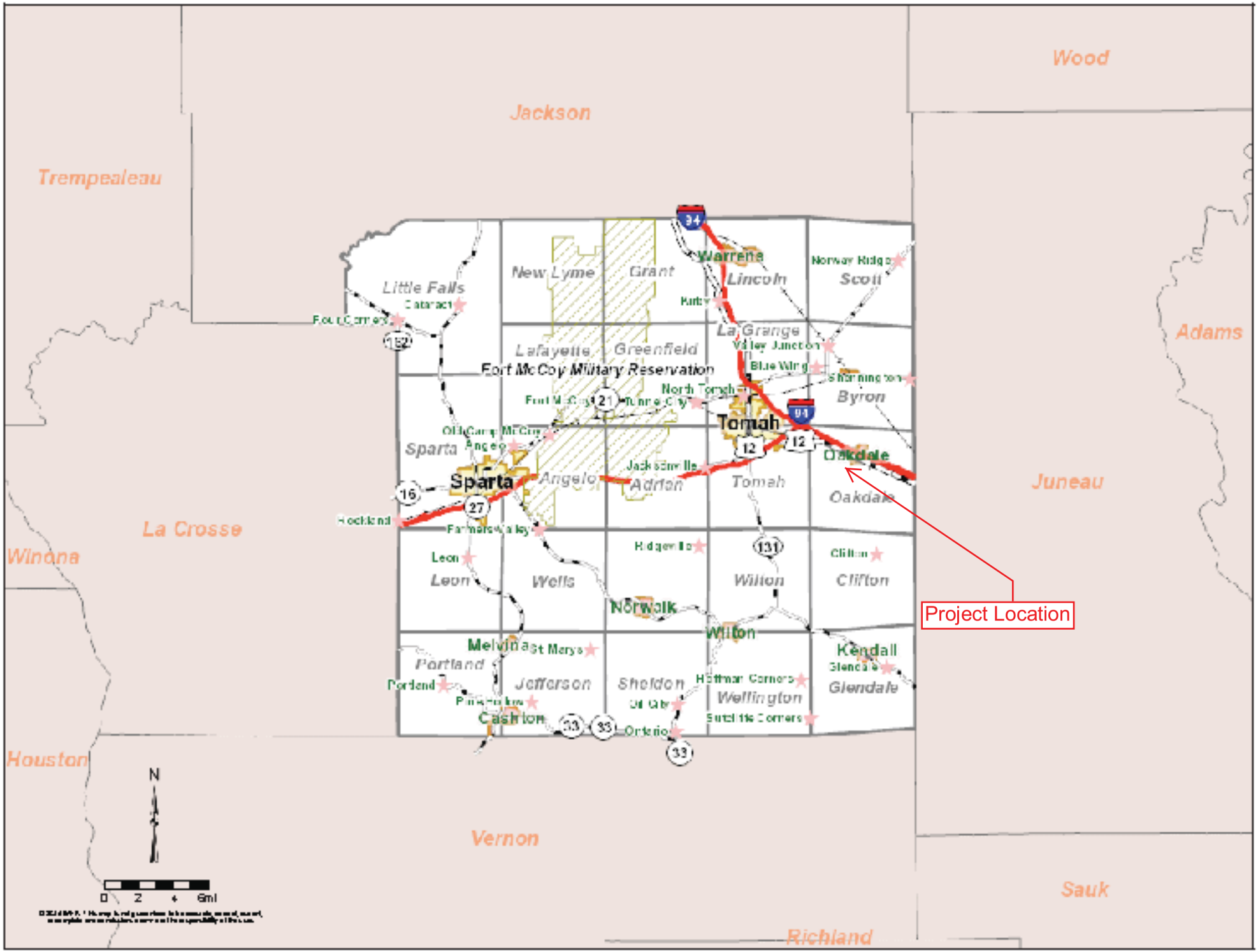


Figure A1 - General Location Map

, together with plans and markings provided

eous Notes:

dimensions within the precision requirements

rounds observed in the field or information found in the recorded documents provided.

E TABLE–

NT G	TANGENT BEARING	CENTRAL ANGLE	ARC LENGTH	CHORD LENGTH
1"W	S85°36'19"E	35°09'00"	139.26'	137.09'
2"W	N89°48'09"E	04°35'32"	114.85'	114.82'
3"E	S66°32'56"W	04°58'30"	25.44'	25.43'
2"W	N83°36'11"E	06°11'58"	155.05'	154.98'
1"W	S62°25'36"E	33°58'13"	187.95'	185.21'
4"E	N86°23'24"W	23°57'48"	160.18'	159.02'
3"W	N11°55'49"E	05°16'30"	70.62'	70.59'
5"W	S84°10'13"E	28°49'02"	104.61'	103.52'
5"E	S06°39'19"W	02°18'26"	33.79'	33.79'
4"E	S83°36'11"W	00°01'23"	0.15'	0.15'
1"E	S89°48'10"W	06°11'59"	147.92'	147.85'
7"E	S16°18'11"W	14°57'24"	93.47'	93.20'
1"E	S01°50'45"E	18°08'56"	263.86'	262.76'
5"W	S32°54'01"E	31°03'16"	212.01'	209.43'

BEARINGS & DISTANCES

1–8	S00°03'48"W 138.04'
5–6	N00°23'54"E 600.89'
6–8	N89°02'19"E 274.44'
6–7	S00°45'35"E 33.01'
5–8	S00°45'35"E 660.03'
7–9	N89°02'19"E 27.00'
9–10	S89°02'04"E 49.50'
8–9	N89°02'19"E 88.35'
9–12	S89°02'04"E 49.79'
9–11	S89°02'04"E 49.50'
11–12	S89°02'04"E 6.28'
10–11	N00°25'54"E 33.00'

- WOOD R/W POST FOUND
- STEEL R/W CHANNEL FOUND
- P.K. NAIL FOUND
- LATH SET
- POWER POLE
- POWER POLE ANCHOR
- TRANSFORMER
- ELECTRIC METER
- L.P. TANK
- TELEPHONE JUNCTION BOX
- CABLE TV JUNCTION BOX
- SATELITE DISH
- WELL
- SEPTIC SYSTEM VENT
- SEPTIC TANK
- A/C UNIT
- MAILBOX
- SIGN
- RAILROAD SWITCH
- RAILROAD SIGN
- DENOTES WETLANDS
- AERIAL ELECTRIC LINE
- UNDERGROUND TELEPHONE LINE
- UNDERGROUND FIBER OPTIC
- UNDERGROUND ELECTRIC LINE
- FENCE
- PREVIOUSLY RECORDED AS (000)
- P.O.B. POINT OF BEGINNING
- P.O.C. POINT OF COMMENCEMENT

LOCATION SKETCH
NOT TO SCALE

UNDERGROUND UTILITIES

THIS DRAWING HAS BEEN PREPARED, IN PART, ON THE BASIS OF INFORMATION COMPILED AND FURNISHED BY OTHERS. THE ENGINEER AND/OR SURVEYOR WILL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WHICH HAVE BEEN INCORPORATED INTO THIS DOCUMENT AS A RESULT. LOCATION AND DEPTH OF UNDERGROUND UTILITIES SHALL BE FIELD VERIFIED PRIOR TO BEGINNING DESIGN, EXCAVATION OR CONSTRUCTION WORK. DIGGERS HOTLINE STANDARD LOCATE TICKET NUMBERS: 20113912716, 20113912743, 20113912770, 20113912772, 20113912785, 20114607866, 20114607974, 20114608011, 20114608055, 20114607966, 20114607974, 20114608031, 20114608055, 20115100010, 20115100014, 20115100017, 20115100129, 20115100132 AND 20115100135.

WETLAND NOTE:

A. WETLANDS SOUTH OF THE CANADIAN PACIFIC RAILROAD WERE DELINEATED BY:
WETLAND & WILDLIFE SERVICES, LLC
AL O'LEARY
PHONE: (715) 323–2050

B. WETLANDS NORTH OF THE CANADIAN PACIFIC RAILROAD WERE DELINEATED BY:
STAR ENVIRONMENTAL, INC.
GARY STANGNOLL LICENSED PROFESSIONAL SOIL SCIENTIST
705 THIRD STREET
P.O. BOX 434
MARATHON, WI 54448
PHONE: (715) 443–6115

FLOOD NOTE:

A. FLOOD PLAIN SOUTH OF CANADIAN PACIFIC RAILROAD IN SECTION 8, 9, 16 & 17, T17N, R1E WAS DETERMINED BY A FLOOD PLAIN STUDY OF BEAR CREEK AND INDIAN CREEK, THE STUDY WAS COMPLETED BY LAMPERT–LEE & ASSOCIATES AS PROJECT NO. 11–040, DATED JULY 2, 2011.

B. FLOOD PLAIN NORTH OF CANADIAN PACIFIC RAILROAD IS ZONE A OF THE FLOOD INSURANCE RATE MAP, COMMUNITY PANEL NO. 55081C0410D, WHICH BEARS AN EFFECTIVE DATE OF JANUARY 20, 2010 AND IS IN A SPECIAL FLOOD HAZARD AREA. FLOOD NOTE: ZONE A — AREAS OF 100–YEAR FLOOD; BASE FLOOD ELEVATIONS AND FLOOD HAZARD FACTORS NOT DETERMINED.

C. BY GRAPHIC PLOTTING ONLY, THESE PROPERTIES IN SECTIONS 18 & 19, T17N, R1E ARE IN ZONES A & X OF THE FLOOD INSURANCE RATE MAP, COMMUNITY PANEL NO. 55081C0410D, WHICH BEARS AN EFFECTIVE DATE OF JANUARY 20, 2010 AND IS IN A SPECIAL FLOOD HAZARD AREA. ZONE A – SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD – NO BASE FLOOD ELEVATION DETERMINED. ZONE X – AREA DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN.


PROPERTY BOUNDARY
PROPERTY BOUNDARY

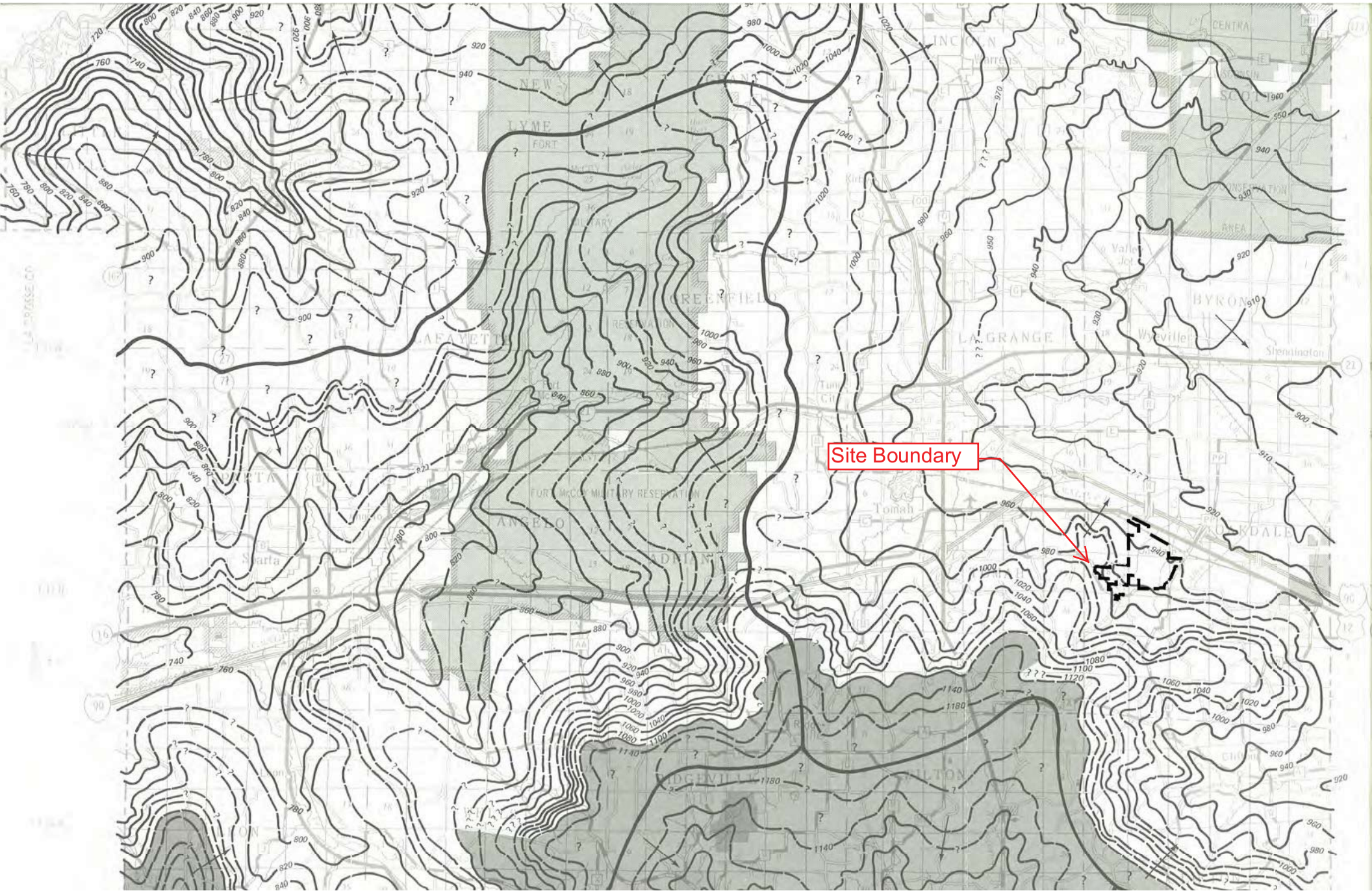
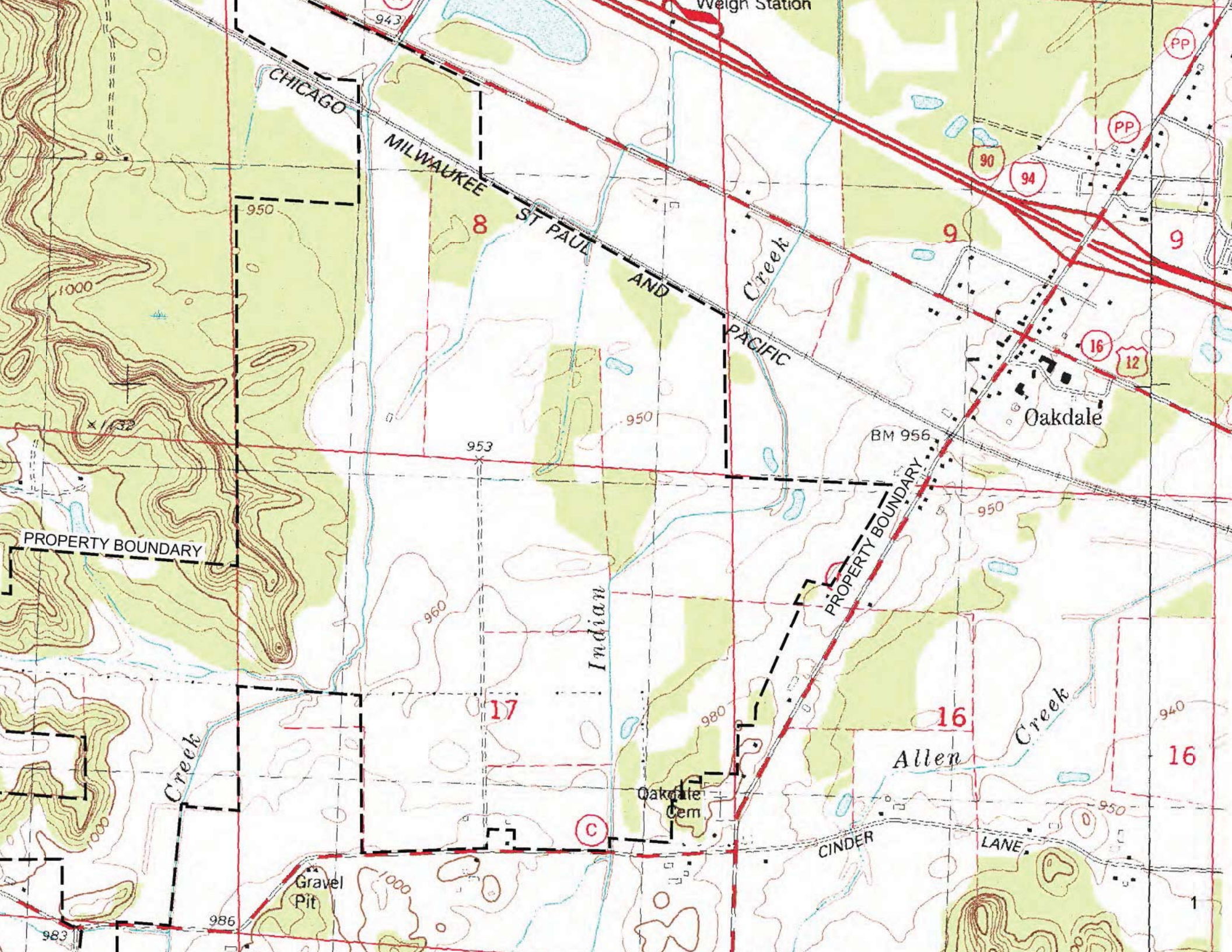


Figure A4 - Groundwater Elevation Map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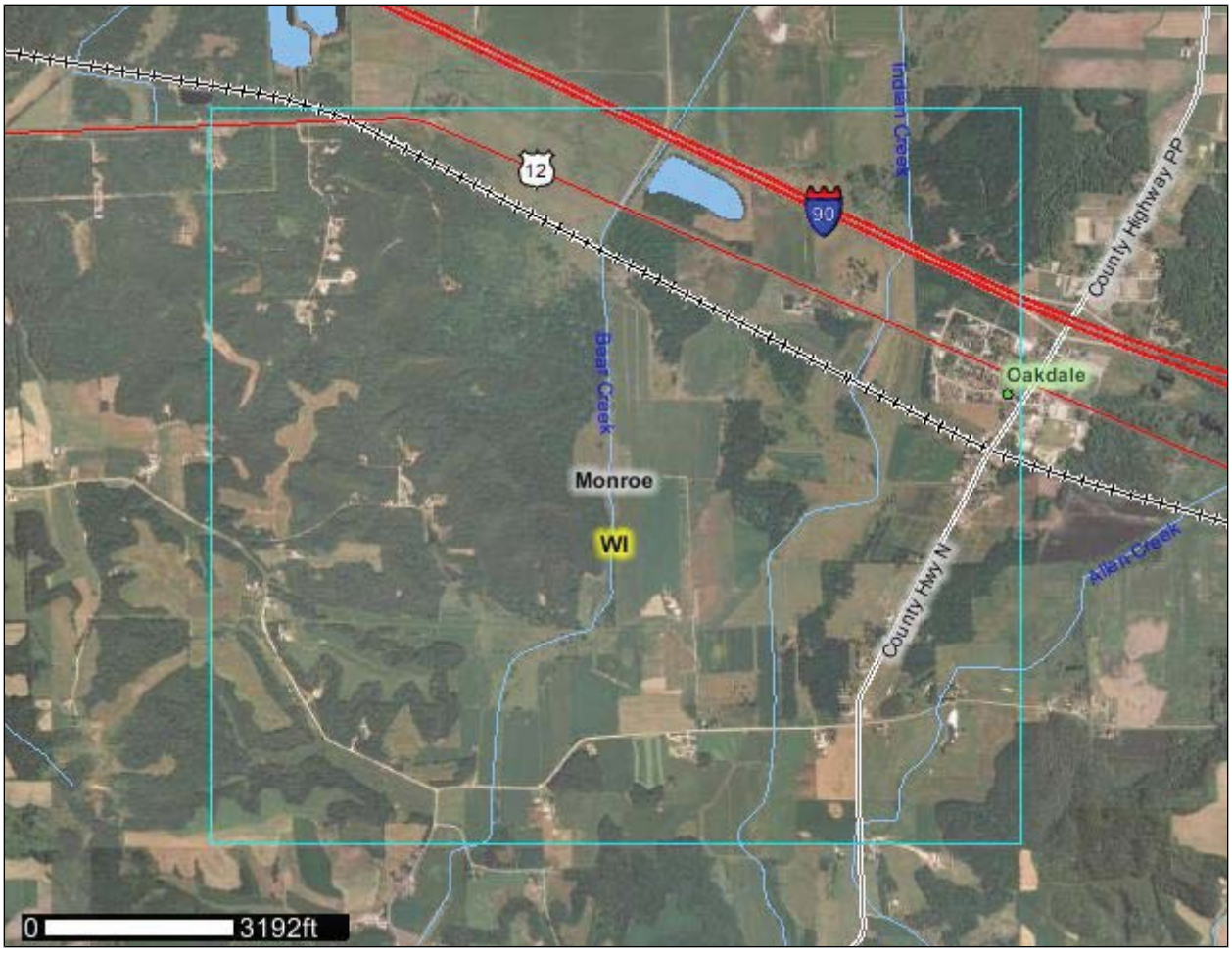
United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Monroe County, Wisconsin



April 5, 2012

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://soils.usda.gov/sqi/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (http://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://soils.usda.gov/contact/state_offices/).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Soil Data Mart Web site or the NRCS Web Soil Survey. The Soil Data Mart is the data storage site for the official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the

individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

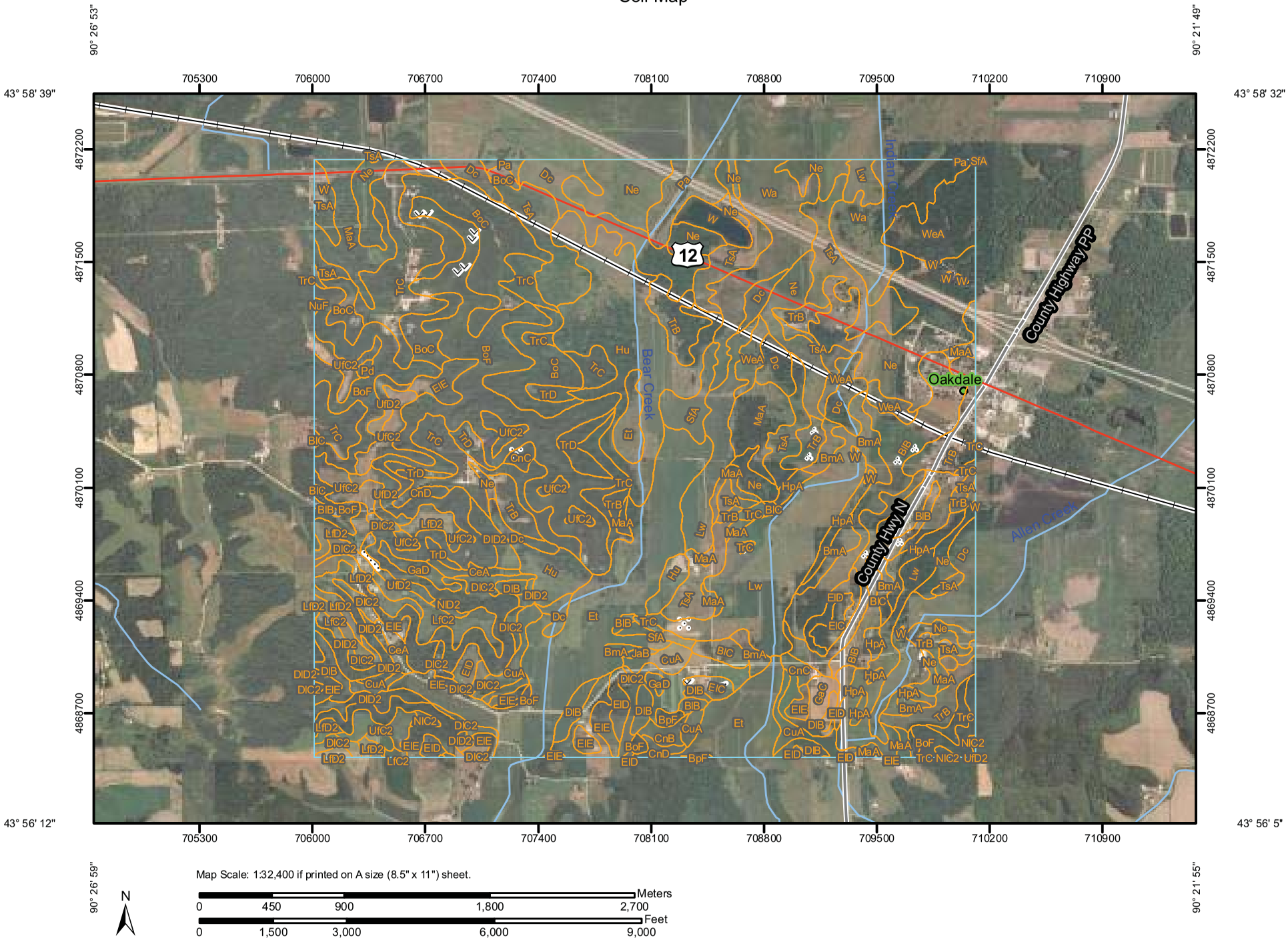

Figure A6 - Soil Resource Report - Monroe County, Wisconsin

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Units

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other

Special Line Features
- Gully
- Short Steep Slope
- Other

Political Features
- Cities

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

MAP INFORMATION

Map Scale: 1:32,400 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:15,840.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 15N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Monroe County, Wisconsin
Survey Area Data: Version 7, May 13, 2009

Date(s) aerial images were photographed: 6/18/2005; 8/1/2005; 6/6/2005

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Monroe County, Wisconsin (WI081)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
BlB	Billett sandy loam, 2 to 6 percent slopes	136.6	3.6%
BlC	Billett sandy loam, 6 to 12 percent slopes	52.7	1.4%
BmA	Billett sandy loam, moderately well drained, 0 to 3 percent	53.0	1.4%
BoC	Boone sand, 6 to 12 percent slopes	165.6	4.4%
BoF	Boone sand, 12 to 45 percent slopes	383.1	10.2%
BpF	Boone-Rock outcrop complex, 30 to 70 percent slopes	4.0	0.1%
CeA	Ceresco fine sandy loam, 0 to 3 percent slopes	14.1	0.4%
CnB	Council silt loam, 2 to 6 percent slopes	7.6	0.2%
CnC	Council silt loam, 6 to 12 percent slopes	11.0	0.3%
CnD	Council silt loam, 12 to 20 percent slopes	10.2	0.3%
CuA	Curran silt loam, 0 to 3 percent slopes	48.4	1.3%
Dc	Dawson peat	172.2	4.6%
DlB	Downs silt loam, 2 to 6 percent slopes	45.5	1.2%
DlC2	Downs silt loam, 6 to 12 percent slopes, eroded	104.7	2.8%
DlD2	Downs silt loam, 12 to 20 percent slopes, eroded	44.0	1.2%
ElC	Eleva sandy loam, 6 to 12 percent slopes	17.4	0.5%
ElD	Eleva sandy loam, 12 to 20 percent slopes	39.0	1.0%
ElE	Eleva sandy loam, 20 to 45 percent slopes	117.2	3.1%
Et	Ettrick silt loam	292.1	7.8%
GaC	Gale silt loam, 6 to 12 percent slopes	9.4	0.2%
GaD	Gale silt loam, 12 to 20 percent slopes	12.1	0.3%
HpA	Hoopeston sandy loam, 0 to 3 percent slopes	48.5	1.3%
Hu	Houghton muck	204.9	5.4%
JaB	Jackson silt loam, 2 to 6 percent slopes	2.1	0.1%
LfC2	La Farge silt loam, 4 to 12 percent slopes, eroded	31.5	0.8%
LfD2	La Farge silt loam, 12 to 20 percent slopes, eroded	51.9	1.4%
Lw	Lows sandy loam	253.3	6.7%
MaA	Meehan and Au Gres sands, 0 to 3 percent slopes	116.0	3.1%
Ne	Newson loamy sand	299.5	8.0%

Monroe County, Wisconsin (WI081)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
NlC2	Norden silt loam, 4 to 12 percent slopes, eroded	4.9	0.1%
NlD2	Norden silt loam, 12 to 20 percent slopes, eroded	3.1	0.1%
NuF	Norden, Urne, and Dorerton soils, 20 to 45 percent slopes	1.1	0.0%
Pa	Palms muck	36.3	1.0%
Pd	Pits	1.9	0.1%
SfA	Shiffer loam, 0 to 3 percent slopes	28.4	0.8%
TrB	Tarr sand, 0 to 6 percent slopes	119.5	3.2%
TrC	Tarr sand, 6 to 12 percent slopes	203.8	5.4%
TrD	Tarr sand, 12 to 20 percent slopes	36.2	1.0%
TsA	Tarr sand, moderately well drained, 0 to 3 percent slopes	213.9	5.7%
UfC2	Urne fine sandy loam, 4 to 12 percent slopes, eroded	80.4	2.1%
UfD2	Urne fine sandy loam, 12 to 20 percent slopes, eroded	26.1	0.7%
W	Water	21.9	0.6%
Wa	Wautoma sand	159.4	4.2%
WeA	Wyeville loamy sand, 0 to 3 percent slopes	79.4	2.1%
Totals for Area of Interest		**3,763.7**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different

management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Monroe County, Wisconsin

BIB—Billett sandy loam, 2 to 6 percent slopes

Map Unit Setting

Elevation: 680 to 1,700 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 135 to 160 days

Map Unit Composition

Billett and similar soils: 100 percent

Description of Billett

Setting

Landform: Stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium over sandy outwash

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Moderate (about 6.3 inches)

Interpretive groups

Land capability (nonirrigated): 3s

Typical profile

0 to 9 inches: Sandy loam
9 to 22 inches: Sandy loam
22 to 32 inches: Loamy sand
32 to 60 inches: Sand

BIC—Billett sandy loam, 6 to 12 percent slopes

Map Unit Setting

Elevation: 680 to 1,700 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 135 to 160 days

Map Unit Composition

Billett and similar soils: 100 percent

Description of Billett

Setting

Landform: Stream terraces
Landform position (three-dimensional): Riser
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium over sandy outwash

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Moderate (about 6.3 inches)

Interpretive groups

Land capability (nonirrigated): 3e

Typical profile

0 to 9 inches: Sandy loam
9 to 22 inches: Sandy loam
22 to 32 inches: Loamy sand
32 to 60 inches: Sand

BmA—Billett sandy loam, moderately well drained, 0 to 3 percent

Map Unit Setting

Elevation: 680 to 1,700 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 135 to 160 days

Map Unit Composition

Billett and similar soils: 100 percent

Description of Billett

Setting

Landform: Stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium over sandy outwash

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained

Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Moderate (about 6.7 inches)

Interpretive groups

Land capability (nonirrigated): 3s

Typical profile

0 to 8 inches: Sandy loam
8 to 30 inches: Fine sandy loam
30 to 36 inches: Loamy fine sand
36 to 60 inches: Fine sand

BoC—Boone sand, 6 to 12 percent slopes

Map Unit Setting

Elevation: 700 to 1,400 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 135 to 160 days

Map Unit Composition

Boone and similar soils: 100 percent

Description of Boone

Setting

Landform: Hills
Landform position (two-dimensional): Summit, shoulder, backslope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Sandy residuum weathered from sandstone

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Very low (about 1.8 inches)

Interpretive groups

Land capability (nonirrigated): 6s

Typical profile

0 to 2 inches: Sand
2 to 22 inches: Fine sand
22 to 60 inches: Weathered bedrock

BoF—Boone sand, 12 to 45 percent slopes

Map Unit Setting

Elevation: 700 to 1,400 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 135 to 160 days

Map Unit Composition

Boone and similar soils: 100 percent

Description of Boone

Setting

Landform: Hills
Landform position (two-dimensional): Summit, shoulder, backslope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Sandy residuum weathered from sandstone

Properties and qualities

Slope: 12 to 45 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Very low (about 1.8 inches)

Interpretive groups

Land capability (nonirrigated): 7s

Typical profile

0 to 2 inches: Sand
2 to 22 inches: Fine sand
22 to 60 inches: Weathered bedrock

BpF—Boone-Rock outcrop complex, 30 to 70 percent slopes

Map Unit Setting

Elevation: 700 to 1,400 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 135 to 160 days

Map Unit Composition

Boone and similar soils: 55 percent
Rock outcrop: 40 percent

Description of Boone

Setting

Landform: Hills
Landform position (two-dimensional): Shoulder, backslope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Sandy residuum weathered from sandstone

Properties and qualities

Slope: 30 to 70 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Very low (about 1.8 inches)

Interpretive groups

Land capability (nonirrigated): 7s

Typical profile

0 to 2 inches: Sand
2 to 22 inches: Fine sand
22 to 60 inches: Weathered bedrock

Description of Rock Outcrop

Setting

Landform: Hills
Landform position (two-dimensional): Shoulder, backslope
Down-slope shape: Linear
Across-slope shape: Linear

Interpretive groups

Land capability (nonirrigated): 8s

Typical profile

0 to 4 inches: Unweathered bedrock

CeA—Ceresco fine sandy loam, 0 to 3 percent slopes

Map Unit Setting

Elevation: 600 to 1,000 feet
Mean annual precipitation: 28 to 33 inches

Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 135 to 160 days

Map Unit Composition
Ceresco and similar soils: 100 percent

Description of Ceresco

Setting
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium and/or sandy alluvium

Properties and qualities
Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Available water capacity: Moderate (about 8.9 inches)

Interpretive groups
Land capability (nonirrigated): 3w

Typical profile
0 to 14 inches: Fine sandy loam
14 to 36 inches: Sandy loam
36 to 60 inches: Sandy loam

Minor Components

Lows
Percent of map unit:
Landform: Depressions, drainageways

CnB—Council silt loam, 2 to 6 percent slopes

Map Unit Setting
Elevation: 700 to 1,400 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 135 to 160 days

Map Unit Composition
Council and similar soils: 100 percent

Description of Council

Setting

Landform: Hills
Landform position (two-dimensional): Toeslope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Silty and/or loamy colluvium

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: High (about 11.0 inches)

Interpretive groups

Land capability (nonirrigated): 2e

Typical profile

0 to 8 inches: Silt loam
8 to 52 inches: Loam
52 to 60 inches: Loam

CnC—Council silt loam, 6 to 12 percent slopes

Map Unit Setting

Elevation: 700 to 1,400 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 135 to 160 days

Map Unit Composition

Council and similar soils: 100 percent

Description of Council

Setting

Landform: Hills
Landform position (two-dimensional): Toeslope, footslope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Silty and/or loamy colluvium

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: High (about 11.0 inches)

Interpretive groups
Land capability (nonirrigated): 3e

Typical profile
0 to 8 inches: Silt loam
8 to 52 inches: Loam
52 to 60 inches: Loam

CnD—Council silt loam, 12 to 20 percent slopes

Map Unit Setting
Elevation: 700 to 1,400 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 135 to 160 days

Map Unit Composition
Council and similar soils: 100 percent

Description of Council

Setting
Landform: Hills
Landform position (two-dimensional): Footslope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Silty and/or loamy colluvium

Properties and qualities
Slope: 12 to 20 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: High (about 11.0 inches)

Interpretive groups
Land capability (nonirrigated): 4e

Typical profile
0 to 8 inches: Silt loam
8 to 52 inches: Loam
52 to 60 inches: Loam

CuA—Curran silt loam, 0 to 3 percent slopes

Map Unit Setting

Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 135 to 160 days

Map Unit Composition

Curran and similar soils: 100 percent

Description of Curran

Setting

Landform: Stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loess and/or silty alluvium over sandy alluvium

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: Rare
Frequency of ponding: None
Available water capacity: High (about 11.2 inches)

Interpretive groups

Land capability (nonirrigated): 2w

Typical profile

0 to 13 inches: Silt loam
13 to 50 inches: Silt loam
50 to 60 inches: Sand

Minor Components

Ettrick

Percent of map unit:
Landform: Depressions, drainageways

Kato

Percent of map unit:
Landform: Depressions, drainageways

Dc—Dawson peat

Map Unit Setting

Elevation: 600 to 1,800 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 135 to 160 days

Map Unit Composition

Dawson and similar soils: 100 percent

Description of Dawson

Setting

Landform: Depressions
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Herbaceous organic material over sandy alluvium

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 5.95 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Available water capacity: Very high (about 20.5 inches)

Interpretive groups

Land capability (nonirrigated): 7w

Typical profile

0 to 12 inches: Peat
12 to 42 inches: Muck
42 to 60 inches: Sand

DlB—Downs silt loam, 2 to 6 percent slopes

Map Unit Setting

Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 135 to 160 days

Map Unit Composition
Downs and similar soils: 100 percent

Description of Downs

Setting
Landform: Hills, stream terraces
Landform position (two-dimensional): Summit, toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave, linear
Across-slope shape: Linear
Parent material: Loess and/or silty alluvium

Properties and qualities
Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: High (about 11.6 inches)

Interpretive groups
Land capability (nonirrigated): 2e

Typical profile
0 to 9 inches: Silt loam
9 to 40 inches: Silty clay loam
40 to 60 inches: Silt loam

DIC2—Downs silt loam, 6 to 12 percent slopes, eroded

Map Unit Setting
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 135 to 160 days

Map Unit Composition
Downs and similar soils: 100 percent

Description of Downs

Setting
Landform: Hills
Landform position (two-dimensional): Summit, toeslope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loess and/or silty alluvium

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: High (about 11.6 inches)

Interpretive groups

Land capability (nonirrigated): 3e

Typical profile

0 to 9 inches: Silt loam
9 to 40 inches: Silty clay loam
40 to 60 inches: Silt loam

DlD2—Downs silt loam, 12 to 20 percent slopes, eroded

Map Unit Setting

Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 135 to 160 days

Map Unit Composition

Downs and similar soils: 100 percent

Description of Downs

Setting

Landform: Hills
Landform position (two-dimensional): Footslope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loess and/or silty alluvium

Properties and qualities

Slope: 12 to 20 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: High (about 11.6 inches)

Interpretive groups

Land capability (nonirrigated): 4e

Typical profile

0 to 9 inches: Silt loam
9 to 40 inches: Silty clay loam
40 to 60 inches: Silt loam

EIC—Eleva sandy loam, 6 to 12 percent slopes

Map Unit Setting

Elevation: 680 to 1,360 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 135 to 160 days

Map Unit Composition

Eleva and similar soils: 100 percent

Description of Eleva

Setting

Landform: Hills
Landform position (two-dimensional): Summit, backslope, shoulder
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy residuum weathered from sandstone

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 3.9 inches)

Interpretive groups

Land capability (nonirrigated): 3e

Typical profile

0 to 2 inches: Sandy loam
2 to 28 inches: Sandy loam
28 to 60 inches: Weathered bedrock

EID—Eleva sandy loam, 12 to 20 percent slopes

Map Unit Setting

Elevation: 680 to 1,360 feet

Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 135 to 160 days

Map Unit Composition
Eleva and similar soils: 100 percent

Description of Eleva

Setting
Landform: Hills
Landform position (two-dimensional): Shoulder, backslope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy residuum weathered from sandstone over sandstone

Properties and qualities
Slope: 12 to 20 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 3.9 inches)

Interpretive groups
Land capability (nonirrigated): 4e

Typical profile
0 to 2 inches: Sandy loam
2 to 28 inches: Sandy loam
28 to 60 inches: Weathered bedrock

EIE—Eleva sandy loam, 20 to 45 percent slopes

Map Unit Setting
Elevation: 680 to 1,360 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 135 to 160 days

Map Unit Composition
Eleva and similar soils: 100 percent

Description of Eleva

Setting
Landform: Hills
Landform position (two-dimensional): Backslope, shoulder
Down-slope shape: Convex
Across-slope shape: Convex

Parent material: Loamy residuum weathered from sandstone over sandstone

Properties and qualities

Slope: 20 to 45 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 3.9 inches)

Interpretive groups

Land capability (nonirrigated): 7e

Typical profile

0 to 2 inches: Sandy loam
2 to 28 inches: Sandy loam
28 to 60 inches: Weathered bedrock

Et—Ettrick silt loam

Map Unit Setting

Elevation: 700 to 1,100 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 135 to 160 days

Map Unit Composition

Ettrick and similar soils: 100 percent

Description of Ettrick

Setting

Landform: Depressions, drainageways
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Parent material: Silty alluvium

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.14 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Frequent
Frequency of ponding: Frequent
Available water capacity: Very high (about 14.3 inches)

Interpretive groups

Land capability (nonirrigated): 6w

Typical profile

0 to 10 inches: Silt loam
10 to 35 inches: Silt loam
35 to 60 inches: Stratified fine sand to silt loam

GaC—Gale silt loam, 6 to 12 percent slopes

Map Unit Setting

Elevation: 700 to 1,400 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 135 to 160 days

Map Unit Composition

Gale and similar soils: 100 percent

Description of Gale

Setting

Landform: Hills
Landform position (two-dimensional): Summit, backslope, footslope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loess over sandy residuum weathered from sandstone; loess over sandy residuum weathered from sandstone

Properties and qualities

Slope: 6 to 12 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Moderate (about 6.3 inches)

Interpretive groups

Land capability (nonirrigated): 3e

Typical profile

0 to 7 inches: Silt loam
7 to 29 inches: Silt loam
29 to 33 inches: Loam
33 to 39 inches: Sand
39 to 60 inches: Weathered bedrock

GaD—Gale silt loam, 12 to 20 percent slopes

Map Unit Setting

Elevation: 700 to 1,400 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 135 to 160 days

Map Unit Composition

Gale and similar soils: 100 percent

Description of Gale

Setting

Landform: Hills
Landform position (two-dimensional): Summit, shoulder
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loess over sandy residuum weathered from sandstone

Properties and qualities

Slope: 12 to 20 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Moderate (about 6.3 inches)

Interpretive groups

Land capability (nonirrigated): 4e

Typical profile

0 to 7 inches: Silt loam
7 to 29 inches: Silt loam
29 to 33 inches: Loam
33 to 39 inches: Sand
39 to 60 inches: Weathered bedrock

HpA—Hoopeston sandy loam, 0 to 3 percent slopes

Map Unit Setting

Elevation: 400 to 1,400 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 46 to 52 degrees F

Frost-free period: 135 to 160 days

Map Unit Composition

Hoopeston and similar soils: 100 percent

Description of Hoopeston

Setting

Landform: Depressions, drainageways
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Parent material: Sandy and/or loamy alluvium over sandy alluvium; loamy alluvium over sandy alluvium

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Moderate (about 6.4 inches)

Interpretive groups

Land capability (nonirrigated): 3w

Typical profile

0 to 10 inches: Sandy loam
10 to 24 inches: Sandy loam
24 to 60 inches: Loamy sand

Minor Components

Lows

Percent of map unit:
Landform: Depressions, drainageways

Hu—Houghton muck

Map Unit Setting

Elevation: 600 to 1,000 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 135 to 160 days

Map Unit Composition

Houghton and similar soils: 100 percent

Description of Houghton

Setting

Landform: Depressions
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Herbaceous organic material

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 5.95 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Available water capacity: Very high (about 23.9 inches)

Interpretive groups

Land capability (nonirrigated): 6w

Typical profile

0 to 60 inches: Muck

JaB—Jackson silt loam, 2 to 6 percent slopes

Map Unit Setting

Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 135 to 160 days

Map Unit Composition

Jackson and similar soils: 100 percent

Description of Jackson

Setting

Landform: Stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loess and/or silty alluvium over sandy alluvium

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 30 to 72 inches
Frequency of flooding: None

Frequency of ponding: None
Available water capacity: High (about 10.2 inches)

Interpretive groups
Land capability (nonirrigated): 2e

Typical profile
0 to 9 inches: Silt loam
9 to 23 inches: Silt loam
23 to 41 inches: Silt loam
41 to 44 inches: Stratified sand to silt loam
44 to 60 inches: Sand

LfC2—La Farge silt loam, 4 to 12 percent slopes, eroded

Map Unit Setting
Elevation: 800 to 1,400 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 135 to 160 days

Map Unit Composition
La farge and similar soils: 100 percent

Description of La Farge

Setting
Landform: Hills
Landform position (two-dimensional): Summit
Down-slope shape: Convex
Across-slope shape: Convex

Properties and qualities
Slope: 4 to 12 percent
Depth to restrictive feature: 24 to 40 inches to paralithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Moderate (about 6.3 inches)

Interpretive groups
Land capability (nonirrigated): 3e

Typical profile
0 to 8 inches: Silt loam
8 to 25 inches: Silt loam
25 to 31 inches: Fine sandy loam
31 to 60 inches: Unweathered bedrock

LfD2—La Farge silt loam, 12 to 20 percent slopes, eroded

Map Unit Setting

Elevation: 800 to 1,400 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 135 to 160 days

Map Unit Composition

La farge and similar soils: 100 percent

Description of La Farge

Setting

Landform: Hills
Landform position (two-dimensional): Summit, shoulder
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loess over residuum weathered from glauconitic sandstone

Properties and qualities

Slope: 12 to 20 percent
Depth to restrictive feature: 24 to 40 inches to paralithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Moderate (about 6.3 inches)

Interpretive groups

Land capability (nonirrigated): 4e

Typical profile

0 to 8 inches: Silt loam
8 to 25 inches: Silt loam
25 to 31 inches: Fine sandy loam
31 to 60 inches: Unweathered bedrock

Lw—Lows sandy loam

Map Unit Setting

Elevation: 800 to 1,100 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 135 to 160 days

Map Unit Composition
Lows and similar soils: 100 percent

Description of Lows

Setting
Landform: Depressions, drainageways
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Parent material: Loamy alluvium over sandy alluvium

Properties and qualities
Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Occasional
Frequency of ponding: Frequent
Available water capacity: Moderate (about 7.4 inches)

Interpretive groups
Land capability (nonirrigated): 6w

Typical profile
0 to 8 inches: Sandy loam
8 to 11 inches: Loam
11 to 30 inches: Loam
30 to 60 inches: Sand

MaA—Meehan and Au Gres sands, 0 to 3 percent slopes

Map Unit Setting
Elevation: 600 to 1,950 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 135 to 160 days

Map Unit Composition
Meehan and similar soils: 60 percent
Au gres and similar soils: 30 percent

Description of Meehan

Setting
Landform: Drainageways, depressions
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Parent material: Sandy alluvium derived from sandstone

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 4.0 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability (nonirrigated): 4w

Typical profile

0 to 9 inches: Sand
9 to 27 inches: Sand
27 to 60 inches: Sand

Description of Au Gres

Setting

Landform: Depressions, drainageways
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 4.3 inches)

Interpretive groups

Land capability (nonirrigated): 4w

Typical profile

0 to 16 inches: Sand
16 to 26 inches: Sand
26 to 60 inches: Sand

Minor Components

Newson

Percent of map unit:
Landform: Depressions, drainageways

Ne—Newson loamy sand

Map Unit Setting

Elevation: 600 to 2,000 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 135 to 160 days

Map Unit Composition

Newson and similar soils: 100 percent

Description of Newson

Setting

Landform: Depressions, drainageways
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Parent material: Sandy alluvium

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Occasional
Frequency of ponding: Frequent
Available water capacity: Low (about 5.0 inches)

Interpretive groups

Land capability (nonirrigated): 6w

Typical profile

0 to 6 inches: Loamy sand
6 to 25 inches: Loamy sand
25 to 60 inches: Sand

NIC2—Norden silt loam, 4 to 12 percent slopes, eroded

Map Unit Setting

Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 135 to 160 days

Map Unit Composition
Norden and similar soils: 100 percent

Description of Norden

Setting
Landform: Hills
Landform position (two-dimensional): Summit, backslope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loess over loamy residuum weathered from glauconitic sandstone

Properties and qualities
Slope: 4 to 12 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 5.8 inches)

Interpretive groups
Land capability (nonirrigated): 3e

Typical profile
0 to 9 inches: Silt loam
9 to 35 inches: Loam
35 to 39 inches: Sandy loam
39 to 60 inches: Unweathered bedrock

NID2—Norden silt loam, 12 to 20 percent slopes, eroded

Map Unit Setting
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 135 to 160 days

Map Unit Composition
Norden and similar soils: 100 percent

Description of Norden

Setting
Landform: Hills
Landform position (two-dimensional): Footslope, backslope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loess over loamy residuum weathered from glauconitic sandstone

Properties and qualities

Slope: 12 to 20 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 5.8 inches)

Interpretive groups

Land capability (nonirrigated): 4e

Typical profile

0 to 9 inches: Silt loam
9 to 35 inches: Loam
35 to 39 inches: Sandy loam
39 to 60 inches: Unweathered bedrock

NuF—Norden, Urne, and Dorerton soils, 20 to 45 percent slopes

Map Unit Setting

Elevation: 800 to 1,400 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 135 to 160 days

Map Unit Composition

Norden and similar soils: 40 percent
Urne and similar soils: 30 percent
Dorerton and similar soils: 15 percent

Description of Norden

Setting

Landform: Hills
Landform position (two-dimensional): Summit, shoulder, backslope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loess over loamy residuum weathered from glauconitic sandstone

Properties and qualities

Slope: 20 to 45 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 5.5 inches)

Interpretive groups

Land capability (nonirrigated): 7e

Typical profile

0 to 3 inches: Loam
3 to 10 inches: Loam
10 to 29 inches: Loam
29 to 60 inches: Unweathered bedrock

Description of Urne

Setting

Landform: Hills
Landform position (two-dimensional): Shoulder, summit, backslope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy residuum weathered from glauconitic sandstone

Properties and qualities

Slope: 20 to 45 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 4.3 inches)

Interpretive groups

Land capability (nonirrigated): 7e

Typical profile

0 to 2 inches: Fine sandy loam
2 to 32 inches: Very fine sandy loam
32 to 38 inches: Very fine sandy loam
38 to 60 inches: Weathered bedrock

Description of Dorerton

Setting

Landform: Hills
Landform position (two-dimensional): Backslope, shoulder, summit
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loess over loamy residuum

Properties and qualities

Slope: 20 to 45 percent
Depth to restrictive feature: 45 to 70 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Moderate (about 7.9 inches)

Interpretive groups

Land capability (nonirrigated): 7e

Typical profile

0 to 4 inches: Silt loam
4 to 21 inches: Loam
21 to 56 inches: Channery loam
56 to 60 inches: Very channery loamy sand

Pa—Palms muck

Map Unit Setting

Elevation: 250 to 1,500 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 135 to 160 days

Map Unit Composition

Palms and similar soils: 100 percent

Description of Palms

Setting

Landform: Depressions
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Herbaceous organic material over loamy alluvium

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 1.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Available water capacity: Very high (about 18.2 inches)

Interpretive groups

Land capability (nonirrigated): 6w

Typical profile

0 to 34 inches: Muck
34 to 60 inches: Silty clay loam

Pd—Pits

Map Unit Setting

Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 135 to 160 days

Map Unit Composition

Pits: 100 percent

Description of Pits

Interpretive groups

Land capability (nonirrigated): 8s

SfA—Shiffer loam, 0 to 3 percent slopes

Map Unit Setting

Elevation: 680 to 1,360 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 135 to 160 days

Map Unit Composition

Shiffer and similar soils: 100 percent

Description of Shiffer

Setting

Landform: Depressions, drainageways
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Parent material: Loamy alluvium over sandy alluvium

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Available water capacity: Moderate (about 7.0 inches)

Interpretive groups

Land capability (nonirrigated): 2w

Typical profile

0 to 9 inches: Loam
9 to 21 inches: Loam
21 to 29 inches: Sandy loam
29 to 60 inches: Sand

Minor Components

Kato

Percent of map unit:
Landform: Depressions, drainageways

Lows

Percent of map unit:
Landform: Depressions, drainageways

TrB—Tarr sand, 0 to 6 percent slopes

Map Unit Setting

Elevation: 700 to 1,400 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 135 to 160 days

Map Unit Composition

Tarr and similar soils: 100 percent

Description of Tarr

Setting

Landform: Stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy residuum weathered from sandstone

Properties and qualities

Slope: 0 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 3.7 inches)

Interpretive groups

Land capability (nonirrigated): 4s

Typical profile
0 to 4 inches: Sand
4 to 32 inches: Sand
32 to 60 inches: Sand

TrC—Tarr sand, 6 to 12 percent slopes

Map Unit Setting
Elevation: 700 to 1,400 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 135 to 160 days

Map Unit Composition
Tarr and similar soils: 100 percent

Description of Tarr

Setting
Landform: Hills
Landform position (two-dimensional): Footslope, backslope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Sandy residuum weathered from sandstone

Properties and qualities
Slope: 6 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 3.7 inches)

Interpretive groups
Land capability (nonirrigated): 6s

Typical profile
0 to 4 inches: Sand
4 to 32 inches: Sand
32 to 60 inches: Sand

TrD—Tarr sand, 12 to 20 percent slopes

Map Unit Setting
Elevation: 700 to 1,400 feet

Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 135 to 160 days

Map Unit Composition
Tarr and similar soils: 100 percent

Description of Tarr

Setting
Landform: Hills
Landform position (two-dimensional): Footslope, backslope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Sandy residuum weathered from sandstone

Properties and qualities
Slope: 12 to 20 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 3.7 inches)

Interpretive groups
Land capability (nonirrigated): 7s

Typical profile
0 to 4 inches: Sand
4 to 32 inches: Sand
32 to 60 inches: Sand

TsA—Tarr sand, moderately well drained, 0 to 3 percent slopes

Map Unit Setting
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 135 to 160 days

Map Unit Composition
Tarr and similar soils: 100 percent

Description of Tarr

Setting
Landform: Depressions, drainageways
Down-slope shape: Concave, linear
Across-slope shape: Concave
Parent material: Sandy residuum weathered from sandstone

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 3.8 inches)

Interpretive groups

Land capability (nonirrigated): 4s

Typical profile

0 to 7 inches: Sand
7 to 38 inches: Sand
38 to 60 inches: Sand

UfC2—Urne fine sandy loam, 4 to 12 percent slopes, eroded

Map Unit Setting

Elevation: 800 to 1,200 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 135 to 160 days

Map Unit Composition

Urne and similar soils: 100 percent

Description of Urne

Setting

Landform: Hills
Landform position (two-dimensional): Summit
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy residuum weathered from glauconitic sandstone

Properties and qualities

Slope: 4 to 12 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 4.3 inches)

Interpretive groups

Land capability (nonirrigated): 3e

Typical profile

0 to 2 inches: Fine sandy loam
2 to 32 inches: Very fine sandy loam
32 to 38 inches: Very fine sandy loam
38 to 60 inches: Weathered bedrock

UfD2—Urne fine sandy loam, 12 to 20 percent slopes, eroded

Map Unit Setting

Elevation: 800 to 1,200 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 135 to 160 days

Map Unit Composition

Urne and similar soils: 100 percent

Description of Urne

Setting

Landform: Hills
Landform position (two-dimensional): Shoulder, backslope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy residuum weathered from glauconitic sandstone

Properties and qualities

Slope: 12 to 20 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 4.3 inches)

Interpretive groups

Land capability (nonirrigated): 4e

Typical profile

0 to 2 inches: Fine sandy loam
2 to 32 inches: Very fine sandy loam
32 to 38 inches: Very fine sandy loam
38 to 60 inches: Weathered bedrock

W—Water

Map Unit Setting

Elevation: 660 to 980 feet
Mean annual precipitation: 30 to 33 inches
Mean annual air temperature: 37 to 55 degrees F
Frost-free period: 145 to 165 days

Map Unit Composition

Water: 100 percent

Description of Water

Interpretive groups

Other vegetative classification: Not Assigned (water) (Nwat)

Wa—Wautoma sand

Map Unit Setting

Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 135 to 160 days

Map Unit Composition

Wautoma and similar soils: 100 percent

Description of Wautoma

Setting

Landform: Depressions, drainageways
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Parent material: Sandy alluvium over clayey lacustrine deposits

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Available water capacity: Moderate (about 7.2 inches)

Interpretive groups

Land capability (nonirrigated): 6w

Typical profile
0 to 7 inches: Sand
7 to 22 inches: Sand
22 to 60 inches: Silty clay

WeA—Wyeville loamy sand, 0 to 3 percent slopes

Map Unit Setting
Elevation: 650 to 1,170 feet
Mean annual precipitation: 28 to 33 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 135 to 160 days

Map Unit Composition
Wyeville and similar soils: 100 percent

Description of Wyeville

Setting
Landform: Stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy alluvium over clayey lacustrine deposits

Properties and qualities
Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Moderate (about 7.5 inches)

Interpretive groups
Land capability (nonirrigated): 3w

Typical profile
0 to 9 inches: Loamy sand
9 to 27 inches: Sand
27 to 60 inches: Silty clay loam

Minor Components

Wautoma
Percent of map unit:
Landform: Depressions, drainageways

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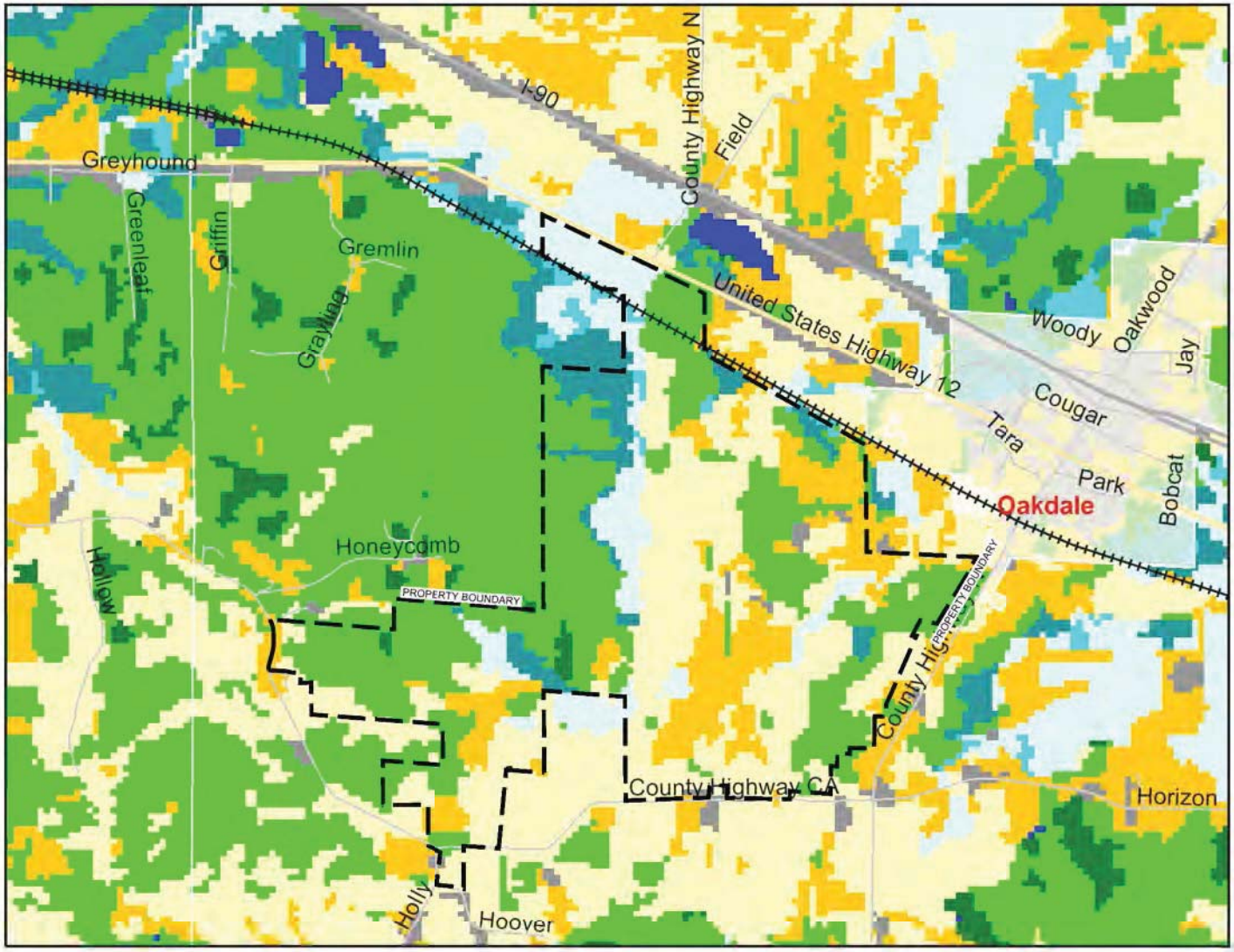
Map Created on Feb 07, 2012



Legend

- County Boundaries
- Railroads
- Major Highways
- Interstate
- US Highway
- State Highway
- Local Roads
- Civil Towns
- Civil Town
- Cities and Villages
- Village
- City
- DNR Managed Lands
- Fee
- WISCLAND Landcover
- High Intensity Urban
- Low Intensity Urban
- Golf Course
- General Agriculture
- Cranberry Bog
- Grassland
- Coniferous Forest
- Broad-leaved Deciduous Forest
- Mixed Deciduous-Coniferous Forest
- Open Water
- Emergent-Wet Meadow Wetland
- Lowland Shrub Wetland
- Forested Wetland
- Barren
- Shrubland
- Cloud Cover
- Other

Scale: 1:32,558

This map is a user generated static output from an Internet mapping site and is for general reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. THIS MAP IS NOT TO BE USED FOR NAVIGATION.

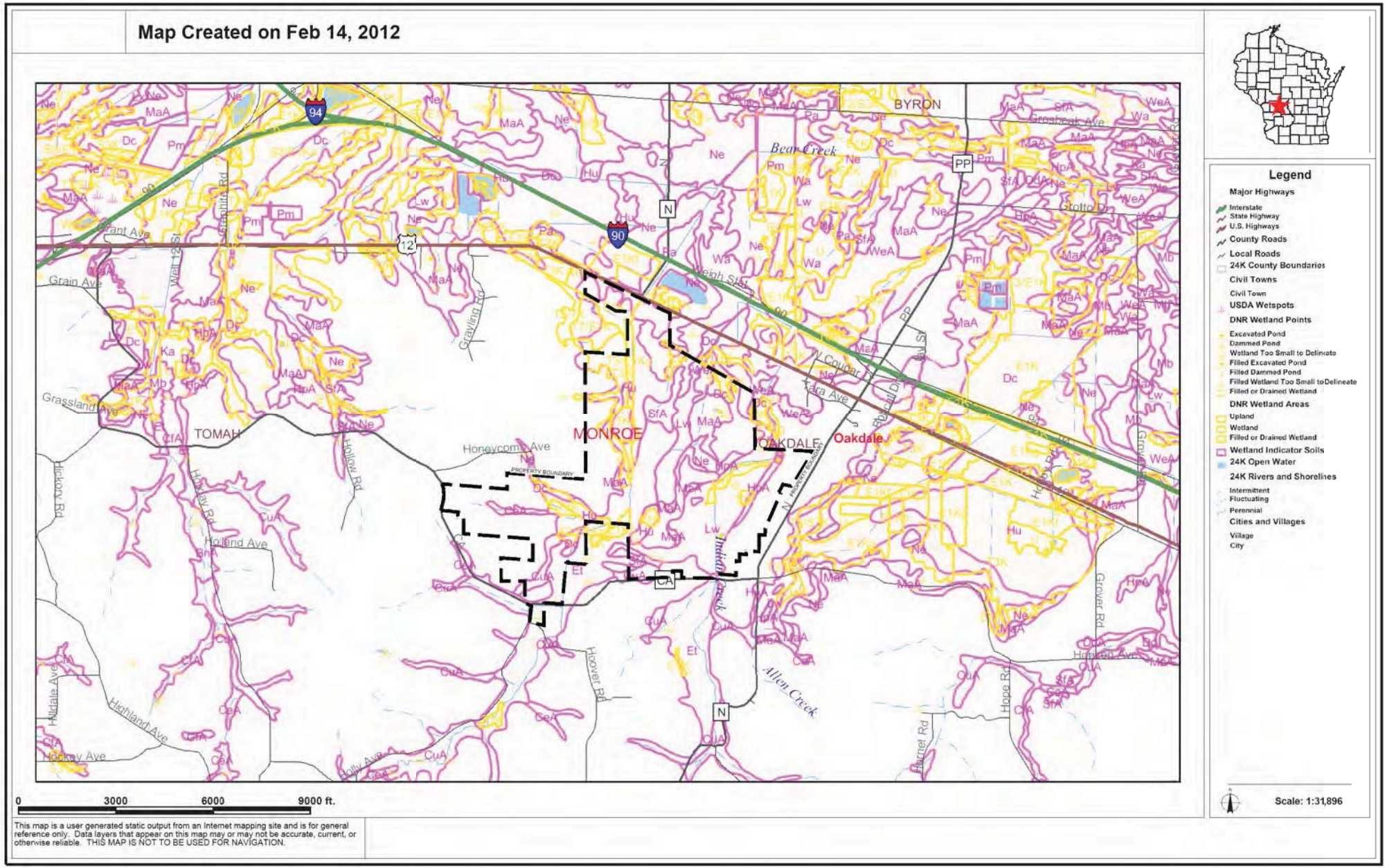


Figure A8 - WDNR Wetland Mapping

RECEIVED JAN 13 2012

Star Environmental, Inc.
SOILS AND ENVIRONMENTAL STUDIES

P.O. Box 434 – 705 Third Street
Marathon, WI 54448
(715) 443-6115 – FAX: 1-715-443-6108
Email: starenvironmental@hotmail.com

January 10, 2012

Mr. Larry D. Koopman
Lampert-Lee & Associates
10968 State Highway 54 East
Wisconsin Rapids, WI 54494-8718

RE: Fairview Cranberry Company, LLC., Smart Sand Railroad Spur & Wash Plant located in the NW1/4, Section 8, T.17N-R.1E, Town of Oakdale, Monroe County, Wisconsin.

This Wetland Study Report, which you requested, has been completed and forwarded to Mr. Bruce Norton, US Army Corps of Engineers, for his review and certification.

The wetland boundaries are accurately located on the Wetland Map and your land development should be designed to minimize any adverse impact to the protected wetlands.

If your planned development requires activities within the designated wetland areas, such as cranberry beds, roads, building sites, ponds or utility crossings, permits will be required from both the US Army Corps of Engineers and the Wisconsin DNR.

If you have any further questions or concerns on this Wetland Project, please call me.

Thank you.

Sincerely,

Gary W. Starzinski
Licensed Professional Soil Scientist
Recognized USACE & WDNR Wetland Consultant
STAR ENVIRONMENTAL, INC.

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Enclosures

WETLAND STUDY REPORT

ON THE

FAIRVIEW CRANBERRY COMPANY, LLC.

SMART SAND RAILROAD SPUR & WASH PLANT

TOWN OF OAKDALE

MONROE COUNTY,

WISCONSIN

Prepared By:

GARY W. STARZINSKI

LICENSED PROFESSIONAL SOIL SCIENTIST

RECOGNIZED USACE & WDNR WETLAND CONSULTANT

STAR ENVIRONMENTAL, INC.

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Email: starenvironmental@hotmail.com

January 10, 2012

Mr. Bruce Norton
U.S. Army Corps of Engineers
1114 S. Oak Street
LaCrescent, MN 55947

RE: Fairview Cranberry Company, LLC., Smart Sand Railroad Spur & Wash Plant located in the NW1/4, Section 8, T.17N-R.1E, Town of Oakdale, Monroe County, Wisconsin.

Our client, Mr. Larry D. Koopman, Lampert-Lee & Associates, the engineering company, requested this Wetland Study Report, to determine the wetland boundary and the extent of wetlands on this property. The Smart Sand Railroad Spur & Wash Plant development is being proposed on this property.

Enclosed are copies of the Wetland Study Report and onsite photos. The wetlands have been documented, the boundary flagged and surveyed.

Upon review of the enclosed report, onsite photos and Wetland Map, please certify the Wetland Map, indicate your opinion, the U.S. Army Corps jurisdiction on the wetlands and any requirements to allow the cranberry expansion of this given property.

If you have any questions or comments, please call me. Thank you.

Sincerely,

Gary W. Starzinski
Licensed Professional Soil Scientist
Recognized USACE & WDNR Wetland Consultant
STAR ENVIRONMENTAL, INC.

Enclosures

cc: Larry D. Koopman, Lampert-Lee & Associates

FAIRVIEW CRANBERRY COMPANY, LLC.
SMART SAND RAILROAD SPUR & WASH PLANT
WETLAND STUDY REPORT

Introduction

From September 22, 2011 through January 10, 2012, Star Environmental, Inc. conducted a Wetland Study in the NW1/4, Section 8, T.17N-R.1E, Town of Oakdale, Monroe County, Wisconsin.

Methods

Wetland delineation techniques and criteria for evaluation of results used here followed the U.S. Army Corps of Engineers 1987 "Corps of Engineers Wetlands Delineation Manualand the Regional Supplement." The property was subjected to a preliminary survey using a Wisconsin Wetland Inventory Map, recent aerial photographs, and soils maps.

During field surveys, all vegetation types were investigated to identify locations where hydrologic settings, soils and vegetation characteristic of wetland systems occurred, as defined and determined by methods detailed in the above wetland delineation manual.

Two transects were established perpendicular to a baseline and the surface water flow. At sample plots along these transects, vegetation types, their indicator status, soil types and the hydrologic settings were documented and recorded on forms from the delineation manual.

The actual wetland delineation boundaries were surveyed and mapped by Lampert – Lee & Associates.

Wetland Status

Twelve sample plots were evaluated for wetland characteristics. Sample plots A-2, A-5, A-7, B-2, B-3, and B-5 do not meet the necessary wetland requirements and are considered uplands.

Sample plots A-1, A-3, A-4, A-6, B-1 and B-4 meet the criteria for soils, plant life and hydrologic conditions for wetlands.

Wetland Status (continued)

The wetland areas A-1 and A-3 would be classified as a Farmed Wetland Plant Community dominated by reed canary grass.

The wetland areas A-4, A-6, B-1 and B-4 would be classified as a Hardwood Swamp Plant Community dominated by black ash trees.

Hydrology

The wetland hydrology would be classified as a ground water depression that intersects the water table with significant inflow and outflow via this ground water.

An expected wetland hydrology of this area would be described as intermittent wet periods from March through June followed by dryer periods form July through February. The hydrology is basically fed by water form a cyclic fluctuating ground water table. Wet fall periods could also facilitate the wetland hydrology in this area.

Surface water flows northwest towards the Bear Creek.

Soils

Soils within the Wetland Plant Community Area are classified as poorly drained Ponycreek Series, a Humaqueptic Psammaquent formed in sandy deposits and the Dawson Series Series, a Terric Borosaprist formed in organics over sandy material. The Ponycreek and Dawson Series are considered hydric soils.

Soils located on the uplands are classified as the somewhat poorly-drained Ironrun Series, a Typic Endoquent and moderately well drained Tarr Series, a Typic Quartzipsammednt which formed in sandy deposits on uplands underlaid by sandstone. . The Ironrun and Tarr Series are not hydric soils.

History

This land parcel had been utilized as woodland and farmland in past years. The Smart Sand Railroad Spur & Wash Plant development is being planned for this site.

Conclusion

This Wetland Study Report indicates that both a Farmed Wetland and Hardwood Swamp Plant Communities exist on this property.

Wetland permits and mitigation may be necessary for the proposed development. A development plan may be required to avoid protected wetland areas or minimizing any adverse impacts such as cranberry beds, roads, building site development or drainage of wetlands.

This Wetland Report should be beneficial in determining the extent and location of wetlands and provide important information for the land development of this given land parcel.

The final wetland authority rests with the appropriate regulatory agencies: the U.S. Army Corps of Engineers, the WDNR and the local zoning officials.

This report, conclusion and recommendations are the professional opinion of Gary W. Starzinski, Licensed Professional Soil Scientist and Recognized USACE & WDNR Wetland Consultant.

Gary W. Starzinski, Date 11/12/12
Licensed Professional Soil Scientist
Recognized USACE & WDNR Wetland Consultant

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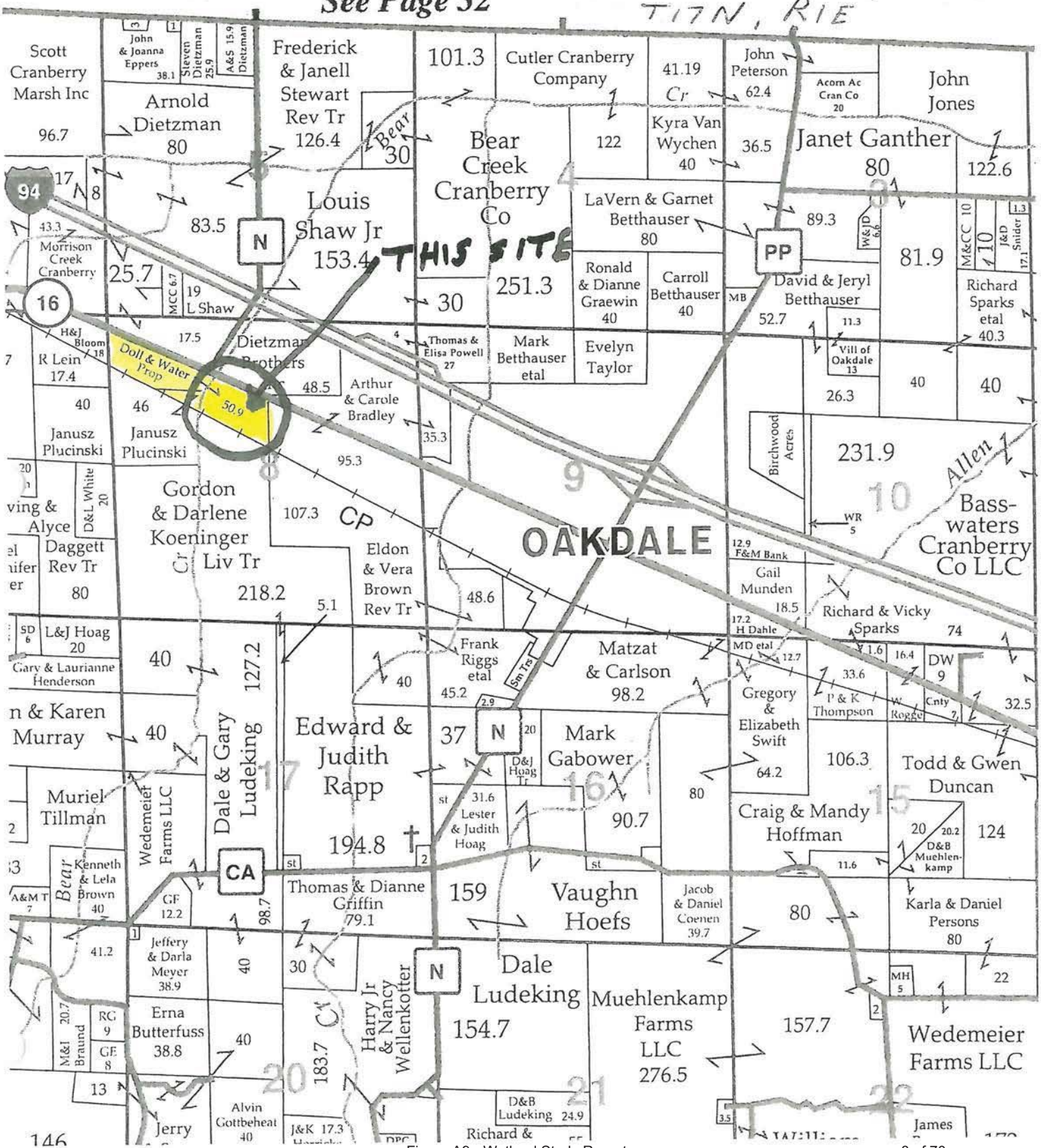
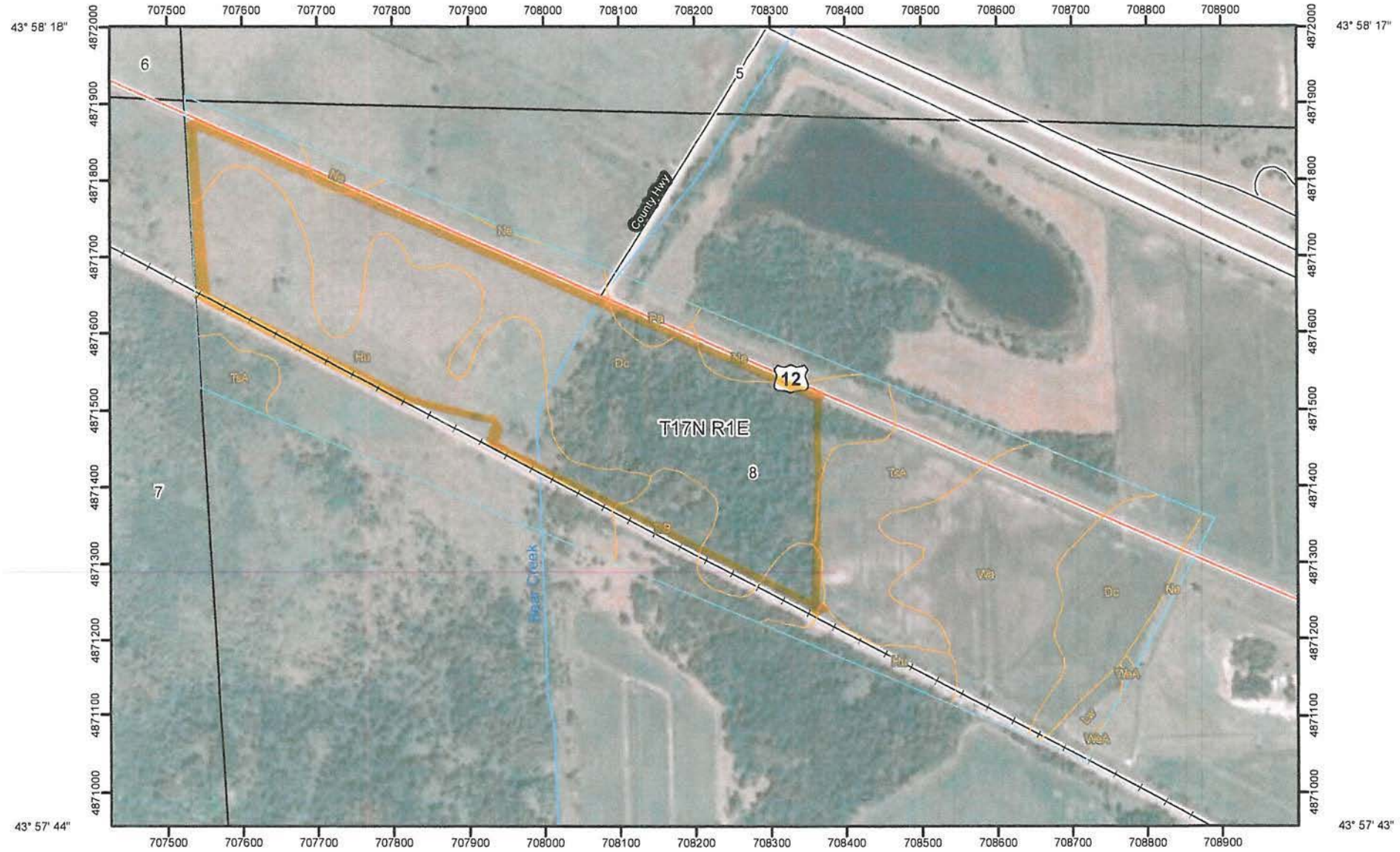
Town of Oakdale
Monroe County
T17N, R1E

See Page 32



FAIRVIEW CRANBERRY CO., LLC



Map Unit Legend

Monroe County, Wisconsin (WI081)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
BoC	Boone sand, 6 to 12 percent slopes	1.1	0.6%
Dc	Dawson peat	35.6	20.3%
Hu	Houghton muck	51.5	29.3%
Ne	Newson loamy sand	25.5	14.5%
Pa	Palms muck	11.4	6.5%
TrB	Tarr sand, 0 to 6 percent slopes	9.0	5.1%
TrC	Tarr sand, 6 to 12 percent slopes	0.8	0.4%
TsA	Tarr sand, moderately well drained, 0 to 3 percent slopes	32.8	18.7%
W	Water	7.7	4.4%
Wa	Wautoma sand	0.3	0.1%
Totals for Area of Interest		**175.6**	**100.0%**

PLANT SPECIES RECORDED AT SAMPLE PLOTS

FAIRVIEW CRANBERRY COMPANY, LLC.

SMART SAND RAILROAD SPUR & WASH PLANT LIST

COMMON NAME	SCIENTIFIC NAME	INDICATOR STATUS
Box elder	Acer negundo	FACW-
Maple, red	Acer rubrum	FAC
Grass, quack	Agropyron repens	FACU
Sarsasparilla, wild	Aralia nudicaulis	FACU
Milkweed, common	Asclepias syriaca	FACU
Aster, large-leafed	Aster macrophyllus	FACU
Reedgrass, blue-joint	Calamogrostis canadensis	OBL
Sedge, lake	Carex lacustria	OBL
Sedge, Pennsylvania	Carex pensylvanica	NI
Sedge, hummock	Carex stricta	OBL
Thistle, bull	Cirsium vulgare	FACU-
Hazelnut, American	Corylus americana	FACU-
Spikerush	Eleocharis, spp.	OBL
Ash, white	Fraxinus americana	FACU
Ash, black	Fraxinus nigra	FACW+
Bedstraw, rough	Galium asprellum	OBL
Fern, sensitive	Onoclea sensibilis	FACW
Grass, reed canary	Phalaris arundinacea	FACW+
Timothy, common	Phleum pratense	FACU
Smartweed, swamp	Polygonum hydropiperoides	OBL
Aspen, quaking	Populus tremuloides	FAC
Fern, bracken	Pteridium aquilinum	FACU
Oak, red	Quercus rubra	FACU
Raspberry, common red	Rubus idaeus	FACU+
Elderberry, American	Sambucus canadensis	FACW-
Goldenrod, canada	Solidago canadensis	FACU
Tansy, common	Tanacetum vulgare	FACU
Elm, American	Ulmus americana	FACW-
Nettle, stinging	Urtica dioica	FAC+
Blueberry, low bush	Vaccinium angustifolium	FACU
Ash northern-prickly	Xanthoxylum americanum	NI

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: Fairview Cranberry-Smart Sand Site City/County: Monroe Sampling Date: 9/22/11
Applicant/Owner: Fairview Cranberry Company, LLC. State: Wisconsin Sampling Point: A-1
Investigator(s): Gary W. Starzinski Section, Township, Range: Sec.8,T 17 N-R 1 E
Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): concave
Slope (%): 0% Lat.: Long.: Datum:
Soil Map Unit Name Dawson Peat NWI Classification: Farmed Wetland
Are climatic/hydrologic conditions of the site typical for this time of the year? Yes (If no, explain in remarks)
Are vegetation ____, soil ____, or hydrology ____ significantly disturbed? No Are "normal
Are vegetation ____, soil ____, or hydrology ____ naturally problematic? No circumstances" present? Yes
(If needed, explain any answers in remarks)
This site is abandon farmland dominated by reed canary grass.

SUMMARY OF FINDINGS

Hydrophytic vegetation present?	Y	**Is the sampled area within a wetland?**	Y
Hydric soil present?	Y		
Indicators of wetland hydrology present?	Y	If yes, optional wetland site ID:	

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living
- X Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled
- ___ Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- X FAC-Neutral Test (D5)
- ___ Microtopographic Relief (D4)

Field Observations:

Surface water present?	Yes	____	No	X	Depth (inches): ____
Water table present?	Yes	X	No	____	Depth (inches): 15
Saturation present? (includes capillary fringe)	Yes	X	No	____	Depth (inches): 6

Indicators of wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Soil mapsand GIS photos.

Remarks:

VEGETATION - Use scientific names of plants

Sampling Point: A-1

Tree Stratum	Plot Size ( )	Absolute % Cover	Dominant Species	Indicator Status
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
		0	= Total Cover	

Sapling/Shrub Stratum	Plot Size ( )	Absolute % Cover	Dominant Species	Indicator Status
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
		0	= Total Cover	

Herb Stratum	Plot Size (5 FT.)	Absolute % Cover	Dominant Species	Indicator Status
1	*Phalaris arundinacea*	100	Y	FACW
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
		100	= Total Cover	

Woody Vine Stratum	Plot Size ( )	Absolute % Cover	Dominant Species	Indicator Status
1				
2				
3				
4				
5				
		0	= Total Cover	

50/20 Thresholds

	20%	50%
Tree Stratum	0	0
Sapling/Shrub Stratum	0	0
Herb Stratum	20	50
Woody Vine Stratum	0	0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across all Strata: 1 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	0	x 1 =	0	
FACW species	100	x 2 =	200	
FAC species	0	x 3 =	0	
FACU species	0	x 4 =	0	
UPL species	0	x 5 =	0	
Column totals	100 (A)		200	(B)

Prevalence Index = B/A = 2.00

Hydrophytic Vegetation Indicators:

___ Rapid test for hydrophytic vegetation

X Dominance test is >50%

X Prevalence index is ≤3.0*

___ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)

___ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Definitions of Vegetation Strata:

Tree - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines - All woody vines greater than 3.28 ft in height.

Hydrophytic vegetation present? Y

Remarks: (Include photo numbers here or on a separate sheet)

SOIL **Sampling Point:** A-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-10	5YR3/2	99	7.5YR5/6	1	C	PL	Mucky Peat	
-24	10YR2/1	100					Muck	

*Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains
**Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

- X Histisol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- X Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Suface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L**
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):
Type: _____
Depth (inches): _____

Hydric soil present? Y

Remarks:

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: Fairview Cranberry-Smart Sand Site City/County: Monroe Sampling Date: 9/22/11
Applicant/Owner: Fairview Cranberry Company, LLC. State: Wisconsin Sampling Point: A-2
Investigator(s): Gary W. Starzinski Section, Township, Range: Sec.8,T 17 N-R 1 E
Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex
Slope (%): 4% Lat.: Long.: Datum:
Soil Map Unit Name Ironrun Loamy Sand NWI Classification: Upland
Are climatic/hydrologic conditions of the site typical for this time of the year? Yes (If no, explain in remarks)
Are vegetation ____, soil ____, or hydrology ____ significantly disturbed? No Are "normal
Are vegetation ____, soil ____, or hydrology ____ naturally problematic? No circumstances" present? Yes
(If needed, explain any answers in remarks)
This site is abandon farmland dominated by Canada Goldenrod.

SUMMARY OF FINDINGS

Hydrophytic vegetation present?	N	**Is the sampled area within a wetland?**	N
Hydric soil present?	N		
Indicators of wetland hydrology present?	Y	If yes, optional wetland site ID:	

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Microtopographic Relief (D4)

Field Observations:

Surface water present?	Yes ____	No X	Depth (inches):	
Water table present?	Yes ____	No X	Depth (inches):	
Saturation present? (includes capillary fringe)	Yes ____	No X	Depth (inches):	

Indicators of wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Soil mapsand GIS photos.

Remarks:

VEGETATION - Use scientific names of plants

Sampling Point: A-2

Tree Stratum	Plot Size ( )	Absolute % Cover	Dominant Species	Indicator Status
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
		0	= Total Cover	

Sapling/Shrub Stratum	Plot Size ( )	Absolute % Cover	Dominant Species	Indicator Status
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
		0	= Total Cover	

Herb Stratum	Plot Size (5 FT.)	Absolute % Cover	Dominant Species	Indicator Status
1	*Solidago canadensis*	85	Y	FACU
2	*Asclepias syriaca*	5	N	UPL
3	*Cirsium vulgare*	5	N	FACU
4	*Phalaris arundinacea*	5	N	FACW
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
		100	= Total Cover	

Woody Vine Stratum	Plot Size ( )	Absolute % Cover	Dominant Species	Indicator Status
1				
2				
3				
4				
5				
		0	= Total Cover	

50/20 Thresholds

	20%	50%
Tree Stratum	0	0
Sapling/Shrub Stratum	0	0
Herb Stratum	20	50
Woody Vine Stratum	0	0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across all Strata: 1 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 0.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	0	x 1 =	0	
FACW species	5	x 2 =	10	
FAC species	0	x 3 =	0	
FACU species	90	x 4 =	360	
UPL species	5	x 5 =	25	
Column totals	100 (A)		395	(B)
Prevalence Index = B/A =			3.95	

Hydrophytic Vegetation Indicators:

___ Rapid test for hydrophytic vegetation

___ Dominance test is >50%

___ Prevalence index is ≤3.0*

___ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)

___ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Definitions of Vegetation Strata:

Tree - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines - All woody vines greater than 3.28 ft in height.

Hydrophytic vegetation present? N

Remarks: (Include photo numbers here or on a separate sheet)

SOIL **Sampling Point:** A-2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-8	10YR3/2	100					Loamy Sand	
-24	10YR5/4	98	7.5YR5/6	2	C	M	Loamy Sand	

*Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains
**Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

___ Histisol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ Depleted Below Dark Suface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7) (**LRR R, MLRA 149B**)
___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**
___ Loamy Mucky Mineral (F1) (**LRR K, L**)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils:

___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**
___ Coast Prairie Redox (A16) (**LRR K, L, R**)
___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
___ Dark Surface (S7) (**LRR K, L**
___ Polyvalue Below Surface (S8) (**LRR K, L**)
___ Thin Dark Surface (S9) (**LRR K, L**)
___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
___ Red Parent Material (TF2)
___ Very Shallow Dark Surface (TF12)
___ Other (Explain in Remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):
Type: _____
Depth (inches): _____

Hydric soil present? N

Remarks:

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: Fairview Cranberry-Smart Sand Site City/County: Monroe Sampling Date: 9/22/11
Applicant/Owner: Fairview Cranberry Company, LLC. State: Wisconsin Sampling Point: A-3
Investigator(s): Gary W. Starzinski Section, Township, Range: Sec.8,T 17 N-R 1 E
Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): concave
Slope (%): 0% Lat.: Long.: Datum:
Soil Map Unit Name Dawson Peat NWI Classification: Farmed Wetland
Are climatic/hydrologic conditions of the site typical for this time of the year? Yes (If no, explain in remarks)
Are vegetation ____, soil ____, or hydrology ____ significantly disturbed? No Are "normal
Are vegetation ____, soil ____, or hydrology ____ naturally problematic? No circumstances" present? Yes
(If needed, explain any answers in remarks)
This site is abandon farmland dominated by reed canary grass.

SUMMARY OF FINDINGS

Hydrophytic vegetation present?	Y	**Is the sampled area within a wetland?**	Y
Hydric soil present?	Y		
Indicators of wetland hydrology present?	Y	If yes, optional wetland site ID:	

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- X FAC-Neutral Test (D5)
- ___ Microtopographic Relief (D4)

Field Observations:

Surface water present?	Yes	____	No	X	Depth (inches): ____
Water table present?	Yes	X	No	____	Depth (inches): 12
Saturation present? (includes capillary fringe)	Yes	X	No	____	Depth (inches): 4

Indicators of wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Soil mapsand GIS photos.

Remarks:

VEGETATION - Use scientific names of plants

Sampling Point: A-3

Tree Stratum	Plot Size ( )	Absolute % Cover	Dominant Species	Indicator Status
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
		0	= Total Cover	

Sapling/Shrub Stratum	Plot Size ( )	Absolute % Cover	Dominant Species	Indicator Status
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
		0	= Total Cover	

Herb Stratum	Plot Size (5 FT.)	Absolute % Cover	Dominant Species	Indicator Status
1	*Phalaris arundinacea*	100	Y	FACW
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
		100	= Total Cover	

Woody Vine Stratum	Plot Size ( )	Absolute % Cover	Dominant Species	Indicator Status
1				
2				
3				
4				
5				
		0	= Total Cover	

50/20 Thresholds

	20%	50%
Tree Stratum	0	0
Sapling/Shrub Stratum	0	0
Herb Stratum	20	50
Woody Vine Stratum	0	0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across all Strata: 1 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	0	x 1 =	0
FACW species	100	x 2 =	200
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column totals	100 (A)		200 (B)

Prevalence Index = B/A = 2.00

Hydrophytic Vegetation Indicators:

- ___ Rapid test for hydrophytic vegetation
- X Dominance test is >50%
- X Prevalence index is ≤3.0*
- ___ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ___ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Definitions of Vegetation Strata:

Tree - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines - All woody vines greater than 3.28 ft in height.

Hydrophytic vegetation present? Y

Remarks: (Include photo numbers here or on a separate sheet)

SOIL **Sampling Point:** A-3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-12	5YR3/2	99	7.5YR5/6	1	C	PL	Mucky Peat	
-24	10YR2/1	100					Muck	

*Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains
**Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

- X Histisol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- X Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Suface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L**
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):
Type: _____
Depth (inches): _____

Hydric soil present? Y

Remarks:

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: Fairview Cranberry-Smart Sand Site City/County: Monroe Sampling Date: 9/22/11
Applicant/Owner: Fairview Cranberry Company, LLC. State: Wisconsin Sampling Point: A-4
Investigator(s): Gary W. Starzinski Section, Township, Range: Sec.8,T 17 N-R 1 E
Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): concave
Slope (%): 1% Lat.: Long.: Datum:
Soil Map Unit Name Newson Mucky Sand NWI Classification: Hardwood Swamp
Are climatic/hydrologic conditions of the site typical for this time of the year? Yes (If no, explain in remarks)
Are vegetation ____, soil ____, or hydrology ____ significantly disturbed? No Are "normal
Are vegetation ____, soil ____, or hydrology ____ naturally problematic? No circumstances" present? Yes
(If needed, explain any answers in remarks)

SUMMARY OF FINDINGS

Hydrophytic vegetation present?	Y	**Is the sampled area within a wetland?**	Y
Hydric soil present?	Y		
Indicators of wetland hydrology present?	Y	If yes, optional wetland site ID:	

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- X FAC-Neutral Test (D5)
- ___ Microtopographic Relief (D4)

Field Observations:

Surface water present?	Yes	____	No	X	Depth (inches): ____
Water table present?	Yes	X	No	____	Depth (inches): 10
Saturation present? (includes capillary fringe)	Yes	X	No	____	Depth (inches): 0

Indicators of wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Soil mapsand GIS photos.

Remarks:

VEGETATION - Use scientific names of plants

Sampling Point: A-4

Tree Stratum (Plot Size (30 FT.))	Absolute % Cover	Dominant Species	Indicator Status
1 *Fraxinus nigra*	80	Y	FACW
2 *Ulmus americana*	20	Y	FACW
3			
4			
5			
6			
7			
8			
9			
10			
	100	= Total Cover	

Sapling/Shrub Stratum (Plot Size (30 FT.))	Absolute % Cover	Dominant Species	Indicator Status
1 *Fraxinus nigra*	90	Y	FACW
2 *Ulmus americana*	10	N	FACW
3			
4			
5			
6			
7			
8			
9			
10			
	100	= Total Cover	

Herb Stratum (Plot Size (5 FT.))	Absolute % Cover	Dominant Species	Indicator Status
1 *Calamagrostis canadensis*	40	Y	OBL
Urtica dioica	40	Y	FAC
3 *Onoclea sensibilis*	20	Y	FACW
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
	100	= Total Cover	

Woody Vine Stratum (Plot Size ( ))	Absolute % Cover	Dominant Species	Indicator Status
1			
2			
3			
4			
5			
	0	= Total Cover	

50/20 Thresholds

	20%	50%
Tree Stratum	20	50
Sapling/Shrub Stratum	20	50
Herb Stratum	20	50
Woody Vine Stratum	0	0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across all Strata: 6 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	40	x 1 =	40
FACW species	220	x 2 =	440
FAC species	40	x 3 =	120
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column totals	300 (A)		600 (B)

Prevalence Index = B/A = 2.00

Hydrophytic Vegetation Indicators:

- ___ Rapid test for hydrophytic vegetation
- X Dominance test is >50%
- X Prevalence index is ≤3.0*
- ___ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ___ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Definitions of Vegetation Strata:

Tree - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines - All woody vines greater than 3.28 ft in height.

Hydrophytic vegetation present? Y

Remarks: (Include photo numbers here or on a separate sheet)

SOIL **Sampling Point:** A-4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-4	10YR2/1	99	7.5YR5/6	1	C	PL	Mucky Sand	
-24	5G6/1	100					Loamy sand	

*Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains
**Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

___ Histisol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ Depleted Below Dark Suface (A11)
___ Thick Dark Surface (A12)
_X_ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7) (**LRR R, MLRA 149B**)
___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**
___ Loamy Mucky Mineral (F1) (**LRR K, L**)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils:

___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**
___ Coast Prairie Redox (A16) (**LRR K, L, R**)
___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
___ Dark Surface (S7) (**LRR K, L**
___ Polyvalue Below Surface (S8) (**LRR K, L**)
___ Thin Dark Surface (S9) (**LRR K, L**)
___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
___ Red Parent Material (TF2)
___ Very Shallow Dark Surface (TF12)
___ Other (Explain in Remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):
Type: _____
Depth (inches): _____

Hydric soil present? Y

Remarks:

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: Fairview Cranberry-Smart Sand Site City/County: Monroe Sampling Date: 9/22/11
Applicant/Owner: Fairview Cranberry Company, LLC. State: Wisconsin Sampling Point: A-5
Investigator(s): Gary W. Starzinski Section, Township, Range: Sec.8,T 17 N-R 1 E
Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex
Slope (%): 3% Lat.: Long.: Datum:
Soil Map Unit Name Ironrun Loamy Sand NWI Classification: Upland
Are climatic/hydrologic conditions of the site typical for this time of the year? Yes (If no, explain in remarks)
Are vegetation ____, soil ____, or hydrology ____ significantly disturbed? No Are "normal
Are vegetation ____, soil ____, or hydrology ____ naturally problematic? No circumstances" present? Yes
(If needed, explain any answers in remarks)

SUMMARY OF FINDINGS

Hydrophytic vegetation present?	N	**Is the sampled area within a wetland?**	N
Hydric soil present?	N		
Indicators of wetland hydrology present?	N	If yes, optional wetland site ID:	

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Microtopographic Relief (D4)

Field Observations:

Surface water present?	Yes ____	No X	Depth (inches):	
Water table present?	Yes ____	No X	Depth (inches):	
Saturation present? (includes capillary fringe)	Yes ____	No X	Depth (inches):	

Indicators of wetland hydrology present? N

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Soil mapsand GIS photos.

Remarks:

VEGETATION - Use scientific names of plants

Sampling Point: A-5

Tree Stratum (Plot Size (30 FT.))	Absolute % Cover	Dominant Species	Indicator Status
1 *Quercus rubra*	50	Y	FACU
2 *Fraxinus americana*	50	Y	FACU
3			
4			
5			
6			
7			
8			
9			
10			
	100 = Total Cover		

Sapling/Shrub Stratum (Plot Size (30 FT.))	Absolute % Cover	Dominant Species	Indicator Status
1 *Quercus rubra*	50	Y	FACU
2 *Fraxinus americana*	30	Y	FACU
3 *Corylus americana*	20	Y	FACU
4			
5			
6			
7			
8			
9			
10			
	100 = Total Cover		

Herb Stratum (Plot Size (5 FT.))	Absolute % Cover	Dominant Species	Indicator Status
1 *Carex pensylvanica*	70	Y	UPL
2 *Aster macrophyllus*	20	Y	UPL
3 *Vaccinium angustifolium*	10	N	FACU
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
	100 = Total Cover		

Woody Vine Stratum (Plot Size ( ))	Absolute % Cover	Dominant Species	Indicator Status
1			
2			
3			
4			
5			
	0 = Total Cover		

50/20 Thresholds

	20%	50%
Tree Stratum	20	50
Sapling/Shrub Stratum	20	50
Herb Stratum	20	50
Woody Vine Stratum	0	0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across all Strata: 7 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 0.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	210	x 4 =	840
UPL species	90	x 5 =	450
Column totals	300 (A)		1290 (B)

Prevalence Index = B/A = 4.30

Hydrophytic Vegetation Indicators:

___ Rapid test for hydrophytic vegetation
___ Dominance test is >50%
___ Prevalence index is ≤3.0*
___ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
___ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Definitions of Vegetation Strata:

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Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines - All woody vines greater than 3.28 ft in height.

Hydrophytic vegetation present? N

Remarks: (Include photo numbers here or on a separate sheet)

SOIL **Sampling Point:** A-5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-4	10YR3/2	100					Loamy Sand	
-24	10YR4/4	98	7.5YR5/6	2	C	M	Loamy Sand	

*Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains
**Location: PL=Pore Lining, M=Matrix

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___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ Depleted Below Dark Suface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7) (**LRR R, MLRA 149B**)
___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**
___ Loamy Mucky Mineral (F1) (**LRR K, L**)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils:

___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**
___ Coast Prairie Redox (A16) (**LRR K, L, R**)
___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
___ Dark Surface (S7) (**LRR K, L**
___ Polyvalue Below Surface (S8) (**LRR K, L**)
___ Thin Dark Surface (S9) (**LRR K, L**)
___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
___ Red Parent Material (TF2)
___ Very Shallow Dark Surface (TF12)
___ Other (Explain in Remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):
Type: _____
Depth (inches): _____

Hydric soil present? N

Remarks: