Wetland Monitoring Report

Project Site:

Swan Road (TR 222) Mitigation Site
Perry County, Illinois

IDOT Sequence Number: 12315

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Project Summary

A first-year monitoring survey was conducted at the wetland mitigation site for Swan Road (TR 222) over Little Beaucoup Creek in Perry County, Illinois. Introductory information, goal, objective, performance criteria, methods, and results are presented in this report, followed by discussion and recommendations. Wetland determination results and a printout of the digital orthoquad (DOQ) showing wetland boundaries and sampling points are also included. Wetland determination forms can be found in Appendix A, species lists in Appendix B, and figures in Appendix C.

Signed: _____

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Date: 02/21/2011

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Table of Contents

Project Summary 2
Introduction 4
Goal, Objective, and Performance Criteria 4
Methods 5
Results 6
Discussion 7
Literature Cited 9
APPENDIX A 10
Wetland Determination Forms 11
APPENDIX B 19
Wetland Plant Species Lists 20
APPENDIX C 22
Figure 1 – Mitigation Site Location Map 23
Figure 2 – 2011 Wetland Mitigation Monitoring Map 24
Figure 3 – ISGS Wetland Hydrology Map 25

Cover Photo: Facing south with the mitigation area on both sides of Swan Road.

Swan Road (TR 222) Mitigation Site
Perry County, Illinois

Introduction

First-year monitoring was conducted on September 6 and 26, 2011 at the Swan Road mitigation site. This project is located approximately 3.5 miles northeast of Tamaroa, Illinois (Figure 1, Appendix C). The legal location of this site is Section 13, Township 4 South, Range 2 West, Perry County, Illinois. The total planned mitigation area is 0.725 acres (Hieser 2007). This site lies within the Big Muddy drainage basin (Hydrologic unit code 7140106). The site was constructed in 2008, with site work including excavation of the old road bed and seeding both portions of the site with a seed mix, possibly inclusive of red top (*Agrostis gigantea*). Natural regeneration from the adjacent forest is expected, hence no trees were planted. Soils at the site are mapped as Bonnie silt loam (USDA-NRCS *Web Soil Survey*), which is listed as a hydric soil. Photo stations will be established in 2012 to further document site development.

This report discusses the goal, objective, and performance criteria for the mitigation project, the methods used for monitoring the site, monitoring results, and discussion and recommendations based on the results. Methods and results are discussed by performance criterion for each goal.

Goal, Objective, and Performance Criteria

Goal, objective, and performance criteria for the Swan Road site follow those specified in the *Conceptual Compensation Plan for the Creation of Wetlands* (Hieser 2007) developed for this site. The project goal, listed below, should be attained by the end of the 5-year monitoring period. The goal, objective, and performance criteria are listed below.

Project goal: To create forested wetland.

> **Objective:** Replace impacted wetland at a ratio of 5.5:1 with functional jurisdictional wetlands of similar function and type.
>
> **Performance criteria:**
> 1. Predominance of hydrophytic vegetation: More than 50% of the dominant plant species must be hydrophytic.
>
> 2. Presence of hydric soils: Hydric soil characteristics should be present, or conditions favorable for hydric soil formation should persist at the site.
>
> 3. Presence of wetland hydrology: The area must be either permanently or periodically inundated at average depths of less than 6.6 ft or be saturated to the surface for at

least 5% of the growing season when the site also meets the soils and vegetation criteria or 12.5% of the growing season if the other two criteria are not met.

Methods

The soils and vegetation at this mitigation site were assessed during a site visit in 2010 (Zylka et al. 2010); however, full monitoring at this mitigation area began in 2011. INHS personnel will monitor the biological and soil parameters and ISGS personnel will monitor hydrology.

Project goal: To create a forested wetland.

1. Predominance of hydrophytic vegetation: The method for determining dominant vegetation at a wetland site is described in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region* (U.S. Army Corps of Engineers 2010) and further explained in the *Federal Manual for Identifying and Delineating Jurisdictional Wetlands* (Federal Interagency Committee for Wetland Delineation 1989). It is based on aerial coverage estimates for individual plant species. Each of the dominant plant species is then assigned its wetland indicator status rating (Reed 1988). Any plant rated facultative or wetter (i.e., FAC, FAC+, FACW, and OBL) is considered a hydrophyte. A predominance of wetland vegetation in the plant community exists if more than 50% of the dominant species present are hydrophytic. Predominance of hydrophytic vegetation was determined at the sampling point level as part of the routine wetland determination procedure. Site-wide dominant species were estimated visually, and are noted in the site species list for each site.

   Each native plant species was assigned a "coefficient of conservatism" (C) (Taft et al. 1997), a subjective rating of species fidelity to undegraded natural communities, ranging from zero to ten. Conservative species - those more likely to be found in "pristine" natural areas - were assigned high numbers, whereas non-conservative species - those that occur in anthropogenically disturbed areas - were given lower numbers. Non-native species and those not identifiable to species level were not assigned a rating. The Floristic Quality Index (FQI) is computed as FQI = (mean C) X ($\sqrt{N}$), where mean C is the mean coefficient of conservatism for all native plant species at a site and N is the total number of native plant species at the site. In very general terms, higher FQI values for plant communities indicate more similarity to "pristine" natural areas, as compared to those communities with lower FQI values. Botanical nomenclature follows Mohlenbrock (2002).

2. Occurrence of hydric soils: To monitor hydric soil development, the soil was sampled at various locations within each vegetative cover type. Soil profile morphology, including horizon color, texture, and structure was analyzed at representative points throughout the site. Additionally, the presence, type, size, and abundance of redoximorphic features were recorded. In the absence of hydric soil indicators, hydrologic data can be

used to confirm that conditions favorable for hydric soil formation persist at the site (Environmental Laboratory 1987).

3. Presence of wetland hydrology: The extent of wetland hydrology at the Swan Road site was monitored by the Illinois State Geological Survey (ISGS) and is shown on the accompanying figure (Figure 3, Appendix C) (Miner et al. 2011). The following methods are adapted from that ISGS report. An area must be inundated or saturated for no less than 5% of the growing season (10 days at this site) in order to satisfy wetland hydrology criteria using the 1987 Manual, or a minimum of 14 consecutive days when using the 2010 Midwest Region supplement. These areas will be determined to be jurisdictional wetlands if vegetation and soils criteria mentioned above are also met. Areas that are inundated or saturated for greater than 12.5% of the growing season (26 days at this site) satisfy wetland hydrology criteria in a conclusive manner, and strongly indicate wetland conditions, especially where soil and/or vegetation data are inconclusive or slow to respond after site construction activities. To assist in proper characterization of wetland mitigation sites, the ISGS report shows areas that are inundated or saturated for greater than 5% and greater than 12.5% of the growing season. Areas satisfying wetland hydrology criteria in the 2010 Midwest Region supplement (14 consecutive days during the growing season) are also shown for comparison. Inundation occurs when surface water is present at depths no greater than 6.6 ft, while saturation occurs when the water table is no deeper than 1 ft below land surface. Furthermore, INHS personnel will survey the site annually for field indicators of wetland hydrology.

   Inundation and saturation at the site were monitored using 7 monitoring wells. Water levels were measured monthly starting in May. Manual readings were supplemented by 2 dataloggers, which measure surface- and ground-water levels at regular intervals to document all hydrologic events. Additional details regarding site conditions and monitoring results for wetland hydrology in 2011 are summarized in the *ISGS Annual Report for Active IDOT Wetland Compensation and Hydrologic Monitoring Sites, September 1, 2010 to August 31, 2011* (Miner et al. 2011).

Site boundaries were recorded using a Trimble Global Positioning System (either model Pathfinder Pro XR or Pathfinder Pro XRS), with a presumed accuracy of +/- 0.5 m under optimal field conditions. Locations of determination sites were overlaid on a digital orthophoto quadrangle (DOQ) and approximate area was determined for each wetland site using ArcGIS 10.0 software (ESRI 2010). Resulting areas are calculated in acres, reported to two decimal places.

Results

Project goal: To create a forested wetland.

1. Predominance of hydrophytic vegetation: Dominant hydrophytic vegetation is present in Sites 1 and 3. Sites 2 and 4 currently do not have dominant hydrophytic vegetation. Dominant species for each site are listed on the Wetland Determination Data Forms in Appendix A.

   The FQI was calculated for each wetland site using native species only. Site 1 had a mean C value (mCv) of 2.8 and an FQI score of 17.5 while Site 3 had a mCv of 2.8 and an FQI of 16.0. In 2011, few species indicative of higher natural quality were present. Only one species was present with a C value of 6 or greater [cardinal flower (*Lobelia cardinalis*)].

2. Occurrence of hydric soils: Hydric soils are present in Site 1 and Site 3, but not present in the rest of the mitigation site. The hydric soils within the mitigation site are the poorly to very poorly drained Bonnie silt loam. The non-hydric soils in Sites 2 and 4 are the somewhat poorly drained Belknap silt loam. Soil descriptions are available on the Wetland Determination Data Forms in Appendix A.

3. Presence of wetland hydrology: According to the 2011 ISGS annual monitoring report (Miner et al 2011), 0.6 acres of the Swan Road Site satisfied wetland hydrology criteria (Environmental Laboratory 1987) for more than 5% of the 2011 growing season (Figure 3, Appendix C). Zero acres satisfied the wetland hydrology criteria for more than 12.5% of the growing season. For comparison, 0.6 acres satisfied the wetland hydrology criteria (U.S. Army Corps of Engineers 2010) for 14 or more consecutive days.

   Total precipitation for the 2011 monitoring period was 137% of normal, and 218% of normal for the period March through May (Miner et al 2011).

   During visits to the mitigation area, the following indicators of wetland hydrology were observed: sediment deposits, drift deposits, geomorphic position, crayfish burrows, and FAC-neutral test.

Discussion

This is the first year of monitoring by both INHS and ISGS at the Swan Road site. Based on 2011 data, only part of the mitigation site, Sites 1 and 3 (Figure 2, Appendix C), met all three wetland criteria, for a total wetland area of 0.50 acres. More of the mitigation site may have met wetland hydrology for 5 to 12.5% of the growing season, but hydrology monitoring began in May, after spring rains. While Site 1 is in close proximity to forest, it is also a very open site that will require more time than Site 3 to become forested. Woody species are present on Site 1, but not to the extent they are present on Site 3.

The wetland potential of Site 2 is uncertain. It currently does not possess hydrophytic vegetation or hydric soils, but it met wetland hydrology for 5% of the growing season.

Site 3 is mostly surrounded by floodplain forest. Most of the site itself is treeless, but is within the canopy of the surrounding forest. The site currently contains many woody species (see Appendix B for full species list) that should eventually attain tree size. According to the ISGS, this year this site did not meet the 5% hydrology criterion, but hydrology monitoring was started in May rather than prior to the growing season. Based on its topographic position and the current presence of numerous wetland hydrology indicators, we believe this site will be found to have wetland hydrology in the future.

Site 4 does not appear poised to become wetland. Not only does it lack all three wetland criteria, it also is topographically slightly higher than the adjacent Site 3.

The potential for development of hydric soil for Site 2 would appear to be better than for Site 3 due to the presence of at least 5% wetland hydrology. This will not guarantee hydric soil development, but at least provides an indication of potential, especially if wetland hydrology continues annually and/or periods of inundation and saturation increase in duration. Hydric soil development might be aided through mechanical site work to lower the soil surface as Sites 2 and 3 are slightly higher in elevation than Sites 1 and 3.

This mitigation area will require nearly complete conversion to wetland to successfully meet the required mitigation acreage. Currently only 0.50 acres can be considered wetland. The acquisition of additional acreage would provide a greater chance for success. Additionally, preservation credit could be sought with acquisition of the adjacent wetland to the east of Site 1. Given the current topography of the site, particularly the areas surrounding sampling points 2A and 4A (Figure 2, Appendix C), it is unlikely that the required acreage will be realized.

Literature Cited

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APPENDIX A

Wetland Determination Forms

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Swan Road Mitigation Site City/County: Perry Sampling Date: September 6, 2011

Applicant/Owner: IDOT District 9 State: IL Sampling Point: 1A

Investigator(s): Kurylo, Zylka and Marcum Section, Township, Range: Sec 13, T4S, R2W

Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): concave

Slope (%): <2 Lat: 38.17852 Long: -89.27771 Datum: NAD 83

Soil Map Unit Name: Bonnie silt loam NWI classification: PFO1A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes [X] No [ ] (If no, explain in Remarks.)

Are Vegetation [ ], Soil [ ], or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes [X] No [ ]

Are Vegetation [ ], Soil [ ], or Hydrology [ ] naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes [X]	No [ ]	**Is the Sampled Area within a Wetland?** Yes [X] No [ ]
Hydric Soil Present?	Yes [X]	No [ ]	
Wetland Hydrology Present?	Yes [X]	No [ ]	

Remarks: Community type: Wet forbland

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft radius)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		

Sapling/Shrub Stratum (Plot size: 15 ft radius)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		

Herb Stratum (Plot size: 5 ft radius)			
1. *Aster lancelolatus*	70	Yes	FACW
2. *Euthamia graminifolia*	20	No	FACW-
3. *Acer saccharinum*	15	No	FACW
4. *Bidens frondosa*	10	No	FACW
5. *Xanthium strumarium*	10	No	FAC
6. *Dichanthelium clandestinum*	2	No	FACW
7.			
8.			
9.			
10.			
	127 = Total Cover		

Woody Vine Stratum (Plot size: 30 ft radius)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- [X] 1 - Rapid Test for Hydrophytic Vegetation
- [ ] 2 - Dominance Test is >50%
- [ ] 3 - Prevalence Index is ≤3.0[1]
- [ ] 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes [X] No [ ]

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

SOIL

Sampling Point: 1A

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 4/2	80	10YR 3/6	20	C	M	SI-SIL	
8-12	10YR 4/3	75	10YR 4/2	5	D	M	SI-SIL	
			10YR 3/6	20	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- [ ] Histosol (A1)
- [ ] Histic Epipedon (A2)
- [ ] Black Histic (A3)
- [ ] Hydrogen Sulfide (A4)
- [ ] Stratified Layers (A5)
- [ ] 2 cm Muck (A10)
- [ ] Depleted Below Dark Surface (A11)
- [ ] Thick Dark Surface (A12)
- [ ] Sandy Mucky Mineral (S1)
- [ ] 5 cm Mucky Peat or Peat (S3)
- [ ] Sandy Gleyed Matrix (S4)
- [ ] Sandy Redox (S5)
- [ ] Stripped Matrix (S6)
- [ ] Loamy Mucky Mineral (F1)
- [ ] Loamy Gleyed Matrix (F2)
- [x] Depleted Matrix (F3)
- [ ] Redox Dark Surface (F6)
- [ ] Depleted Dark Surface (F7)
- [ ] Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- [ ] Coast Prairie Redox (A16)
- [ ] Dark Surface (S7)
- [ ] Iron-Manganese Masses (F12)
- [ ] Very Shallow Dark Surface (TF12)
- [ ] Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes [x] No [ ]

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

- [ ] Surface Water (A1)
- [ ] High Water Table (A2)
- [ ] Saturation (A3)
- [ ] Water Marks (B1)
- [x] Sediment Deposits (B2)
- [x] Drift Deposits (B3)
- [ ] Algal Mat or Crust (B4)
- [ ] Iron Deposits (B5)
- [ ] Inundation Visible on Aerial Imagery (B7)
- [ ] Sparsely Vegetated Concave Surface (B8)
- [ ] Water-Stained Leaves (B9)
- [ ] Aquatic Fauna (B13)
- [ ] True Aquatic Plants (B14)
- [ ] Hydrogen Sulfide Odor (C1)
- [ ] Oxidized Rhizospheres on Living Roots (C3)
- [ ] Presence of Reduced Iron (C4)
- [ ] Recent Iron Reduction in Tilled Soils (C6)
- [ ] Thin Muck Surface (C7)
- [ ] Gauge or Well Data (D9)
- [ ] Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- [ ] Surface Soil Cracks (B6)
- [ ] Drainage Patterns (B10)
- [ ] Dry-Season Water Table (C2)
- [x] Crayfish Burrows (C8)
- [ ] Saturation Visible on Aerial Imagery (C9)
- [ ] Stunted or Stressed Plants (D1)
- [x] Geomorphic Position (D2)
- [x] FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes [ ] No [x] Depth (inches): _____

Water Table Present? Yes [ ] No [x] Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes [ ] No [x] Depth (inches): _____

Wetland Hydrology Present? Yes [x] No [ ]

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

ISGS well data indicates this site makes wetland hydrology at least 5% of the growing season.

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Swan Road Mitigation Site City/County: Perry Sampling Date: September 6, 2011

Applicant/Owner: IDOT District 9 State: IL Sampling Point: 2A

Investigator(s): Kurylo, Zylka and Marcum Section, Township, Range: Section 13, Township 4S, Range 2W

Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): convex to none

Slope (%): <5 Lat: 38.17822 Long: -89.27784 Datum: NAD 83

Soil Map Unit Name: NRCS mapped as Bonnie silt loam, revised to Belknap silt loam NWI classification: PFO1A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes [X] No [ ] (If no, explain in Remarks.)

Are Vegetation [ ], Soil [ ], or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes [X] No [ ]

Are Vegetation [ ], Soil [ ], or Hydrology [ ] naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes [ ]	No [X]	**Is the Sampled Area within a Wetland?** Yes [ ] No [X]
Hydric Soil Present?	Yes [ ]	No [X]	
Wetland Hydrology Present?	Yes [X]	No [ ]	

Remarks: Community type: Forbland

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft radius)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		

Sapling/Shrub Stratum (Plot size: 15 ft radius)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		

Herb Stratum (Plot size: 5 ft radius)			
1. *Solidago canadensis*	50	Yes	FACU
2. *Aster lanceolatus*	40	Yes	FACW
3. *Euthamia graminifolia*	15	No	FACW-
4. *Acer saccharium*	2	No	FACW
5.			
6.			
7.			
8.			
9.			
10.			
	107 = Total Cover		

Woody Vine Stratum (Plot size: 30 ft radius)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- [ ] 1 - Rapid Test for Hydrophytic Vegetation
- [ ] 2 - Dominance Test is >50%
- [ ] 3 - Prevalence Index is ≤3.0[1]
- [ ] 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes [ ] No [X]

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

SOIL

Sampling Point: 2A

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 4/3	96	10YR 4/2	2	D	M	SI-SIL	
			7.5YR 4/6	2	C	M		
4-12	10YR 4/3	79	10YR 4/2	20	D	M	SI-SIL	
			7.5YR 3/3	1	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- [ ] Histosol (A1)
- [ ] Histic Epipedon (A2)
- [ ] Black Histic (A3)
- [ ] Hydrogen Sulfide (A4)
- [ ] Stratified Layers (A5)
- [ ] 2 cm Muck (A10)
- [ ] Depleted Below Dark Surface (A11)
- [ ] Thick Dark Surface (A12)
- [ ] Sandy Mucky Mineral (S1)
- [ ] 5 cm Mucky Peat or Peat (S3)
- [ ] Sandy Gleyed Matrix (S4)
- [ ] Sandy Redox (S5)
- [ ] Stripped Matrix (S6)
- [ ] Loamy Mucky Mineral (F1)
- [ ] Loamy Gleyed Matrix (F2)
- [ ] Depleted Matrix (F3)
- [ ] Redox Dark Surface (F6)
- [ ] Depleted Dark Surface (F7)
- [ ] Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- [ ] Coast Prairie Redox (A16)
- [ ] Dark Surface (S7)
- [ ] Iron-Manganese Masses (F12)
- [ ] Very Shallow Dark Surface (TF12)
- [ ] Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes [ ] No [X]

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

- [ ] Surface Water (A1)
- [ ] High Water Table (A2)
- [ ] Saturation (A3)
- [ ] Water Marks (B1)
- [X] Sediment Deposits (B2)
- [ ] Drift Deposits (B3)
- [ ] Algal Mat or Crust (B4)
- [ ] Iron Deposits (B5)
- [ ] Inundation Visible on Aerial Imagery (B7)
- [ ] Sparsely Vegetated Concave Surface (B8)
- [ ] Water-Stained Leaves (B9)
- [ ] Aquatic Fauna (B13)
- [ ] True Aquatic Plants (B14)
- [ ] Hydrogen Sulfide Odor (C1)
- [ ] Oxidized Rhizospheres on Living Roots (C3)
- [ ] Presence of Reduced Iron (C4)
- [ ] Recent Iron Reduction in Tilled Soils (C6)
- [ ] Thin Muck Surface (C7)
- [ ] Gauge or Well Data (D9)
- [ ] Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- [ ] Surface Soil Cracks (B6)
- [ ] Drainage Patterns (B10)
- [ ] Dry-Season Water Table (C2)
- [X] Crayfish Burrows (C8)
- [ ] Saturation Visible on Aerial Imagery (C9)
- [ ] Stunted or Stressed Plants (D1)
- [ ] Geomorphic Position (D2)
- [ ] FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes [ ] No [X] Depth (inches): _____

Water Table Present? Yes [ ] No [X] Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes [ ] No [X] Depth (inches): _____

Wetland Hydrology Present? Yes [X] No [ ]

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

ISGS well data indicates this site makes wetland hydrology at least 5% of the growing season.

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Swan Road Mitigation Site City/County: Perry Sampling Date: September 26, 2011

Applicant/Owner: IDOT District 9 State: IL Sampling Point: 3A

Investigator(s): Kurylo, Zylka and Marcum Section, Township, Range: Section 13, Township 4S, Range 2W

Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none to concave

Slope (%): 0 Lat: 38.17794 Long: -89.27809 Datum: NAD 83

Soil Map Unit Name: Bonnie silt loam NWI classification: U

Are climatic / hydrologic conditions on the site typical for this time of year? Yes [X] No [ ] (If no, explain in Remarks.)

Are Vegetation [ ], Soil [ ], or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes [X] No [ ]

Are Vegetation [ ], Soil [ ], or Hydrology [ ] naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes [X]	No [ ]	**Is the Sampled Area within a Wetland?** Yes [X] No [ ]
Hydric Soil Present?	Yes [X]	No [ ]	
Wetland Hydrology Present?	Yes [X]	No [ ]	

Remarks: Community type: Wet floodplain forest

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: whole)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer saccharinum*	30	Yes	FACW
2. *Ulmus americana*	30	Yes	FACW-
3. *Fraxinus lanceolata*	20	Yes	FACW
4. *Quercus palustris*	20	Yes	FACW
5. *Gleditisa triacanthos/Juglans nigra*	10/10	No	FAC+/FACU
	120	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15 ft radius)			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	
Herb Stratum (Plot size: 5 ft radius)			
1. *Aster lanceolatus*	70	Yes	FACW
2. *Persicaria punctata*	2	No	OBL
3. *Ambroshia trifida*	2	No	FAC+
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	74%	= Total Cover	
Woody Vine Stratum (Plot size: 30 ft radius)			
1.			
2.			
		= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- [X] 1 - Rapid Test for Hydrophytic Vegetation
- [ ] 2 - Dominance Test is >50%
- [ ] 3 - Prevalence Index is ≤3.0[1]
- [ ] 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes [X] No [ ]

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

SOIL

Sampling Point: 3A

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 4/3	90	10YR 5/2	5	D	M	SI-SIL	
			7.5YR 3/3	5	C	M	SI-SIL	
3-15	10YR 4/2	85	7.5YR 3/4	15	C	M	SI-SIL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ 5 cm Mucky Peat or Peat (S3)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ Coast Prairie Redox (A16)
- ☐ Dark Surface (S7)
- ☐ Iron-Manganese Masses (F12)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☒ No ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☒ Sediment Deposits (B2)
- ☒ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☒ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☒ Geomorphic Position (D2)
- ☒ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____

Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

ISGS well data indicates that this site did not meet wetland hydrology for even 5% of the growing season.

Remarks:

ISGS monitoring started in May, a moths into the growing season and after the spring rains. The presence of 2 primary and 3 secondary wetland hydrology indicators would seem to be indicative of wetland hydrology. In the future, wetland hydrology determinations will be deferred to the ISGS.

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Swan Road Mitigation Site City/County: Perry Sampling Date: September 26, 2011

Applicant/Owner: IDOT District 9 State: IL Sampling Point: 4A

Investigator(s): Kurylo, Zylka and Marcum Section, Township, Range: Section 13, Township 4S, Range 2W

Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none

Slope (%): 0 Lat: 38.17780 Long: -89.27774 Datum: NAD 83

Soil Map Unit Name: NRCS mapped as Bonnie silt loam, revised to Belknap silt loam NWI classification: U

Are climatic / hydrologic conditions on the site typical for this time of year? Yes [X] No [ ] (If no, explain in Remarks.)

Are Vegetation [ ], Soil [ ], or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes [X] No [ ]

Are Vegetation [ ], Soil [ ], or Hydrology [ ] naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes [ ]	No [X]	**Is the Sampled Area within a Wetland?** Yes [ ] No [X]
Hydric Soil Present?	Yes [ ]	No [X]	
Wetland Hydrology Present?	Yes [ ]	No [X]	

Remarks: Community type: Mesic floodplain forest

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: Entire site)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Juglans nigra*	20	Yes	FACU
2. *Acer saccharinum*	20	Yes	FACW
3. *Ulmus americana*	20	Yes	FACW-
4.			
5.			
	60	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15 ft radius)			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	

Herb Stratum (Plot size: 5 ft radius)			
1. *Festuca pratensis*	90	Yes	FACU-
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	90	= Total Cover	

Woody Vine Stratum (Plot size: 30 ft radius)			
1.			
2.			
		= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- [ ] 1 - Rapid Test for Hydrophytic Vegetation
- [ ] 2 - Dominance Test is >50%
- [ ] 3 - Prevalence Index is ≤3.0[1]
- [ ] 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes [ ] No [X]

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

SOIL

Sampling Point: 4A

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-14	10YR 4/3	100					SIL-SI	
14-24	10YR 4/3	96	7.5YR 3/3	1	C	M	SIL-SI	
			10YR 4/2	3	D	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- [ ] Histosol (A1)
- [ ] Histic Epipedon (A2)
- [ ] Black Histic (A3)
- [ ] Hydrogen Sulfide (A4)
- [ ] Stratified Layers (A5)
- [ ] 2 cm Muck (A10)
- [ ] Depleted Below Dark Surface (A11)
- [ ] Thick Dark Surface (A12)
- [ ] Sandy Mucky Mineral (S1)
- [ ] 5 cm Mucky Peat or Peat (S3)
- [ ] Sandy Gleyed Matrix (S4)
- [ ] Sandy Redox (S5)
- [ ] Stripped Matrix (S6)
- [ ] Loamy Mucky Mineral (F1)
- [ ] Loamy Gleyed Matrix (F2)
- [ ] Depleted Matrix (F3)
- [ ] Redox Dark Surface (F6)
- [ ] Depleted Dark Surface (F7)
- [ ] Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- [ ] Coast Prairie Redox (A16)
- [ ] Dark Surface (S7)
- [ ] Iron-Manganese Masses (F12)
- [ ] Very Shallow Dark Surface (TF12)
- [ ] Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes [ ] No [X]

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

- [ ] Surface Water (A1)
- [ ] High Water Table (A2)
- [ ] Saturation (A3)
- [ ] Water Marks (B1)
- [ ] Sediment Deposits (B2)
- [ ] Drift Deposits (B3)
- [ ] Algal Mat or Crust (B4)
- [ ] Iron Deposits (B5)
- [ ] Inundation Visible on Aerial Imagery (B7)
- [ ] Sparsely Vegetated Concave Surface (B8)
- [ ] Water-Stained Leaves (B9)
- [ ] Aquatic Fauna (B13)
- [ ] True Aquatic Plants (B14)
- [ ] Hydrogen Sulfide Odor (C1)
- [ ] Oxidized Rhizospheres on Living Roots (C3)
- [ ] Presence of Reduced Iron (C4)
- [ ] Recent Iron Reduction in Tilled Soils (C6)
- [ ] Thin Muck Surface (C7)
- [ ] Gauge or Well Data (D9)
- [ ] Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- [ ] Surface Soil Cracks (B6)
- [ ] Drainage Patterns (B10)
- [ ] Dry-Season Water Table (C2)
- [X] Crayfish Burrows (C8)
- [ ] Saturation Visible on Aerial Imagery (C9)
- [ ] Stunted or Stressed Plants (D1)
- [ ] Geomorphic Position (D2)
- [ ] FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes [ ] No [X] Depth (inches): _____

Water Table Present? Yes [ ] No [X] Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes [ ] No [X] Depth (inches): _____

Wetland Hydrology Present? Yes [ ] No [X]

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

ISGS well data indicates that this site did not meet wetland hydrology for even 5% of the growing season.

Remarks:

APPENDIX B

Wetland Plant Species Lists

Site 1 Wet Forbland (proposed forested wetland)

SPECIES LIST (Dominant species and strata indicated by bold.)

Scientific name	Common name	Stratum	Wetland indicator status	Coefficient of conservatism
Acer saccharinum	silver maple	shrub	FACW	1
Aster lanceolatus	**panicled aster**	**herb**	**FACW**	**3**
Betula nigra	river birch	shrub	FACW	4
Bidens frondosa	common beggar's ticks	herb	FACW	1
Boehmeria cylindrica	false nettle	herb	OBL	3
Boltonia asteroides	false aster	herb	FACW	5
Campsis radicans	trumpet creeper	shrub	FAC	2
Cicuta maculata	water hemlock	herb	OBL	4
Carex cristatella	crested oval sedge	herb	FACW+	3
Carex vulpinoidea	fox sedge	herb	OBL	3
Cyperus strigosus	straw-colored flatsedge	herb	FACW	0
Dichanthelium clandestinum	deer-tongue grass	herb	FACW	4
Echinochloa muricata	barnyard grass	herb	OBL	0
Euthamia graminifolia	grassleaf goldenrod	herb	FACW-	3
Glyceria striata	fowl manna grass	herb	OBL	4
Impatiens capensis	jewelweed	herb	FACW	2
Juncus dudleyi	Dudley's rush	herb	FAC	4
Leersia oryzoides	rice cutgrass	herb	OBL	3
Lobelia cardinalis	cardinal-flower	herb	OBL	6
Ludwigia alternifolia	seedbox	herb	OBL	5
Lycopus americanus	common water horehound	herb	OBL	3
Lythrum alatum	winged loosestrife	herb	OBL	5
Mimulus ringens	monkey flower	herb	OBL	5
Paspalum laeve	smooth lens grass	herb	UPL	2
Penthorum sedoides	ditch stonecrop	herb	OBL	2
Phyla lanceolata	fog-fruit	herb	OBL	1
Platanus occidentalis	sycamore	shrub	FACW	3
Persicaria punctata	dotted smartweed	herb	OBL	3
Populus deltoides	eastern cottonwood	herb	FAC+	2
Prunella vulgaris	self-heal	herb	FAC	1
Rotala ramosior	tooth-cup	herb	OBL	4
Rumex crispus	curly dock	herb	FAC+	*
Salix interior	sandbar willow	shrub	OBL	1
Salix nigra	black willow	shrub	OBL	3
Scirpus atrovirens	dark green bulrush	herb	OBL	4
Setaria glauca	pigeon grass	herb	FAC	*
Solidago canadensis	Canada goldenrod	herb	FACU	1
Ulmus americana	American elm	herb,shrub	FACW-	5
Verbena hastata	blue vervain	herb	FACW+	3
Xanthium strumarium	cocklebur	herb	FAC	0

* Non-native species

mCv = 2.8

FQI = 17.5

Site 3 Wet Floodplain Forest

SPECIES LIST (Dominant species and strata indicated by bold.)

Scientific name	Common name	Stratum	Wetland indicator status	Coefficient of conservatism
Acer saccharinum	**silver maple**	**tree**	**FACW**	**1**
Amaranthus tuberculatus	tall waterhemp	herb	OBL	1
Ambrosia trifida	**giant ragweed**	**herb**	**FAC+**	**0**
Aster lanceolatus	**panicled aster**	**herb**	**FACW**	**3**
Boehmeria cylindrica	false nettle	herb	OBL	3
Calystegia sepium	American bindweed	herb	FAC	1
Cicuta maculata	water hemlock	herb	OBL	4
Cinna arundinacea	stout wood reed	herb	FACW	5
Elymus virginicus	Virginia wild rye	herb	FACW-	4
Fallopia scandens	climbing buckwheat	herb	FAC	2
Fraxinus lanceolata	**green ash**	**tree**	**FACW**	**2**
Gleditisa triacanthos	honey locust	tree	FAC+	2
Glyceria striata	fowl manna grass	herb	OBL	4
Impatiens capensis	jewelweed	herb	FACW	2
Ipomoea lacunosa	small white morning-glory	herb	FACW	1
Juglans nigra	black walnut	tree	FACU	4
Laportea canadensis	wood nettle	herb	FACW	2
Leersia oryzoides	rice cutgrass	herb	OBL	3
Leersia virginica	white grass	herb	FACW	4
Lobelia siphilitica	blue cardinal-flower	herb	FACW+	4
Lycopus virginicus	bugle weed	herb	OBL	5
Perilla frutescens	beefsteak plant	herb	FAC	*
Phlox divaricata	blue phlox	herb	FACU	5
Pilea pumila	Canada clearweed	herb	FACW	3
Persicaria punctata	**dotted smartweed**	**herb**	**OBL**	**3**
Quercus palustris	**pin oak**	**tree**	**FACW**	**4**
Rudbeckia laciniata	cutleaf coneflower	herb	FACW+	3
Rumex crispus	curly dock	herb	FAC+	*
Scirpus atrovirens	dark green bulrush	herb	OBL	4
Smilax tamnoides	bristly greenbrier	vine	FAC	3
Solidago canadensis	Canada goldenrod	herb	FACU	1
Solidago gigantea	late goldenrod	herb	FACW	3
Toxicodendron radicans	poison ivy	herb,shrub	FAC+	1
Ulmus americana	**American elm**	**tree**	**FACW-**	**5**
Xanthium strumarium	cocklebur	herb	FAC	0

* Non-native species

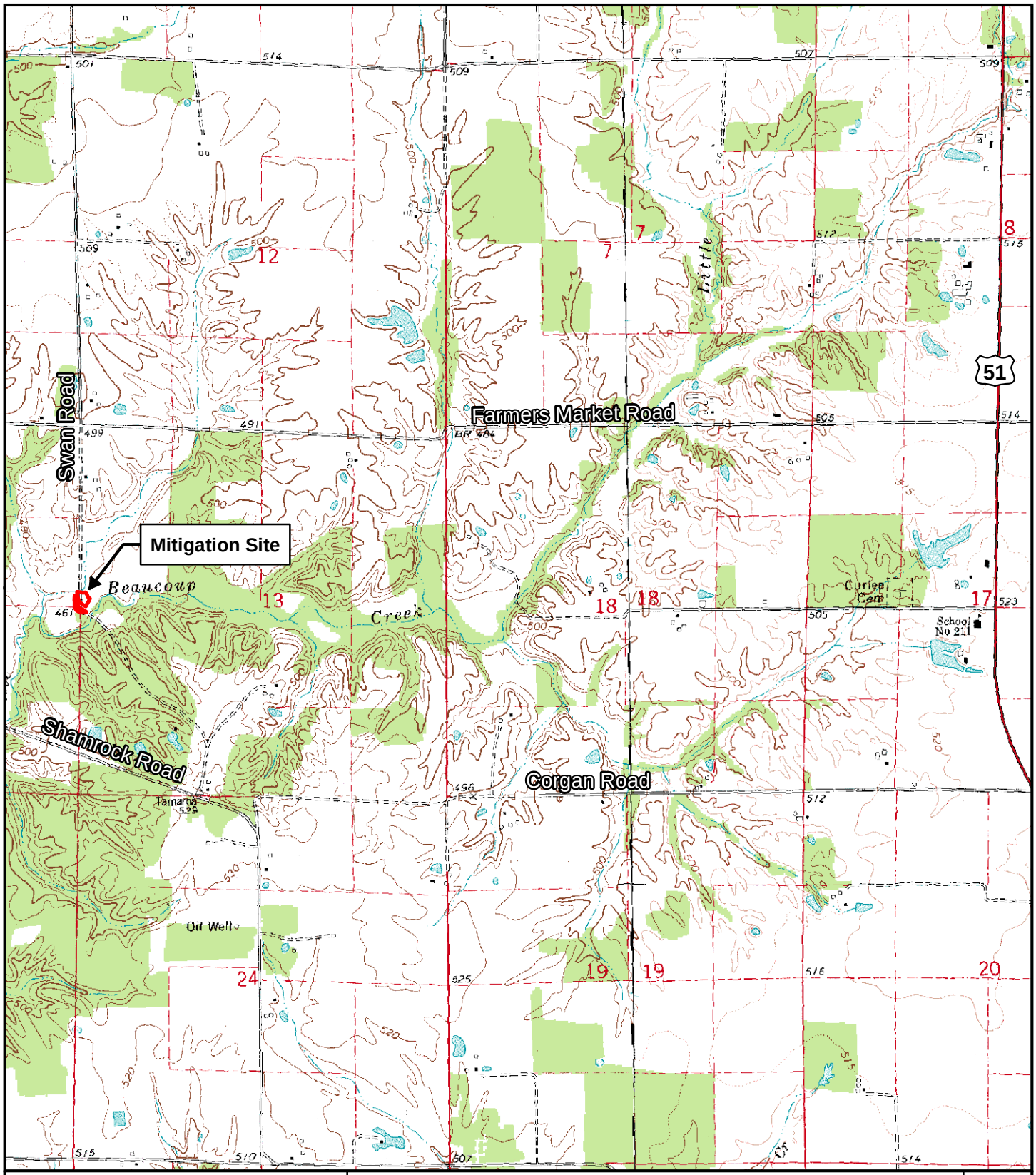
mCv = 2.8

FQI = 16.0

APPENDIX C

Figures

Figure 1 – Mitigation Site Location Map
Figure 2 – 2011 Wetland Mitigation Monitoring Map
Figure 3 – ISGS 2011 Wetland Hydrology Map



ILLINOIS
UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

Wetland Science Program
Illinois Natural History Survey
Prairie Research Institute
1816 South Oak Street
Champaign, Illinois 61820

Mitigation Site Location Map
Swan Road (TR 222)
Perry County

Seq. No: 12315

0 Meters 500
1 : 24,000

0 Feet 2,000
1 inch : 2,000 feet

February 2012

Figure 1

N

ILLINOIS
UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN
Wetland Science Program
Illinois Natural History Survey
Prairie Research Institute
1816 South Oak Street
Champaign, Illinois 61820

2011 Wetland Mitigation Monitoring Map
Swan Road (TR 222)
Perry County

Seq. No: 12315

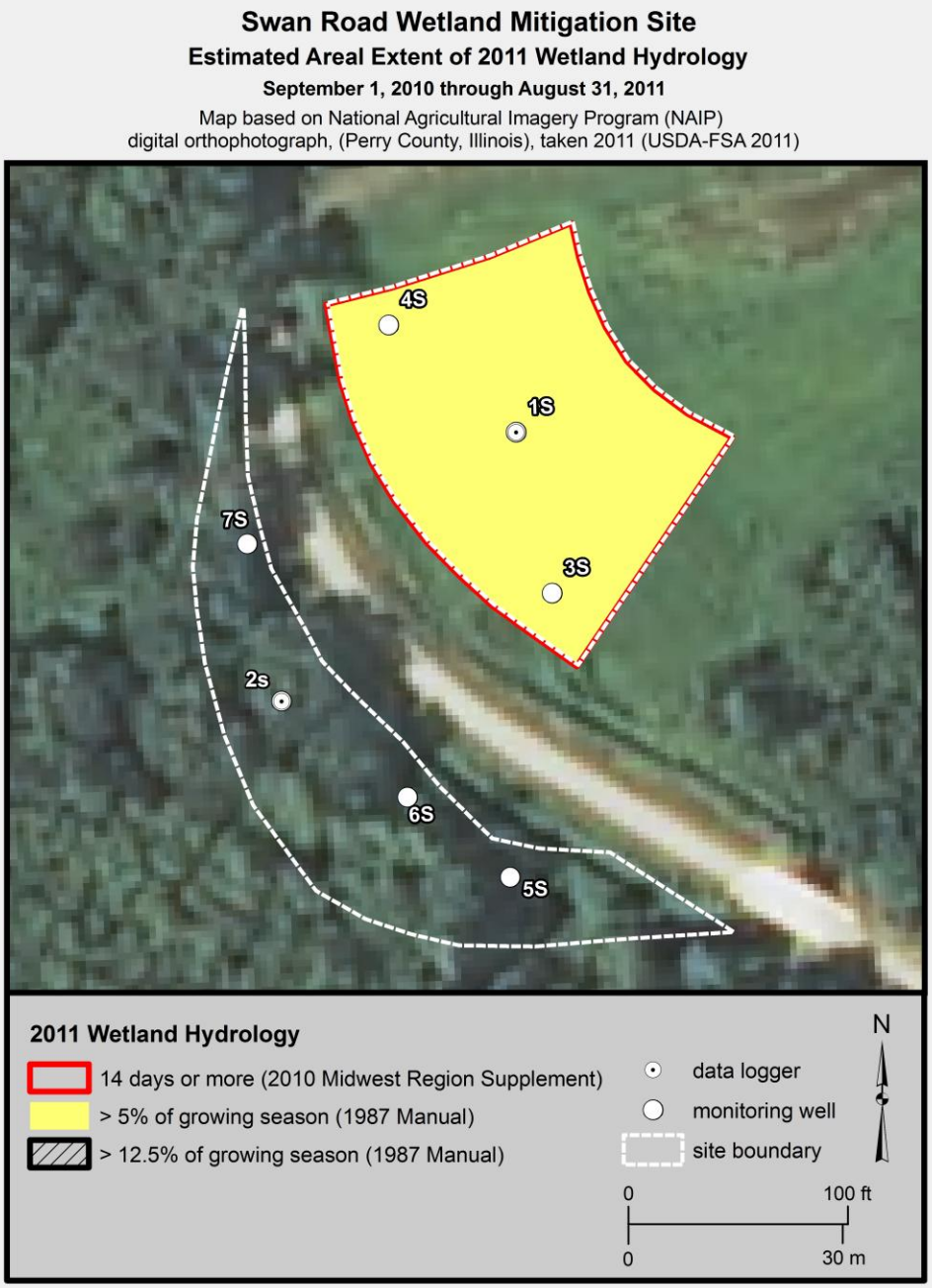
0 Meters 25
1 : 1,200

0 Feet 100
1 inch : 100 feet

February 2012

Figure 2

N

Figure 3

ISGS 2011 Wetland Hydrology Map (Miner et al. 2011)