APPENDIX A References

APPENDIX A References

Author unknown. 2006. Carroll County, Missouri. United States Department of Agriculture Natural Resources Conservation Service. Hydric Soils List (tabular data version 3, dated 01/25/06).

Author unknown. 2006. Carroll County, Missouri. United States Department of Agriculture Natural Resources Conservation Service. SSURGO Data Package.

Author unknown. 2006. Ray County, Missouri. United States Department of Agriculture Natural Resources Conservation Service. Hydric Soils List.

Author unknown. 2006. Ray County, Missouri. United States Department of Agriculture Natural Resources Conservation Service. SSURGO Data Package.

Brown, L. 1979. *Grasses: An Identification Guide* (Roger Tory Peterson Institute). Houghton Mifflin Company. New York, New York.

Cook, M.A. 1994. Soil Survey of Carroll County, Missouri. United States Department of Agriculture Soil Conservation Service (now the Natural Resources Conservation Service).

Cox, D.D. 2002. *A Naturalist's Guide to Wetland Plants: An Ecology for Eastern North America*. Syracuse University Press. Syracuse, New York.

Eastman, J. 1995. *Swamp and Bog: Trees, Shrubs, and Wildflowers of Eastern Freshwater Wetlands*. Stackpole Books. Mechanicsburg, Pennsylvania.

Knobel, E. 1980. *Field Guide to the Grasses, Sedges and Rushes of the United States* (2nd Edition). Dover Publications Inc. New York, New York.

Muenscher, W.C. 1980. *Weeds* (2nd Edition). Comstock Publishing Associates (division of Cornell University Press). Ithaca, New York.

Munsell Color. 2000. *Munsell Soil Color Charts, 2000 Revised Washable Edition*, GretagMacbeth. New Windsor, New York.

Niering, William A. 1985. *Wetlands* (The Audubon Society Nature Guides). Alfred A. Knopf, Inc. New York.

APPENDIX A References

Petrides, George A. 1972. *A Field Guide to Trees and Shrubs: Northeastern and North-central United States and Southeastern and South-central Canada*, 2nd Edition. Houghton Mifflin Company, Boston.

Preston, G.D. 1986. Soil Survey of Clay and Ray Counties, Missouri. United States Department of Agriculture Soil Conservation Service (now the Natural Resources Conservation Service).

Smith, M. and A. Carr. 1988. *Rodale's Garden Insect, Disease & Weed Identification Guide*. Rodale Press. Emmaus, Pennsylvania.

Smith, J.R. and B.S. Smith. 1980. *The Prairie Garden*. The University of Wisconsin Press. Madison, Wisconsin.

Steyermark, J.A. 1963. *Flora of Missouri*. Iowa State Press. Ames, Iowa.

United States Army Corps of Engineers. 1986. 33 CFR Part 328. Final Rules and Regulations dated Thursday, November 13, 1986.

United States Army Corps of Engineers. 1987. US Army Corps of Engineers Waterways Experiment Station, Wetlands Research Program Technical Report Y-87-1. http://el.erdc.usace.army.mil/elpubs/pdf/wlman87.pdf

United States Department of Agriculture, Natural Resources Conservation Service. 1997. The PLANTS database. National Plant Data Center, Baton Rouge, Louisiana. http://plants.usda.gov

United States Department of Agriculture Natural Resources Conservation Service: Geospatial Data Gateway. 2006. http://datagateway.nrcs.usda.gov

United States Department of Homeland Security, Federal Emergency Management Agency. 1996. Flood Insurance Rate Map: Carroll County, Missouri. Community-Panel Numbers 290057 0100 B and 290057 0175 B.

United States Department of Homeland Security, Federal Emergency Management Agency. 1983. Flood Insurance Rate Map: Ray County, Missouri. Community-Panel Numbers 290778 0050 B and 290778 0100 B.

United States Department of the Interior, Geological Survey. 1978. Hardin, Missouri Quadrangle 7.5 Minute Series (Topographic). Washington, D.C.

APPENDIX A References

United States Department of the Interior, Geological Survey. 1978. Norborne, Missouri Quadrangle 7.5 Minute Series (Topographic). Washington, D.C.

United States Department of the Interior, Geological Survey. 1979. Roads, Missouri Quadrangle 7.5 Minute Series (Topographic). Washington, D.C.

United States Department of the Interior, Geological Survey. 1979. Stet, Missouri Quadrangle 7.5 Minute Series (Topographic). Washington, D.C.

United States Department of the Interior, Fish & Wildlife Service. 1988. *National List of Plants Species that Occur in Wetlands: North Central (Region 3)*.

United States Department of the Interior, Fish & Wildlife Service. 2006. National Wetlands Inventory. Branch of Habitat Assessment, Wetlands Mapper. http://wetlandsfws.er.usgs.gov.

United States Geological Survey National Water Information System: Web Interface. 2006. Streamflow Measurements for Missouri (USGS 06895500 Missouri River at Waverly, Missouri). http://nwis.waterdata.usgs.gov/mo/nwis/measurements

University of Illinois at Urbana-Champaign - College of Agriculture. 1981. *Weeds of the North Central States*. North Central Regional Research Publication No. 281. Agricultural Experiment Station. Urbana, Illinois.

APPENDIX B Field Data Forms

DATA FORM

ROUTINE WETLAND DETERMINATION
1987 COE Wetlands Determination Manual

Project/Site: AEC1 - Norborne Date: 06/01/96
Applicant/Owner: AEC1 County: Carroll
Investigator: JLS, CBC State: MO
Do Normal Circumstances exist on this site? Yes No Community ID: 1
Is the site significantly disturbed (Atypical Situation?) Yes No Transect ID:
Is the area a potential Problem Area? Yes No Plot ID: A

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
*1. P. Thrasius	H	15% FACW	11.		
*2. H. Vulgare	H	40% FAC*	12.		
3. C. Canadensis	H	10% NL	13.		
*4. S. Virgata	H	10% FAC*	14.		
5. E. Hystellata	H	15% FAC*	15.		
6.			16.		
7.					
8.					

Percent of Dominant Species that are OBL, FACW or FAC (excluding FACU):

Remarks: * = surrogate used for indicator
No tree, sapling/shrub + no vine layer. H=Herb

HYDROLOGY

RECORDED DATA (Describe in Remarks):
- ❑ Stream, Lake, or Tide Gauge
- ❑ Aerial Photographs
- ❑ Other
- ❑ No Recorded Data Available

FIELD OBSERVATIONS:
- Depth of Surface Water: — (in.)
- Depth to Free Water in Pit: — (in.)
- Depth to Saturated Soil: — (in.)

WETLAND HYDROLOGY INDICATORS:

PRIMARY INDICATORS:
- ❑ Inundated
- ❑ Saturated in Upper 12 Inches
- ❑ Water Marks
- ❑ Drift Lines
- ❑ Sediment Deposits
- ❑ Drainage Patterns in Wetlands

SECONDARY INDICATORS (2 or more required):
- ❑ Oxidized Root Channels in Upper 12 Inches
- ❑ Water Stained Leaves
- ☒ Local Soil Survey Data
- ❑ FAC-Neutral Test
- ❑ Other (Explain in Remarks)

Remarks: At higher edge of a railroad embankment, no signs of inundation/saturation

SOILS

Map Unit Name (Series and Phase): Baker silty clay loam — Drainage Class: Very Poor

Taxonomy (Subgroup): _____ — Field Observations Confirm Mapped Type? Yes (No)

PROFILE DESCRIPTION

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc
0-2	O				Roots
2-9	A	SYR 2.5/1	—	—	Sandy/Silt
9-12		Refusal at 12" bgs			Rock

HYDRIC SOIL INDICATORS

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Streaking in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☒ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Hydric Soil Present? Yes (No)

Remarks: Soil unsuitable for application

WETLAND DETERMINATION

Hydrophytic Vegetation Present?		
Wetland Hydrology Present?	Yes	No
Hydric Soils Present?	Yes	No
Is this sampling point a Wetland?	Yes	No
	Yes	No

Remarks:

DATA FORM

ROUTINE WETLAND DETERMINATION
1987 COE Wetlands Determination Manual

Project/Site: AECI-Northview
Applicant/Owner: AECI
Investigator: JES, CBC

Date: 06/01/06
County: Carroll
State: MO
Community ID: 1
Transect ID:
Plot ID: B

Do Normal Circumstances exist on this site? Yes No
Is the site significantly disturbed (Atypical Situation?) Yes No
Is the area a potential Problem Area? Yes No

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. H. Commutis	H 60%	NL	9.		
* A. Syriaca	H 5%	OBL	10.		
+ 3 Spatial estimate	H 30%	FACW+	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FACU):

Remarks:
H = herb
* = surrogate used for indicator

HYDROLOGY

RECORDED DATA (Describe in Remarks):
- ❑ Stream, Lake, or Tide Gauge
- ❑ Aerial Photographs
- ❑ Other
- ❑ No Recorded Data Available

FIELD OBSERVATIONS:
- Depth of Surface Water: 0 (in.)
- Depth to Free Water in Pit: 0 (in.)
- Depth to Saturated Soil: 0 (in.)

WETLAND HYDROLOGY INDICATORS:

PRIMARY INDICATORS:
- ❑ Inundated
- ❑ Saturated in Upper 12 Inches
- ❑ Water Marks
- ❑ Drift Lines
- ❑ Sediment Deposits
- ❑ Drainage Patterns in Wetlands

SECONDARY INDICATORS (2 or more required):
- ❑ Oxidized Root Channels in Upper 12 Inches
- ❑ Water Stained Leaves
- ☒ Local Soil Survey Data
- ❑ FAC-Neutral Test
- ❑ Other (Explain in Remarks)

Remarks: Depressional area with potential to hold/accumulate water in rain events and flooding

SOILS

Map Unit Name (Series and Phase): Bookes Silty Clay Drainage Class: Very Poor

Taxonomy (Subgroup): _____ Field Observations Confirm Mapped Type? Yes (No)

PROFILE DESCRIPTION

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-1	O				
1-6	A	10YR 2/1	—	—	Silt w/ Sand
6-10	A	10YR 2/1	—	—	Sandy Silt

HYDRIC SOIL INDICATORS

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Streaking in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☒ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Hydric Soil Present? Yes No

Remarks: Soil dry and very compact

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes	No
Wetland Hydrology Present?	Yes	No
Hydric Soils Present?	Yes	No
Is this sampling point a Wetland?	Yes	No

Remarks:

DATA FORM

ROUTINE WETLAND DETERMINATION
1987 COE Wetlands Determination Manual

Project/Site: AECI - Norborne — Date: 08/01/06
Applicant/Owner: AECI — County: Carroll
Investigator: JLS, CBC — State: MO
Do Normal Circumstances exist on this site? Yes No — Community ID: 1
Is the site significantly disturbed (Atypical Situation?) Yes No — Transect ID:
Is the area a potential Problem Area? Yes No — Plot ID: C

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. A. fatua	H	90% NL	9.		
2. E. canadensis	H	10% FACW to FACU	10.		
3. *H. vulgare	H	5% FACW+ to FAC+	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FACU):

Remarks:
H= Herb
*= surrogate used for indicator

HYDROLOGY

RECORDED DATA (Describe in Remarks):
- ❑ Stream, Lake, or Tide Gauge
- ❑ Aerial Photographs
- ❑ Other
- ❑ No Recorded Data Available

FIELD OBSERVATIONS:
- Depth of Surface Water: — (in.)
- Depth to Free Water in Pit: — (in.)
- Depth to Saturated Soil: — (in.)

WETLAND HYDROLOGY INDICATORS:

PRIMARY INDICATORS:
- ❑ Inundated
- ❑ Saturated in Upper 12 Inches
- ❑ Water Marks
- ❑ Drift Lines
- ❑ Sediment Deposits
- ❑ Drainage Patterns in Wetlands

SECONDARY INDICATORS (2 or more required):
- ❑ Oxidized Root Channels in Upper 12 Inches
- ❑ Water Stained Leaves
- ☒ Local Soil Survey Data
- ❑ FAC-Neutral Test
- ❑ Other (Explain in Remarks)

Remarks:
Depressional area between county road and railroad tracks, likely would only hold water in flood event

SOILS

Map Unit Name (Series and Phase): Booker Silty Clay Drainage Class: Very Poor

Taxonomy (Subgroup): _____ Field Observations Confirm Mapped Type? Yes (No)

PROFILE DESCRIPTION

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-2					Topsoil
2-16	B	5Y 3/1	—	—	Clay/Fine Sand

HYDRIC SOIL INDICATORS

- ❑ Histosol
- ❑ Histic Epipedon
- ❑ Sulfidic Odor
- ❑ Aquic Moisture Regime
- ❑ Reducing Conditions
- ☒ Gleyed or Low-Chroma Colors
- ❑ Concretions
- ❑ High Organic Streaking in Surface Layer in Sandy Soils
- ❑ Organic Streaking in Sandy Soils
- ☒ Listed on Local Hydric Soils List
- ❑ Listed on National Hydric Soils List
- ❑ Other (Explain in Remarks)

Hydric Soil Present? Yes No

Remarks: Some moisture, not as much as the plots A+B.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?		
Wetland Hydrology Present?	Yes	No
Hydric Soils Present?	Yes	No
Is this sampling point a Wetland?	Yes	No
Remarks:	Yes	No

DATA FORM

ROUTINE WETLAND DETERMINATION
1987 COE Wetlands Determination Manual

Project/Site: AECI-Norborne
Applicant/Owner: AECI
Investigator: JES, CBC

Date: 08/01/06
County: Cutoff
State: MO
Community ID: 2
Transect ID:
Plot ID: A

Do Normal Circumstances exist on this site? Yes No
Is the site significantly disturbed (Atypical Situation?) Yes No
Is the area a potential Problem Area? Yes No

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. L. Commerson	H 50%	NL	9.		
*2. A. Syriaca	H 5%	OBL to UPL	10.		
*3. C. Cyperinus	H 40%	FACW to OBL	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FACU):

Remarks:
H- Herbaceous
*= Surrogate used for indicator

HYDROLOGY

RECORDED DATA (Describe in Remarks):
- ❑ Stream, Lake, or Tide Gauge
- ❑ Aerial Photographs
- ❑ Other
- ❑ No Recorded Data Available

FIELD OBSERVATIONS:
Depth of Surface Water: — (in.)
Depth to Free Water in Pit: — (in.)
Depth to Saturated Soil: ____ (in.)

WETLAND HYDROLOGY INDICATORS:

PRIMARY INDICATORS:
- ❑ Inundated
- ❑ Saturated in Upper 12 Inches
- ❑ Water Marks
- ❑ Drift Lines
- ❑ Sediment Deposits
- ❑ Drainage Patterns in Wetlands

SECONDARY INDICATORS (2 or more required):
- ❑ Oxidized Root Channels in Upper 12 Inches
- ❑ Water Stained Leaves
- ☒ Local Soil Survey Data
- ❑ FAC-Neutral Test
- ❑ Other (Explain in Remarks)

Remarks: Area on slope, leading down from railroad

SOILS

Map Unit Name (Series and Phase): Bookers Silty Clay — Drainage Class: Very Poor

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? (Yes) No

PROFILE DESCRIPTION

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-4	OA	10YR 4/2			SiH
4-12	B	5Y 2.5/1	—	—	Clay w/ trace sand
12-16	B	5Y 2.5/1	10YR 5/8	common fine distinct	

HYDRIC SOIL INDICATORS

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Streaking in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☒ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Hydric Soil Present? Yes No

Remarks: some moisture in soil

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes	No
Wetland Hydrology Present?	Yes	No
Hydric Soils Present?	Yes	No
Is this sampling point a Wetland?	Yes	No

Remarks:

DATA FORM

ROUTINE WETLAND DETERMINATION
1987 COE Wetlands Determination Manual

Project/Site: AECI - Norborne
Applicant/Owner: AECI
Investigator: JES, CBC
Date: 08/01/96
County: Carroll
State: MO
Community ID: 2
Transect ID:
Plot ID: B

Do Normal Circumstances exist on this site? Yes No
Is the site significantly disturbed (Atypical Situation?) Yes No
Is the area a potential Problem Area? Yes No

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
*1. Carex Cristatella	H 40%	FACW- to OBL	10.		
2. Juncus Communis	H 10%	NL	11.		
3. N. Graminea	H 1%	FAC	12.		
4. Hydrocotyle ranunculoides	H 10%	FACW	13.		
5. P. Pensylvanicum	H 40%	FACW+	14.		
6.			15.		
7.			16.		
8.					

Percent of Dominant Species that are OBL, FACW or FAC (excluding FACU):

Remarks:
H = herb
* = surrogate used for indicator

HYDROLOGY

RECORDED DATA (Describe in Remarks):
- ❑ Stream, Lake, or Tide Gauge
- ❑ Aerial Photographs
- ❑ Other
- ❑ No Recorded Data Available

FIELD OBSERVATIONS:
- Depth of Surface Water: — (in.)
- Depth to Free Water in Pit: — (in.)
- Depth to Saturated Soil: — (in.)

WETLAND HYDROLOGY INDICATORS:

PRIMARY INDICATORS:
- ❑ Inundated
- ❑ Saturated in Upper 12 Inches
- ❑ Water Marks
- ❑ Drift Lines
- ❑ Sediment Deposits
- ❑ Drainage Patterns in Wetlands

SECONDARY INDICATORS (2 or more required):
- ❑ Oxidized Root Channels in Upper 12 Inches
- ❑ Water Stained Leaves
- ☒ Local Soil Survey Data
- ❑ FAC-Neutral Test
- ❑ Other (Explain in Remarks)

Remarks: Depressional area adjacent to railroad track

SOILS

Map Unit Name (Series and Phase): Bookers Silty Clay — Drainage Class: Very Poor

Taxonomy (Subgroup): _____ — Field Observations Confirm Mapped Type? (Yes) No

PROFILE DESCRIPTION

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-1					
1-12		5Y 3/1	5YR 4/6	common distinct	clay
12-16		5Y 3/1	5YR 4/6	fine	clay/sandy

HYDRIC SOIL INDICATORS

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Streaking in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☒ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Hydric Soil Present? Yes No

Remarks: Soil dry at surface to 12" bgs. Continues to be dry throughout. Soil compact.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes No

Wetland Hydrology Present? Yes No

Hydric Soils Present? Yes No

Is this sampling point a Wetland? Yes No

Remarks:

DATA FORM

ROUTINE WETLAND DETERMINATION
1987 COE Wetlands Determination Manual

Project/Site: AECI-Norborne Date: 08/01/96
Applicant/Owner: AECI County: Carroll
Investigator: JLS, CBC State: MO
Do Normal Circumstances exist on this site? Yes No Community ID: 2
Is the site significantly disturbed (Atypical Situation?) Yes No Transect ID:
Is the area a potential Problem Area? Yes No Plot ID: C

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. A. fatua	H 70%	NL	9.		
2. N. arguta	H 20%	FAC	10.		
3. * E. canadensis	H 5%	FACW to FACW	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FACU):

Remarks:
H = herb
* = surrogate used for indicator

HYDROLOGY

RECORDED DATA (Describe in Remarks):
- ❑ Stream, Lake, or Tide Gauge
- ❑ Aerial Photographs
- ❑ Other
- ❑ No Recorded Data Available

FIELD OBSERVATIONS:
Depth of Surface Water: — (in.)
Depth to Free Water in Pit: — (in.)
Depth to Saturated Soil: — (in.)

WETLAND HYDROLOGY INDICATORS:

PRIMARY INDICATORS:
- ❑ Inundated
- ❑ Saturated in Upper 12 Inches
- ❑ Water Marks
- ❑ Drift Lines
- ❑ Sediment Deposits
- ❑ Drainage Patterns in Wetlands

SECONDARY INDICATORS (2 or more required):
- ❑ Oxidized Root Channels in Upper 12 Inches
- ❑ Water Stained Leaves
- ☒ Local Soil Survey Data
- ❑ FAC-Neutral Test
- ❑ Other (Explain in Remarks)

Remarks: Area adjacent to county road, slopes downward from road

SOILS

Map Unit Name (Series and Phase): Bookers Silty Clay | Drainage Class: Very Poor

Taxonomy (Subgroup): _____ | Field Observations Confirm Mapped Type? (Yes) No

PROFILE DESCRIPTION

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-1					topsoil
1-16		2.5Y 2.5/1	5YR 4/6	few distinct	Clay w/ trace sand

HYDRIC SOIL INDICATORS

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Streaking in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☒ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Hydric Soil Present? Yes No

Remarks: Soil dry and compact at 12" bgs, becomes more moist

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes	No
Wetland Hydrology Present?	Yes	No
Hydric Soils Present?	Yes	No
Is this sampling point a Wetland?	Yes	No

Remarks:

DATA FORM

ROUTINE WETLAND DETERMINATION
1987 COE Wetlands Determination Manual

Project/Site: AECI-Norborne Date: 08/01/96
Applicant/Owner: AECI County: Carroll
Investigator: JEZ, CBE State: MO
Do Normal Circumstances exist on this site? Yes No Community ID: 3
Is the site significantly disturbed (Atypical Situation?) Yes No Transect ID:
Is the area a potential Problem Area? Yes No Plot ID: A

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. S. Rigida	S	OBL	9.		
2. V. Comburnis	H	NL	10.		
3. L. nutans	H	NL	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FACU):

Remarks:
S = Sapling/shrub
H = herb
* = Surrogate used for indicator

HYDROLOGY

RECORDED DATA (Describe in Remarks):
- ❑ Stream, Lake, or Tide Gauge
- ❑ Aerial Photographs
- ❑ Other
- ❑ No Recorded Data Available

FIELD OBSERVATIONS:
- Depth of Surface Water: — (in.)
- Depth to Free Water in Pit: — (in.)
- Depth to Saturated Soil: — (in.)

WETLAND HYDROLOGY INDICATORS:

PRIMARY INDICATORS:
- ❑ Inundated
- ❑ Saturated in Upper 12 Inches
- ❑ Water Marks
- ❑ Drift Lines
- ❑ Sediment Deposits
- ❑ Drainage Patterns in Wetlands

SECONDARY INDICATORS (2 or more required):
- ❑ Oxidized Root Channels in Upper 12 Inches
- ❑ Water Stained Leaves
- ☒ Local Soil Survey Data
- ❑ FAC-Neutral Test
- ❑ Other (Explain in Remarks)

Remarks: Upland immediately adjacent to railroad tracks

SOILS

Map Unit Name (Series and Phase): Bookes Silty clay | Drainage Class: very Poor

Taxonomy (Subgroup): _____ | Field Observations Confirm Mapped Type? Yes (No)

PROFILE DESCRIPTION

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-8		—	—	—	Sandy Rock
8+					rock

HYDRIC SOIL INDICATORS

- ❑ Histosol
- ❑ Histic Epipedon
- ❑ Sulfidic Odor
- ❑ Aquic Moisture Regime
- ❑ Reducing Conditions
- ❑ Gleyed or Low-Chroma Colors
- ❑ Concretions
- ❑ High Organic Streaking in Surface Layer in Sandy Soils
- ❑ Organic Streaking in Sandy Soils
- ☒ Listed on Local Hydric Soils List
- ❑ Listed on National Hydric Soils List
- ❑ Other (Explain in Remarks)

Hydric Soil Present? Yes No

Remarks: Sand is loose and dry

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes	No
Wetland Hydrology Present?	Yes	No
Hydric Soils Present?	Yes	No
Is this sampling point a Wetland?	Yes	No

Remarks:

DATA FORM

ROUTINE WETLAND DETERMINATION
1987 COE Wetlands Determination Manual

Project/Site: AECI - Norborne
Applicant/Owner: AECI
Investigator: TLS, CRE

Date: 08/01/16
County: Carroll
State: MO
Community ID: 2
Transect ID:
Plot ID: B

Do Normal Circumstances exist on this site? Yes No
Is the site significantly disturbed (Atypical Situation?) Yes No
Is the area a potential Problem Area? Yes No

VEGETATION

	Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1.	S. alterniflora	S	40% OBL	9.		
2.*	C. laccustris	H	30% FACW- to OBL	10.		
3.	C. communis	H	5% NL	11.		
4.*	A. salicaca	H	5% OBL to FACW	12.		
5.	C. sepium	V	4% NL	13.		
6.				14.		
7.				15.		
8.				16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FACU):

Remarks:
S=sapling/shrub
H=herb
V=vine
*=surrogate used for indicator

HYDROLOGY

RECORDED DATA (Describe in Remarks):
- ❑ Stream, Lake, or Tide Gauge
- ❑ Aerial Photographs
- ❑ Other
- ❑ No Recorded Data Available

FIELD OBSERVATIONS:
- Depth of Surface Water: ___ (in.)
- Depth to Free Water in Pit: ___ (in.)
- Depth to Saturated Soil: ___ (in.)

WETLAND HYDROLOGY INDICATORS:

PRIMARY INDICATORS:
- ❑ Inundated
- ❑ Saturated in Upper 12 Inches
- ❑ Water Marks
- ❑ Drift Lines
- ❑ Sediment Deposits
- ❑ Drainage Patterns in Wetlands

SECONDARY INDICATORS (2 or more required):
- ❑ Oxidized Root Channels in Upper 12 Inches
- ❑ Water Stained Leaves
- ☒ Local Soil Survey Data
- ❑ FAC-Neutral Test
- ❑ Other (Explain in Remarks)

Remarks: Depressional area, downslope of railroad tracks, likely to pond water during rain + flood

SOILS

Map Unit Name (Series and Phase): Booker Silty Clay Drainage Class: Very Poor

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes (No)

PROFILE DESCRIPTION

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-1					
1-10		7.5YR 2.5/1	dark smearing		clay/silt
10-16		7.5YR 3/2	7.5YR 5/6	many, distinct variation	

HYDRIC SOIL INDICATORS

- ❑ Histosol
- ❑ Histic Epipedon
- ❑ Sulfidic Odor
- ❑ Aquic Moisture Regime
- ❑ Reducing Conditions
- ☒ Gleyed or Low-Chroma Colors
- ❑ Concretions
- ❑ High Organic Streaking in Surface Layer in Sandy Soils
- ❑ Organic Streaking in Sandy Soils
- ☒ Listed on Local Hydric Soils List
- ❑ Listed on National Hydric Soils List
- ❑ Other (Explain in Remarks)

Hydric Soil Present? Yes No

Remarks:
Soil very dry

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes	No
Wetland Hydrology Present?	Yes	No
Hydric Soils Present?	Yes	No
Is this sampling point a Wetland?	Yes	No

Remarks:

DATA FORM

ROUTINE WETLAND DETERMINATION
1987 COE Wetlands Determination Manual

Project/Site: AEC-Norborne
Applicant/Owner: AEC
Investigator: SLS, CBC
Date: 08/01/96
County: Carroll
State: MO
Community ID: 3
Transect ID:
Plot ID: C

Do Normal Circumstances exist on this site? Yes No
Is the site significantly disturbed (Atypical Situation?) Yes No
Is the area a potential Problem Area? Yes No

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. T. aestivum	H 40%	NL	9.		
2. E. Communis	H 20%	NL	10.		
3. S. lexigia	S 10%	OBL	11.		
4. *Eu. Canadensis	H 10%	FACW to FACW	12.		
5. A. Tonsa	H 10%	FAC+	13.		
6. A. Fatua	H 10%	NL	14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FACU):

Remarks:
*= surrogate used for indicator

HYDROLOGY

RECORDED DATA (Describe in Remarks):
- ❑ Stream, Lake, or Tide Gauge
- ❑ Aerial Photographs
- ❑ Other
- ❑ No Recorded Data Available

FIELD OBSERVATIONS:
- Depth of Surface Water: — (in.)
- Depth to Free Water in Pit: — (in.)
- Depth to Saturated Soil: — (in.)

WETLAND HYDROLOGY INDICATORS:

PRIMARY INDICATORS:
- ❑ Inundated
- ❑ Saturated in Upper 12 Inches
- ❑ Water Marks
- ❑ Drift Lines
- ❑ Sediment Deposits
- ❑ Drainage Patterns in Wetlands

SECONDARY INDICATORS (2 or more required):
- ❑ Oxidized Root Channels in Upper 12 Inches
- ❑ Water Stained Leaves
- ☒ Local Soil Survey Data
- ❑ FAC-Neutral Test
- ❑ Other (Explain in Remarks)

Remarks:
Immediately adjacent to county road, slight slope down from road

SOILS

Map Unit Name (Series and Phase): Booker Silty Clay — Drainage Class: Very Poor

Taxonomy (Subgroup): _____ Field Observations Confirm Mapped Type? Yes (No)

PROFILE DESCRIPTION

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-4		7.5YR 2.5/1	—		silty w/clay
4-10		7.5YR 2.5/1	—		clay w/silt
10-16		7.5YR 4/2	7.5YR 5/8	many distinct medium	clay w/silt + trace sand

HYDRIC SOIL INDICATORS

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Streaking in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☒ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Hydric Soil Present? Yes No

Remarks: Moisture increases w/ depth

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes	No
Wetland Hydrology Present?	Yes	No
Hydric Soils Present?	Yes	No
Is this sampling point a Wetland?	Yes	No

Remarks:

DATA FORM

ROUTINE WETLAND DETERMINATION
1987 COE Wetlands Determination Manual

Project/Site: AECI-Norbatine
Applicant/Owner: AECI
Investigator: JBS, CBC
Date: 08/04/06
County: Carroll
State: MO
Community ID: 4
Transect ID:
Plot ID: B

Do Normal Circumstances exist on this site? Yes No
Is the site significantly disturbed (Atypical Situation?) Yes No
Is the area a potential Problem Area? Yes No

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. S. amboigua	H 30%	OBL	9.		
2. P. arundinacea	H 30%	FAC	10.		
3. * P. pubescens	H 30%	OBL	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FACU):

Remarks:
H= herb
*= surrogate used for indicator

HYDROLOGY

RECORDED DATA (Describe in Remarks):
- ❑ Stream, Lake, or Tide Gauge
- ❑ Aerial Photographs
- ❑ Other
- ❑ No Recorded Data Available

FIELD OBSERVATIONS:
Depth of Surface Water: — (in.)
Depth to Free Water in Pit: 8 (in.)
Depth to Saturated Soil: 8 (in.)

WETLAND HYDROLOGY INDICATORS:
Saturated to ground surface

PRIMARY INDICATORS:
- ❑ Inundated
- ☒ Saturated in Upper 12 Inches
- ❑ Water Marks
- ❑ Drift Lines
- ❑ Sediment Deposits
- ❑ Drainage Patterns in Wetlands

SECONDARY INDICATORS (2 or more required):
- ❑ Oxidized Root Channels in Upper 12 Inches
- ❑ Water Stained Leaves
- ☒ Local Soil Survey Data
- ❑ FAC-Neutral Test
- ❑ Other (Explain in Remarks)

Remarks: Immediately adjacent to drainage ditch at intersection of County road 103 and George Hale Trust 103.

SOILS

Map Unit Name (Series and Phase): Booker Silty Clay — Drainage Class: Very Poor

Taxonomy (Subgroup): _____ — Field Observations Confirm Mapped Type? Yes (No)

PROFILE DESCRIPTION

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-16		Gley2 3/1 5PB	7.5YR 4/6	Few, distinct, medium	Silt w/ sand

HYDRIC SOIL INDICATORS

- ❑ Histosol
- ❑ Histic Epipedon
- ❑ Sulfidic Odor
- (X) Aquic Moisture Regime
- ❑ Reducing Conditions
- (X) Gleyed or Low-Chroma Colors
- ❑ Concretions
- ❑ High Organic Streaking in Surface Layer in Sandy Soils
- ❑ Organic Streaking in Sandy Soils
- (X) Listed on Local Hydric Soils List
- ❑ Listed on National Hydric Soils List
- ❑ Other (Explain in Remarks)

Hydric Soil Present? Yes No

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes	No
Wetland Hydrology Present?	Yes	No
Hydric Soils Present?	Yes	No
Is this sampling point a Wetland?	Yes	No

Remarks:

DATA FORM

ROUTINE WETLAND DETERMINATION
1987 COE Wetlands Determination Manual

Project/Site: AEC1 - Nortcarne
Applicant/Owner: AEC1
Investigator: JLB, CBC
Date: 08/01/06
County: Carroll
State: MO
Community ID: 4
Transect ID:
Plot ID: A

Do Normal Circumstances exist on this site? Yes No
Is the site significantly disturbed (Atypical Situation?) Yes No
Is the area a potential Problem Area? Yes No

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
*1.	H. Nuttallii	H	80% FACW-	9.			to FAC+
2.	E. Canadensis	V	10% NI	10.			
3.				11.			
4.				12.			
5.				13.			
6.				14.			
7.				15.			
8.				16.			

Percent of Dominant Species that are OBL, FACW or FAC (excluding FACU):

Remarks: Majority of vegetation dead here. Adjacent sorghum field was sprayed and killed veg. taken adjacent to field.

*= Surrogate used for indicator

HYDROLOGY

RECORDED DATA (Describe in Remarks):
- ❑ Stream, Lake, or Tide Gauge
- ❑ Aerial Photographs
- ❑ Other
- ❑ No Recorded Data Available

FIELD OBSERVATIONS:
- Depth of Surface Water: ___ (in.)
- Depth to Free Water in Pit: ___ (in.)
- Depth to Saturated Soil: ___ (in.)

WETLAND HYDROLOGY INDICATORS:

PRIMARY INDICATORS:
- ❑ Inundated
- ❑ Saturated in Upper 12 Inches
- ❑ Water Marks
- ❑ Drift Lines
- ❑ Sediment Deposits
- ❑ Drainage Patterns in Wetlands

SECONDARY INDICATORS (2 or more required):
- ❑ Oxidized Root Channels in Upper 12 Inches
- ❑ Water Stained Leaves
- ☒ Local Soil Survey Data
- ❑ FAC-Neutral Test
- ❑ Other (Explain in Remarks)

Remarks: Upland of point 4B adjacent to planted sorghum field. Beginning downward slope to drainage ditch.

SOILS

Map Unit Name (Series and Phase): Bodine Silty Clay Drainage Class: Very Poor

Taxonomy (Subgroup): _____ Field Observations Confirm Mapped Type? (Yes) No

PROFILE DESCRIPTION

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-2					
2-6		7.5YR 2.5/1			Clay, Weak Fine Granular
6-16		7.5YR 5/2	7.5YR 5/8	few/distinct/medium	

HYDRIC SOIL INDICATORS

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Streaking in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☒ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Hydric Soil Present? Yes No

Remarks: Soil somewhat moist

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes	No
Wetland Hydrology Present?	Yes	No
Hydric Soils Present?	Yes	No
Is this sampling point a Wetland?	Yes	No

Remarks:

DATA FORM

ROUTINE WETLAND DETERMINATION
1987 COE Wetlands Determination Manual

Project/Site: AECI - Norborne
Applicant/Owner: AECI
Investigator: JLS, CBC
Do Normal Circumstances exist on this site? Yes No
Is the site significantly disturbed (Atypical Situation?) Yes No
Is the area a potential Problem Area? Yes No

Date: 08/01/06
County: Carroll
State: MO
Community ID: S
Transect ID:
Plot ID: B

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. S. cambagua	45%	OBL	9.		
2. P punctatum	45%	OBL	10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FACU):

Remarks:

HYDROLOGY

RECORDED DATA (Describe in Remarks):
- ❑ Stream, Lake, or Tide Gauge
- ❑ Aerial Photographs
- ❑ Other
- ❑ No Recorded Data Available

FIELD OBSERVATIONS:
- Depth of Surface Water: — (in.)
- Depth to Free Water in Pit: — (in.)
- Depth to Saturated Soil: 1 (in.)

WETLAND HYDROLOGY INDICATORS:

PRIMARY INDICATORS:
- ❑ Inundated
- ☒ Saturated in Upper 12 Inches
- ❑ Water Marks
- ❑ Drift Lines
- ❑ Sediment Deposits
- ❑ Drainage Patterns in Wetlands

SECONDARY INDICATORS (2 or more required):
- ❑ Oxidized Root Channels in Upper 12 Inches
- ❑ Water Stained Leaves
- ☒ Local Soil Survey Data
- ❑ FAC-Neutral Test
- ❑ Other (Explain in Remarks)

Remarks: Adjacent to drainage ditch (north side). Downland of [illegible] from soybean field to ditch

SOILS

Map Unit Name (Series and Phase): Booker Silty Clay — Drainage Class: Very Poor

Field Observations — Confirm Mapped Type? (Yes) No

Taxonomy (Subgroup): _____

PROFILE DESCRIPTION

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-5		10YR 3/2	10YR 5/8	few distinct medium	clay/silt
5-16		10YR 3/1	10YR 5/8	few distinct medium	clay/silt

HYDRIC SOIL INDICATORS

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Streaking in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☒ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Hydric Soil Present? Yes No

Remarks: Soil Saturated Throughout

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes	No
Wetland Hydrology Present?	Yes	No
Hydric Soils Present?	Yes	No
Is this sampling point a Wetland?	Yes	No

Remarks:

DATA FORM

ROUTINE WETLAND DETERMINATION
1987 COE Wetlands Determination Manual

Project/Site: AEC1 - Norborne — Date: 08/01/96
Applicant/Owner: AEC1 — County: Carroll
Investigator: SCS, COE — State: MO
Do Normal Circumstances exist on this site? Yes No — Community ID: 5
Is the site significantly disturbed (Atypical Situation?) Yes No — Transect ID:
Is the area a potential Problem Area? Yes No — Plot ID: A

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Ambrosia	25%	FAC+	9.		
2. Andropogon	25%	FAC	10.		
3. Unidentified	40%	OBL	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FACU):

Remarks:

HYDROLOGY

RECORDED DATA (Describe in Remarks):
- ❑ Stream, Lake, or Tide Gauge
- ❑ Aerial Photographs
- ❑ Other
- ❑ No Recorded Data Available

FIELD OBSERVATIONS:
- Depth of Surface Water: — (in.)
- Depth to Free Water in Pit: — (in.)
- Depth to Saturated Soil: — (in.)

WETLAND HYDROLOGY INDICATORS:

PRIMARY INDICATORS:
- ❑ Inundated
- ❑ Saturated in Upper 12 Inches
- ❑ Water Marks
- ❑ Drift Lines
- ❑ Sediment Deposits
- ❑ Drainage Patterns in Wetlands

SECONDARY INDICATORS (2 or more required):
- ❑ Oxidized Root Channels in Upper 12 Inches
- ❑ Water Stained Leaves
- ☒ Local Soil Survey Data
- ❑ FAC-Neutral Test
- ❑ Other (Explain in Remarks)

Remarks: Upland at point SB. On downward slope leading from soybean field to drainage ditch

SOILS

Map Unit Name (Series and Phase): Bartles Silty Clay Drainage Class: Very Poor

Taxonomy (Subgroup): _____ Field Observations Confirm Mapped Type? Yes / No

PROFILE DESCRIPTION

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-2		7.5YR 3/1	—	—	Clay w/ Fine Sand
2-16		2.5Y 3/1	5YR 5/6	Faint, medium	Clay

HYDRIC SOIL INDICATORS

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Streaking in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☒ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Hydric Soil Present? Yes / No

Remarks: Moisture increases with depth

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes / No

Wetland Hydrology Present? Yes / No

Hydric Soils Present? Yes / No

Is this sampling point a Wetland? Yes / No

Remarks: In this plot transition from wetland to upland

DATA FORM

ROUTINE WETLAND DETERMINATION
1987 COE Wetlands Determination Manual

Project/Site: AECL-Norborne — Date: 08/01/96
Applicant/Owner: AECL — County: Carroll
Investigator: JTG, CEC — State: MO
Do Normal Circumstances exist on this site? Yes No — Community ID: 16
Is the site significantly disturbed (Atypical Situation?) Yes No — Transect ID:
Is the area a potential Problem Area? Yes No — Plot ID: A

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Cyperus esculentus	H	60% FAC	9.		
2. Ambrosia artemisiifolia	H	10% FACU-	10.		
3. Polygonum lapathifolium	H	30% FACW	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FACU):

Remarks: Vegetation present and green at convergence of 3 drainage ditches in soybean field.
*Aggregate wetland for indicator

HYDROLOGY

RECORDED DATA (Describe in Remarks):
- ❑ Stream, Lake, or Tide Gauge
- ❑ Aerial Photographs
- ❑ Other
- ❑ No Recorded Data Available

FIELD OBSERVATIONS:
- Depth of Surface Water: — (in.)
- Depth to Free Water in Pit: — (in.)
- Depth to Saturated Soil: very moist 12 (in.)

WETLAND HYDROLOGY INDICATORS:
Change in vegetation
Shown on photos #31-33

PRIMARY INDICATORS:
- ❑ Inundated
- ❑ Saturated in Upper 12 Inches
- ❑ Water Marks
- ❑ Drift Lines
- ❑ Sediment Deposits
- ❑ Drainage Patterns in Wetlands

SECONDARY INDICATORS (2 or more required):
- ❑ Oxidized Root Channels in Upper 12 Inches
- ❑ Water Stained Leaves
- ☒ Local Soil Survey Data
- ❑ FAC-Neutral Test
- ❑ Other (Explain in Remarks)

Remarks: Appears to be depressional area in soybean field where drainage ditches meet and water ponds sufficiently to support

SOILS

Map Unit Name (Series and Phase): Bookers Silty Clay Drainage Class: Very Poor

Taxonomy (Subgroup): _____ Field Observations Confirm Mapped Type? (Yes) No

PROFILE DESCRIPTION

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-1		2.5Y 2.5/1	—	—	Silt, dry
1-10		2.5Y 2.5/1			clay w/ silt
10-16		5Y 4/1	2.5Y 5/6	common, distinct	

HYDRIC SOIL INDICATORS

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Streaking in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☒ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Hydric Soil Present? Yes No

Remarks: Moisture increases with depth, soil at 12-16" bgs very moist

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes	No
Wetland Hydrology Present?	Yes	No
Hydric Soils Present?	Yes	No
Is this sampling point a Wetland?	Yes	No

Remarks:

DATA FORM

ROUTINE WETLAND DETERMINATION
1987 COE Wetlands Determination Manual

Project/Site: AECI-Norborne Date: 08/01/06
Applicant/Owner: AECI County: Carroll
Investigator: JBG, CBC State: MO
Do Normal Circumstances exist on this site? Yes No Community ID: 7
Is the site significantly disturbed (Atypical Situation?) Yes No Transect ID:
Is the area a potential Problem Area? Yes No Plot ID: A

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. A. saccharinum	T	10% FACW	10.		
2. C. sericea	V	10% NL	11.		
3. A. canadensis	H	30% FAC	12.		
4. Dist. spicata	H	20% OBL	13.		
*5. E. canadensis	H	15% FAC (to FACW)	14.		
6.			15.		
7.			16.		
8.					

Percent of Dominant Species that are OBL, FACW or FAC (excluding FACU):

Remarks:
T=Tree
V=Vine
H=Herb
*= Surrogate used for indicator

HYDROLOGY

RECORDED DATA (Describe in Remarks):
- ❑ Stream, Lake, or Tide Gauge
- ❑ Aerial Photographs
- ❑ Other
- ❑ No Recorded Data Available

FIELD OBSERVATIONS:
Depth of Surface Water: — (in.)
Depth to Free Water in Pit: — (in.)
Depth to Saturated Soil: — (in.)

WETLAND HYDROLOGY INDICATORS:

PRIMARY INDICATORS:
- ❑ Inundated
- ❑ Saturated in Upper 12 Inches
- ❑ Water Marks
- ❑ Drift Lines
- ❑ Sediment Deposits
- ❑ Drainage Patterns in Wetlands

SECONDARY INDICATORS (2 or more required):
- ❑ Oxidized Root Channels in Upper 12 Inches
- ❑ Water Stained Leaves
- ☒ Local Soil Survey Data
- ❑ FAC-Neutral Test
- ❑ Other (Explain in Remarks)

Remarks:
Immediately upslope of drainage ditch. Steep slope leading down to ditch. This point is above bank that would typically hold water.

SOILS

Map Unit Name (Series and Phase): Bolmer Silty Clay Loam — Drainage Class: Poor

Taxonomy (Subgroup): _____ — Field Observations Confirm Mapped Type? Yes (No)

PROFILE DESCRIPTION

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-16		7.5YR 3/2	—	~	loamy silt w/ trace sand

HYDRIC SOIL INDICATORS

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Streaking in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☒ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Hydric Soil Present? Yes No

Remarks: Soil mostly dry. Some moisture with depth.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes No
Wetland Hydrology Present?	Yes No
Hydric Soils Present?	Yes No
Is this sampling point a Wetland?	Yes No

Remarks: This point is outside of wetland area; however wetland fringe surrounds site and measured about 5' up in elevation from water's edge

DATA FORM

ROUTINE WETLAND DETERMINATION
1987 COE Wetlands Determination Manual

Project/Site: AEC1-Norborne Date: 08/11/16 ?
Applicant/Owner: AEC County: Carroll
Investigator: JLS, CDC State: MO
Do Normal Circumstances exist on this site? Yes No Community ID: B
Is the site significantly disturbed (Atypical Situation?) Yes No Transect ID:
Is the area a potential Problem Area? Yes No Plot ID: B

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *C. microcarpa	H 30%	FAC	9.		
2. B. virginica	H 10%	FAC	10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FACU):

Remarks:
Only about 40% of the plot (ditch) has vegetation
* = Surrogate used for indicator

HYDROLOGY

RECORDED DATA (Describe in Remarks):
- ❑ Stream, Lake, or Tide Gauge
- ❑ Aerial Photographs
- ❑ Other
- ❑ No Recorded Data Available

FIELD OBSERVATIONS:
- Depth of Surface Water: — (in.)
- Depth to Free Water in Pit: — (in.)
- Depth to Saturated Soil: — (in.)

WETLAND HYDROLOGY INDICATORS:

PRIMARY INDICATORS:
- ❑ Inundated
- ❑ Saturated in Upper 12 Inches
- ❑ Water Marks
- ❑ Drift Lines
- ❑ Sediment Deposits
- ❑ Drainage Patterns in Wetlands

SECONDARY INDICATORS (2 or more required):
- ❑ Oxidized Root Channels in Upper 12 Inches
- ❑ Water Stained Leaves
- ☒ Local Soil Survey Data
- ❑ FAC-Neutral Test
- ❑ Other (Explain in Remarks)

Remarks:
Manmade or natural drainage ditch through soybean field. This point is in center of drainage ditch

SOILS

Map Unit Name (Series and Phase): Bookes Silty Clay Drainage Class: Very Poor

Taxonomy (Subgroup): _____ Field Observations Confirm Mapped Type? (Yes) No

PROFILE DESCRIPTION

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-1		10YR 2/1	—	—	clay/silt
1-10		10YR 2/1	—	—	clay/silt
10-16		2.5Y 2.5/1	2.5Y 4/3	few distinct, medium	clay w/ silt

HYDRIC SOIL INDICATORS

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Streaking in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☒ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Hydric Soil Present? Yes No

Remarks: Moisture increases with depth

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes No

Wetland Hydrology Present? Yes No

Hydric Soils Present? Yes No

Is this sampling point a Wetland? Yes No

Remarks:

DATA FORM

ROUTINE WETLAND DETERMINATION
1987 COE Wetlands Determination Manual

Project/Site: AEC1-Norborne Date: 08/01/06
Applicant/Owner: AEC1 County: Carroll
Investigator: SLS, CBC State: MO
Do Normal Circumstances exist on this site? Yes No Community ID: 0
Is the site significantly disturbed (Atypical Situation?) Yes No Transect ID:
Is the area a potential Problem Area? Yes No Plot ID: A

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. G. max	H	5% NL	9.		
2.			10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FACU):

Remarks: Planted soybean field. Edge of field NEXT to ditch

HYDROLOGY

RECORDED DATA (Describe in Remarks):
- ❑ Stream, Lake, or Tide Gauge
- ❑ Aerial Photographs
- ❑ Other
- ❑ No Recorded Data Available

FIELD OBSERVATIONS:
- Depth of Surface Water: — (in.)
- Depth to Free Water in Pit: — (in.)
- Depth to Saturated Soil: — (in.)

WETLAND HYDROLOGY INDICATORS:

PRIMARY INDICATORS:
- ❑ Inundated
- ❑ Saturated in Upper 12 Inches
- ❑ Water Marks
- ❑ Drift Lines
- ❑ Sediment Deposits
- ❑ Drainage Patterns in Wetlands

SECONDARY INDICATORS (2 or more required):
- ❑ Oxidized Root Channels in Upper 12 Inches
- ❑ Water Stained Leaves
- ☒ Local Soil Survey Data
- ❑ FAC-Neutral Test
- ❑ Other (Explain in Remarks)

Remarks: Hydrology not present. Area is planted soybean and is drained. Ditch is about 5 feet wide

SOILS

Map Unit Name (Series and Phase): Booker Silty Clay Drainage Class: Very Poor

Taxonomy (Subgroup): _____ Field Observations Confirm Mapped Type? Yes (No)

PROFILE DESCRIPTION

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-16		—	—	—	Topsoil

HYDRIC SOIL INDICATORS

- ❑ Histosol
- ❑ Histic Epipedon
- ❑ Sulfidic Odor
- ❑ Aquic Moisture Regime
- ❑ Reducing Conditions
- ❑ Gleyed or Low-Chroma Colors
- ❑ Concretions
- ❑ High Organic Streaking in Surface Layer in Sandy Soils
- ❑ Organic Streaking in Sandy Soils
- ☒ Listed on Local Hydric Soils List
- ❑ Listed on National Hydric Soils List
- ❑ Other (Explain in Remarks)

Hydric Soil Present? Yes No

Remarks: Edge of planted soybean field, adjacent to drainage ditch, some clay at bottom of soil core

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes No

Wetland Hydrology Present? Yes No

Hydric Soils Present? Yes No

Is this sampling point a Wetland? Yes No

Remarks:

DATA FORM

ROUTINE WETLAND DETERMINATION
1987 COE Wetlands Determination Manual

Project/Site: AECI- Norborne
Date: 08/02/96
Applicant/Owner: AECI
County: Carroll
Investigator: JLS, CBC
State: MO
Do Normal Circumstances exist on this site? Yes No
Community ID:
Is the site significantly disturbed (Atypical Situation?) Yes No
Transect ID:
Is the area a potential Problem Area? Yes No
Plot ID: A

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. E. crusgalli	H 90%	FACW	9.		
2. E. atropurpureus	S 1%	FAC	10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FACU):

Remarks:
S = sapling/shrub
H = herb

HYDROLOGY

RECORDED DATA (Describe in Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other
- ☐ No Recorded Data Available

FIELD OBSERVATIONS:
- Depth of Surface Water: — (in.)
- Depth to Free Water in Pit: — (in.)
- Depth to Saturated Soil: — (in.)

WETLAND HYDROLOGY INDICATORS:

PRIMARY INDICATORS:
- ☐ Inundated
- ☐ Saturated in Upper 12 Inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

SECONDARY INDICATORS (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 Inches
- ☐ Water Stained Leaves
- ☒ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

Remarks: Cracks in soil in drainage way indicate it has held significant water for some time. Immediately downslope of soybean field and upslope of a drainage way. Area heavily overgrown in vegetation.

SOILS

Map Unit Name (Series and Phase): Bookers Silty Clay Drainage Class: Very Poor

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes (No)

PROFILE DESCRIPTION

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-8					Topsoil
	Refusal at 8" bgs				

HYDRIC SOIL INDICATORS

- ❑ Histosol
- ❑ Histic Epipedon
- ❑ Sulfidic Odor
- ❑ Aquic Moisture Regime
- ❑ Reducing Conditions
- ❑ Gleyed or Low-Chroma Colors
- ❑ Concretions
- ❑ High Organic Streaking in Surface Layer in Sandy Soils
- ❑ Organic Streaking in Sandy Soils
- ☒ Listed on Local Hydric Soils List
- ❑ Listed on National Hydric Soils List
- ❑ Other (Explain in Remarks)

Hydric Soil Present? Yes No

Remarks: Soil dry

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes No

Wetland Hydrology Present? Yes No

Hydric Soils Present? Yes No

Is this sampling point a Wetland? Yes No

Remarks:

DATA FORM

ROUTINE WETLAND DETERMINATION
1987 COE Wetlands Determination Manual

Project/Site: AEL - Norbourne
Applicant/Owner: AEL
Investigator: JLS, CEC
Date: 03/02/2016
County: Amelia
State: VA
Community ID: 9
Transect ID:
Plot ID: B

Do Normal Circumstances exist on this site? Yes No
Is the site significantly disturbed (Atypical Situation?) Yes No
Is the area a potential Problem Area? Yes No

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. E. Crus-galli	H 50%	FACW	10.		
2. S. Virginica	H 40%	OBL	11.		
3. A. Americana	S 5%	FACW	12.		
4. V. Nudipina	S 5%	FACW	13.		
5.			14.		
6.			15.		
7.			16.		
8.					

Percent of Dominant Species that are OBL, FACW or FAC (excluding FACU):

Remarks:

HYDROLOGY

RECORDED DATA (Describe in Remarks):
- ❑ Stream, Lake, or Tide Gauge
- ❑ Aerial Photographs
- ❑ Other
- ❑ No Recorded Data Available

FIELD OBSERVATIONS:
- Depth of Surface Water: — (in.)
- Depth to Free Water in Pit: — (in.)
- Depth to Saturated Soil: — (in.)

WETLAND HYDROLOGY INDICATORS:

PRIMARY INDICATORS:
- ❑ Inundated
- ❑ Saturated in Upper 12 Inches
- ❑ Water Marks
- ❑ Drift Lines
- ❑ Sediment Deposits
- ❑ Drainage Patterns in Wetlands

SECONDARY INDICATORS (2 or more required):
- ❑ Oxidized Root Channels in Upper 12 Inches
- ❑ Water Stained Leaves
- ☒ Local Soil Survey Data
- ❑ FAC-Neutral Test
- ❑ Other (Explain in Remarks)

Remarks: Within bank of a ditch. Soil in ditch is cracked and ditch is heavily overgrown

SOILS

Map Unit Name (Series and Phase): Booker Silty Clay

Drainage Class: Very Poor

Field Observations Confirm Mapped Type? Yes (No)

Taxonomy (Subgroup): _____

PROFILE DESCRIPTION

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-4		10YR 3/1	10YR 4/6	Common distinct	Silt w/clay
4-		Gley 3/1 10Y	2.5YR 4/6	Many prominent	Silt w/clay

HYDRIC SOIL INDICATORS

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Streaking in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☒ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Hydric Soil Present? Yes No

Remarks: Soil moist with gleyed matrix and much mottling

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes No

Wetland Hydrology Present? Yes No

Hydric Soils Present? Yes No

Is this sampling point a Wetland? Yes No

Remarks:

DATA FORM

ROUTINE WETLAND DETERMINATION
1987 COE Wetlands Determination Manual

Project/Site: AFCL - Norborne — Date: 09/02/16
Applicant/Owner: AFCL — County: Carroll
Investigator: [illegible] — State: MO
Do Normal Circumstances exist on this site? Yes No — Community ID:
Is the site significantly disturbed (Atypical Situation?) Yes No — Transect ID:
Is the area a potential Problem Area? Yes No — Plot ID: C

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. L. Commutus	H 40%	NL	9.		
2. E. Canadensis	H 50%	FACW	10.		
3. V. Dulcifera	V 1%	FACW+	11.		
4. V. hastata	H 5%	FACW+	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FACU):

Remarks:
V = Vine
H = herb

HYDROLOGY

RECORDED DATA (Describe in Remarks):
- ❑ Stream, Lake, or Tide Gauge
- ❑ Aerial Photographs
- ❑ Other
- ❑ No Recorded Data Available

FIELD OBSERVATIONS:
- Depth of Surface Water: — (in.)
- Depth to Free Water in Pit: — (in.)
- Depth to Saturated Soil: — (in.)

WETLAND HYDROLOGY INDICATORS:

PRIMARY INDICATORS:
- ❑ Inundated
- ❑ Saturated in Upper 12 Inches
- ❑ Water Marks
- ❑ Drift Lines
- ❑ Sediment Deposits
- ❑ Drainage Patterns in Wetlands

SECONDARY INDICATORS (2 or more required):
- ❑ Oxidized Root Channels in Upper 12 Inches
- ❑ Water Stained Leaves
- ☒ Local Soil Survey Data
- ❑ FAC-Neutral Test
- ❑ Other (Explain in Remarks)

Remarks:
Upslope of drainage ditch and downslope of county road. Area highly disturbed with weedy roadside vegetation.

SOILS

Map Unit Name (Series and Phase): Booker Silty Clay Drainage Class: Very Poor

Taxonomy (Subgroup): _____ Field Observations Confirm Mapped Type? Yes (No)

PROFILE DESCRIPTION

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-16					topsoil

HYDRIC SOIL INDICATORS

- ❑ Histosol
- ❑ Histic Epipedon
- ❑ Sulfidic Odor
- ❑ Aquic Moisture Regime
- ❑ Reducing Conditions
- ❑ Gleyed or Low-Chroma Colors
- ❑ Concretions
- ❑ High Organic Streaking in Surface Layer in Sandy Soils
- ❑ Organic Streaking in Sandy Soils
- ☒ Listed on Local Hydric Soils List
- ❑ Listed on National Hydric Soils List
- ❑ Other (Explain in Remarks)

Hydric Soil Present? Yes No

Remarks: Soil dry and compact

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes No

Wetland Hydrology Present? Yes No

Hydric Soils Present? Yes No

Is this sampling point a Wetland? Yes No

Remarks: Standing water present at southeast quad intersection of Road J and 200 (10 sq ft) Based on vegetation growth patterns, appears that area immediately surrounding culvert pipes at road intersections hold the most water most frequently.

DATA FORM

ROUTINE WETLAND DETERMINATION
1987 COE Wetlands Determination Manual

Project/Site: AFCI - Norborne
Applicant/Owner: AFCI
Investigator: JDS, CBC

Date: 6/20/06
County: Carroll
State: MO
Community ID: 18
Transect ID:
Plot ID: A

Do Normal Circumstances exist on this site? Yes No
Is the site significantly disturbed (Atypical Situation?) Yes No
Is the area a potential Problem Area? Yes No

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Potentilla canadensis	V	10% FACU- to OBL	10.		
2. Cirsium arvense	T	40% FAC	11.		
3. *Rudbeckia laciniata	H	10% FACW	12.		
4.			13.		
5.			14.		
6.			15.		
7.			16.		
8.					

Percent of Dominant Species that are OBL, FACW or FAC (excluding FACU):

Remarks:
T = tree
H = herb
V = vine
* = surrogate used for indicator

HYDROLOGY

No obvious watermarks on trees nor drift lines

RECORDED DATA (Describe in Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other
- ☐ No Recorded Data Available

FIELD OBSERVATIONS:
- Depth of Surface Water: ____ (in.)
- Depth to Free Water in Pit: ____ (in.)
- Depth to Saturated Soil: ____ (in.)

WETLAND HYDROLOGY INDICATORS:

PRIMARY INDICATORS:
- ☐ Inundated
- ☐ Saturated in Upper 12 Inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

SECONDARY INDICATORS (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 Inches
- ☐ Water Stained Leaves
- ☒ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

Remarks: Within a ~50 foot corridor between two soybean fields. Corridor is vegetated with mixed trees and herbs. Depression that appears to carry water at times of the year. Plot A is in the center and upslope. Plot A is in the east

SOILS

Map Unit Name (Series and Phase): Bolmer Silty Clay Loam Drainage Class: Poor

Taxonomy (Subgroup): Field Observations

PROFILE DESCRIPTION Confirm Mapped Type? Yes (No)

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-8		Refusal at 8" bgs			topsoil

HYDRIC SOIL INDICATORS

- ❑ Histosol
- ❑ Histic Epipedon
- ❑ Sulfidic Odor
- ❑ Aquic Moisture Regime
- ❑ Reducing Conditions
- ❑ Gleyed or Low-Chroma Colors
- ❑ Concretions
- ❑ High Organic Streaking in Surface Layer in Sandy Soils
- ❑ Organic Streaking in Sandy Soils
- ☒ Listed on Local Hydric Soils List
- ❑ Listed on National Hydric Soils List
- ❑ Other (Explain in Remarks)

Hydric Soil Present? Yes No

Remarks: Soil very dry and compact

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes No

Wetland Hydrology Present? Yes No

Hydric Soils Present? Yes No

Is this sampling point a Wetland? Yes No

Remarks:

DATA FORM

ROUTINE WETLAND DETERMINATION
1987 COE Wetlands Determination Manual

Project/Site: AECI - Marbaine Date: 05/02/96
Applicant/Owner: AECI County: Carroll
Investigator: JES, CBC State: Mo
Do Normal Circumstances exist on this site? Yes No Community ID: 1D
Is the site significantly disturbed (Atypical Situation?) Yes No Transect ID:
Is the area a potential Problem Area? Yes No Plot ID: B

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Potentilla canadensis	V	FACW to OBL	11.		
2. A. alternifolia	S	FACW	12.		
3. C. dimmandii	S	FAC	13.		
4.			14.		
5.			15.		
6.			16.		
7.					
8.					

Percent of Dominant Species that are OBL, FACW or FAC (excluding FACU):

Remarks:
* = surrogate used for indicator

HYDROLOGY

RECORDED DATA (Describe in Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other
- ☐ No Recorded Data Available

FIELD OBSERVATIONS:
- Depth of Surface Water: — (in.)
- Depth to Free Water in Pit: — (in.)
- Depth to Saturated Soil: — (in.)

WETLAND HYDROLOGY INDICATORS:

PRIMARY INDICATORS:
- ☐ Inundated
- ☐ Saturated in Upper 12 Inches
- ☒ Water Marks most darker alternifolia at very base of trees
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☒ Drainage Patterns in Wetlands

SECONDARY INDICATORS (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 Inches
- ☒ Water Stained Leaves
- ☒ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

Remarks: Plot B is within a depressional area with little to no vegetation on the ground although nearly completely shaded with tree cover. This plot area appears to carry/hold water for some period of time.

SOILS

Map Unit Name (Series and Phase): Bolmer Silty Clay Loam Drainage Class: Poor

Taxonomy (Subgroup): _____ Field Observations Confirm Mapped Type? Yes (No)

PROFILE DESCRIPTION

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-16		2.5Y 3/1	—	—	Silty clay, dry

HYDRIC SOIL INDICATORS

- ❑ Histosol
- ❑ Histic Epipedon
- ❑ Sulfidic Odor
- ❑ Aquic Moisture Regime
- ❑ Reducing Conditions
- ☒ Gleyed or Low-Chroma Colors
- ❑ Concretions
- ❑ High Organic Streaking in Surface Layer in Sandy Soils
- ❑ Organic Streaking in Sandy Soils
- ☒ Listed on Local Hydric Soils List
- ❑ Listed on National Hydric Soils List
- ❑ Other (Explain in Remarks)

Hydric Soil Present? Yes No

Remarks: Soil very dry and very hard

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes	No
Wetland Hydrology Present?	Yes	No
Hydric Soils Present?	Yes	No
Is this sampling point a Wetland?	Yes	No

Remarks:

DATA FORM

ROUTINE WETLAND DETERMINATION
1987 COE Wetlands Determination Manual

Project/Site: AEG1-Norborne
Applicant/Owner: AEG1
Investigator: JDS, CBC

Date: 08/02/16
County: Carroll
State: MO
Community ID: D
Transect ID:
Plot ID: C

Do Normal Circumstances exist on this site? Yes No
Is the site significantly disturbed (Atypical Situation?) Yes No
Is the area a potential Problem Area? Yes No

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Quercus palustris	T 20%	FAC	9.		
2. Acer saccharinum	T 10%	FACW	10.		
3. *Potentilla canadensis	H 5%	FACU to OBL	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FACU):

Remarks:
T=tree
H=herb
V=vine
*=surrogate used for indicator

HYDROLOGY

RECORDED DATA (Describe in Remarks):
- ❑ Stream, Lake, or Tide Gauge
- ❑ Aerial Photographs
- ❑ Other
- ❑ No Recorded Data Available

FIELD OBSERVATIONS:
- Depth of Surface Water: — (in.)
- Depth to Free Water in Pit: — (in.)
- Depth to Saturated Soil: — (in.)

WETLAND HYDROLOGY INDICATORS:

PRIMARY INDICATORS:
- ❑ Inundated
- ❑ Saturated in Upper 12 Inches
- ❑ Water Marks
- ❑ Drift Lines
- ❑ Sediment Deposits
- ❑ Drainage Patterns in Wetlands

SECONDARY INDICATORS (2 or more required):
- ❑ Oxidized Root Channels in Upper 12 Inches
- ❑ Water Stained Leaves
- ☒ Local Soil Survey Data
- ❑ FAC-Neutral Test
- ❑ Other (Explain in Remarks)

Remarks: This plot (like Plot A) is upslope of an apparent drainageway (Plot B). Groundcover is somewhat sparse but much tree cover. No readily apparent drift lines or water marks.

SOILS

Map Unit Name (Series and Phase): Bremer Silty Clay Loam Drainage Class: Poor

Taxonomy (Subgroup): _____ Field Observations Confirm Mapped Type? Yes (No)

PROFILE DESCRIPTION

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-12		10YR 3/1	—	—	Silt/clay
		Refusal at 12" bgs			

HYDRIC SOIL INDICATORS

- ❑ Histosol
- ❑ Histic Epipedon
- ❑ Sulfidic Odor
- ❑ Aquic Moisture Regime
- ❑ Reducing Conditions
- ☒ Gleyed or Low-Chroma Colors
- ❑ Concretions
- ❑ High Organic Streaking in Surface Layer in Sandy Soils
- ❑ Organic Streaking in Sandy Soils
- ☒ Listed on Local Hydric Soils List
- ❑ Listed on National Hydric Soils List
- ❑ Other (Explain in Remarks)

Hydric Soil Present? Yes No

Remarks: Soil very dry with many roots

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes	No
Wetland Hydrology Present?	Yes	No
Hydric Soils Present?	Yes	No
Is this sampling point a Wetland?	Yes	No

Remarks:

DATA FORM

ROUTINE WETLAND DETERMINATION
1987 COE Wetlands Determination Manual

Project/Site: AEC - Norborne — Date: 09/02/1996
Applicant/Owner: AEC — County: Carroll
Investigator: JDS, CBC — State: MO
Do Normal Circumstances exist on this site? Yes No — Community ID: 11
Is the site significantly disturbed (Atypical Situation?) Yes No — Transect ID:
Is the area a potential Problem Area? Yes No — Plot ID: A

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Cephalanthus occidentalis	T 40%	FAC	9.		
2. Acer saccharinum	H 15%	FACW	10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FACU):

Remarks:
Tree species present in several stages of maturity. Full grown trees with dbh of several feet and new saplings.

HYDROLOGY

RECORDED DATA (Describe in Remarks):
- ❑ Stream, Lake, or Tide Gauge
- ❑ Aerial Photographs
- ❑ Other
- ❑ No Recorded Data Available

FIELD OBSERVATIONS:
- Depth of Surface Water: — (in.)
- Depth to Free Water in Pit: — (in.)
- Depth to Saturated Soil: — (in.)

WETLAND HYDROLOGY INDICATORS:
Plot A is above cut off bank

PRIMARY INDICATORS:
- ❑ Inundated
- ❑ Saturated in Upper 12 Inches
- ❑ Water Marks
- ❑ Drift Lines
- ❑ Sediment Deposits
- ❑ Drainage Patterns in Wetlands

SECONDARY INDICATORS (2 or more required):
- ❑ Oxidized Root Channels in Upper 12 Inches
- ❑ Water Stained Leaves
- ☒ Local Soil Survey Data
- ❑ FAC-Neutral Test
- ❑ Other (Explain in Remarks)

Remarks: Same drainage pathway as community 10, but further south. Plot A is upslope of drainage way (about 2-3' higher than bank of drainage way.

SOILS

Map Unit Name (Series and Phase): Booker Silty Clay — Drainage Class: Very Poor

Taxonomy (Subgroup): _____ — Field Observations Confirm Mapped Type? Yes (No)

PROFILE DESCRIPTION

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-8					Topsoil
	Refusal at 8" bags				

HYDRIC SOIL INDICATORS

- ❑ Histosol
- ❑ Histic Epipedon
- ❑ Sulfidic Odor
- ❑ Aquic Moisture Regime
- ❑ Reducing Conditions
- ❑ Gleyed or Low-Chroma Colors
- ❑ Concretions
- ❑ High Organic Streaking in Surface Layer in Sandy Soils
- ❑ Organic Streaking in Sandy Soils
- ☒ Listed on Local Hydric Soils List
- ❑ Listed on National Hydric Soils List
- ❑ Other (Explain in Remarks)

Hydric Soil Present? Yes No

Remarks: Soil very dry and compact.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes	No
Wetland Hydrology Present?	Yes	No
Hydric Soils Present?	Yes	No
Is this sampling point a Wetland?	Yes	No

Remarks:

DATA FORM

ROUTINE WETLAND DETERMINATION
1987 COE Wetlands Determination Manual

Project/Site: AEP-Norborne Date: 08/02/1996
Applicant/Owner: AEP County: Carroll
Investigator: JES, CRC State: MO
Do Normal Circumstances exist on this site? Yes No Community ID: 11
Is the site significantly disturbed (Atypical Situation?) Yes No Transect ID:
Is the area a potential Problem Area? Yes No Plot ID: B

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Andropogon virginicus	T	FAC	9.		
2.			10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FACU):

Remarks: No vegetation on ground in this area, only canopy cover from overhead trees.

HYDROLOGY

RECORDED DATA (Describe in Remarks):
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other
- ☐ No Recorded Data Available

FIELD OBSERVATIONS:
- Depth of Surface Water: — (in.)
- Depth to Free Water in Pit: — (in.)
- Depth to Saturated Soil: — (in.)

WETLAND HYDROLOGY INDICATORS:

PRIMARY INDICATORS:
- ☐ Inundated
- ☐ Saturated in Upper 12 Inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☒ Drainage Patterns in Wetlands

SECONDARY INDICATORS (2 or more required):
- ☐ Oxidized Root Channels in Upper 12 Inches
- ☒ Water Stained Leaves
- ☒ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

Remarks: Plot B is within the drainage ditch. Drainage ditch measures about 8 feet wide (water here does not flow further north)

SOILS

Map Unit Name (Series and Phase): Booker Silty Clay Drainage Class: Very Poor

Taxonomy (Subgroup): _____ Field Observations Confirm Mapped Type? (Yes) No

PROFILE DESCRIPTION

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-		7.5YR 2.5/1			Silty clay
12-16		↓	7.5YR 7/6	many distinct	
			7.5YR 6/2		

HYDRIC SOIL INDICATORS

- ❑ Histosol
- ❑ Histic Epipedon
- ❑ Sulfidic Odor
- ❑ Aquic Moisture Regime
- ❑ Reducing Conditions
- ☒ Gleyed or Low-Chroma Colors
- ❑ Concretions
- ❑ High Organic Streaking in Surface Layer in Sandy Soils
- ❑ Organic Streaking in Sandy Soils
- ☒ Listed on Local Hydric Soils List
- ❑ Listed on National Hydric Soils List
- ❑ Other (Explain in Remarks)

Hydric Soil Present? Yes No

Remarks: Soil dry and compact. Moisture slightly increases with depth

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes No

Wetland Hydrology Present? Yes No

Hydric Soils Present? Yes No

Is this sampling point a Wetland? Yes No

Remarks:

DATA FORM

ROUTINE WETLAND DETERMINATION
1987 COE Wetlands Determination Manual

Project/Site: AECI - Norborne — Date: 08/02/06
Applicant/Owner: AECI — County: Carroll
Investigator: JLB, CBC — State: MO
Do Normal Circumstances exist on this site? Yes No — Community ID: 11
Is the site significantly disturbed (Atypical Situation?) Yes No — Transect ID:
Is the area a potential Problem Area? Yes No — Plot ID: C

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Cr. drummondii	T 20%	FAC	9.		
2. Toxicodendron radicans*	T 40%	FACU- to OBL	10.		
3. A. deratum	H 10%	FACW	11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FACU):

Remarks: Plot almost completely shaded with canopy cover
*=surrogate used for indicator

HYDROLOGY

RECORDED DATA (Describe in Remarks):
- ❑ Stream, Lake, or Tide Gauge
- ❑ Aerial Photographs
- ❑ Other
- ❑ No Recorded Data Available

FIELD OBSERVATIONS:
- Depth of Surface Water: — (in.)
- Depth to Free Water in Pit: — (in.)
- Depth to Saturated Soil: — (in.)

WETLAND HYDROLOGY INDICATORS:

PRIMARY INDICATORS:
- ❑ Inundated
- ❑ Saturated in Upper 12 Inches
- ❑ Water Marks
- ❑ Drift Lines
- ❑ Sediment Deposits
- ❑ Drainage Patterns in Wetlands

SECONDARY INDICATORS (2 or more required):
- ❑ Oxidized Root Channels in Upper 12 Inches
- ❑ Water Stained Leaves
- ☒ Local Soil Survey Data
- ❑ FAC-Neutral Test
- ❑ Other (Explain in Remarks)

Remarks: Upslope from drainage ditch (Plot B). Elevation of Plot A is equivalent to Plot C elevation. Plot cut off bank and no apparent water staining or drift lines.

SOILS

Map Unit Name (Series and Phase): Boeer Silty Clay

Drainage Class: Very Poor

Taxonomy (Subgroup): _____

Field Observations Confirm Mapped Type? Yes (No)

PROFILE DESCRIPTION

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-16					Topsoil

HYDRIC SOIL INDICATORS

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Streaking in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☒ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Hydric Soil Present? Yes No

Remarks: Soil very dry throughout core

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes	No
Wetland Hydrology Present?	Yes	No
Hydric Soils Present?	Yes	No
Is this sampling point a Wetland?	Yes	No

Remarks:

APPENDIX C Photographic Documentation

URS

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Associated Electric Cooperative, Inc.	Norborne, Missouri	21561720.00200

Photo No.	Date:
1	8/1/06

Description:

From southwest corner of AECI property, looking east. Corridor of volunteer vegetation. Notice rail line on right side of photo.

Photo No.	Date:
2	8/1/06

Description:

From intersection of County Roads 111 and 324. Looking along north side of rail line.

URS

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Associated Electric Cooperative, Inc.	Norborne, Missouri	21561720.00200

Photo No.	Date:
3	8/1/06

Description:

Plot area 2. Plot 2A is nearest the railroad. Plot 2B is in the center and Plot 2C is nearest the roadway at the base of the photo.

Photo No.	Date:
4	8/1/06

Description:

From the intersection of County Road 103 and the north edge of the George Hale Trust property. Looking east at drainage ditch.

URS

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Associated Electric Cooperative, Inc.	Norborne, Missouri	21561720.00200

Photo No.	Date:
5	8/1/06

Description:

Plot area 4. Plot 4A is upland and 4B is adjacent to the drainage ditch.

Photo No.	Date:
6	8/1/06

Description:

Plot area 5. Plot 5A is upland and 5B is downland.

URS

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Associated Electric Cooperative, Inc.	Norborne, Missouri	21561720.00200

Photo No.	Date:
7	8/1/06

Description:

Plot area 6. Looking west.

Photo No.	Date:
8	8/1/06

Description:

Plot area 7. Looking southeast. Note steep bank on this side of the ditch and more gradual slope on opposite side.

URS

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Associated Electric Cooperative, Inc.	Norborne, Missouri	21561720.00200

Photo No.	Date:
9	8/1/06

Description:

Plot area 8. Looking south at ditch through soybean field.

Photo No.	Date:
10	8/2/06

Description:

Plot area 9. Looking south from County Road 300. Plot 9B is in the drainage ditch, with Plots 9A and 9C upland on either side of the ditch.

URS

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Associated Electric Cooperative, Inc.	Norborne, Missouri	21561720.00200

Photo No.	Date:
11	8/2/06

Description:

Drainage ditch running parallel to County Road 300, immediately south of road. Photo taken from intersection of Road JJ and County Road 300, looking east. Culvert pipe runs under Road JJ.

Photo No.	Date:
12	8/2/06

Description:

Plot area 10. Looking north from center of drainage way. Plot 10B is within the drainageway. Plots 10A and 10C are on either side of the drainageway.

URS

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Associated Electric Cooperative, Inc.	Norborne, Missouri	21561720.00200

Photo No.	Date:
13	8/2/06

Description:

Wet area immediately north of County Road 300. A pond lies west of this area. Appears that this area serves as an overflow for the pond to the west. Based on apparent hydrology and visual identification of species present along water's edge, wetland areas do exist here; however they were not field delineated, as this area appears to be outside of the facility property owned by AECI.

Photo No.	Date:
14	8/2/06

Description:

Plot area 11. Standing in drainage way, looking north. Plot 11B is in drainage way, Plot 11A is to the east and Plot 11C to the west.

URS

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Associated Electric Cooperative, Inc.	Norborne, Missouri	21561720.00200

Photo No.	Date:
15	8/2/06

Description:

Farmhouse, shed and pond on Randol Craig property. Looking north from County Road 300. Notice the topography beyond the house. This represents the southernmost extent of the upland topography in the study area.

Photo No.	Date:
16	8/2/06

Description:

From the northwest corner of the Kevin Edgar property, looking southeast. Looking over fallow field (appears it was formerly planted in corn). Some topography in area. Elevation dips to the east.

URS

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Associated Electric, Inc.	Norborne, Missouri	21561720.00200

Photo No.	Date:
17	8/2/06

Description:

Creek on the Kevin Edgar property. Standing at north property boundary where creek enters property, looking south. Notice the steep cut of the bank.

Photo No.	Date:
18	8/2/06

Description:

Creek on the Kevin Edgar property. Further south of creek point pictured in Photo 17. Downed trees at various points of creek may impeded water flow, leading to some of the erosion/cutting observed along the bank. Advanced the soil probe at edge of the creek, at an elevation below opposite bank cut. Soils are hard and dry and do not appear hydric.

URS

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Associated Electric Cooperative, Inc.	Norborne, Missouri	21561720.00200

Photo No.	Date:
19	8/3/06

Description:

From County Road 121, looking west. Area between Norfolk Southern railroad and Burlington Northern Santa Fe railroad. Notice gravel/rock sidings. Vegetation present (primarily volunteer species). Norborne drainage ditch transmits runoff water from north to waterways to south. The drainage ditch crosses through the area between the tracks. Note that this site is associated with one of the railroad connection alternatives and not the facility.

Photo No.	Date:
20	8/3/06

Description:

Wakenda Creek West Fork. From County Road JJ crossing, looking east.

URS

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Associated Electric Cooperative, Inc.	Norborne, Missouri	21561720.00200

Photo No.	Date:
21	8/3/06

Description:

From the intersection of County Roads 290 and JJ. Looking southeast at Section 9 R25W T52N.

Photo No.	Date:
22	8/3/06

Description:

From the intersection of County Roads 280 and JJ. Looking southeast at Section 4 R25W T52N. Tree line bisects this section.

URS

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Associated Electric Cooperative, Inc.	Norborne, Missouri	21561720.00200

Photo No.	Date:
23	8/3/06

Description:

From the intersection of County Roads 270 and 121. Looking southeast at Section 33 T53N R25W.

Photo No.	Date:
24	8/3/06

Description:

From the intersection of County Roads 270 and 111. Looking southeast at Section 32 T53N R25W.

URS

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Associated Electric Cooperative, Inc.	Norborne, Missouri	21561720.00200

Photo No.	Date:
25	8/3/06

Description:

From the intersection of County Roads 260 and 111. Looking southeast at Section 29 T53N R25W.

Photo No.	Date:
26	8/3/06

Description:

From the intersection of County Roads 260 and 111. Looking southwest at Section 30 T53N R25W.

URS

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Associated Electric Cooperative, Inc.	Norborne, Missouri	21561720.00200

Photo No.	Date:
27	8/3/06

Description:

From the intersection of County Roads 300 and 111. Looking southwest at Section 18 T52N R25W.

Photo No.	Date:
28	8/3/06

Description:

From the intersection of County Roads 111 and 290. Looking southwest at Section 7 T52N R25W.

URS

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Associated Electric Cooperative, Inc.	Norborne, Missouri	21561720.00200

Photo No.	Date:
29	8/3/06

Description:

From the intersection of County Roads 290 and 111. Looking southeast at Section 8 T52N R25W. Notice farm pond.

Photo No.	Date:
30	8/3/06

Description:

Potential wooded wetland immediately south of County Road 290 between County Roads 111 and 121. This area represents a topographical low, vegetated and mapped drainage way.

URS

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Associated Electric Cooperative, Inc.	Norborne, Missouri	21561720.00200

Photo No.	Date:
31	8/3/06

Description:

From the intersection of County Roads JJ and 111. Looking south at Section 5 T52N R25W. Notice tree line in distance, this surrounds the Wakenda Creek West Fork.

Photo No.	Date:
32	8/3/06

Description:

From the intersection of County Roads 101 and JJ. Looking southeast at Section 6 T52N R25W.

URS

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Associated Electric Cooperative, Inc.	Norborne, Missouri	21561720.00200

Photo No.	Date:
33	8/3/06

Description:

From the intersection of County Road JJ and an unnamed road. Looking northeast at Section 31 T53N R25W.

Photo No.	Date:
34	8/3/06

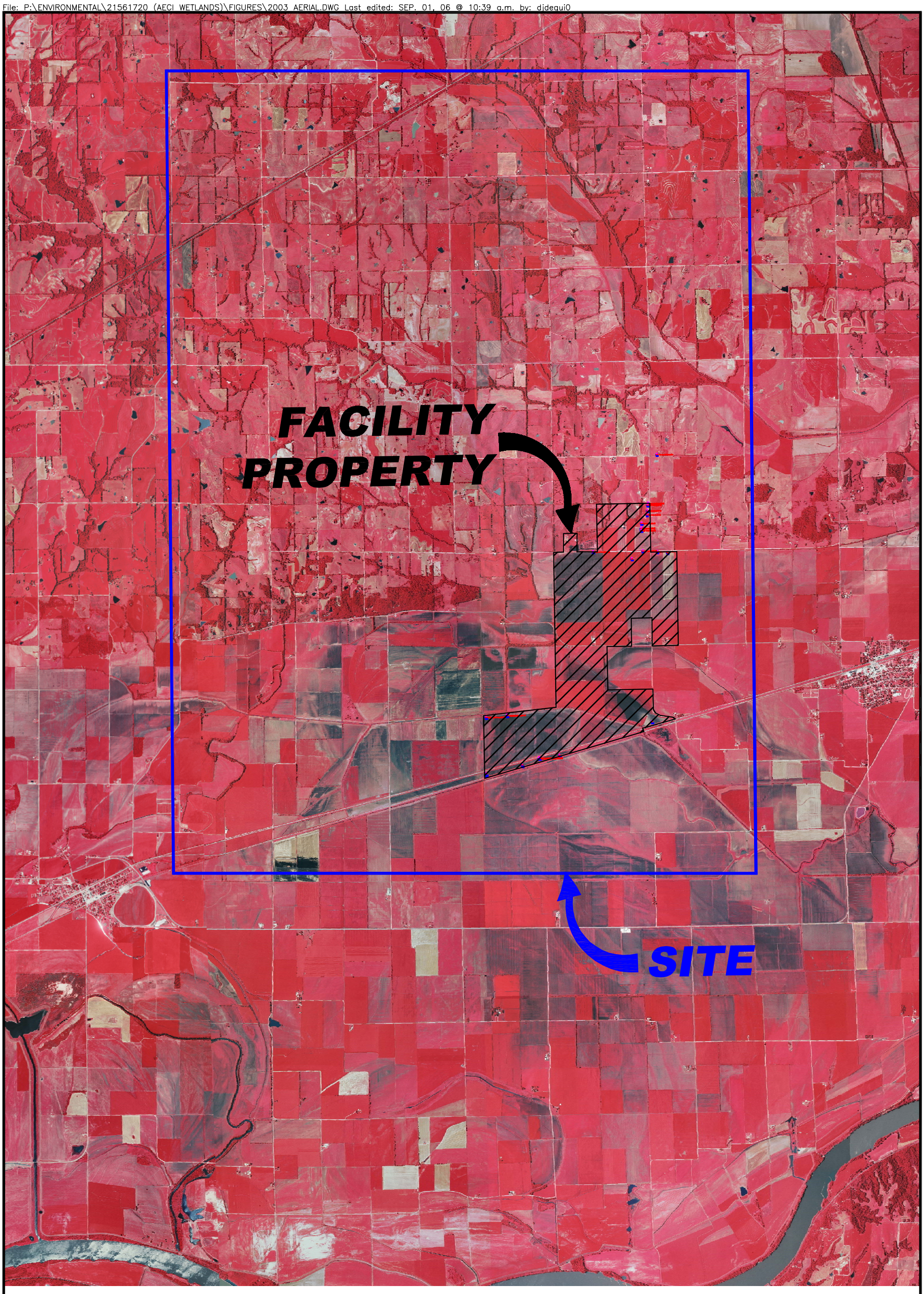
Description:

Burlington Northern Santa Fe rail line. Looking east from Road A.

APPENDIX D

Historical Aerial Photographs (2003 and 2004)

File: P:\ENVIRONMENTAL\21561720 (AECI WETLANDS)\FIGURES\2003 AERIAL.DWG Last edited: SEP. 01, 06 @ 10:39 a.m. by: djdegui0



QUADRANGLE LOCATION

NOTE:
SITE AREA INCLUDES FACILITY PROPERTY AND ALTERNATIVE CORRIDORS.

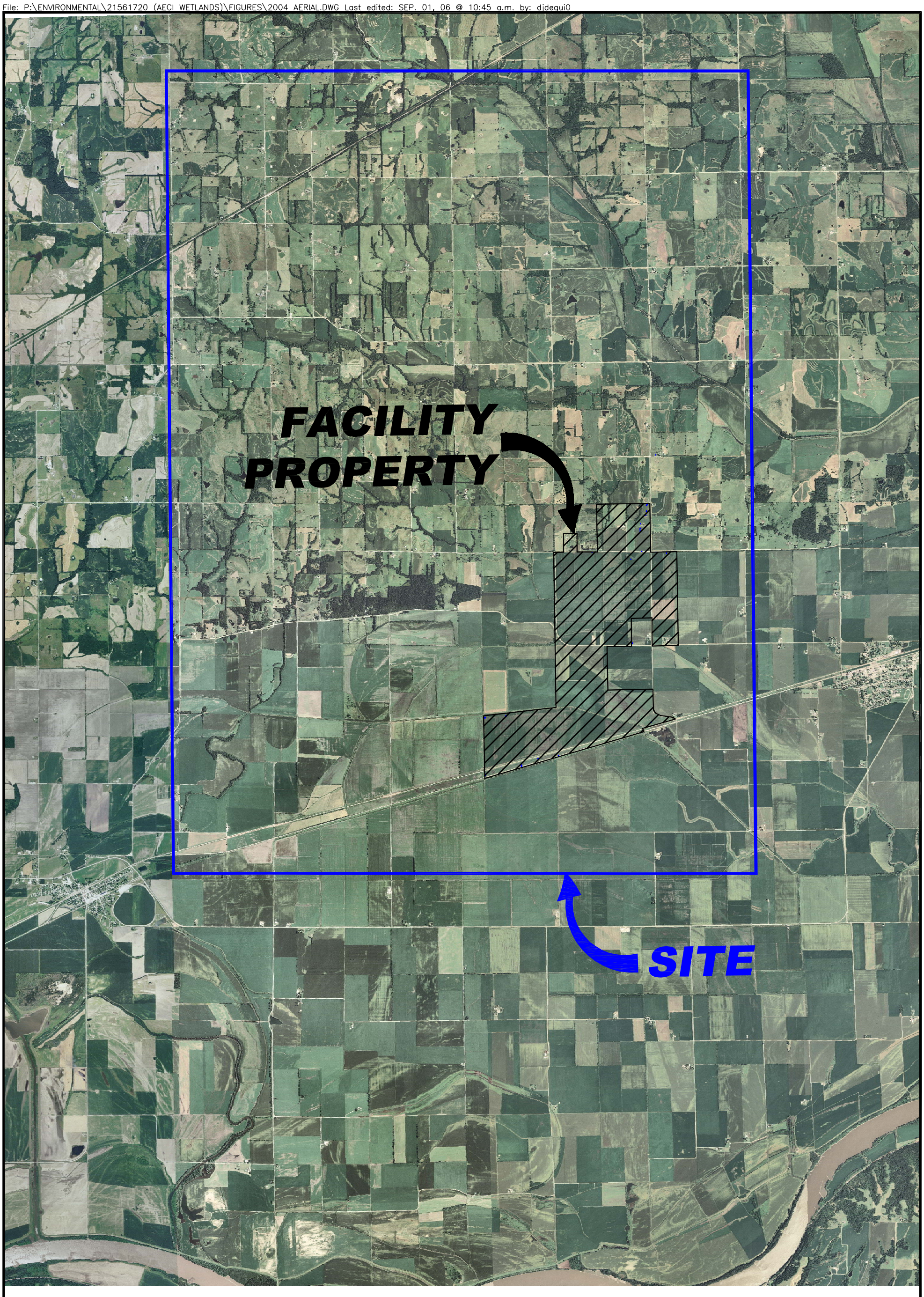
Ø 1500

SCALE FEET

N

ASSOCIATED ELECTRIC COOPERATIVE, INC. NORBORNE, MISSOURI PRELIMINARY JURISDICTIONAL WETLAND DETERMINATION		PROJECT NO. 21561720.00200
URS		
DRN. BY:djd 8/9/06 DSGN. BY:js CHKD. BY:	2003 Site Aerial Photograph	FIG. NO. 1

File: P:\ENVIRONMENTAL\21561720 (AECI WETLANDS)\FIGURES\2004 AERIAL.DWG Last edited: SEP. 01, 06 @ 10:45 a.m. by: djdegui0



QUADRANGLE LOCATION

NOTE:
SITE AREA INCLUDES FACILITY PROPERTY AND ALTERNATIVE CORRIDORS.

Ø 1500

SCALE FEET

N

ASSOCIATED ELECTRIC COOPERATIVE, INC. NORBORNE, MISSOURI PRELIMINARY JURISDICTIONAL WETLAND DETERMINATION		PROJECT NO. 21561720.00200
URS		
DRN. BY:djd 8/9/06 DSGN. BY:js CHKD. BY:	2004 Site Aerial Photograph	FIG. NO. 2

APPENDIX E Missouri River Gage Data

TABLE E-1

Missouri River (Waverly, MO) High Water Elevations for 5% and 12.5% of the Carroll County, Missouri Growing Season

	10-Day High Water Elevation	24-Day High Water Elevation
1996	19.58	19.06
1997	22.06	21.13
1998	20.37	14.68
1999	21.74	20.07
2000	13.81	12.83
2001	18.30	16.78
2002	13.94	11.55
2003	12.86	11.87
2004	16.07	13.92
2005	16.66	14.18

NOTES:
The 10-day and 24-day elevations represent the high water elevations for 5% and 12.5% of the growing season, respectively.

APPENDIX F Wetland Definitions

APPENDIX F Wetland Definitions

Active water table - A condition in which the zone of soil saturation fluctuates, resulting in periodic anaerobic soil conditions. Soils with an active water table often contain bright mottles and matrix chromas of 2 or less.

Adaptation - A modification of a species that makes it more fit for existence under the conditions of its environment. These modifications are the result of genetic selection processes.

Aerenchymous tissue - A type of plant tissue in which cells are unusually large and arranged in a manner that results in air spaces in the plant organ. Such tissues are often referred to as spongy and usually provide increased buoyancy.

Aerobic - A situation in which molecular oxygen is a part of the environment.

Anaerobic - A situation in which molecular oxygen is absent (or effectively so) from the environment.

Aquatic roots - Roots that develop on stems above the normal position occupies by roots in response to prolonged inundation.

Aquic moisture regime - A mostly reducing soil moisture regime nearly free of dissolved oxygen due to saturation by ground water or its capillary fringe and occurring at periods when the soil temperature at 19.7 in. is greater than 5 C.

Arched roots - Roots produces on plant stems in a position above the normal position of roots, which serve to brace the plant during and following periods of prolonged inundation.

Areal cover - A measure of dominance that defines the degree to which above-ground portions of plants (not limited to those rooted in a sample plot) cover the ground surface. It is possible for the total areal cover in a community to exceed 100 percent because (a) most plant communities consists of two or more vegetative strata; (b) areal cover is estimated by vegetative layer; and (C) foliage within a single layer may overlap.

Atypical situation - As used in wetland determinations, this term refers to areas in which one or more parameters (vegetation, soil, and/or hydrology) have been sufficiently altered by recent human activities or natural events to preclude the presence of wetland indicators of the parameters.

APPENDIX F Wetland Definitions

Backwater flooding - Situation in which the source of inundation is overbank flooding from a nearby stream.

Basal area - The cross-sectional area of a tree trunk measured in square inches, square centimeters, etc. Basal area is normally measured at 4.5 ft above the ground level and is used as a measure of dominance. This term is also applicable to the cross-sectional area of a clumped herbaceous plant, measured at 1.0 in. above the soil surface.

Bench mark - A fixed, more or less permanent reference point or object, the elevation of which is known. The US Geological Survey (USGS) installs brass caps in bridge abutments or otherwise permanently sets bench marks at convenient locations nationwide. The elevations on these marks are referenced to the National Geodetic Vertical Datum (NGVD), also commonly known as mean sea level (MSL).

Biennial - An event that occurs at 2-year intervals.

Buried Soil - A once-exposed soil now covered by an alluvial, loessal, or other deposit (including man-made).

Canopy Layer - The uppermost layer of vegetation in a plant community. In forested areas, mature trees comprise the canopy layer, while the tallest herbaceous species constitute the canopy layer in a marsh.

Capillary fringe - A zone immediately above the water table (zero gauge pressure) in which water is drawn upward from the water table by capillary action.

Chemical reduction - Any process by which one compound or ion acts as an electron donor. In such cases, the valence state of the electron donor is decreased.

Chroma - The relative purity or saturation of a color; intensity of distinctive hue as related to grayness; one of the three variables of color.

Comprehensive wetland determination - A type of wetland determination that is based on the strongest possible evidence, requiring the significant collection of quantitative data.

Concretion - A local concentration of chemical compounds (e.g. calcium carbonate, iron oxide) in the form of a grain or nodule of varying size, shape, hardness, and color.

APPENDIX F Wetland Definitions

Contour - An imaginary line of constant elevation on the ground surface. The corresponding line on a map is called a “contour line”.

Criteria- Standards, rules, or tests on which a judgment or decision may be based.

Density - The number of individuals of a species per unit area.

Detritus - Minute fragments of plant parts found on the soil surface.

Diameter at breast height (DBH) - The width of plant stem as measured at 4.5 ft. above the ground surface.

Dike - A bank (usually earthen) constructed to control or confine water.

Dominance - A descriptor of vegetation that is related to the standing crop of a species in an area, usually measured by height, areal cover, or basal area (for trees).

Dominant Species - A plant species that exerts a controlling influence on or defines the character of a community.

Drained - A condition in which ground or surface water has been reduced or eliminated from an area by artificial means.

Drift line - An accumulation of debris along a contour (parallel to the water flow) that represents the height of an inundation event.

Duration (inundation/soil saturation) - The length of time during which water stands at or above the soil surface (inundation), or during which the soil is saturated. As used in wetland determinations, duration refers to a period during the growing season.

Ecological tolerance - The range of environmental conditions in which a plant species can grow.

Emergent plant - A rooted herbaceous plant species that has parts extending above water surface.

Field capacity - The percentage of water remaining in a soil after it has been saturated and after free drainage is negligible.

Fill material - Any material placed in an area to increase surface elevation.

APPENDIX F Wetland Definitions

Flooded - A condition in which the soil surface is temporarily covered with flowing water from any source, such as streams overflowing their banks, runoff from adjacent or surrounding slopes, inflow form high tides, or any combination of sources.

Flora - A list of all plant species that occur in an area.

Frequency (inundation or soil saturation) - The periodicity of coverage of an area by surface water or soil saturation. It is usually expressed as the number of years (e.g. 50 years) the soil is inundated or saturated at least once each year during part of the growing season per 100 years or as 1-, 2-, 5-year, etc., inundation frequency.

Frequency (vegetation) - The distribution of individuals of a species in an area. It is quantitatively expressed as

$$\frac{\text{Number of samples containing species A}}{\text{Total number of samples}} \times 100$$

More than one species may have a frequency of 100 percent within the same area.

Frequently flooded - A flooding class in which flooding is likely to occur often under normal weather conditions (more than 50-percent chance of flooding in any year or more than 50 times in 100 years).

Gleyed - A soil condition resulting from prolonged soil saturation, which is manifested by the presence of bluish or greenish colors through the soil mass or in mottles (spots or streaks) among other colors.

Ground water - That portion of the water below the ground surface that is under greater pressure than atmospheric pressure.

Growing season - The portion of the year when soil temperatures at 19.7 inches below the soil surface are higher than biologic zero (5 C) (US Department of Agriculture - Soil Conservation Service 1985).

Habitat - The environment occupied by individuals of a particular species, population, or community.

Headwater flooding - A situation in which an area becomes inundated directly by surface runoff from upland areas.

Herb - A non-woody individual of a macrophytic species. In this manual, seedlings, of woody plants (including vines) that are less than 3.2 ft in height are considered to be herbs.

Herbaceous layer - Any vegetative stratum of a plant community that is composed predominantly of herbs.

Histic epipedon - An 8- to 16-in. soil layer at of near the surface that is saturated for 30 consecutive days or more during the growing season in most years and contains a minimum of 20 percent organic matter when no clay is present or a minimum of 30 percent organic matter when 60 percent or greater clay is present

Histosols - An order in soil taxonomy composed or organic soils that have organic soil materials in more than half of the upper 80 cm or that are of any thickness if directly overlying bedrock.

Hue - A characteristic of color that denotes a color in relation to red, yellow, blue, etc; one of the three variables of color.

Hydric soil - A soil that is saturated, flooded or ponded long enough during the growing season to develop anaerobic conditions that favor the growth and regeneration of hydrophytic vegetation (US Department of Agriculture-Soil Conservation Service 1985). Hydric soils that occur in areas having positive indicators of hydrophytic vegetation and wetland hydrology are wetland soils.

Hydric soil condition - A situation in which characteristics exist that are associated with soil development under reducing conditions.

Hydrologic zone - an area that is inundated or has saturated soils within a specified range of frequency and duration of inundation and soil saturation.

Hydrology - The science dealing with the properties, distribution, and circulation of water.

Hydrophyte - Any macrophyte that grows in water or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content; plant typically found in wet habitats.

APPENDIX F Wetland Definitions

Hydrophytic vegetation - The sum total of macrophytic plant life growing in water or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content. When hydrophytic vegetation comprises a community where indicators of hydric soils and wetland hydrology also occur, the area has wetland vegetation.

Hypertrophied lenticels - An exaggerated (oversized) pore on the surface of stems of woody plants through which gases are exchanged between the plant and the atmosphere.

Importance value - A quantitative term describing the relative influence of a plant species in a plant community, obtained by summing any combination of relative frequency, relative density, and relative dominance.

Indicator - An event, entity, or condition that typically characterizes a prescribed environment or situation; indicators determine or aid in the determining whether or not certain stated circumstances exist.

Indicator status - One of the categories (e.g. OBL) that describes the estimated probability of a plant species occurring in wetlands.

Intercellular air space - A cavity between cells in plant tissues, resulting from variations in cell shape and configuration. Aerenchymous tissue (a morphological adaptation found in many hydrophytes) often has large intercellular air spaces.

Inundation - A condition in which water from any source temporarily or permanently covers a land surface.

Levee - A natural or man-made feature of the landscape that restricts movements of water into or through and area.

Liana - A layer of vegetation in forested plant communities that consists of woody vines. The term may also be applied to a given species.

Limit of biological activity - In reference to soils, the zone below which conditions preclude normal growth of soil organisms. This term often is used to refer to the temperature (5 C) in a soil below which metabolic processes of soil microorganisms, plant roots, and animals are negligible.

Long duration (flooding) - A flooding class in which the period of inundation for a single event ranges from 7 days to 1 month.

APPENDIX F Wetland Definitions

Macrophyte - Any plant species that can be readily observed without the aid of optical magnification. This includes all vascular plant species and mosses (e.g., Sphagnum spp.), as well as large algae (e.g. Chara spp., kelp).

Macrophyte - A term referring to a plant species that is a macrophyte.

Major portion of the root zone - The portion of the soil profile in which more than 50 percent of plant roots occur. In wetlands, this usually constitutes the upper 12 in. of the profile.

Man-induced wetland - Any area that develops wetland characteristics due to some activity (e.g. irrigation) of man.

Mapping unit - As used in this manual, some common characteristic of soil, vegetation, and/or hydrology that can be shown at the scale of mapping for the defined purpose and objectives of a survey.

Mean sea level - A datum, or "plane of zero elevation", established by averaging all stages of oceanic tides over a 19-year tidal cycle or "epoch". This plane is corrected for curvature of the earth and is the standard reference for elevations on the earth's surface. The correct term for mean sea level is the National Geodetic Vertical Datum (NGVD).

Mesophytic - Any plant species growing where soil moisture and aeration conditions lie between extremes. These species are typically found in habitats with average moisture conditions, neither very dry nor very wet.

Metabolic processes - The complex of internal chemical reactions associates with life-sustaining functions of an organism.

Method - A particular procedure or set of procedures to be followed.

Mineral soil - A soil consisting predominantly of, and having its properties determined predominantly by, mineral matter usually containing less than 20-percent organic matter.

Morphological adaptation - A feature of structure and form that aids in fitting a species to its particular environment (e.g. buttressed base, adventitious roots, aerenchymous tissue).

Mottles - Spots or blotches of different color or shades of color interspersed within the dominant color in a soil layer, usually resulting from the presence or periodic reducing soil conditions.

Muck - Highly decomposed organic material in which the original plant parts are not recognizable.

Multi-trunk - A situation in which a single individual of woody plant species has several stems.

Non-hydric soil - A soil that has developed under predominantly aerobic soil conditions. These soils normally support mesophytic or xerophytic species.

Non-wetland - Any area that has sufficiently dry conditions that indicators of hydrophytic vegetation, hydric soils, and/or wetland hydrology are lacking. As used in the COE Wetlands Delineation Manual, any area that is neither a wetland, a deepwater aquatic habitat, nor other special aquatic site.

Organic pan - A layer usually occurring at 12 to 30 inches below the soil surface in coarse-textured soils, in which organic mater and aluminum (with or without iron) accumulate at the point where the top of the water table most often occurs. Cementing of the organic matter slightly reduces permeability of this layer.

Organic soil - A soil is classified as an organic soil when it is: (1) saturated for prolonged periods (unless artificially drained) and has more than 30-percent organic matter if the mineral fraction is more than 50-percent clay, or more than 20-percent organic matter if the mineral fraction has no clay; or (2) never saturated with water for more than a few days and having more than 34-percent organic matter.

Overbank flooding - Any situation in which inundation occurs as a result of the water level of a stream rising above bank level.

Oxidation -reduction process - A complex of biochemical reactions in soil that influences the valence state of component elements and their ions. Prolonged soil saturation during the growing season elicits anaerobic conditions that shift the overall process to reducing condition.

Oxygen pathway - The sequence of cells, intercellular spaces, tissues, and organs, through which molecular oxygen is transported in plants.

Parameter - A characteristic component of a unit that can be defined. Vegetation soil, and hydrology are three parameters that may be used to define wetlands.

Parent material - The unconsolidated and more or less weathered mineral or organic matter form which a soil profile develops.

Ped - A unit of soil structure (e.g. aggregate, crumb, prism, block, or granule) formed by natural processes.

Peraquic moisture regime - A soil condition in which a reducing environment always occurs due to the presence of ground water at or near the soil surface.

Periodically - A term used in soils or wetland situations to define detectable regular or irregular saturated soil conditions or inundation, resulting from ponding of ground water, precipitation, overland flow, stream flooding, or tidal influences that occur(s) with hours, days, weeks, month, or even years between events.

Permeability - A soil characteristic that enables water or air to move through the profile, measured as the number of inches per hour that water moves downward through the saturated soil.

Physiognomy - A term used to describe a plant community based on the growth habit (e.g., trees, herbs, lianas) of the dominant species.

Physiological adaptation - A feature of the basic physical and chemical activities that occurs in cells and tissues of a species, which results in it being better fitted to its environment (e.g. ability to absorb nutrients under low oxygen tensions).

Plant community - All of the plant populations occurring in a shared habitat or environment.

Plant cover - See areal cover.

Pneumatophore - Modified roots that may function as a respiratory organ in species subjected to frequent inundation or soil saturation (e.g., cypress knees).

Ponded - A condition in which water stands in a closed depression. Water may be removed only by percolation, evaporation, and/or transpiration.

Poorly drained - Soils that commonly are wet at or near the surface during a sufficient part of the year that field crops cannot be grown under natural conditions.

APPENDIX F Wetland Definitions

Positive wetland indicator - Any evidence of the presence of hydrophytic vegetation, hydric soil, and/or wetland hydrology in an area.

Prevalent vegetation - The plant community or communities that occur in an area during a given period. In wetland determinations, the prevalent vegetation is characterized by the dominant macrophytic species that comprise the plant community.

Quantitative - A precise measurement or determination expressed numerically.

Range - When applied to vegetation, the geographical area in which a plant species is known to occur.

Redox potential - A measure of the tendency of a system to donate or accept electrons, which is governed by the nature and proportions of the oxidizing and reducing substances contained in the system.

Reducing environment - An environment conducive to the removal of oxygen and chemical reduction of ions in the soils.

Relative density - A quantitative descriptor, expressed as a percent, of the relative number of individuals of a species in an area; it is calculated by

$$\frac{\text{Number of individuals of species A}}{\text{Total number of individuals of all species}} \times 100$$

Relative dominance - A quantitative descriptor, expressed as a percent, of the relative size or cover of individuals of a species in an area; it is calculated by

$$\frac{\text{Amount* of species A}}{\text{Total amount of all species}} \times 100$$

* The “amount” of a species may be based on percent areal cover, basal area, or height.

Relative frequency - A quantitative descriptor, expressed as a percent of the relative distribution of individuals of a species in an area; it is calculated by

$$\frac{\text{Frequency of species A}}{\text{Total frequency of all species}} \times 100$$

Relief - The change in elevation of a land surface between two points; collectively, the configuration of the earth's surface, including such features as hills and valley.

Reproductive adaptation - A feature of the reproductive mechanism of a species that results in it being better fitted to its environment (e.g. ability for seed germination under water).

Respiration - The sum total of metabolic processes associated with conversion of stored (chemical) energy into kinetic (physical) energy for use by an organism.

Rhizosphere - The zone of soil in which interactions between living plant roots and microorganisms occur.

Root zone - The portion of a soil profile in which plant roots occur.

Routine wetland determination - A type of wetland determination in which office data and/or relatively simple, rapidly applied onsite methods are employed to determine whether or not an area is a wetland.

Sample plot - An area of land used for measuring or observing existing conditions.

Sapling/shrub - A layer of vegetation composed of woody plants 3.0 in. in diameter at breast height but greater than 3.2 ft in height, exclusive of woody vines.

Saturated soil conditions - A condition in which all easily drained voids (pores) between soil particles in the root zone are temporarily or permanently filled with water to the soil surface at pressures greater than atmospheric.

APPENDIX F Wetland Definitions

Soil - Unconsolidated mineral and organic material that supports, or is capable of supporting, plants, and which has recognizable properties due to the integrated effect of climate and living matter acting upon parent material, as conditioned by relief over time.

Soil horizon - A layer of soil or soil material approximately parallel to the land surface and differing from adjacent genetically related layers in physical, chemical, and biological properties or characteristics (e.g. color, structure, texture, etc.)

Soil matrix - The portion of a given soil having the dominant color. In most cases, the matrix will be the portion of the soil having more than 50 percent of the same color.

Soil permeability - The ease with which gases, liquids, or plant roots penetrate or pass through a layer of soil.

Soil phase - A subdivision of a soil series having features (e.g. slope, surface texture, and stoniness) that affect the use and management of the soil, but which do not vary sufficiently to differentiate it as a separate series.

Soil pore - An area within soil occupied by either air or water, resulting from the arrangement of individual soil particles or peds.

Soil profile - A vertical section of a soil through all its horizons and extending into the parent material.

Soil series - A group of soils having horizons similar in differentiating characteristics and arrangement in the soil profile, except for texture of the surface horizon.

Soil structure - The combination or arrangement of primary soil particles into secondary particles, units, or peds.

Soil surface - The upper limits of the soil profile. For mineral soils, this is the upper limit of the highest (A1) mineral horizon. For organic soils, it is the upper limit of undercomposed, dead organic matter.

Soil texture - The relative proportions of the various size of particles in a soil

Somewhat poorly drained - Soils that are wet near enough to the surface or long enough that planting or harvesting operations or crop growth is markedly restricted unless artificial drainage is provided. Somewhat poorly drained soils commonly have a layer with low hydraulic conductivity, wet conditions high in the profile, additions of water through seepage, or a combination of these conditions.

Stilted roots - Aerial roots arising from stems (e.g., trunk and branches), presumably providing plant support (e.g., Rhizophora mangle).

Stooling - A form of asexual reproduction in which new shoots are produced at the base of senescing stems, often resulting in a multi-trunk growth habit.

Stratigraphy - Features of geology dealing with the origin, composition, distribution, and succession of geologic strata (layers).

Substrate - The base or substance on which an attached species is growing.

Surface water - Water present above the substrate or soil surface.

Tidal - A situation in which the water level periodically fluctuates due to the action of lunar and solar forces upon the rotating earth.

Topography - The configuration of a surface, including its relief and the position of its natural and man-made features.

Transect - A line on the ground along which observations are made at some interval.

Transition zone - The area in which a change from wetlands to non-wetlands occurs.

Transpiration - The process in plants by which water vapor is released into the gaseous environment, primarily through stomata.

Tree - A woody plant plan 3.0 in. in diameter at breast height, regardless of height (exclusive of woody vines).

Typical - That which normally, usually, or commonly occurs.

Typically adapted - A term that refers to a species being normally or commonly suited to a given set of environmental conditions, due to some feature of its morphology, physiology, or reproduction.

Unconsolidated parent material - Material from which a soil develops, usually formed by weathering of rock or placement in an area by natural forces (e.g. water, wind, or gravity).

Under normal circumstances - As used in the definition of wetlands, this term refers to situations in which the vegetation has not been substantially altered by man's activities.

Uniform vegetation - A situation in which the same group of dominant species generally occurs throughout a given area.

Upland - Any area that does not qualify as a wetland because the associated hydrologic regime is not sufficiently wet to elicit development of vegetation, soils, an/or hydrologic characteristics associated with wetlands. Such areas occurring within floodplains are more appropriately termed non-wetlands.

Value (soil color) - The relative lightness or intensity of color, approximately a function of the square root of the total amount of light reflected from a surface; one of the three variables of color.

Vegetation - The sum total of macrophytes that occupy a given area.

Vegetation layer - A sub-unit of a plant community in which all component species exhibit the same growth form (e.g., trees, saplings/shrubs, herbs).

Very long duration (flooding) - A duration class in which the length of a single inundation event is greater than 1 month.

Very poorly drained - Soils that are wet to the surface most of the time. These soils are wet enough to prevent the growth of important crops (except rice) unless artificially drained.

Watermark - A line on a tree or other upright structure that represents the maximum static water level reached during an inundation event.

Waters of the United States - The term "waters of the United States" means [1] All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; [2] All interstate waters including interstate wetlands; [3] All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or

foreign commerce including an such waters: [I] Which are or could be used by interstate or foreign travelers for recreational or other purposes; or [ii] From which fish or shellfish are or could be taken and sold by industries in interstate commerce; or [iii] Which are used or could be used for industrial purpose by industries in interstate commerce; [4] All impoundments of waters otherwise defined as waters of the United States under the definition; [5] Tributaries of waters identified in parts 1-4 above; [6] The territorial seas; and [7] Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in parts 1-6 above.

Water table - The upper surface of ground water or that level below which the soil is saturated with water. It is at least 6 in. thick and persists in the soil for more than a few weeks.

Wetlands -Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

Wetland boundary - The point on the ground at which a shift from wetlands to non-wetlands or aquatic habitats occurs. These boundaries usually follow contours.

Wetland determination - The process or procedure by which an area is adjudged a wetland or non-wetland.

Wetland hydrology - The sum total of wetness characteristics in areas that are inundated or have saturated soils for a sufficient duration to support hydrophytic vegetation.

Wetland plant association - Any grouping of plant species that recurs wherever certain wetland conditions occur.

Wetland soil - A soil that has characteristics developed in a reducing atmosphere, which exists when periods of prolonged soil saturation result in anaerobic conditions. Hydric soils that are sufficiently wet to support hydrophytic vegetation are wetland soils.

APPENDIX F Wetland Definitions

Wetland vegetation - The sum total of macrophytic plant life that occurs in areas where the frequency and duration of inundation or soil saturation produce permanently or periodically saturated soils of sufficient duration to exert a controlling influence on the plant species present. Hydrophytic vegetation occurring in areas that also have hydric soils and wetland hydrology may be properly referred to as wetland vegetation.

Woody vine - See liana.

Xerophytic - A plant species that is typically adapted for life in conditions where a lack of water is a limiting factor for growth and/or reproduction. These species are capable of growth in extremely dry conditions as a result of morphological, physiological, and/or reproductive adaptation.

APPENDIX G

Project Team

Name	Role	Capacity
Mark Felton, PWS	Project Manager	Technical Review
Jennifer Schwent	Biologist	Vegetation, Hydrology and Soils
Brent Crafton	Technician	Vegetation

ADAPTIVE ECOSYSTEMS, INC.
A NATURAL SOLUTION™

March 21, 2006

U.S. Army Corps of Engineers
Missouri State Regulatory Office
221 Bolivar Street, Suite 103
Jefferson City, MO 65101
Attn: Kenny Pointer

Re: Associated Electric Cooperative. Request for Approved Jurisdictional Determination; Adaptive Ecosystems Project Number 2006-117.

Mr. Pointer,

Mr. Jerry Bindel of Associated Electric Cooperative has recently request a No Permit Required determination from your office for work to be performed on the property assessed in the enclosed Preliminary Jurisdictional Report. Please note that no fill activities will occur within waters of the U.S. described in the enclosed Report. I have contacted Mr. Bindel regarding his obligation to provide you with a graphic or written description of activities and relative locations of jurisdictional waters in order for your review of his No Permit Required request.

We appreciate your coordination and look forward to hearing from you. If you have any questions I can be reached at (816) 966-8199 ext 104, or by e-mail jrichter@adaptiveecosystems.com.

Sincerely,

John C. Richter

John C. Richter
Adaptive Ecosystems, Inc.

Enclosure

CC:
Mr. Jerry Bindel, Principle Environmental Scientist
Associated Electric Cooperative
P.O. Box 754
Springfield, MO 65801

Preliminary Jurisdictional Report

Carroll County, Missouri

Prepared for:

Associated Electric Cooperative

March, 2006

Prepared by:

ADAPTIVE ECOSYSTEMS, INC.
A NATURAL SOLUTION℠
801 Main Street, Suite 103 Grandview, MO 64030

1.0 Introduction

Adaptive Ecosystems, Inc. has been contracted by Associated Electric Cooperative to prepare a Preliminary Jurisdictional Report for a proposed site in Carroll County, Missouri (Figure 1). This report is a discussion of wetlands and other jurisdictional waters of the U.S. located on the property. Support documentation including figures, photographs, and data sheets are included as supporting materials.

2.0 Preliminary Site Review

Adaptive Ecosystems, Inc. completed an in-house review of available resource data to assist in the identification of jurisdictional wetlands and other Waters of the United States on the project property. The site is described as an approximately 16 acre tract of land located between the Missouri River and an agricultural levee in Sections 19 and 20, Township 51 north, Range 25 west, one mile east of the Ray/Carroll County line. Resource maps and aerial photography reviewed prior to conducting the on-site survey included; a USGS 7.5' topographic map, Carroll County Soils Survey, National Wetlands Inventory map, and an aerial photo of the project area. A summary of the in-house review is provided below.

2.1 USGS 7.5' Topographic Survey, Dover, Missouri Quad. (Figure 2)

The USGS topographic survey for the Dover, Missouri quadrangle shows a large forested area within the boundaries of the project site. The site drains towards the agricultural levee which forms the northern border of the project limits. Elevations range from approximately 685.4 ft. at the river edge to approximately 680 ft. at the northeast corner of the property.

2.2 Carroll County Soil Survey (Figure 3)

The Carroll County Soil Survey shows a single map unit to occur within the boundaries of the project site. The soil map unit is described as follows:

- 68 – Haynie very fine sandy loam. A deep, nearly level, moderately well drained soil found on the slightly higher areas on flood plains along the Missouri River. This soil unit is listed as a Hydric Soil for the State of Missouri. Typical pedon of Haynie very fine sandy loam, 750 feet west and 4,250 feet south of the northeast corner of sec. 20, T. 51 N., R. 25 W. This location is approximately ¾ mile east of the project site.

2.3 National Wetlands Inventory, Dover, Missouri Quad. (Figure 4)

Review of the National Wetlands Inventory (NWI) map for the Dover, Missouri quadrangle identified four wetland features to occur within the project boundaries. They are described as follows:

- Inland Forested Wetland – Polygon covers the eastern half of project site.
- Inland Herbaceous Wetland – Polygon covers the wetstern half of project site.
- Inland Shrub Swamp – Polygons found along toe of agricultural levee.
- Pond – Polygon found in the northeast corner of project site.

2.4 Aerial Photography (Figure 5)

An aerial photograph (source: 2004 DOQQs) is provided as Figure 5. Photo shows western half of project site as tilled cropland and the eastern half of the project site as forested. No wetland signatures are observed in the aerial photograph.

3.0 Field Site Visit

On March 17, 2006, Adaptive Ecosystems, Inc. conducted a pedestrian survey of the entire project area to identify jurisdictional waters including wetlands, streams, and tributaries. The wetland identification for the proposed site was made using the methodology outlined in the 1987 Corps of Engineers Wetland Delineation Manual (USACE, 1987).

Site photographs and data sheets recorded from the field survey are provided as supporting materials. The results of the field survey are shown on the Jurisdictional Waters Map (Figure 6). Dimensions of jurisdictional waters based on scaled measurements from spatially referenced aerial photographs.

4.0 Results

Figure 6 shows location of sampling points. Data sheets were recorded for each sampling point. Data show that the Field and Forest locations did not meet wetland criteria. The Levee sampling point data sheet indicated the area to be within a wetland.

4.1 Tributary

No tributaries were found to occur within the boundaries of the project site.

4.2 Wetlands/Open Water (Figure 6)

To better understand the dynamics of the project area the hydrology was evaluated as it applies to the 1987 Corps of Engineers Wetland Delineation Manual. The hydrology evaluation is as follows:

The '87 Manual requires that within Carroll County the soils must be saturated for a minimum of 9.5 days (5% of the growing season) in most years (5 of 10 years). The project property is adjacent to Missouri River mile 307.7, OHWM elevation 675.0 m.s.l. The NRCS 7-day elevation at Missouri River mile 308 was extrapolated from an NRCS data set to be approximately 677.5 m.s.l. A 9.5 day elevation is assumed to be approximately located at 677.0 m.s.l. The lowest regions of the project area appear as Inland Shrub Swamp and Pond polygons on the National Wetlands Inventory Map (Figure 4). The Pond polygon (Figure 4) may be approximately located between elevations 678.0 m.s.l. and 680.0 m.s.l. The Inland Shrub Swamp polygon may be located at elevations slightly higher than the Pond polygon and as a result display a greater variety of hydrophytic vegetation species.

Elevations of the project site range from approximately 685.4 at the river edge to approximately 680.0 or less at the toe of the levee. The project site is bound by agricultural levees on the north and east borders, the Missouri River on the south border, and a roadway on the west border. The project area encompasses 16 acres. Approximately 8 acres are under cultivation while the remaining 8 acres is second growth forest. Run-off from precipitation events is expected to flow from the river edge towards the agricultural levee which forms the north border.

Open Water - A single open water feature was determined to occur in the northeastern corner of the project site. Elevations indicate site drainage is towards the northeast corner of the project site. At the time of sampling the feature described as open water was dry. Soils were composed predominately of clayey materials in the upper horizon and were determined to be poorly drained. Vegetation was sparse due to a prescribed burn in the area. It is believe that this feature becomes inundated in late spring as hydrology is supplied by local run-off and the rising water table of the adjacent river. Inundation is assumed sufficient to suppress the growth of emergent wetland vegetation during spring and early summer. The open water feature was determined to be approximately 0.06 acre in size.

Palustrine Emergent Wetland - The toe of the agricultural levee is slightly depressional. The construction of the levee may also be responsible for the high clay content of sampled soils along the toe of the levee slope. Combined, a slight depressional area has been formed along the toe of the levee which contains poorly drained soils, with drainage trending towards the northeast corner of the project site. A variety of wetland indicators were found along the toe of the agricultural levee. The soils in wetland sampling areas were composed predominately of clay in the upper horizon, had some manganese streaking, and contained oxidized root channels. Vegetation was dominated by hydrophytic species, most notably panicled aster (*Aster simplex)* - a FACW indicator species. Hydrology may be supplied by both the Missouri River 9.5 day elevation and local run-off from precipitation events. The wetland area parallels the toe of the agricultural levee for approximately 690 linear feet and is approximately 15 feet wide. The total wetland area is approximately 0.24 acre.

5.0 Summary

Jurisdictional wetlands and waters of the U.S. identified on the property consist of: one open water and one palustrine emergent wetland. A total of 0.30 acre of jurisdictional waters was found to occur on the project site (Table 1).

Table 1: Summary of Jurisdictional Waters On-Site.

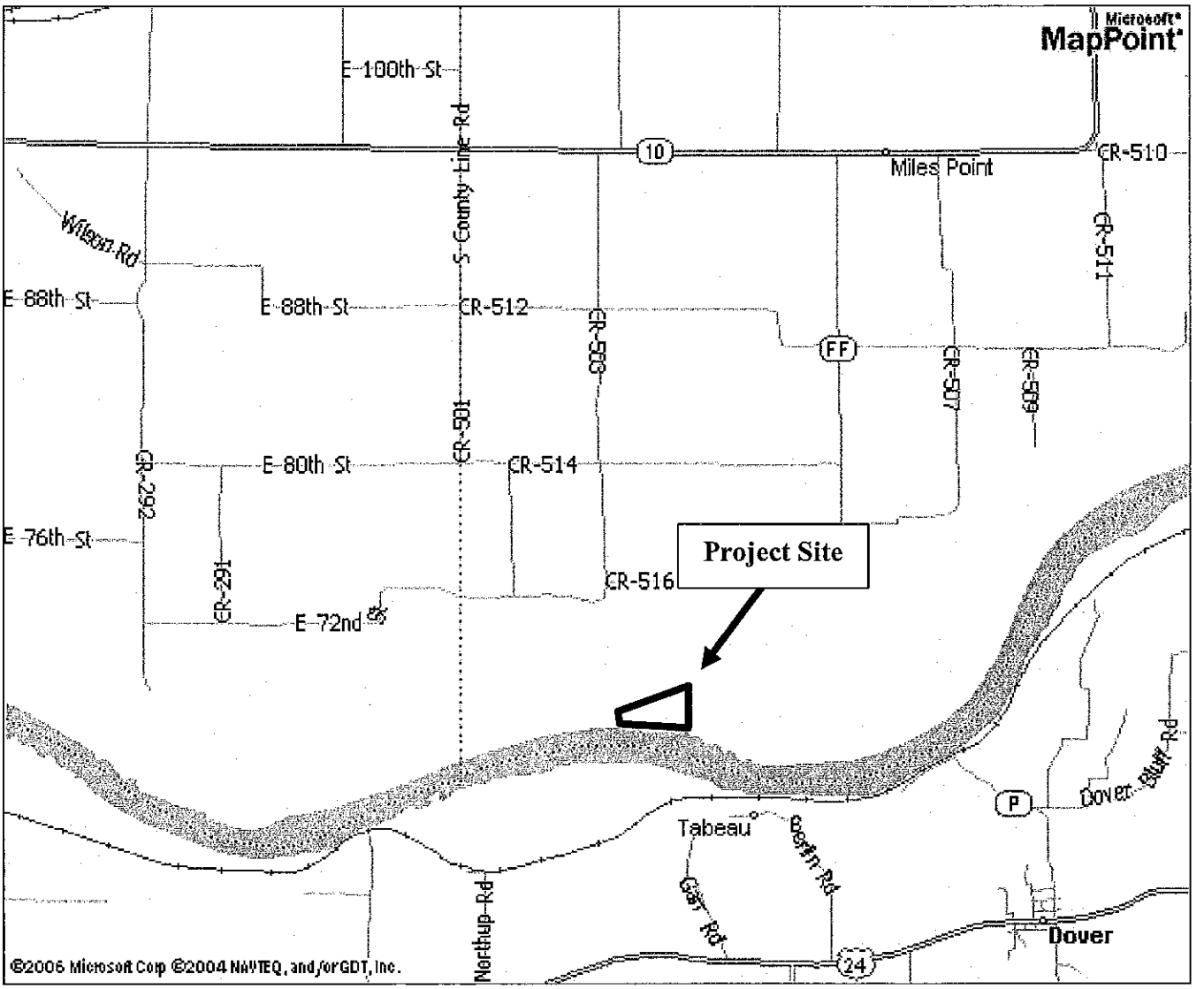
Type of Jurisdictional Water	Acreage
Open Water	0.06
Palustrine Emergent Wetlands	0.24
Total Acreage of Jurisdictional Resources	**0.30 ac.**

Maps and Figures

Site Vicinity Map

Figure 1

Source:* MSN - *Mapblast



Prepared by: Adaptive Ecosystems, Inc. *Project number: 2006-117*

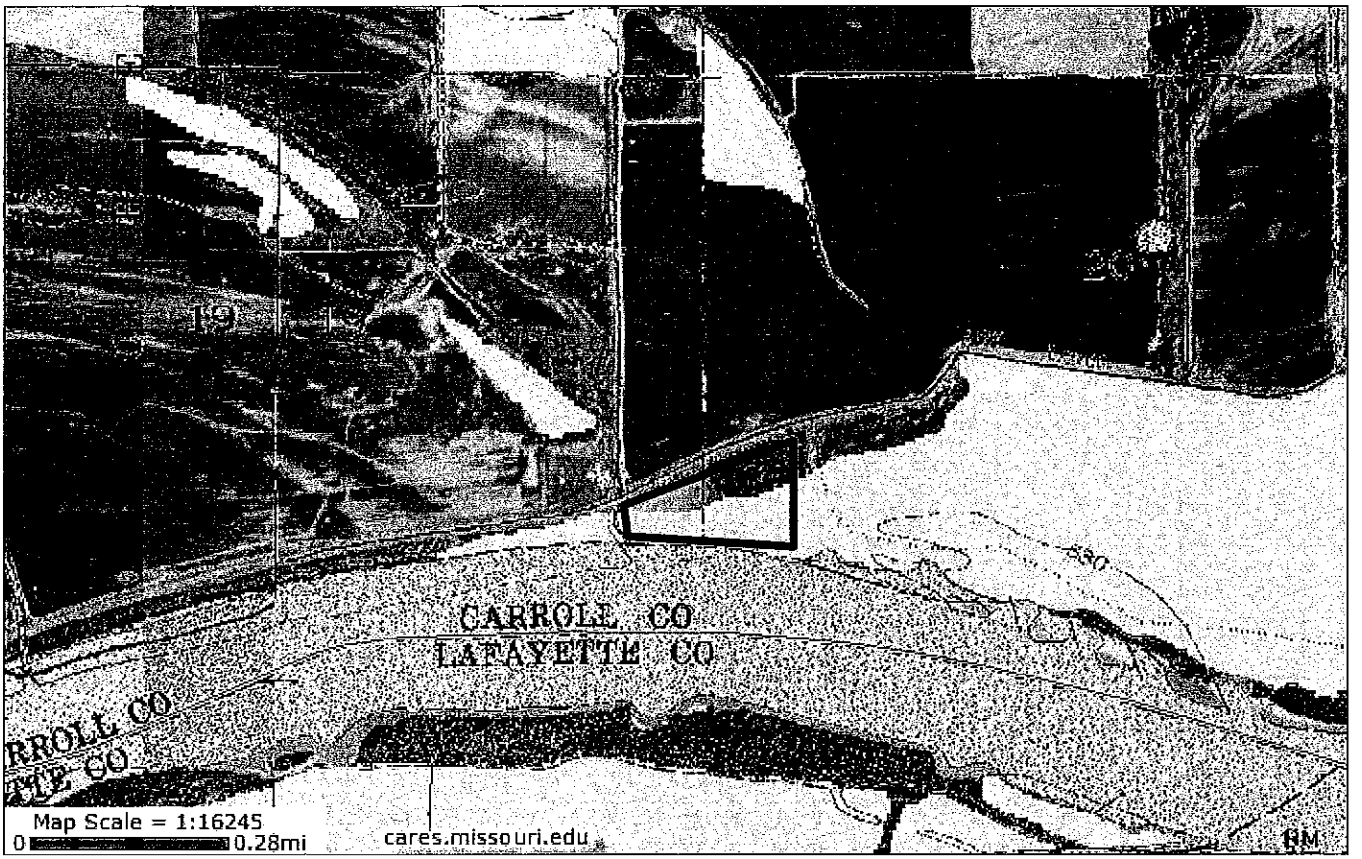
ADAPTIVE ECOSYSTEMS, INC.
A NATURAL SOLUTION™
801 Main Street, Suite 103 Grandview, MO 64030

N
W E
S

USGS Map

Figure 2

Source: USGS 7.5' Topographic Survey, Carroll County, Missouri



Prepared By: Adaptive Ecosystems, Inc.

Project Number 2006-117

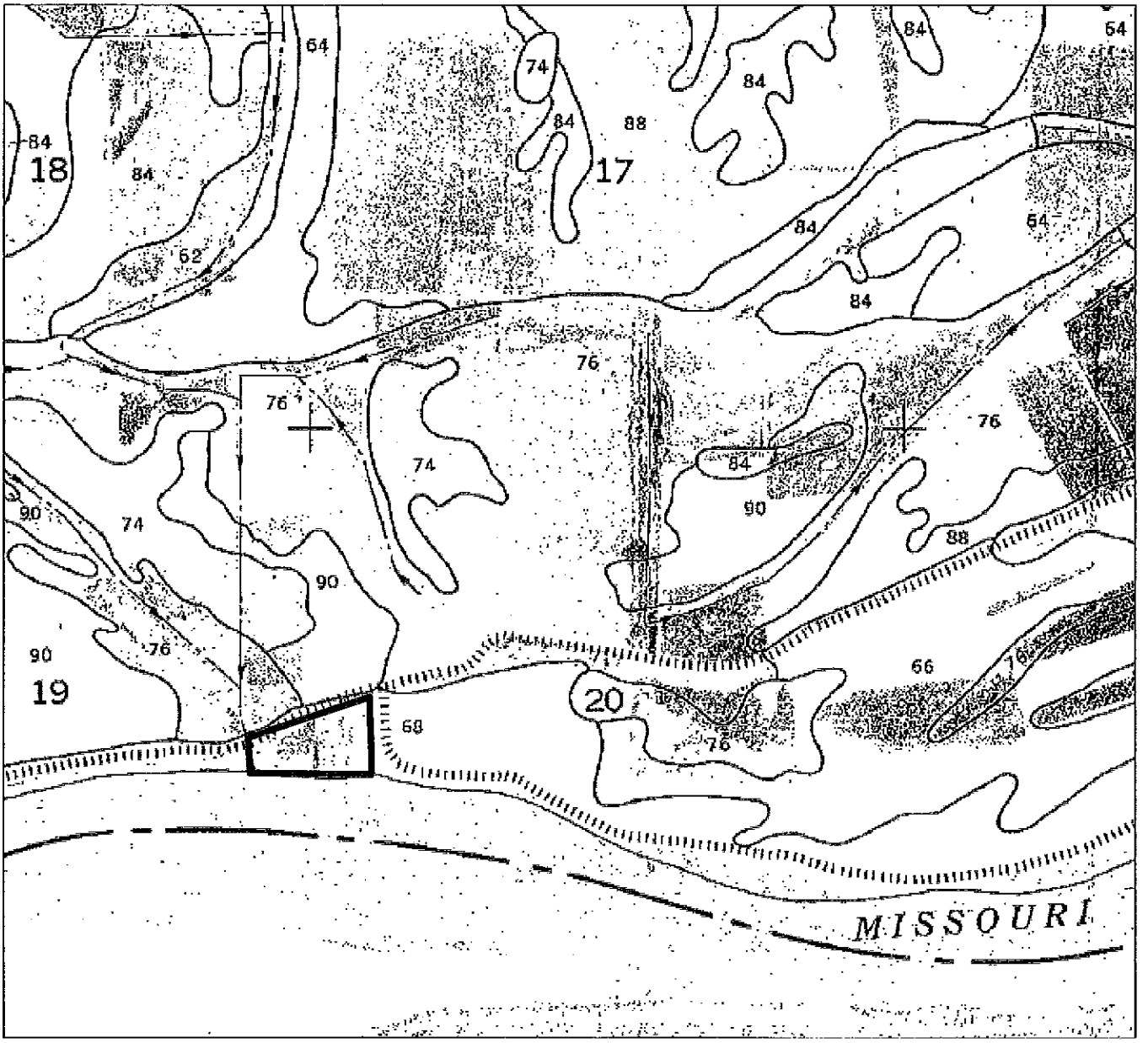
ADAPTIVE ECOSYSTEMS, INC.
A NATURAL SOLUTION™
801 Main Street, Suite 103 Grandview, MO 64030

N
W E
S

NRCS Soil Survey

Figure 3

Source: NRCS Soil Survey, Carroll County, Missouri



Prepared by: Adaptive Ecosystems, Inc. *Project number: 2006-117*

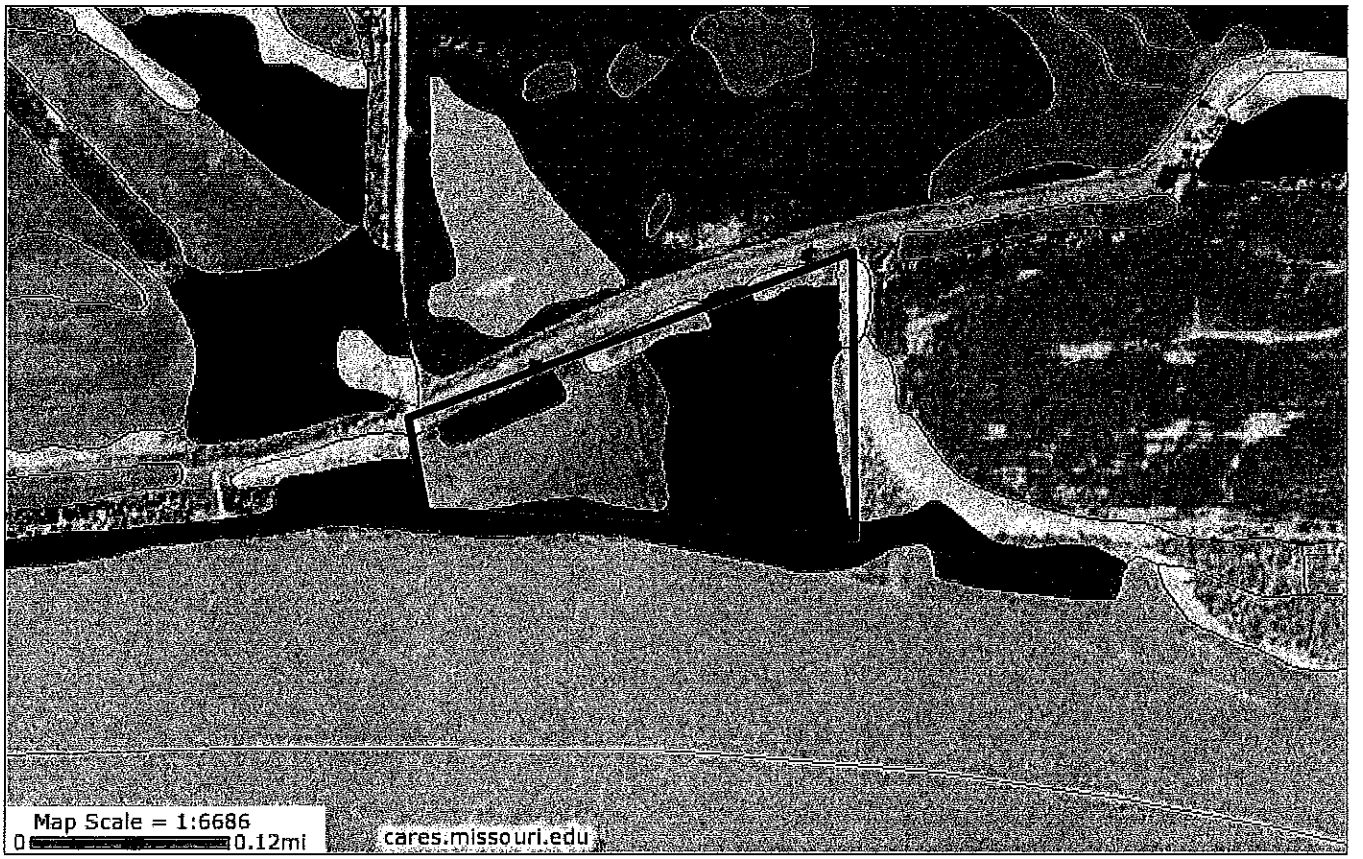
ADAPTIVE ECOSYSTEMS, INC.
A NATURAL SOLUTION™
801 Main Street, Suite 103 Grandview, MO 64030

N
W E
S

NWI Map

Figure 4

Source: NWI Map, Carroll County, Missouri



Prepared By: Adaptive Ecosystems, Inc.

Project Number 2006-117

County Boundaries
National Wetlands Inventory

- Inland Aquatic Bed
- Inland Forested Wetland
- Inland Herbaceous Wetland
- Inland Shrub Swamp
- Lower Perennial River
- Upper Perennial River
- Intermittent River
- Lake (Shallow)
- Lake (Deep)
- Pond
- Pond (Drawdown)
- Other Vegetated Wetland

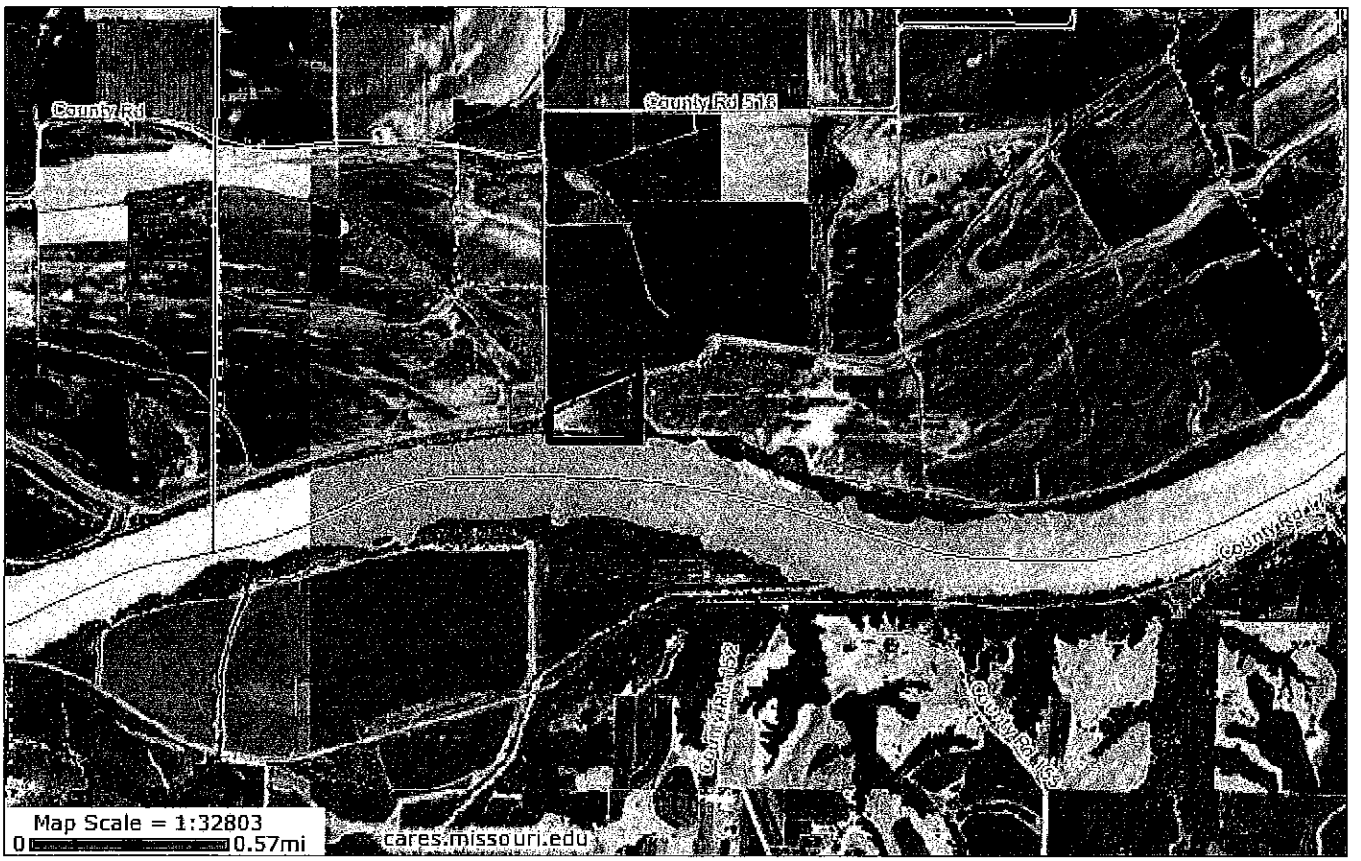
N
W E
S

ADAPTIVE ECOSYSTEMS, INC.
A NATURAL SOLUTION™
801 Main Street, Suite 103 Grandview, MO 64030

Aerial

Figure 5

Source: 2004 DOQQ, Carroll County, Missouri



Prepared By: Adaptive Ecosystems, Inc.

Project Number 2006-117

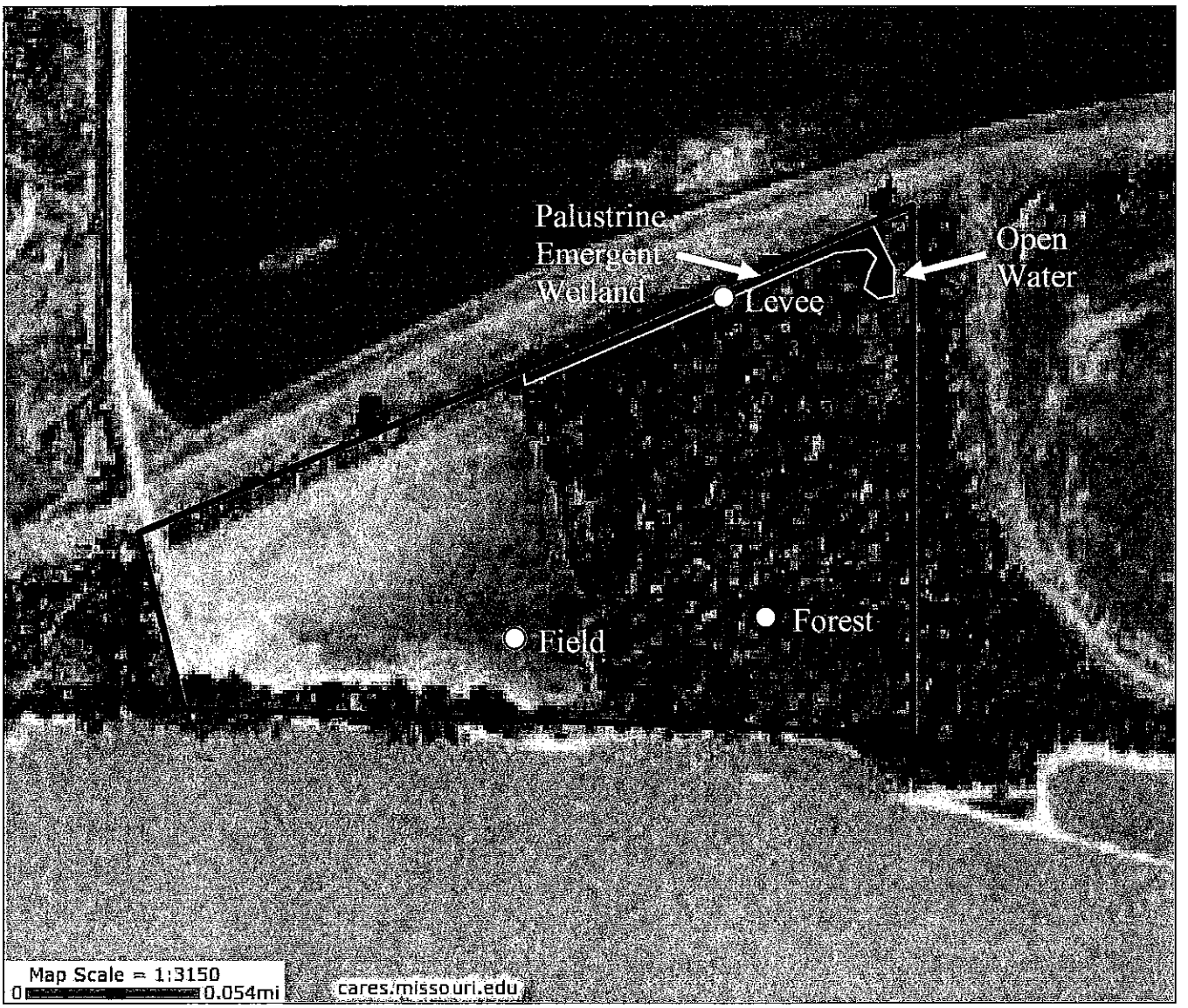
ADAPTIVE ECOSYSTEMS, INC.
A NATURAL SOLUTION™
801 Main Street, Suite 103 Grandview, MO 64030

N
W E
S

Jurisdictional Waters Map

Figure 6

Source: 2004 DOQQ, Carroll County, Missouri



Prepared By: Adaptive Ecosystems, Inc.

Project Number 2006-117

○ = Data Sampling Point

ADAPTIVE ECOSYSTEMS, INC.
A NATURAL SOLUTION™
801 Main Street, Suite 103 Grandview, MO 64030

N
W E
S

Site Photographs

Photo 1 – Project Site

Photo 2 – Levee Sampling Point

Photo 3 – Forest Sampling Point

Photo 4 – Field Sampling Point

Photo 5 – Left Bank of Missouri River

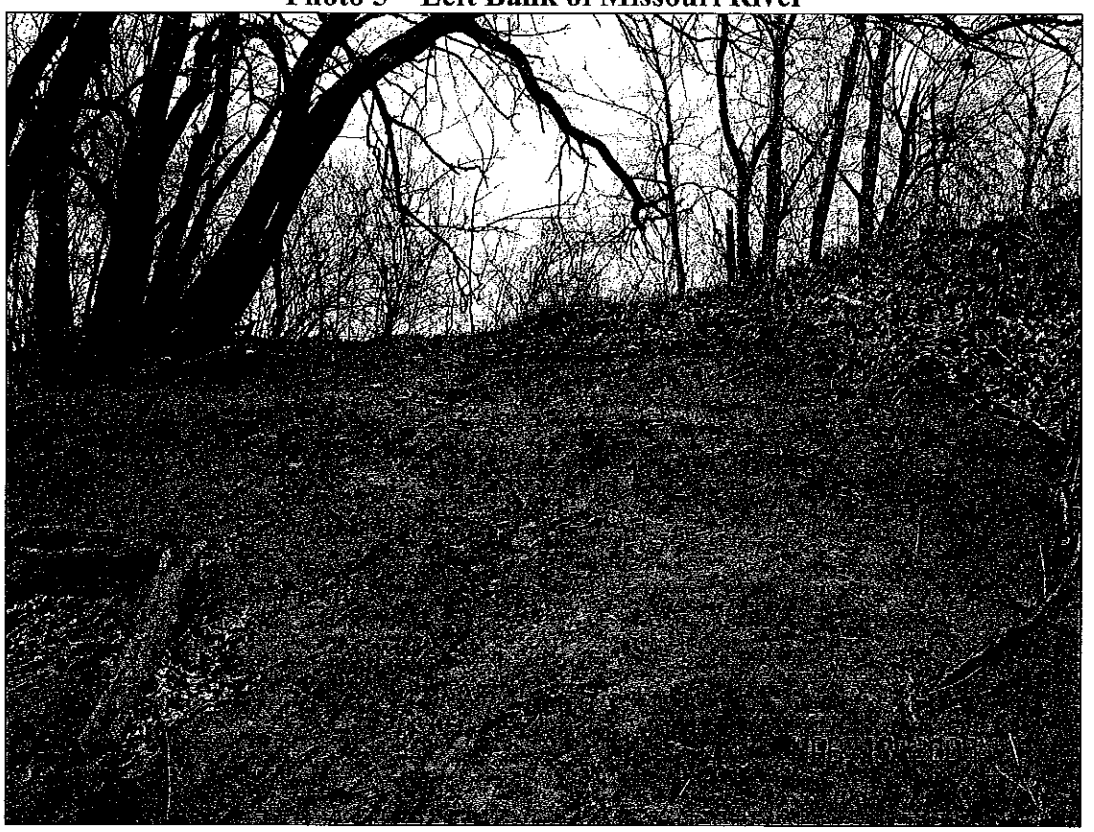


Photo 6 – Haynie very fine sandy loam

Data Sheets

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Associated Electric Applicant/Owner: _____ Investigator: John C. Richter	Date: 3/17/06 County: Carroll State: MO
Do Normal Circumstances exist on the site? (Yes) No Is the site significantly disturbed (Atypical Situation)? Yes (No) Is the area a potential Problem Area? Yes (No) (If needed, explain on reverse.)	Community ID: Field Transect ID: _____ Plot ID: _____

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Lamium amplexicaule H			9.		
2.			10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-).

Remarks: Cropfield – winter wheat

HYDROLOGY

___ Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gauge
- ___ Aerial Photographs
- ___ Other

X No Recorded Data Available

Field Observations:

Depth of Surface Water: _____ (in.)

Depth to Free Water in Pit: _____ (in.)

Depth to Saturated Soil: _____ (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ___ Inundated
- ___ Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- ___ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water-Stained Leaves
- ___ Local Soil Survey Data
- ___ FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name (Series and Phase): Haynie Very fine sandy loam

Drainage Class: mod. well

Taxonomy (Subgroup): mesic Mollic Udifluvents

Field Observations Confirm Mapped Type? (Yes) No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-12"	1	10YR 3/2	—	—	Sandy loam

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low-Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes (No) (Circle)
Wetland Hydrology Present? Yes (No)
Hydric Soils Present? Yes (No)

Is this Sampling Point Within a Wetland? (Circle) Yes (No)

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Associated Electric Applicant/Owner: Investigator: John C. Richter	Date: 3/17/06 County: Carroll State: Mo
Do Normal Circumstances exist on the site? (Yes) No Is the site significantly disturbed (Atypical Situation)? Yes (No) Is the area a potential Problem Area? Yes (No) (If needed, explain on reverse.)	Community ID: Forest Transect ID: Plot ID:

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. Morus alba	T	FAC	9.		
2. Fraxinus pennsylvanica	T	FACW	10.		
3. Acer negundo	T	FACW-	11.		
4. Platanus occidentalis	T	FACW	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 100%

Remarks: 2nd growth forest – thick stands of young white mulberry & green ash

HYDROLOGY

___ Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gauge
- ___ Aerial Photographs
- ___ Other

X No Recorded Data Available

Field Observations:

Depth of Surface Water: ___ (in.)

Depth to Free Water in Pit: ___ (in.)

Depth to Saturated Soil: ___ (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ___ Inundated
- ___ Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- ___ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water-Stained Leaves
- ___ Local Soil Survey Data
- X FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks: Extreme variability in microtopography.

SOILS

Map Unit Name (Series and Phase): Haynie very fine sandy loam

Drainage Class:

Taxonomy (Subgroup):

Field Observations Confirm Mapped Type? Yes (No)

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-3"	1	10YR 3/2			Blocky silty clay - organics
3-8"	2	10YR 4/2 (50%)			fine silty clay
3-8"	2	10YR 3/1 (50%)			fine silty clay
8"+	3	10YR 3/1			silty clay

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- X Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Wetland Hydrology Present? Yes (No)
Hydric Soils Present? Yes (No)

Is this Sampling Point Within a Wetland? (Circle) Yes (No)

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Associated Electric
Applicant/Owner:
Investigator: John C. Richter

Date: 3/17/06
County: Carroll
State: MO

Do Normal Circumstances exist on the site? (Yes) No
Is the site significantly disturbed (Atypical Situation)? Yes (No)
Is the area a potential Problem Area? Yes (No)
(If needed, explain on reverse.)

Community ID: Levee
Transect ID:
Plot ID:

VEGETATION

Dominant Plant Species	Stratum	Indicator
1. Aster simplex	H	FACW
2. Setaria faberi	H	FACU+
3. Rumex obtusifolius	H	FACW
4. Echinochloa muricata	H	OBL
5. Phalaris arundinacea	H	FACW+
6. Panicum capillare	H	FAC
7.		
8.		
9.		
10.		
11.		
12.		
13.		
14.		
15.		
16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 83% (5/6)

Remarks: Hydric vegetation occuring in optimal areas as well as areas of low relief

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
___ Aerial Photographs
___ Other
X No Recorded Data Available

Field Observations:
Depth of Surface Water: ____ (in.)
Depth to Free Water in Pit: ____ (in.)
Depth to Saturated Soil: ____ (in.)

Wetland Hydrology Indicators:
Primary Indicators:
___ Inundated
___ Saturated in Upper 12 Inches
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands
Secondary Indicators (2 or more required):
X Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
X FAC-Neutral Test
___ Other (Explain in Remarks)

Remarks: Extremely variable in micro topography. Hydrology from Mo. River or run-off from adjacent levee or project site. At time of sampling - No ponding water or saturated soils were found in this area. Other wetlands in floodplain indicated ponding/saturated soils at time of sampling.

SOILS

Map Unit Name (Series and Phase): Haynie Very fine sandy loam — Drainage Class: —

Taxonomy (Subgroup): — Field Observations — Confirm Mapped Type? Yes (No)

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-3"	1	10YR 3/1			Blocky clayey upp.
3-12"	2	10YR 5/2			Silty clay, sandy } mg. (few)
3-12"	2	10YR 3/1			Silty clay }

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- X Gleyed or Low-Chroma Colors
- X Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks: Soils presumed imported for levee construction

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Wetland Hydrology Present? (Yes) No
Hydric Soils Present? (Yes) No

Is this Sampling Point Within a Wetland? (Circle) (Yes) No

Remarks:

Presumably poorly drained soils. Local hydrology - from River + site run-off sufficient for wetland criteria. Hydrophytic vegetation expressed in clayey soils regardless of topographic position.

Approved by HQUSACE 3/92